

# NIVELCO CASE STUDIES

## HIGH ACCURACY LEVEL MEASUREMENT OF LPG



**Közép-Európai Gázterminál Kft (Central European Gas Terminal Co.) chose Nivelco to conduct the instrumentation of their site, in the first phase starting with two vessels.**

The trade of LPG is strictly regulated by excise law in Hungary. Excise tax is to be paid by the vendor after the sold LPG quantity. Before this development project the company, which is one of the largest LPG dealers in Hungary, paid excise tax after the incoming LPG quantity, and not after the effectively sold quantity of LPG. The main motivation behind their instrumentation project at the Dunaalmás site was to install measurement instruments that will precisely measure the outgoing LPG quantity. The Hungarian Customs and Finance Guard (HCFG) is the supervisory body for excise tax. They only accept mass or volume values derived from level measurements validated by the NMI (National Metrology Institute). The NMI validates level measurements if the accuracy of the measurement is higher than 2mm.

The level transmitters have an NMI test certificate as well as a custom laboratory calibration certificate. The accuracy of the level measurement is 1mm.

The officers of the HCFG can read the measured value from the display on the electronic module. From the linearization table of the tank and the measured level value the volume can be determined, and from the temperature dependant density the mass of LPG in the tank can be accurately calculated. The missing quantity is the basis for excise tax calculation.



For high alarm indication vibrating forks have been installed.

### Parameters:

Tanks: 2 lying cylindrical tanks above the ground with a total capacity of 10 m<sup>3</sup>, diameter 2,5 m

The nominal pressure of the stored LPG is 16 bars. The effective pressure is lower, typically 12-14 bars in summer and 6-7 bars in winter.

When pressure test is conducted the pressure is 21 bars for 5 minutes.

### Temperature values of the stored LPG:

Ambient: winter -20°C,  
summer +35°C.

Specific gravity of the stored LPG:  
min. 0,51 g/ccm

The instruments are installed in hazardous environment.

### Installed instruments:

- NIVOTRACK MBA-325-A Ex magnetostrictive level transmitter (2 units)
- THERMOCONT TBC-527-A Ex temperature transmitter (2 units)
- NIVOSWITCH RCM-406-8 Ex vibrating fork level switch (2 units)
- NIPRESS DRC-382-6 Ex pressure transmitter (2 units)
- NIPOWER PPK-331-1 power supply (2 units)