

New Technology

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What is coming?

- Level measurement
 - LIDAR
- Tank calibration
 - LIDAR
- Mass measurement
 - New coriolis techniques
- Density
- Air entrainment sensors
 - CIDRA SONARtrac
- New software solutions

LIDAR

- This is a technique using laser light for ranging, distance measurement and 3D modeling.
- It is currently rather expensive for use in level gauging but the cost are falling fast.
- It is seen as a very promising tool for preparing tank calibration tables.
- It also has potential for remote sensing of atmospheric pollutants (sulphur and nitrogen oxides).

Coriolis techniques

- 20 years ago coriolis was suggested and then dismissed for fuel mass flow measurement. Its weakness was dealing with multiphase flow.
- Novel software techniques have brought the multiphase flow accuracy to a couple of % accuracy and this is rapidly improving.
- The current systems can meet the overall accuracy requirement of 0.5% and it is expected that this will improve towards 0.2%.

Density measurement

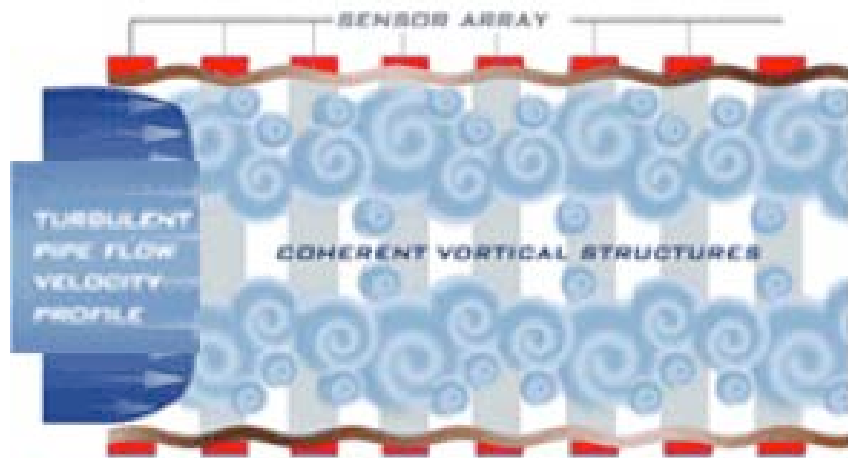
- In line density measurement
- Provides a continuous read out of fluid density in pipelines
- Distillates, Residual and LNG applications.



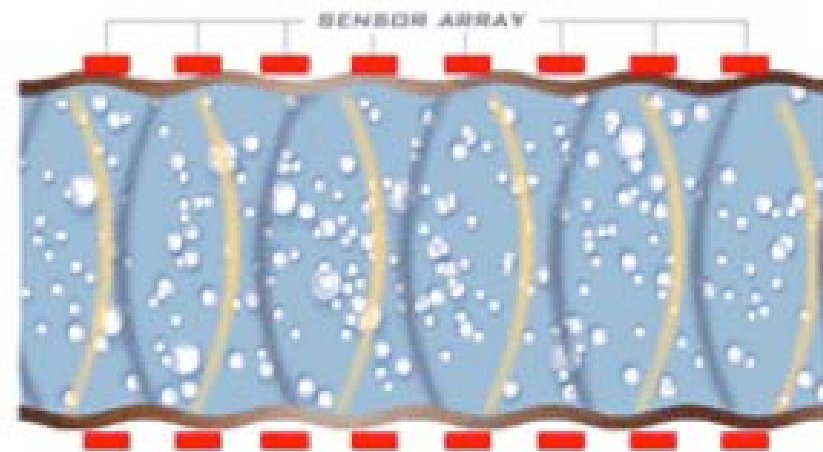
Air entrainment measurement

- CIDRA SONARtrac
- Uses sonar techniques to assess presence of entrained air or vapour.
- Already used in refineries and crude oil production systems.
- Sensors are clamped on to the outside of pipes.

SONARtrac principle



**Sonar array processing
For Volumetric Flow**



**SONAR-based
Speed of Sound
Measurement**

SONARtrac Clamp on



Software developments

- Bunker management systems
 - Operators (BunkerDashboard)
 - Deliverers (iBMS)
 - Traders (Bunkertech)
- Electronic transaction sites
 - Auctions sites (OceanConnect)
 - Bid Ask sites (ClearLynx)
- Electronic documents
 - Checklists , requisitions, BDN (Arbutus Point)



- Neutral web based site for all participants
- Each parties data is secure, private and invisible to all other than the sender and the intended recipient.
- Enquiry messages, chats, terms, offers and confirmations are archived and auditable
- Mobile smart phone access with full functionality



Welcome to ClearLynx.... a neutral transactional platform

Live, dynamic, synchronous
bid/ask trading screen



Mobile App mirrors desktop experience

Maintains same process and privacy you
have when procuring/selling bunkers today
plus...

Features

- Optimization/ Planning tool - Clear**Voyage**
- Live pricing & Demand data - Clear**View**
- Pricing and Data feeds - Clear**Data**
- Instantaneous coverage
- Notifications & Alerts
- Robust Contract module
- Claims Management
- Reporting & Performance Analytics -
Clear**Analytics**
- Audit compliance
 - Continuous deal by deal audit
 - Archived offers
 - Document Control
 - Benchmarking
 - Internal private CHAT log - Clear**Chat**
- Open API's for integration with any system

Slide courtesy of ClearLynx

And in the next 10 years?

- Further Information technology tools
 - Product availability
 - Delivery possibilities
- Shared delivery information
 - On line measurement
 - Electronic BDN
- Emissions and effluent monitoring
 - SO_x
 - No_x
 - CO₂
 - Scrubber wash water
- And more that we haven't imagined yet