



**DIAGNOSTIC ANALYSIS OF PIPES IN STEAM BOILERS  
SUPERHEATERS TO VERIFY DURABILITY CRITERIA AND  
DETERMINE LIMITING LEVEL OF MATERIAL DEGRADATION**

Kosman Gerard, Kurowicz Marek, Kosman Wojciech  
Institute of Power Engineering and Turbomachinery, Silesian University of Technology  
Gliwice, Poland

The main aim of analysis of the pipes in steam boiler superheaters is to determine the limiting level of material degradation caused by corrosion. This research was conducted because nowadays there are various criteria applied to the assessment of the durability of the superheaters but all of them are simplified. The analysis involved several tasks. This paper presents a some of them, including diagnostic tests on samples cut as a piece of piping from the superheaters.

This paper describes the test stand. Its main feature is the possibility to create a stable pressure inside a tested piece of pipe. The pressure may excess the strength of the test piece. The test stand allows then to measure and register the strains in an arbitrary cross-section of the test pipe. The pressure inside the test piece is generated by a hydraulic system, which measures the pressure within 0 - 300 bar.

The changes in geometry of the test piece are measured by two sensors. These sensors are located 1.25 - 1.5 mm from the outer surface of the test piece on the opposite sides of the pipe. During the measurements they are moved around the circle, whose center coincides with the axis of the pipe. This allows to measure the distance between the sensor and the surface of the pipe with the accuracy of several micrometers.