

# Liquid analysis in LNG trains

## Complete solution out of one hand



Liquefaction of natural gas for transport in LNG trains

### Benefits at a glance:

- Competent application know-how, even under challenging and complex conditions.
- Local contact persons and system integrators nearby.
- Complete solution from one source, which greatly simplifies operation.
- Implementation of experiences from previous project phases.
- Latest technology in liquid analysis like Memosens.

**In gas liquefaction plants, many parameters must be monitored to guarantee the safety of the plant and the employees. The different process areas show different demands on liquid analysis. This demanding environment requires the highest level of process knowledge and expertise.**

### Customer challenge

To transport gas economically over long distances, liquefaction of natural gas is a common process. However, since natural gas is highly sensitive and highly flammable, safety precautions must be taken to protect the surrounding area and the environment.

Different limits must therefore be observed in the various process steps in a gas liquefaction plant - also in the area of liquid analysis. Due to the complexity of the plant and the diverse process areas, numerous measuring stations have to be installed and maintained. It is also

important to ensure that the latest technologies are used when replacing equipment. This ensures that safety can be guaranteed in the future.

### Our solution

Liquid analysis in LNG trains can be divided into four areas that require different solutions:

- SRU-Plant
- Utility boilers
- Purification process
- Plant Utility Steam and Condensate

One part of the process is sulfur recovery. In the Sulfur Recovery Unit (SRU) the pH values in the waste heat boilers have to be monitored to be able to intervene immediately in case of unforeseeable events, which can be recognized by the change of the pH value. Due to the temperature and pressure in the heat boilers, the pH measurement is realized with a sampling system. Monitoring of the pH value in the connected condensers

is also essential in order to detect potential leaks .

The pH value is also an important parameter in the utility boiler sector. Both used boilers are connected to a reverse osmosis plant that converts seawater into drinking water. This saturated steam is used in different parts of the plant as process steam and can also be used for the power generation with steam generator turbines. The pH value, which is measured in the outlet of the reverse osmosis plant, is particularly important to protect the downstream processes of the plant.

Each boiler also has a cation exchanger. Before and after this cation exchanger, the conductivity of the media must be checked to ensure proper operation of the exchanger. The process-accompanying cooling circuit is additionally equipped with two sensors for free chlorine and turbidity to ensure the quality of the cooling water.

As part of the purification, carbonite solution is used in the scrubbing process. To regulate the processing of the carbonite solution, the conductivity is monitored in the entire scrubber unit.

Last but not least, the conductivity is also measured in different parts of the complete plant to monitor the utility steam and condensate.

#### Benefits and results

As you can see, liquid analysis is an important part of operating a profitable and safe LNG train. Plant operators benefit from state-of-the-art sensor and analysis technology that provides reliable measured values. Endress+Hauser is also a solution partner with extensive know-how even in such complex applications. The one-stop solution greatly simplifies operation and maintenance. Local contacts nearby support cooperation and coordination. Thus, the ideal process support can be guaranteed.



LNG production is seen as one of the most forward-looking methods in fuel technology.

#### Components

- Two-wire Transmitter CM42 with ATEX certification
- Four wire Transmitter CM442 with Cl-1, Div-2
- Digital pH Sensor CPS11D
- Digital pH Sensor CPS71D
- Digital conductivity sensor CLS15D
- Digital conductivity sensor CLS21D
- Digital conductivity sensor CLS50D
- Digital free chlorine sensor CCS51D
- Turbidity sensor CUS52D
- Multichannel, multiparameter software Memobase Plus CYZ71D

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