Rosemount Tank Radar New Facility:

See the video: http://videos.emersonprocess.com/detail/videos/measure-analyze/video/4886278142001/emerson-g%C3%B6teborg-sweden-brand-new-rosemount-radar-technology-facility?autoStart=true
Rosemount Tank Radar Three Primary Markets and Business Units

**Marine Applications**
- Custody transfer approved level gauging, actuation and cargo/ballast control

**Refineries & Tank Terminals**
- Reliable and highly accurate tank gauging systems for refineries and tank terminals
- Includes emulation of competitor gauges and wireless transmission of signals

**Process Industry**
- Level gauging on both liquid and solid materials for the process industry
In 1976, Rosemount Tank Radar sprung from the Saab missile division.

Olle Edwardsson and Kurt Isaksson started the new business unit within SAAB. The first product is called RUM-21.

World leader within Marine

1976

World leader within Oil industry

1985

A new business unit called Land (current Tank Gauging) is started.

1983

Saab Marine Electronics AB is founded

1980

A new business unit called Process Radar is started.

1996

Acquired by Emerson

2001

World leader within Oil industry

2010

5900 system

2001

A new business unit called Process Radar is started.

2017

40 years as Radar Center of Excellence

5900 system
Rosemount™ Tank Gauging and Overfill Prevention System

High performance bulk liquid measurement and overfill prevention
Rosemount™ 5900S 2-in-1

Unique 2-in-1 technology increases safety and reliability
Radar Tank Gauging in Pressurized and/or cryogenic vessels
Radar Basics

Radar

Tank Gauging

Cryogenic Tank Gauging
Radar Basics

Non-Contact Level Gauging

Evaluation of Non-Contact Techniques:

- **Ultra Sonic:**
  - Significant influence on accuracy by:
    - Tank Temperature
    - Tank Pressure

- **Laser:**
  - Significant influence on accuracy by:
    - Vapour
    - Dirt/deposits obstructing lens

- **Radar:**
  - Little effect from tank environment

Cryogenic Tank Gauging
**Radar Basics**

### Radar Measurement Principles

**Pulse Radar**
- Time of Flight Measurement
- Nano Second time differences

**FMCW (Frequency Modulated Continuous Wave)**
- Continuous transmission
- Frequency Measurement
- Higher accuracy
- Easy to handle disturbing echo
- Very Low Power \(< 0.5 \text{ mW}\)
Radar Basics

Measurement Principle

Frequency $f$ (GHz)

$t_0$, $\Delta f$, $d$, $\Delta f \sim d$

Cryogenic Tank Gauging
Full containment tank solution
We need redundant measurements of the level, both for process control and safety. In addition to this we need SIL rated shut off signals for overfill protection (SIL rated).”

Development manager, Gas engine, terminal and power company

Typical Vessel

- -160 DegC
- Vacuum isolated
- Outer diameter 3.8-7.7 m
- Max Pressure 8 bar
- Minimum of tank entries
Full Project Support
- Design
- Still pipes and accessories
- System/acceptance tests
- Commissioning /Start up
- Service and Warranties

Cryogenic Tank Gauging
We always stand behind our products