

Acoustic Emission *application*

- Global Monitoring of the structural integrity of the pipeline system by **Acoustic Emission** (AE), in two phases: during operation ("AE Condition Monitoring"), on the hot pipes, for enough long periods such that the operating parameters (pressure and / or temperature) suffer significant variations (testing standard of reference: ASTM E 1139); and, respectively, during the hydraulic test – on ambient temperature (testing reference standard: ASTM E 569). For application of **Acoustic Emission** on hot pipes, reliable high signal to noise ratio waveguides were achieved that can be used up to temperatures of 550 °C;

Acoustic Emission *equipment*

- AMSY 6 with 24 channels – Vallen Germany;
 - ASIP-2 Dual channel processor board;
 - TR-2/512MB Transient recorder module for ASIP-2. 256MB per channel.
- AE sensors, 10÷1000 kHz, resonance at 75, 150 or 375 kHz, integrated preamplifier (34 or 40 dB gain);
- Specialized software for AE sources location (linear, planar, spherical, tank bottom, solid and cuboid location);
- Specialized software for recognition and classification pattern;



Acoustic Emission during operation (case study)

Acoustic emission examination of steam pipe with ND
150 mm.

- Duration of examination: 14 hours;
- Temperature recorded during the test: 195÷200 °C;
- Pressure recorded during the test: 13.2÷14.8 bar;
- Sensors used: VS 150 RIC – 4 pcs. and VS 75 SIC – 4 pcs.;
- Coupling conditions: waveguide coupling;
- Total length of examined pipe: **25 m;**

Acoustic Emission during operation (case study)

- Examination results:
 - 5 active sources and 1 **inactive** source

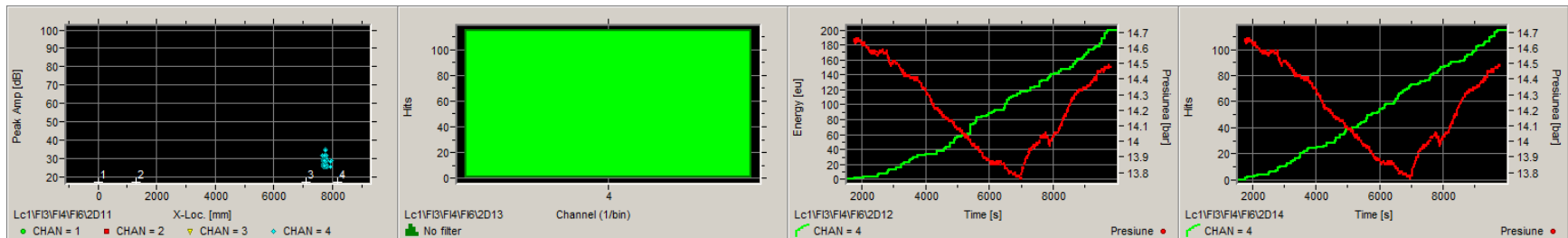


Fig.1 Active source

- NDT follow-up:
 - All active sources were examined with VT, MT, PT and RT;
 - Inactive source was VT examined;
 - Two of active sources representing buttwelds of T-pieces were rejected on NDT follow-up. One of them was an outside crack revealed by MT and PT and other was an inside defect revealed by RT.

Acoustic Emission during pressure test (case study)

Acoustic emission examination of diesel fuel pipe with
ND 350 mm.

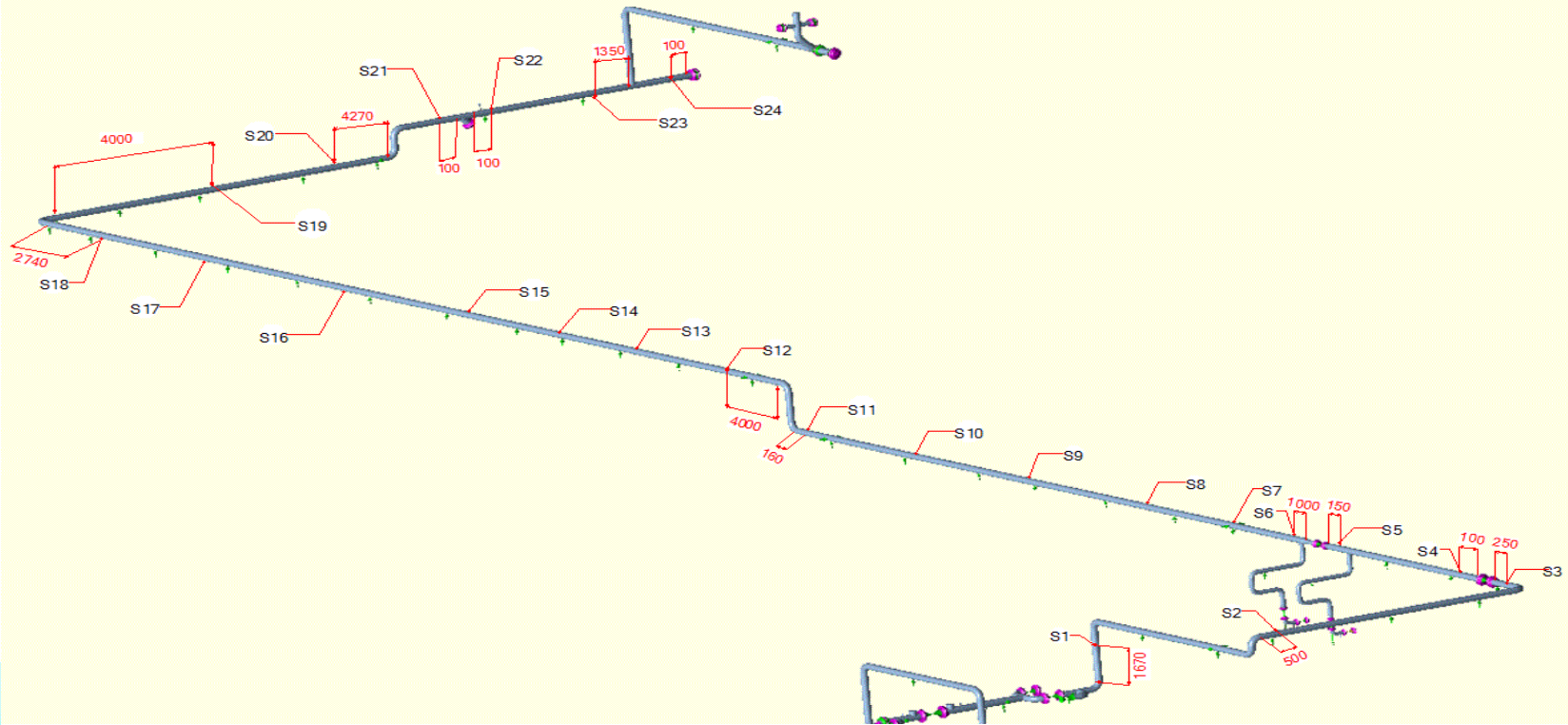


Fig. 2 – Sensors position

Acoustic Emission during pressure test (case study)

- Duration of examination: 2 hours;
- Temperature recorded during the test: 8÷10 °C;
- Pressure recorded during the test: rise and fall of 0÷10 bar;
- Sensors used: VS 150 RIC – 19 pcs. and VS 75 SIC – 5 pcs.;
- **Spectrum range: VS 150 RIC - 95÷300 kHz, VS 75 SIC - 50÷300 kHz;**
- Coupling conditions: Direct coupling of sensors to surface;
- Total length of examined pipe: 166 m;
- Examination results: No acoustic sources;