



KONGSBERG AVMS

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ANNULUS VENT MONITORING SYSTEM FOR FLEXIBLE RISERS

KONGSBERG is an independent provider dedicated to developing and offering asset integrity assurance solutions for risers, umbilicals and wellhead systems in particular.

The KONGSBERG Annulus Vent Monitoring System (AVMS) is a stand-alone system for monitoring of the environment in the annulus of flexible riser pipes. The KONGSBERG AVMS is connected to the vent ports of the riser end-fitting at riser hang-off. The vent gas pressure, temperature and flow are measured continuously and analyzed automatically to estimate the free annulus volume. Changes in the free annulus volume estimate may indicate possible water ingress in annulus caused by damage to the riser outer sheath. Changes in the average vent gas flow may give early warning of anomalies in the venting process. All the monitored data are stored and made available for further processing as part of a life cycle integrity assessment.

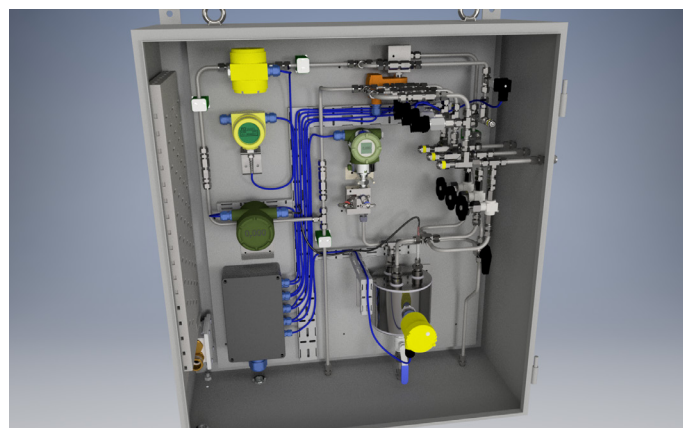
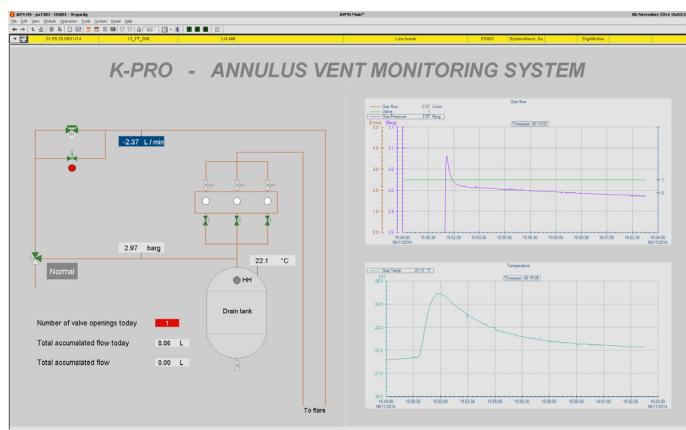
Riser Integrity Management System

As part of a Riser Integrity Management System the collected data from the AVMS together with analysis results based on the measurements can be viewed at the Riser Integrity Server onboard and optionally be transferred to onshore and distributed to riser experts and other stake holders for evaluation and to decide further actions in case of unexpected behavior. In this way the KONGSBERG AVMS system supports and facilitates Integrated Operations and improved Riser Integrity Management.

The KONGSBERG AVMS comprises the following main functions:

- Storage and presentation of monitored data
- High accuracy flow meter
- Automatic estimation and presentation of the free annulus volume
- Detection of flooding of annulus and breach of the outer sheath
- Trigger alarms for abnormal conditions and communicate these to the operation center on board
- Facilitate easy access to vent system for gas and fluid sampling and manual annulus testing
- Interface towards the topside control system (SAS)

- Drain pot with level indicator at lower most system elevation
- Check valves to avoid air or fluid to enter into the riser annulus
- Fail-safe design to avoid annulus pressure higher than specified allowable back pressure
- Optional interfaces to third party instrumentation systems e.g. fiber optics temperature sensing
- Optional interface to process data
- Optional cabinet heater and heat tracing of external vent piping



Technical Data:

Installation in Hazardous Zone:

AVMS cabinets for each riser, designed to fulfill ATEX and PED directives as required for the application and location onboard. The AVMS cabinets can be wall mounted or deck mounted and the size adapted to fit special needs.

Systems in Safe Zone:

- Power and communication: Power supply and communication modules for the instruments
- Valve Control System: Stand-alone valve control system with optional interface to SAS
- Riser Integrity Server: Process station for analysis, storage and data visualization

Specifications subject to change without any further notice.

