1.11.12. SYSTEM FOR UNDERWATER ULTRASONIC TESTING OF TRUNK PIPELINES “SKARUCH-UW1”

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An 8-th channel ultrasonic testing system “SKARUCH-UW1” for base metal and welds testing of underwater sections of trunk pipelines ∅508–1,420 × 7 – 40 mm with immersion depth up to 60 mm is designed.

The system includes:

1. Underwater device:
– Electronic 8-th channel unit (flaw detector-thickness gage);
– Remote monitor;
– Multiple-unit acoustic block with working cable inside;
– Mechanical unit with sensor of testing length.
2. Connecting cable for manage and power.
3. Unit for power and connecting with PC.
4. PC.

The system functions in 16-cycle mode, each cycle implements a certain testing circuit. Each cycle has its own established frequency in accordance with the current norms and regulations, position and duration of gate (depending on thickness and distance to the weld), amplitude thresholds of flaw detection and flaw section measurement. In all 16 cycles amplitudes are captured for each millimeter and subsequently processed by flaw detector.

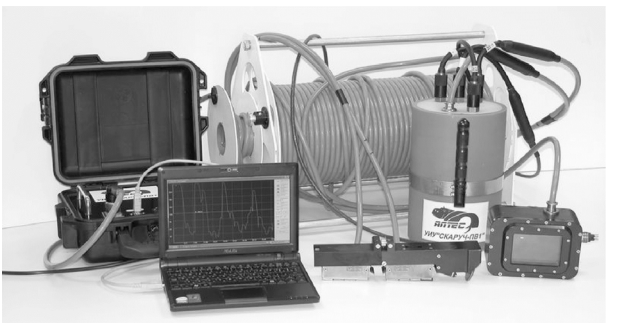

Fig. 1

For butt joints with two-side access the weld and main material are scanned on each millimeter on the both sides of the weld simultaneously, and on the entire tested area if MAU is moved by operator.

Gating and microprocessing of received signals by every PET facilitates identification of flaw by established algorithms (volumetric, planar, volumetric-planar) and determination of its parameters by comparing all the received signals and identification of maximum (for echo methods) and minimum (for echo-mirror methods) amplitudes on each scanned millimeter.

Results can be viewed on the remote screen of the device or in PC. If required results can be printed by printer connected to the flaw detector or to a PC. The evaluation of results allows to qualify the welded joint in accordance with standards.