

# Advanced Inspection of Turbine Components - Important Tool for Steam Turbine Outages

H. RAUSCHENBACH, M. CLOSSEN-VON LANKEN SCHULTZ, M. OPHEYS, M. SIEGEL, Siemens Power Generation, Mülheim a.d. Ruhr (Germany)

**Abstract.** Scheduled Nondestructive inspections are a main part of a steam turbine outage. Due to the high load of the turbine components and the long operating interval, there are special defined requirements for NDT methods. The inspection methods must ensure high sensitivity, reliable and reproducible inspections of the most stressed turbine components. The components are rotating components as well as components affected by high temperatures and pressures. Siemens PG developed sophisticated NDT systems for turbine field service. Especially the inspection of joint bolts, rotors, blade roots and rotor disks of steam turbine rotors were developed according to special requests of customers partly using phased array technique to achieve the most meaningful results for finding cracks in turbine components. Especial blade roots are of complex geometry and phased array technique leads to more information because of ultrasonic imaging which allows to separate geometrically echoes from echoes coming from indications. Therefore a well defined probe position is necessary which can be archived using probe guides or manipulator technique. Some examples of modern inspection techniques will be explained.