

**THE POSSIBILITY OF REVEALING AND ASSESSMENT AGE RELATED
DEGRADATION AND INDUSTRIAL FLAWS IN HIGH CHROMIUM STEELS
PIPING AND EQUIPMENT
BY QUANTITATIVE ACOUSTIC EMISSION
NON-DESTRUCTIVE METHOD**

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ABSTRACT

The advantages of high chromium steels have been considered, which allowed increase the operating temperature of plants by about 60⁰C in 30 years, manufacture thinner and less heavy components, decrease time of start up and shut down processes, as well as thermal fatigue damage. At the same time it was revealed factors that decrease operation safety and lead to failures of high energy equipment and piping. The authors assumed that dangerous situations and economical losses could be prevented as a result of research and development concerning:

- The mechanisms of structural integrity transformation of new high chromium steels, their dependence from operational conditions, and external influences, the earliest quantitative indications of failures.
- Methods for evaluating danger level according to the fracture criterion of interacting randomly dispersed flaws.

It is demonstrated that the Quantitative AE NDI method that was successfully used to diagnose the condition of high-energy piping of nuclear and fossil power plants, chemical and refinery reactors, can be used after certain improvement to inspect high energy equipment made from high chromium steels.

ADVANCED MATERIAL NANOTECHNOLOGY IN ISRAEL

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ABSTRACT

One of the most interesting and perspective directions in material engineering of the last years is development of technology of nanocomposite materials consisting from two or more phases with precise interphase border and nanostructured materials based on interpenetrated polymer network. Israel is one of leaders in nanotechnology, not only in fundamental academic researches but mainly in industrial researches and founding start-up companies. Some important results in the nanotechnology material engineering field in Israel are summarized in the paper.