



# Detection of Surface Cracks and Erosive Damage in Turbine Blades

## Ultrasonic Application Solutions

### Application

During turbine maintenance, ultrasonic testing of blades is used, with other techniques, to detect damage caused by erosion at the blade edges and on the blade surfaces.

Therefore, the GE European Solutions Center developed a user-optimized inspection system which reliably indicates possible defects.



Figure 1: Testing setup

### Solution

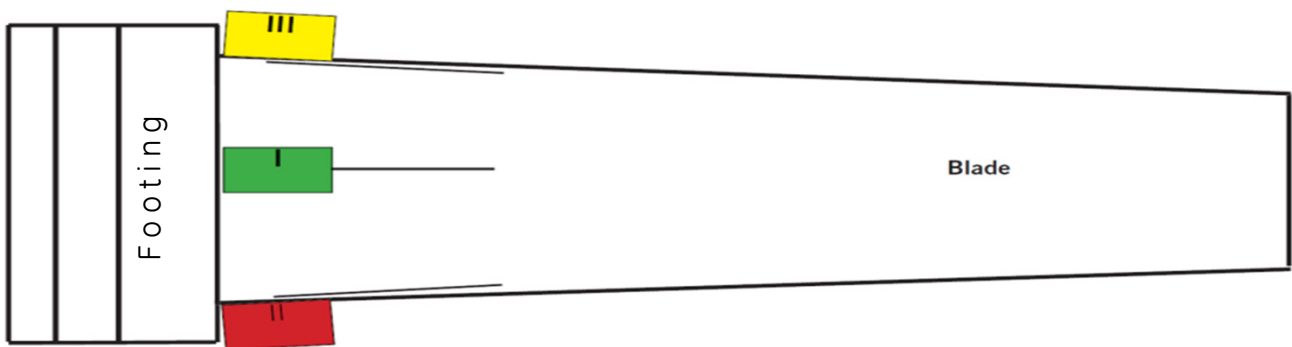
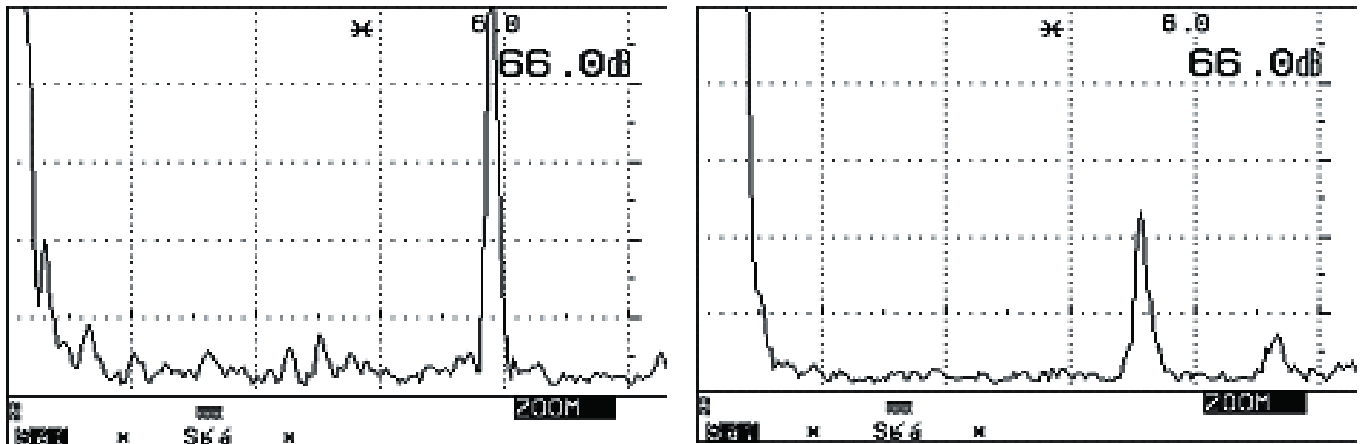


Figure 2: Insonification positions

A prerequisite for testing is access to the blades. Testing is carried out by generating surface waves. The best results are achieved by coupling the probe in the area of the blade root, and scanning in the direction of the

blade end. Depending on the flaws to be detected, scanning is carried out toward the pressure or suction surface (I) and/or the blade edges (leading – trailing edge II and III).

Flaw Detector: USD 15X, USM 36 & Probe: MWB 90-4



### Typical display indications

Scanning II and III, comparison of flaw-free edge with indication from the blade end and the indication of a reference flaw, notch depth 0.5 mm.

### Special features of ultrasonic testing using surface waves

- A high sensitivity is achieved for the detection of cracks that start from the surface (edges) and of other damage.
- For this purpose, the surface (edge) must be free from any remaining couplant or other residues in the direction of sound propagation to prevent reflection indications.
- A field-proven method is to couple the probe at fixed positions, to carry out the test without

shifting the probe along the longitudinal axis, and only orientate by rotating around the vertical axis.

- Testing of blade edges is made easier by a guide notch (longitudinal slot) cut in the probe coupling face.

### Your benefit

- Ensure high quality
- Save money by eliminating destructive testing and by improving your process

#### Part numbers

USM Go+	0113214	USM 36	0037400
MWB 90-4	0056931		

Contact the GE European Solutions Center for your individual inspection problems:

GE Measurement & Control  
European Solutions Center  
[www.utprobes.com](http://www.utprobes.com)  
[Portable.utsolutions@ge.com](mailto:Portable.utsolutions@ge.com)