STRESS ENGINEERING SERVICES INC. an employee-owned company

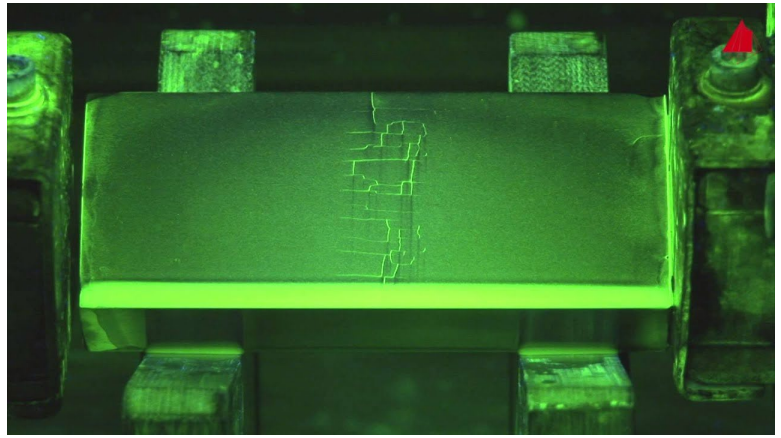
IFS Business Unit

NDT Testing – Acoustic Emission Testing

Date: 30 April 2026

ENGINEERED SOLUTIONS

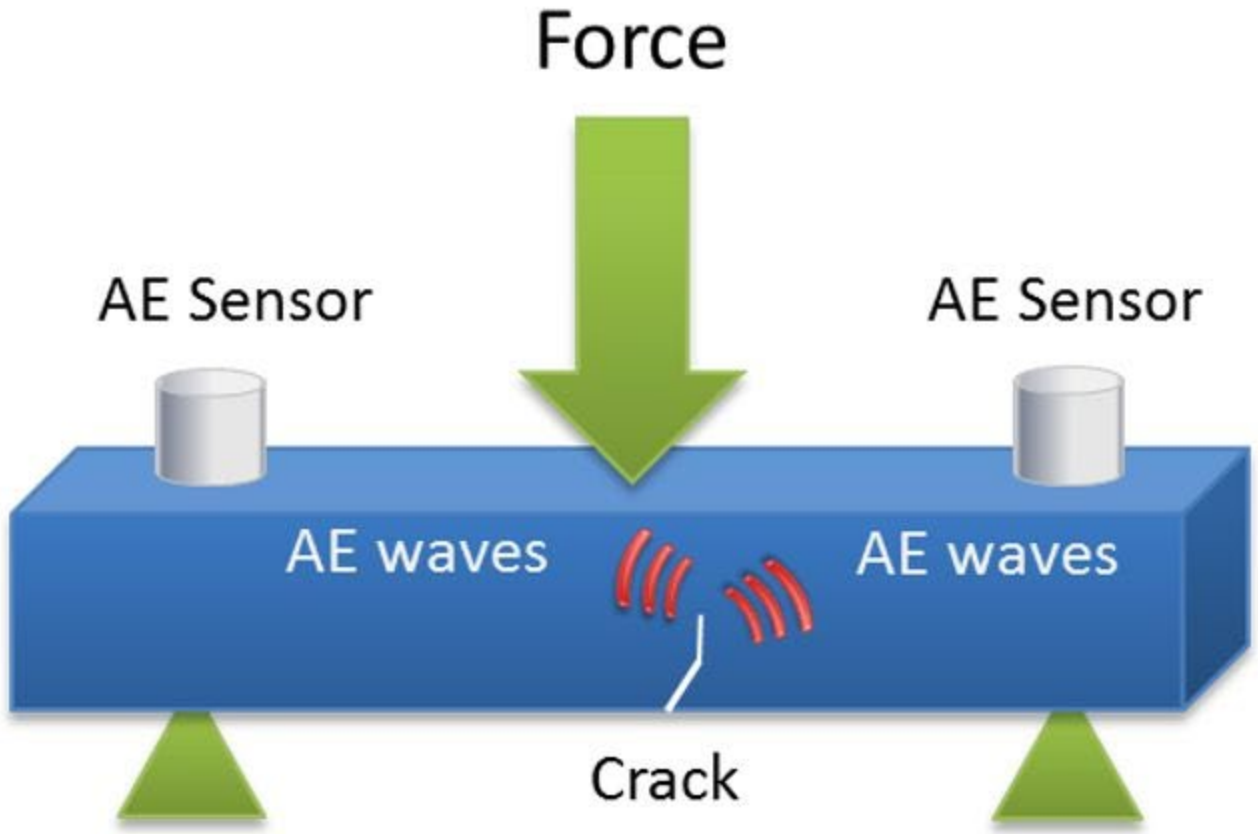
NDT INTRODUCTION



ASME SECTION V

ISO

Acoustic Emission Testing



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ACOUSTIC EMISSION SENSORS

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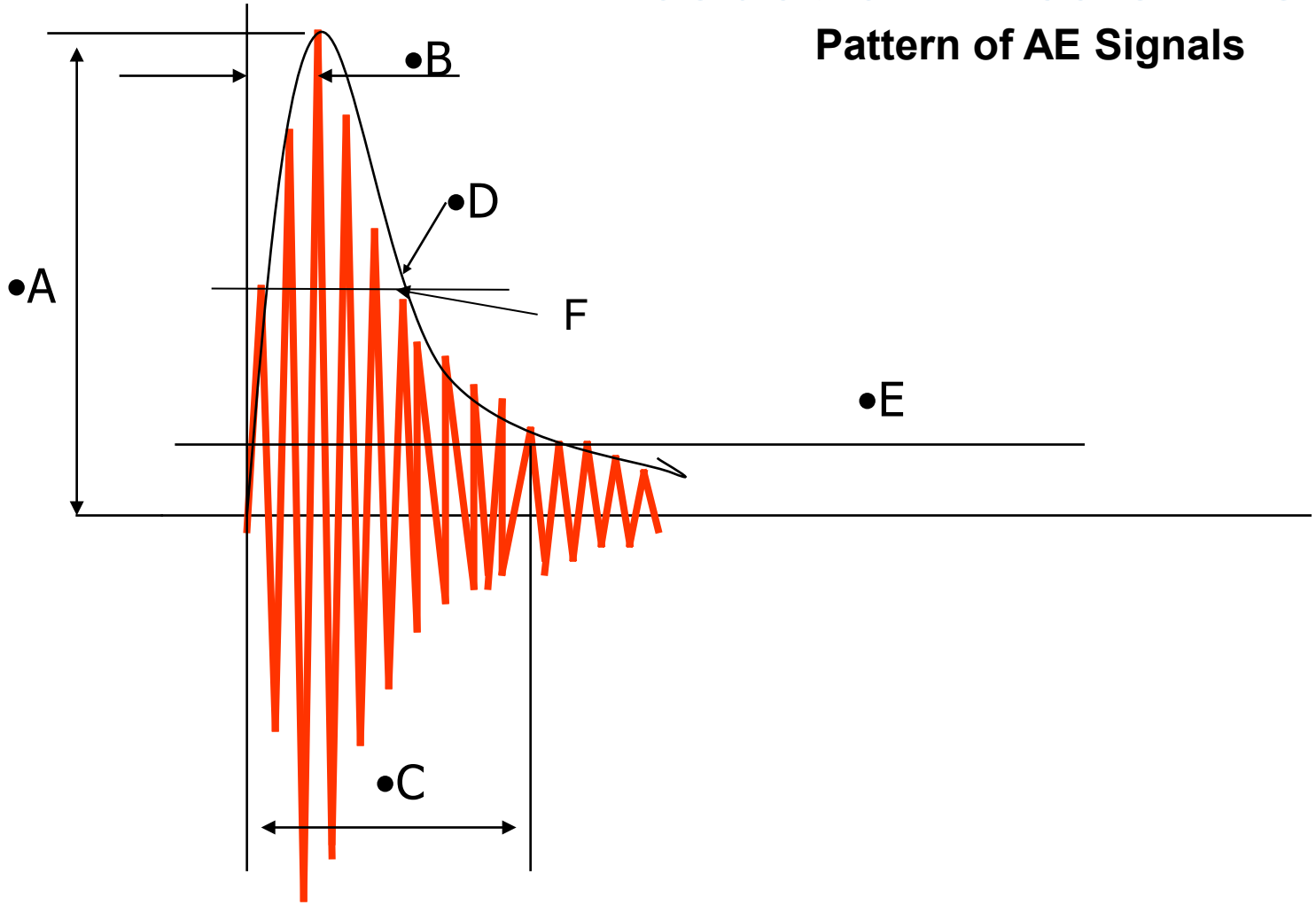
Acoustic Emission Testing



- •A = Amplitude
- •B = Rise time
- •C = Counts & Duration
- •D = Energy
- •E = Threshold
- •F = Average Signal Level

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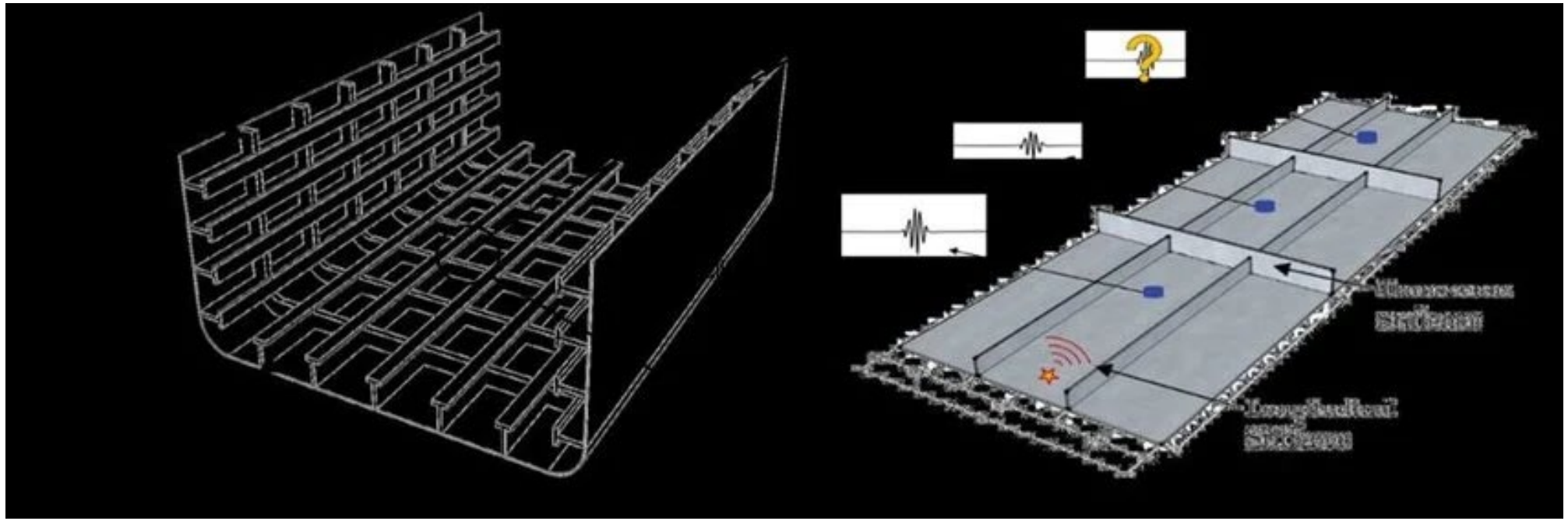
ACOUSTIC EMISSIONS TEST



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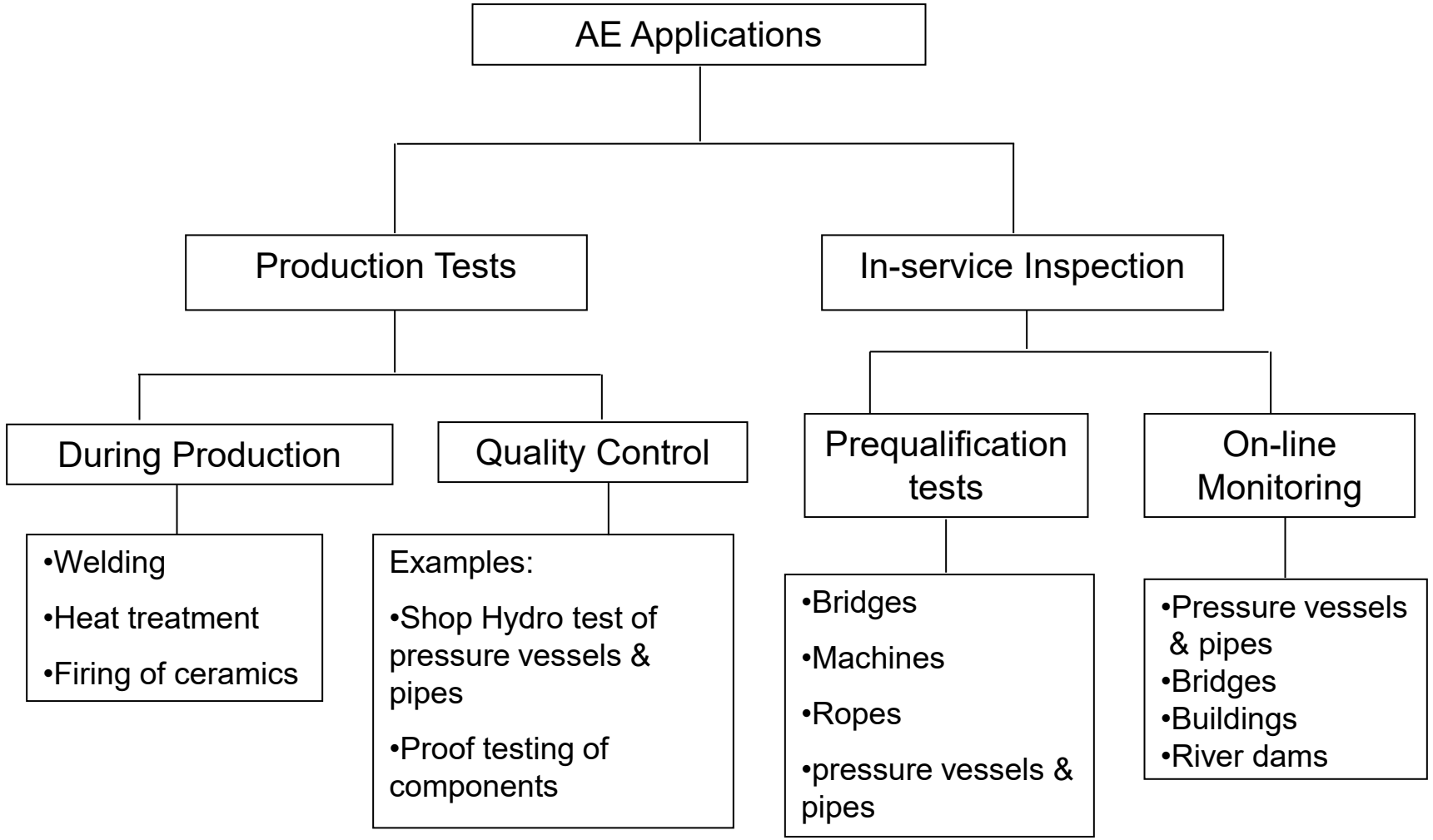
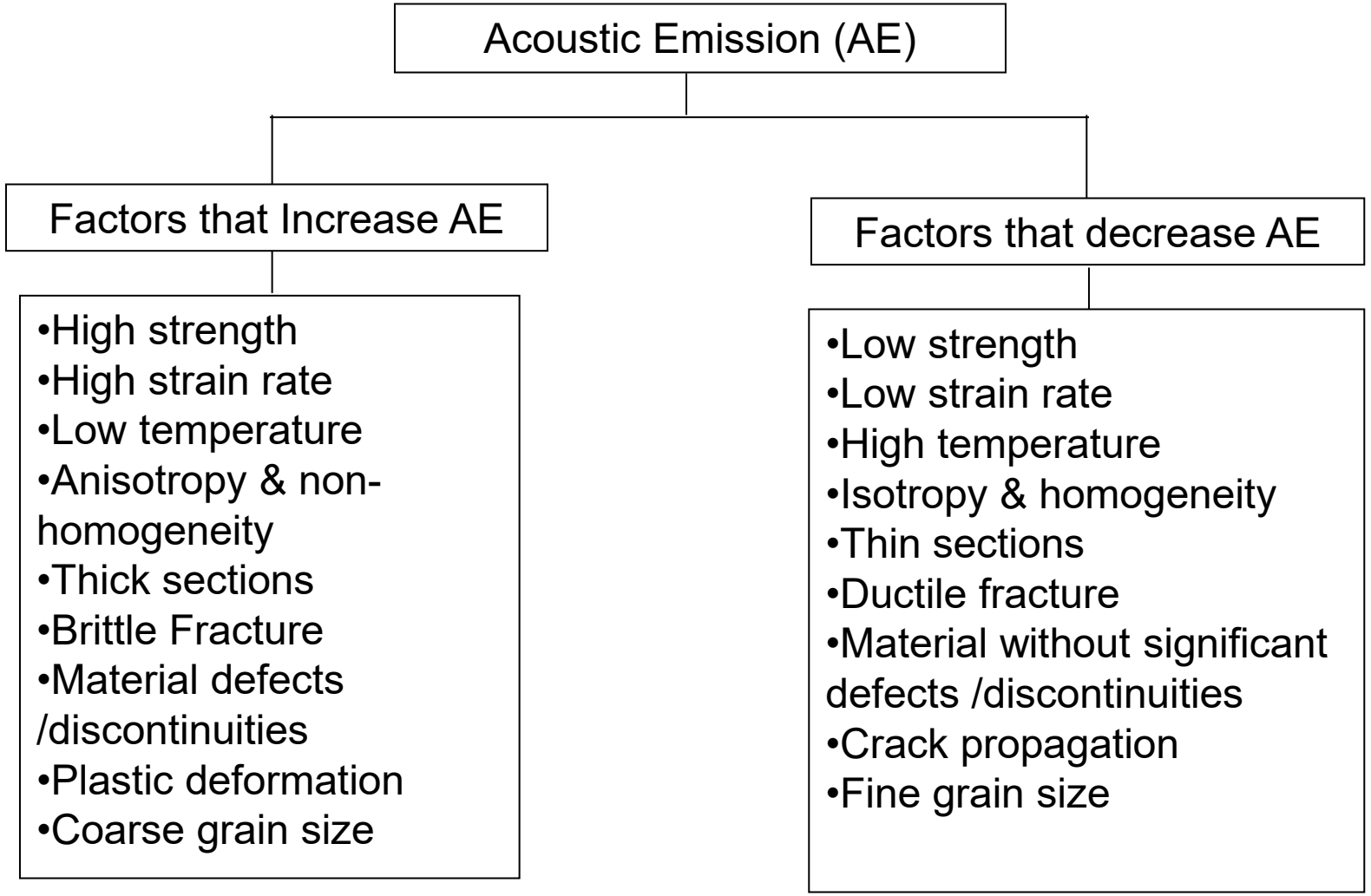
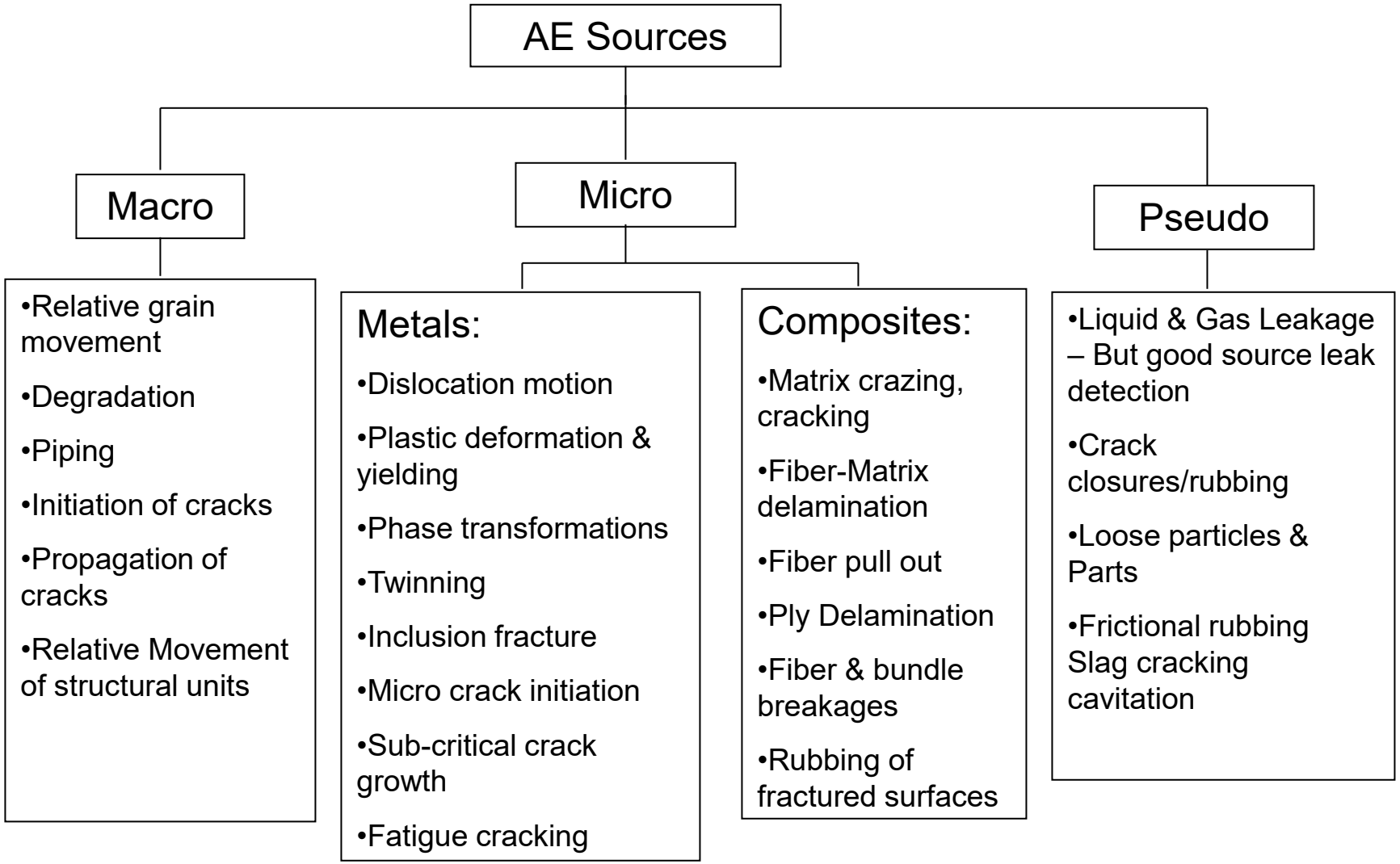
Acoustic Emission Testing



Acoustic Emission Testing



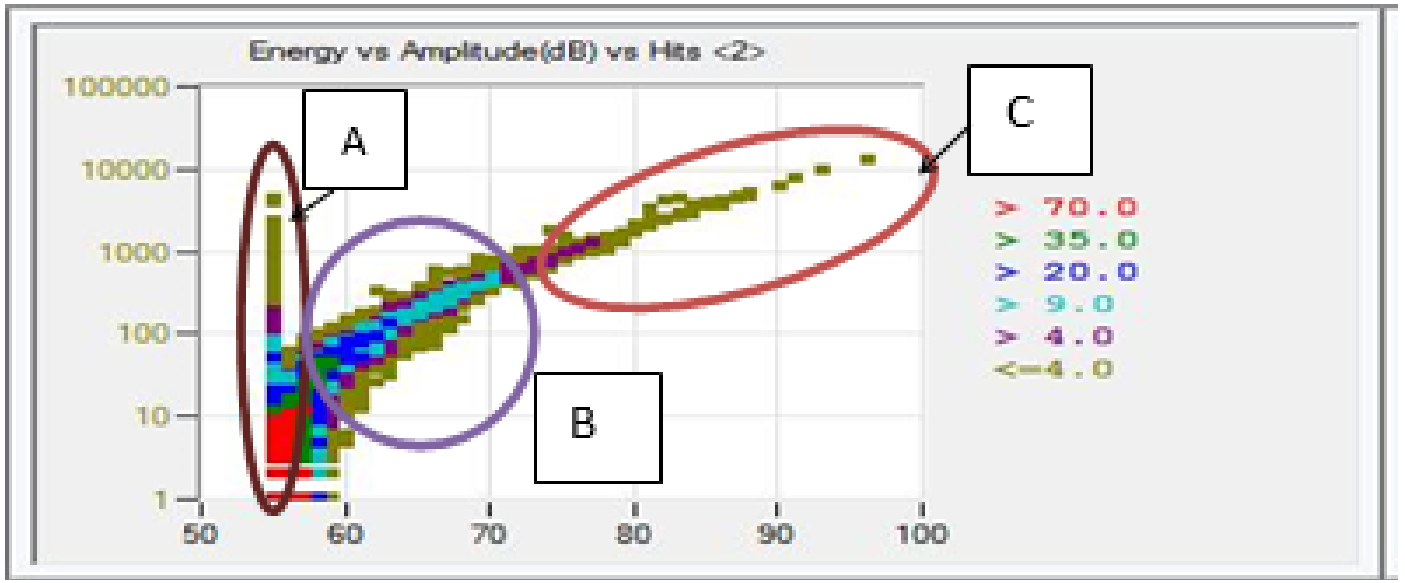
Acoustic Emission Testing



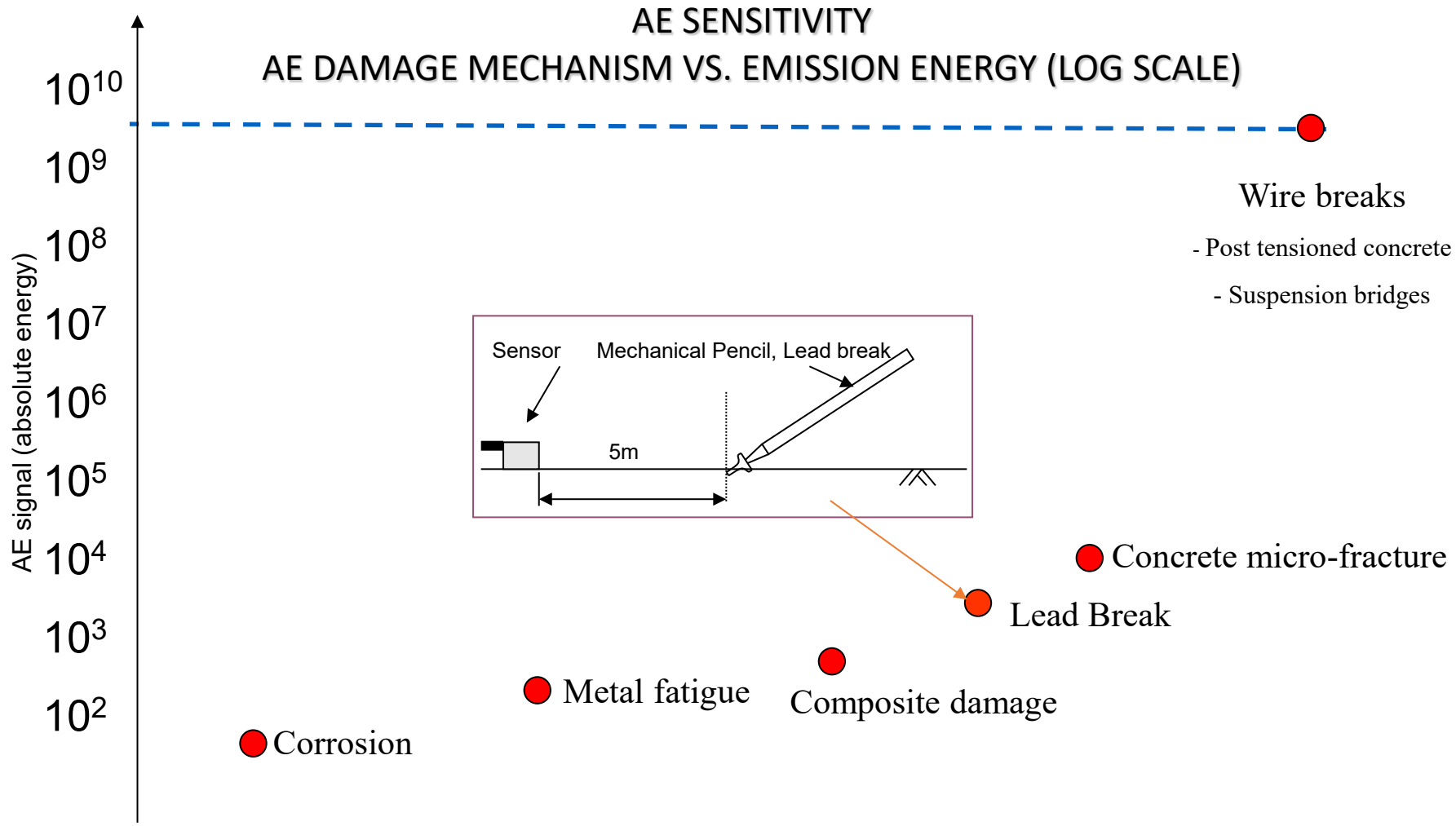
Acoustic Emission Testing

Pattern of AE Signals

A. Mechanical Rubbing. B Micro cracking. C Macro cracking.



Acoustic Emission Testing



Acoustic Emission Testing

Stress loading methods?

Acoustic emission requires a material to be under stress or load in order to show flaw activity. These stresses include:

- Hydrostatic pressure, positive or negative (Product or water)
- Thermal, expansion or contraction (Heating up, or cooling down)
- Mechanical stresses (Presses, torsion, or loading)
- Real time stress (Vehicles, ocean, wind, or earth)

Acoustic Emission Testing

Qualifying vs Quantifying?

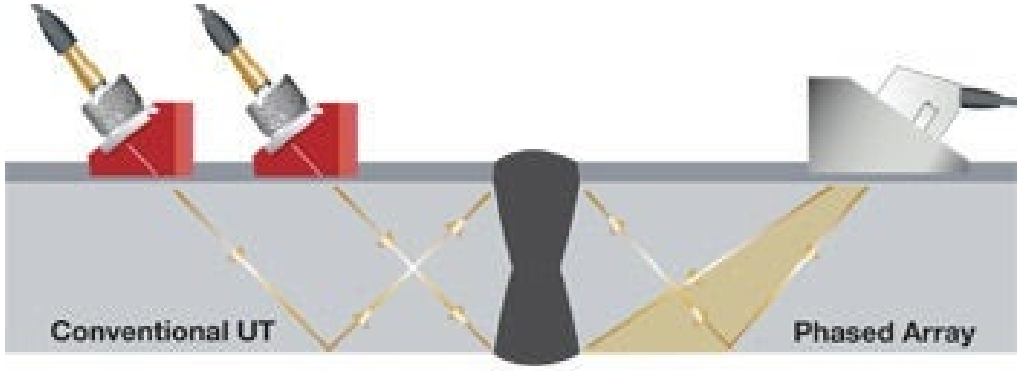
Acoustic emission is the best method for qualifying a damage mechanism as active.

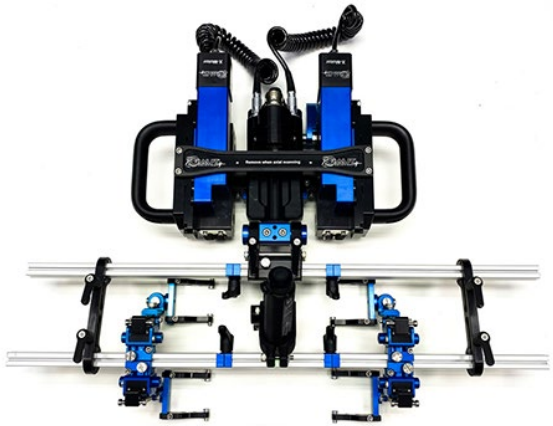
AET is still considered a screening method and secondary inspection methods are required to finalize location and severity.

Methods used to quantify indications found by AET include:

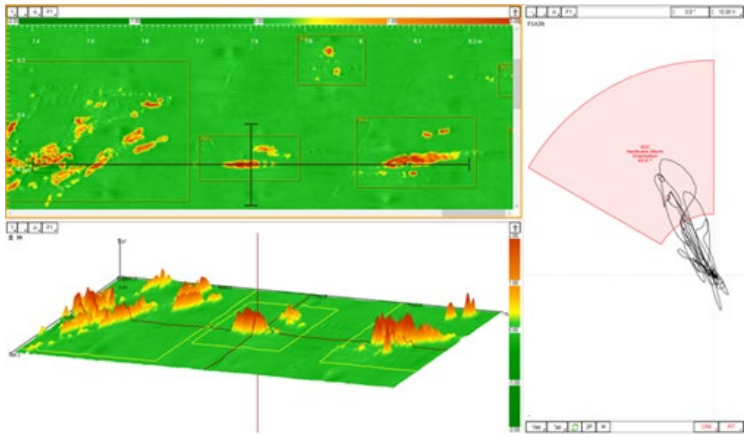
- Eddy current testing (Conventional and Array)
- Phased array ultrasonic testing (Hand scan or automated scanners)
- Magnetic particle inspection (Can only show location and surface breaking length, not depth)
- Dye penetrant inspection (Can only show location and surface breaking length, not depth)

Phased Array Ultrasonics





Eddy Current Array



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Thank You

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