

1.7.22. APPLICATION OF AE METHOD IN NUCLEAR POWER INDUSTRY

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Until now, the acoustic emission method, which is used widely in oil-and-gas industry of Russia, does not find application in non-destructive testing in the nuclear power industry.

New possibilities of this method, which are opened for the last time, hold out a hope of its implementation at nuclear power plants (NPP).

Presently, such possibilities of the acoustic emission method are evaluated with obtained results as:

- Monitoring of material degradation;
- Measurement of corrosion rate;
- Detection of stressed-strained state zones;
- Performance of integral thickness measurements (at a section located between sensors).

Along with traditional application, detection of developing defects like cracks, flaws of welded seams, corrosion, makes this method an attractive one for nuclear power industry.

Taking into account special requirements specified for the performance of non-destructive testing at nuclear power stations, time of personnel staying in zones of increased radiation is an important factor. New architecture of acoustic emission instruments (serial connection of channels) was developed. This architecture allows time of personnel staying in dangerous zones to be reduced by 40%.

Taking into account complex structural features of nuclear power stations and high labor intensity of performance of ultrasonic testing in standard mode, new approach is proposed: to perform firstly testing during shutdowns under acoustic emission method and then to perform testing only at revealed hazardous sections under ultrasonic method.

Long-term positive experience of work is confirmed at oil-and-gas facilities. Application of acoustic emission method as an integral one, using systems of combined diagnostic monitoring is considered as especially prospective one.

Currently, acoustic emission method has found already application in the nuclear power industry of France, USA and Ukraine.

In Russia, first document adjusted for application at NPP's is adopted.