

Railway Operator Improves Safety with High-Quality Compressed Air



could perform reliably at -30°C dew point, that would be adaptable to different train models, and that had a guaranteed lifetime of at least 10 years. To find the right kind of instruments, the operator's engineering team liaised with Nordisk TogTeknikk ANS (NTT). NTT has been helping rolling stock operators with their compressed air challenges for over 10 years. They came up with three possible alternatives, one of which was the Vaisala DRYCAP® Dewpoint Transmitter DMT348. All three instruments were tested extensively both in laboratory conditions and in actual trains for four months.

Vaisala Transmitter Measures Reliably

According to the operator's system engineer, the Vaisala DRYCAP® Dewpoint Transmitter DMT348 was selected for a number of reasons:

- Vaisala's dew point transmitter proved to measure reliably, even in changing and harsh climatic conditions and it was cost-effective. In addition, Vaisala also modified the product to meet our needs, lists the system engineer the reasons for

High quality compressed air is indispensable to the reliability of railway operations. Harsh winters pose special challenges to maintaining this quality, which is why one railway operator decided to update the compressed air systems of over 120 trains.

In 2007, a European transport company kicked off an extensive project to update the compressed air systems of their rolling stock applications. Tens of applications, such as the braking system, coupling, air conditioning, and pneumatic doors, are powered by compressed air. To ensure high quality compressed air and safe operation of the train, dew point monitoring is critical.

Until their update project, the operator had point-checked dew point values every 7,500 kilometers or 14 days. As part of the project, they wanted to switch to continuous dew point monitoring, allowing them to respond quickly to problems and ensure safe operation until more

comprehensive maintenance would take place every 15,000 km or 28 days.

Thorough Testing

The operator needed new online dew point measurement instruments that



During the trials the DMT348 was installed in the compressor compartment (in the picture). In the final installation the probe is installed in the compressed air line and the transmitter inside the car, so that the personnel on train can see the alerts.

choosing Vaisala. The transmitter now includes a display alarm, it can be integrated to the train control system and has a data logging capability.

The Benefits of Continuous Monitoring

A reliable online dew point monitoring system has made it possible for the operator to locate and correct failures quickly, preventing long service breaks. Continuous monitoring has also meant that regular maintenance actions can be performed less frequently and without compromising the operation of the rolling stock applications.

Since starting the project, over 120 locomotives and trains have been retrofitted. The oldest DMT348 transmitters have been operating without maintenance for over three years. The operator has safely extended the calibration cycle of the transmitters by using hand-held dew point meters for reference check-ups. The first units have been sent for calibration, but the monitoring can continue by swapping spare dew point meters.

The Ultimate Test – a Harsh Winter

Throughout most of Europe, recent winters have been very cold and snowy giving the dew point instruments a chance to prove their functionality in changing and harsh conditions.

The railway operator is continuing the project, with some 40 additional trains to be retrofitted.



“In the beginning, I was a bit pessimistic whether the instrument could really function in extreme conditions, but I’ve been positively surprised. The instruments have really helped us protect our equipment. Vaisala’s dew point meters have been stable, high quality and precise.”
Railway operator's system engineer

One of the most important parameters to monitor in compressed air lines is dew point. Any excess moisture in the compressed air line may result in icy or even fractured air lines and cause damage to pneumatic cylinders, which in turn could lead to malfunctioning doors and brakes. Moisture also corrodes metal surfaces and increases wearing.

Challenges

- The railway operator wanted to improve the quality of compressed air.
- The operator wanted to find an online dew point meter that would perform reliably in harsh climatic conditions and be adaptable according to their needs. Periodic check-ups tied manpower and didn't pre-warn of possible problems. They also wanted to safely extend comprehensive train maintenance intervals.

Solution

- Vaisala DRYCAP® Dewpoint Transmitter DMT348 was installed in more than 120 trains, with an additional 40 planned.
- DMT348 provides reliable online monitoring covering a wide measurement range, while tolerating harsh climatic conditions.
- The user interface was modified according to the customer's requirements.

Benefits

- Improved reliability – online dew point monitoring enables continuous monitoring of compressed air quality. Regular maintenance actions can be performed less frequently.
- Cost savings – when failures are located and quickly corrected, costly service breaks can be avoided.

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