ACTIVE TEST GROUP

SYSTEMS OF MAGNETIC PARTICLE INSPECTION OF PIPE ENDS

ERMAG

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SYSTEMS OF MAGNETIC PARTICLE

Compliance to

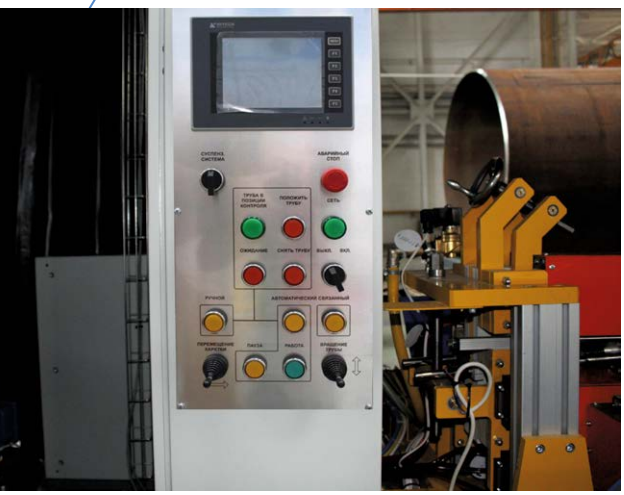
GAZPROM:
СТО Газпром 2-3.7-050-2006
(DNV-OS-F101)

TRANSNEFT:
ОТТ-23.040.00-КТН-135-15
ISO 10893-5:2011

- Application area: at production line of longitudinal electric welded trunk line pipes;
- Objects: the ends of trunk line pipes ∅ 426–1420 mm;
- Detection of surface defects (laminations, cracks) of any directions;
- Inspection areas: bevel, bearing face, outer and inner cylindrical surface at a distance of 200 mm from the pipe ends.

Control station has 3 working modes:

- ▶ Manual
- ▶ Automatic (one station is on)
- ▶ Automatic bound (two stations are on)



Front panel of control station

The system consists of two identical control stations, each of which comprises:

- frame with a tray;
- trolleys with a system of magnetic circuits and a control panel;
- darkening booth;
- suspension system;
- power cabinet;
- PC;
- snapshot camera;
- a source of UV emission;
- printer.

The system stands on a position where the magnetizing device is located in the required inspection zones. The location of the monitoring module and the pipe is set automatically and controlled by the respective gages. After that, the inspection process starts — the magnetizing system is on, the pipe ends are sprinkled with magnetic suspension, the latter is then collected in a tray and circulates through a closed loop.

INSPECTION OF PIPE ENDS (SMPI) 426/1420

ERMAG SERIES

During the process of sprinkling and magnetizing the contrast indication is being formed (method of applied magnetic field)

Indication of magnetic field with indication strips Castrol I

The magnetization system consists of a cruciform magnet that magnetizes pipe in the longitudinal and transverse directions. The geometric arrangement of the magnetic cores and the phase-amplitude ratios of the currents in the coils set such conditions that vector head of magnetic field strength forms quasi-ellipse in time and sequentially magnetizes the inspected areas of pipe in all directions. This allows defect detection of any direction.

System parameters:

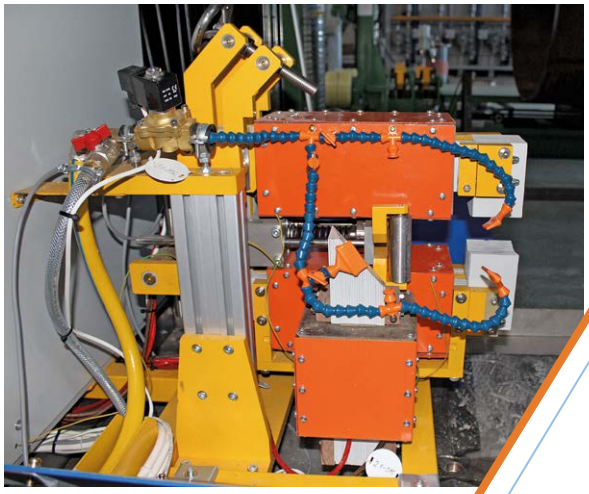
- magnetization: circular, longitudinal and radial;
- magnetizing current — alternate 50 Hz;
- magnetization field: from 2.5 to 4.8 kA/m;
- smooth current regulation mode in the entire range;
- digital recording of the amplitude value;
- current presetting;
- automatic sustension of the current value with an accuracy of 5%;
- generator power — 32 kVA;
- built-in temperature gage;
- magnetization start by means of control panel or automatically.

PROGRAM SOFTWARE «MPI PROTOCOL»

Specialized software «MPI PROTOCOL» is a desktop Windows application for recording and managing protocols. The main window includes two tabs:

The **«Protocol form»** tab is a tab for entering and saving analysis results. After the protocol is saved, it becomes uneditable. In case any fields are not validated, a window with a corresponding error or warning will be displayed.

The **«History»** tab allows search through the specified filter protocols in the database, view them and export them into Word files.



Magnetization block. Side view

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Technical parameters of SMPI 426/1420 ErMag series

Parameter	Value
Amplitude value of magnetic field strength on the inspected part surface, A/m	
– on the outer and inner cylindrical surface of pipe (at the 200 mm from the pipe end) in the direction of longitudinal and circular magnetization	No less than 2 400
– on the pipe end surface and on bevel in radial and perpendicular direction to it	
Length of remaining magnetic field, mm	200
Speed of magnetic suspension supply, l/min	No less than 3
Inspected pipe diameter, mm	426–1420
Inspected pipe wall thickness, mm	5–60
Inspected pipe length, mm	10000–12500
Time inspection of one pipe (with the arrival and departure of control stations, in automatic bound mode), min	6
Precision of station positioning relatively to pipe end, mm	No worse than 5
Time of adjustment to another tube size, min	No more than 30
UV emission of the controlled surface, mcW/cm^2	No less than 2 000
UV emission range, wavelength, nm	«A», from 300 to 400
Power consumption of one station, kVA	No more than 80
Dimensions of one station (W×D×H), mm	
– without darkening booth	1300×1200×3600
– with darkening booth	3500×4200×2200
System weight, kg	No more than 400

Company ActiveTestGroup offers systems for inspection pipes of various assortment. The final dimensions of the system depend on Customer requirements for the location of equipment, diameter and length of the pipes to be inspected.

MAGNETIC PARTICLE INSPECTION SYSTEMS AND EQUIPMENT ErMag SERIES

ErMag 1800

Magnetic particle inspection units, ErMag series, to inspect parts made from ferrous materials or ferromagnetic alloys

FULL UPGRADE OF MAGNETIC PARTICLE INSPECTION UNITS

Example of modernization of magnetic flaw detector УМДЭ-10 000

DEMAGNETIZER DMU 65/65

Semi-automatic device for demagnetization of parts in the conditions of manufacturing, repair and maintenance

SPS-40

System for magnetic suspension application

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