



Application Case Study

DANGER! DANGER!

Multiple Gases

The Application

When hydrocarbon products are moved from a barge or railcar to a processing plant, they are often sent to a storage tank for temporary holding. These storage tanks are cycled frequently and can have different gases (vapors) in them at different times or at the same time.

A chemical plant in the southern USA needed a level transmitter for a temporary storage tank that was used for this purpose. Initial discussions indicated that there was a nitrogen blanket on top of the liquid. The tank was 40 feet (12.2m) tall and 60 feet (18.3m) in diameter. At first, this appeared to be an ideal application for this product.



The Problem

SOR® proposed a U71/BCP for this storage tank. This unit is plenty powerful enough to measure over the required range and a nitrogen blanket is normally not a problem for ultrasonics. However, when the unit was installed it was observed to fluctuate wildly and only occasionally track the liquid correctly.

After intense investigation, several phone calls and a field service trip from SOR, we discovered that the nitrogen blanket was not consistent and there were other vapors in the tank. The customer told us that there is usually a low layer of the hydrocarbon vapor on the liquid, with the nitrogen above that and in some cases

a layer of air at the top. This is due to the rapid filling and emptying of the tank and the fact that they pulled the nitrogen blanket off of the tank when not in use.

The echOsonix was not able to track the liquid because of the different gases and their changing composition. An ultrasonic transmitter must know the speed of sound in the medium in order to operate properly. When there are layers of different gases (all with different speeds of sound), it is impossible to accurately measure the overall speed of sound. The echOsonix can compensate for gases other than air, but it must be one gas only and consistent in mixture.

The Results

The echOsonix was determined to be the wrong technology for the application. It was impossible to calibrate the unit to provide any kind of stable reading. The U71/BCP was pulled out and an RF transmitter was used in its place. The RF transmitter is working properly and can ignore the changes in atmospheric gases.

