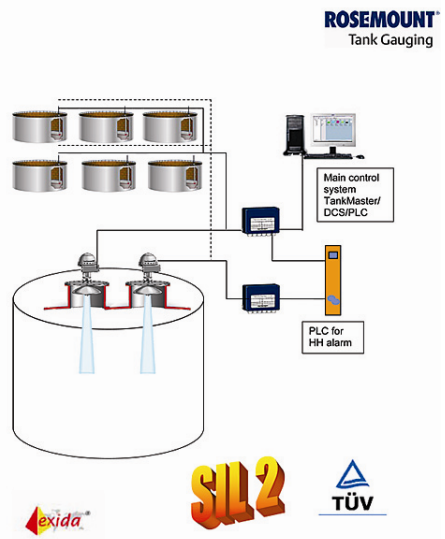
"TankRadar Rex Now Suitable For SIL2 Applications"

Rosemount TankRadar Rex is the first ATG that has been assessed by a third party (exida) and found suitable for use in SIL 2 safety functions according to IEC 61511



Overfill protection has always been important but it has probably never been more in focus than today. With today's modern technology it is possible to design a system that virtually eliminates tank overfills.
Rosemount Tank Gauging has several customers that have installed 2 radar gauges per tank.
The idea is that you have 2 continuous level devices that are checked against one another. In most installations today, you would have an automatic tank gauge and maybe a point switch. Most sites will do a monthly verification or test of this system. In actuality you only know that this system is functioning properly when you physically do the test and see the results. The second you are done, something could fail and you would not be aware of this failure until the next test or you reach an overfill condition. With two Radar gauges with advanced self diagnostics both communicating back to a HOST system it is possible to monitor the health and integrity of both devices automatically and continuously. This is accomplished by comparing the delta level value between each device. This provides a higher level of safety than is common today.
In the example below from a North American site they have installed two radar gauges on the same 20" manway. The two radar gauges communicate separately.
Gauge A is the primary level gauge that is shown on the operator's workstation. (Level and High Level).
Gauge B is the secondary level gauge used as an overfill device. (High High Level)
The system will alarm if any of the below criteria is met:
- Level has reached the alarm set-point of either gauge. (High, High High Level)
- The Delta level between A and B is more than "X". (where X equals the predetermined tolerance between each radar gauge. This value will depend on the installation and the performance of the ATG's used)
- Either A or B gauge fails.
- Manual alarm test of the system.

Who needs tank gauging and safety?

- Oil company executives
- Loss control managers
- Accounting
- Plant managers
- Operation managers
- Maintenance managers
- Instrumentation managers
- ... and their collaborates

Tank gauging is used for

- Transfer control
- ***Safety control***
- Operation control
- Inventory control
- Leakage detection
- Loss control/mass balance

Testing: One of the drawbacks with using the traditional level switch for overfill protection is testing the device. You typically go up to the tank and pull a chain or move a lever that engages the switch which triggers the alarm. It is a random test and there is no guarantee that the switch will perform next time it is engaged or a high level condition is reached. In addition they are tested very infrequently. With a solution using two radar gauges per tank you are continuously testing both devices because they are referenced against each other. An error in one of the devices would be detected immediately.

Excerpt from the Buncefield final report

"Recommendations on the design and operation of fuel storage sites"

www.buncefieldinvestigation.gov.uk

The Incident

In the early hours of Sunday 11th December 2005, a number of explosions occurred at Buncefield Oil Storage Depot, Hemel Hempstead, Hertfordshire. At least one of the initial explosions was of massive proportions and there was a large fire, which engulfed a high proportion of the site. Over 40 people were injured; fortunately there were no fatalities.

Significant damage occurred to both commercial and residential properties in the vicinity and a large area around the site was evacuated on emergency service advice. The fire burned for several days, destroying most of the site and emitting large clouds of black smoke into the atmosphere.

The Buncefield report "**Recommendations on the design and operation of fuel storage sites**" has the following to say about level switches and tank level gauging systems:

"The recommendation is intended to encourage the industry to move away from the use of simple level switches for ultimate high level indication and towards the use of more advanced sensors that incorporate 'on line' diagnostics and can therefore be considered to be 'fail safe'".

Increased dependability of tank level gauging systems

Tank gauging systems often employ mechanical servo gauges to sense the liquid level. However, such gauges appear to be vulnerable to a number of potential failure modes.

This recommendation is intended to encourage the industry to make effective use of the facilities provided in state-of-the-art tank gauging systems to reconcile the indications of product level in tanks with all available information such as product movement requests, pipeline flow measurements, temperature, etc. In this way it may be arranged that the failure of a single element of the system, such as a servo gauge, is detected and the operators alerted before a hazardous situation develops or before a demand is placed on the overfill prevention system.

A further contribution to enhanced dependability may result from the use of modern electronic gauge sensors, for example based on radar technology. Electromechanical servo gauges are intricate devices vulnerable to many failure modes. Electronic sensors eliminate the failure modes associated with mechanical components and may offer a higher reliability alternative. Such devices are readily available."

For the full Buncefield report go to the web site:
www.buncefieldinvestigation.gov.uk

REX and SIL

- Rosemount TankRadar Rex is the first ATG that has been assessed by a third party (*exida*) and found suitable for use in SIL 2 safety functions according to IEC 61511.
- We see an increasing demand for ATG primarily being installed as overfill protection in a Safety Instrumented System (SIS) in accordance with IEC 61511.