

Dr. Boris Muravin

Personal professional experience

Acoustic emission industrial applications (development and implementation)

Sector	Applications
Power industry	<ul style="list-style-type: none">✓ High energy piping on-line inspection.✓ Deaerators.✓ Boiler headers.✓ Turbine components.✓ Leak detection.✓ Dynamic hanger assessment.
Oil, gas and chemical industries	<ul style="list-style-type: none">✓ Process piping.✓ Gas lines.✓ Pressure vessels.✓ Storage tanks.✓ Fractionators.✓ Reactors.✓ Glass-lined equipment.✓ Heat exchangers.
Nuclear industry	<ul style="list-style-type: none">✓ Monitoring water cooling loops.
Civil structures	<ul style="list-style-type: none">✓ Reinforced concrete and metal bridges.✓ Buildings,✓ Tunnels,✓ Concrete structures after fire,✓ Landslide activity.
Airspace	<ul style="list-style-type: none">✓ Composite structures.✓ Titanium alloy pressure vessels.
Military	<ul style="list-style-type: none">✓ Armor.✓ Navy equipment.

Material research and fracture mechanics

Sector	Applications
Failure mechanisms	<ul style="list-style-type: none">✓ Crack interaction problems.✓ Fatigue.✓ Thermal shock.✓ Creep.✓ Stress corrosion cracking, hydrogen embrittlement, caustic corrosion.
Materials	<ul style="list-style-type: none">✓ Investigation of AE, mechanical and metallurgical properties of steels and alloys, different weld joints concrete, composites.
Flaw assessment	<ul style="list-style-type: none">✓ Numerical calculation of stress intensity factors, J-integral values, etc.✓ Remaining lifetime evaluation.

Computational fracture mechanics	<ul style="list-style-type: none"> ✓ Development of numerical methods for crack assessment. ✓ Static and dynamic problems of multiple crack interaction. ✓ Quasi-static and dynamic crack propagation analysis.
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Acoustic emission equipment and analysis methods

Sector	Description
Multifunction AE devices	<ul style="list-style-type: none"> ✓ Definition of requirements and functionality of hardware and software. ✓ Algorithms for hit parameters calculation, development of advanced alarms and location methods.
Sensors	<ul style="list-style-type: none"> ✓ Sensors design, preamplifiers and signal/noise generators requirement and functionality definition.
Analysis method	<ul style="list-style-type: none"> ✓ Development and implementation of statistical data analysis methods including advanced hit detection techniques, data classification, etc.

Acoustic emission training

Sector	Description
University course	<ul style="list-style-type: none"> ✓ Non-destructive testing including Acoustic Emission ✓ Material and processes for NDT technology
Course	<ul style="list-style-type: none"> ✓ Practical course of Acoustic Emission Testing
Seminars	<ul style="list-style-type: none"> ✓ Acoustic Emission testing (fundamentals and applications)

Acoustic emission standards

Sector	Applications
Terminology	<ul style="list-style-type: none"> ✓ Development of standard Acoustic Emission terminology in ASTM (chairman of AE terminology in ASTM subcommittee on AE).
Steam piping examination	<ul style="list-style-type: none"> ✓ Preparation of standard procedure for inspection of steam piping systems during operation.
AE structural health monitoring	<ul style="list-style-type: none"> ✓ Preparation of standard for acoustic emission structural health monitoring.