

News Release

ENEOS and PFN Begin World's First AI-Based Autonomous Operation of Crude Oil Processing Unit

TOKYO - May 24, 2024 - ENEOS Corporation (ENEOS) and Preferred Networks, Inc. (PFN) announced today that they started continuous autonomous operation of an atmospheric distillation unit for processing crude oil in January 2024. The atmospheric distillation unit currently operated autonomously with an AI system is located in the ENEOS Kawasaki Refinery.

Jointly developed by ENEOS and PFN, the AI system automates large-scale, complex operations of oil refinery plants that required human operators with years of experience. Since 2018, ENEOS and PFN have been co-developing AI systems for improving safety and stability of plant operations by reducing dependence on technicians' varying skill levels.

With 24 key operational factors to control and as many as 930 sensors to monitor, the atmospheric distillation unit especially requires a high level of skills and experience. AI-based, continuous autonomous operation of an atmospheric distillation unit is the world's first, according to a consulting firm Globe-Ing Inc.

The AI system for the atmospheric distillation unit continuously monitors 24 key operational factors and adjusts 13 valves at the same time to stabilize fluctuations resulting from crude oil switching as well as changes in crude oil throughput. The AI system has demonstrated higher stability and efficiency compared with manual operations.

ENEOS and PFN plan to deploy the co-developed AI systems to other ENEOS refineries and later provide them as a packaged solution to external parties as well.

Through this collaboration, ENEOS and PFN will also support the United Nations' Sustainable Development Goals, including Goal 9 ("Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation").

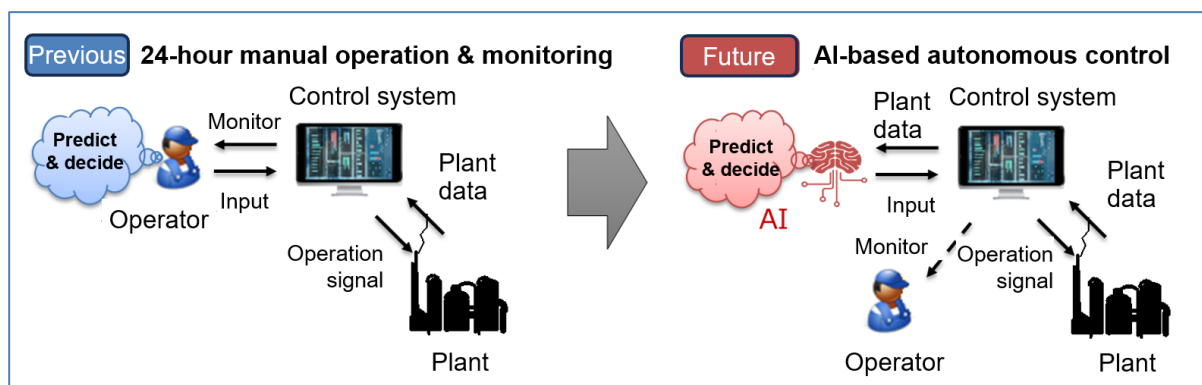
Note: July 2023 news release from ENEOS and PFN :

[ENEOS and PFN Begin Continuous Operation of AI-Based Autonomous Petrochemical Plant System](#)

Atmospheric distillation unit in ENEOS Kawasaki Refinery

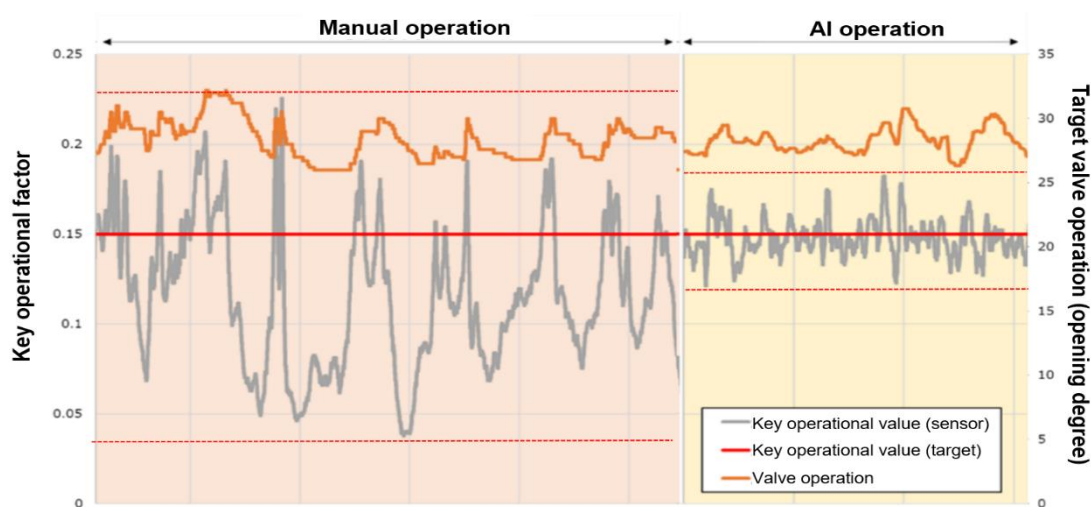


AI system for autonomous plant operation



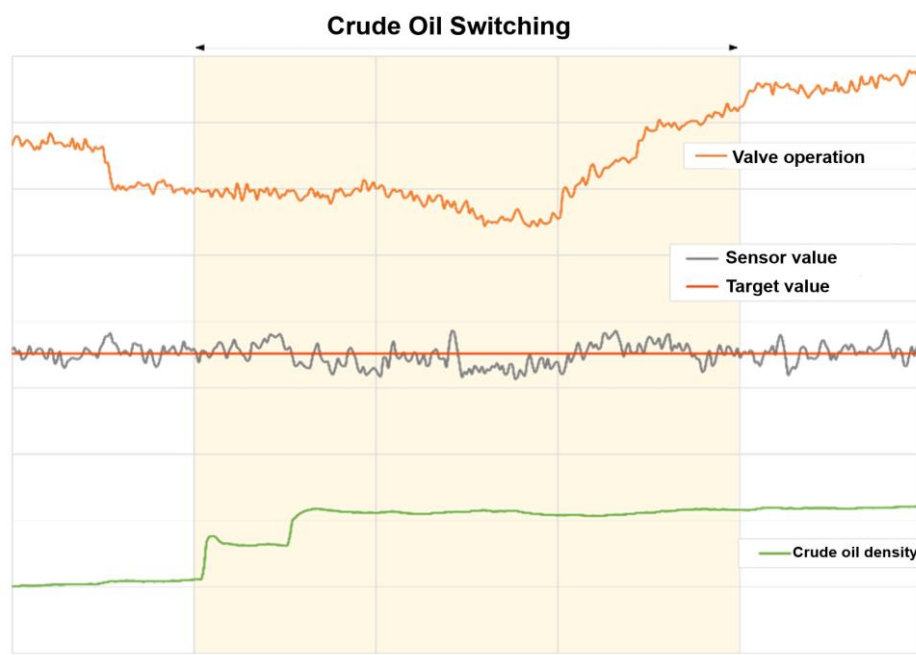
Stability of key operational factor (product property value) and control achieved by AI-based autonomous plant operation system

(Also included in the July 2023 announcement on the continuous autonomous operation of a butadiene extraction unit)



The AI system successfully controls the stability even under external disturbances by maintaining the key operational value close to the target value.

AI-based autonomous operation system's control during crude oil switching



The AI system successfully controls the stability even during crude oil switching operations.

About the ENEOS Group and ENEOS Corporation

ENEOS Group is Japan's leading energy company with manufacturing and sales facilities throughout the world. The Group has developed businesses in the energy and non-ferrous metals segments, from upstream to downstream. While fulfilling our responsibility of providing a stable supply of energy and materials both now and in the future, we will realize a carbon neutral society through energy transition. This is also a great challenge for mankind, and we, the ENEOS Group, will maximize our corporate value by steadily taking on the challenge. <https://www.eneos.co.jp/english/>

About Preferred Networks

Preferred Networks, Inc. (PFN) develops advanced software and hardware technologies in a vertically integrated approach, covering the entire AI value chain from chips, supercomputers, generative AI foundation models to solution and products. Founded in March 2014 in Tokyo, PFN has applied its technologies to a range of industries including manufacturing, transportation, healthcare, entertainment and education. PFN's MN-3, a supercomputer powered by its MN-Core™ AI processor, topped the Green500 ranking as the world's most energy efficient three times in 2020 and 2021. PFN has subsidiaries for materials discovery, robotics and foundation models. <https://www.preferred.jp>

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