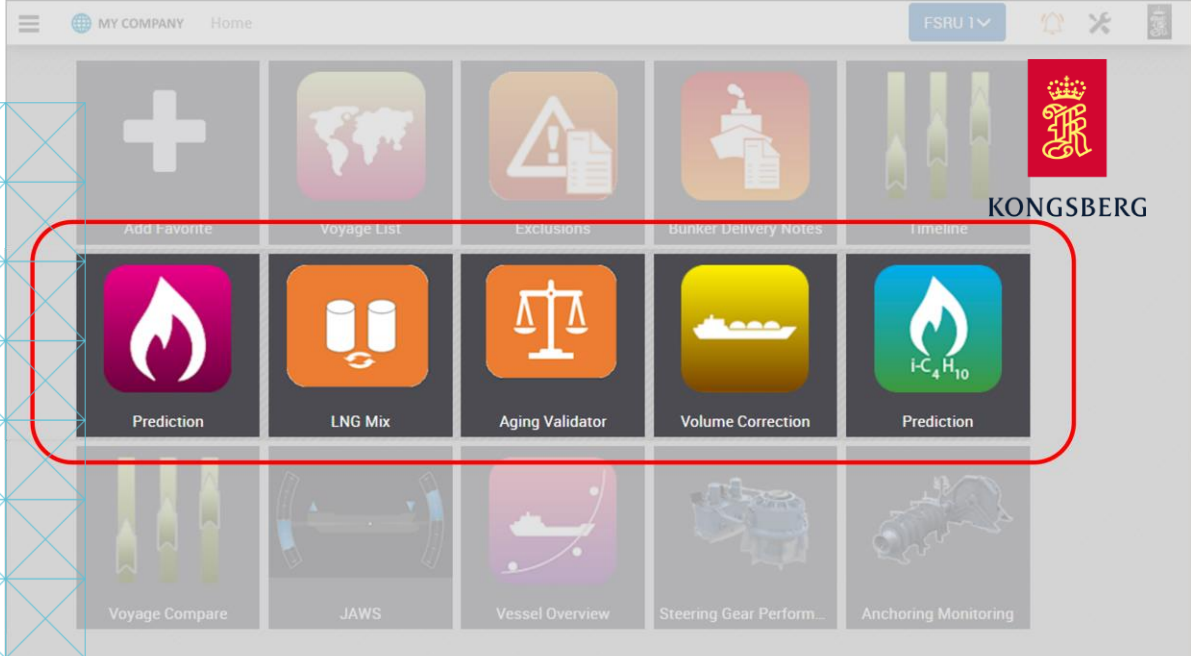


# LNG AGING



## KONGSBERG INFORMATION MANAGEMENT SYSTEM

### K-IMS: LNG Aging

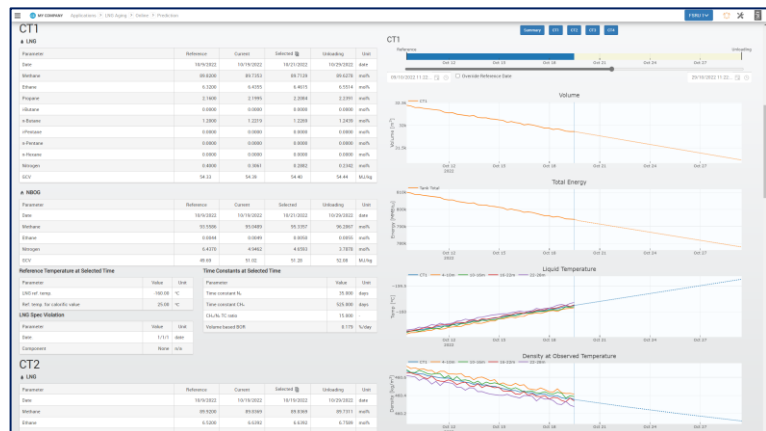
LNG Aging is an application suite available on Kongsberg Maritime’s Information Management System (K-IMS).

Operators can analyze and calculate swiftly implications and consequences of different options for LNG transport, e.g. reducing or increasing speed with respect to aging of LNG compositions and Boil off Rate, rerouting vessels to different terminals while ensuring that requirements are met with respect to LNG compositions.

The K-IMS LNG Aging application suite consists of an Online and Offline module.

#### Intuitive and User-Friendly User Interfaces

The **Online module** includes an **LNG Aging Prediction application** that uses the vessel’s live data for showing current and predicted LNG compositions for selected dates. When changing the selected dates, the application will automatically recalculate the LNG aging and compositions. Feature included to select a summary view for all tanks or individual tank view as shown below.



LNG Aging Online: Prediction for Cargo Tank 1

#### BENEFITS

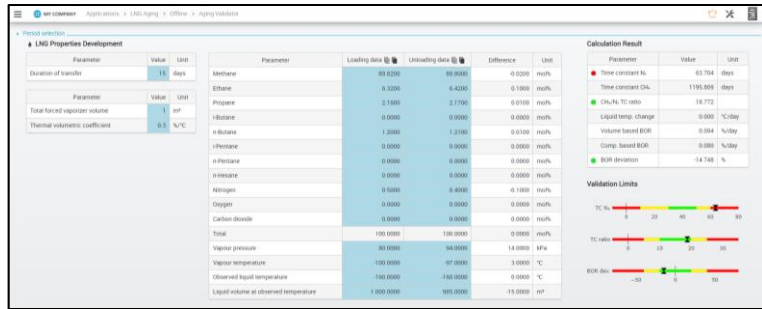
- Stay in full control of the LNG cargo
- Save time when calculating and planning different options for where to ship the LNG Cargo
- Ensure that the quality of the LNG cargo will comply with the requirements of the receiving terminal
- Validate the aging of the LNG cargo against expected values for the vessel

## FEATURES

- LNG Aging is easy to install and comes with several user-friendly applications and interfaces
- Integrated solution with live data from vessel for LNG prediction
- Graphs and Trends for operators to easily track LNG Composition development
- Copy and paste functions for LNG Compositions to easily transfer values between applications
- The application follows ISO6976 for Gross Calorific Value calculations and ISO6578 for Density calculations

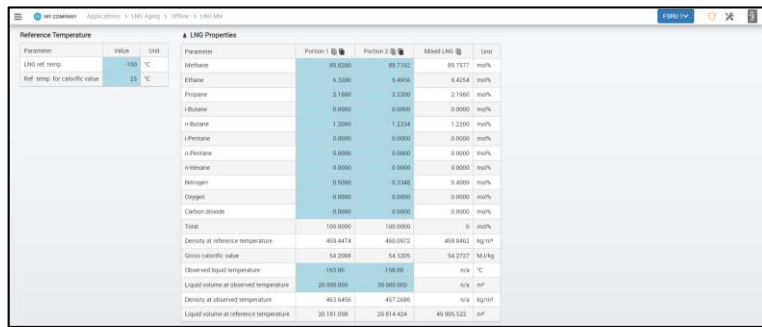
The **Offline module** includes four applications that are based on user data input. The four applications are: **LNG Aging Validator**, **LNG Mix**, **LNG Volume Correction**, and **LNG Aging Prediction**.

With the **LNG Aging Validator application** operators can input the loading and unloading LNG cargo data to validate and compare N<sub>2</sub>- and CH<sub>4</sub> time constants and Boil-Off-Rate against expectations.



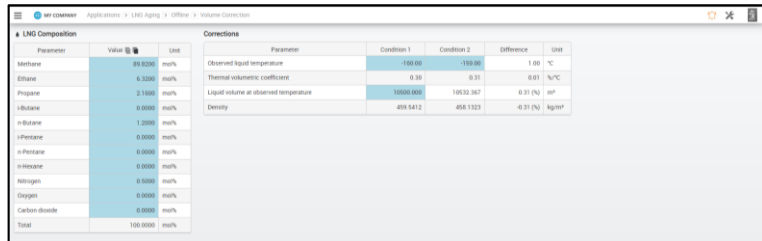
LNG Aging Offline: LNG Aging Validator

With the **LNG Mix application** operators can calculate the LNG composition after mixing two portions of LNG cargo e.g. the remaining LNG heel with a new loading of LNG at a terminal.



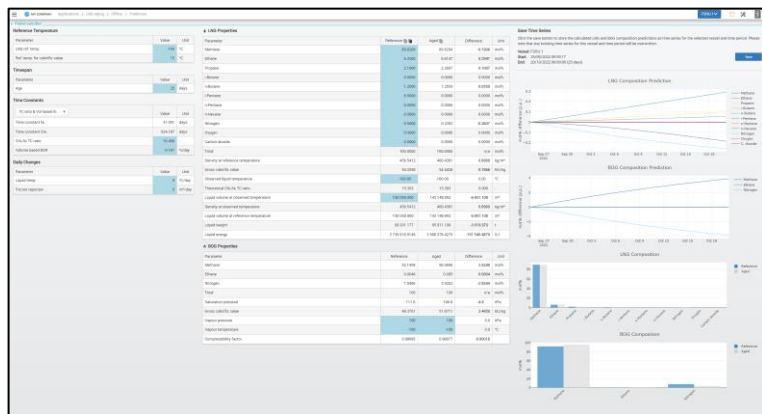
LNG Aging Offline: Mix Calculator

With the **LNG Volume Correction application** operators can calculate how the LNG cargo volume and density changes when the cargo temperature changes.



LNG Aging Offline: Volume Correction

With the **LNG Aging Prediction application** operators can calculate how the LNG compositions age and take data-driven decisions on e.g. reshuffling LNG cargo to other terminals while ensuring compliance with quality requirements.



LNG Aging Offline: Prediction