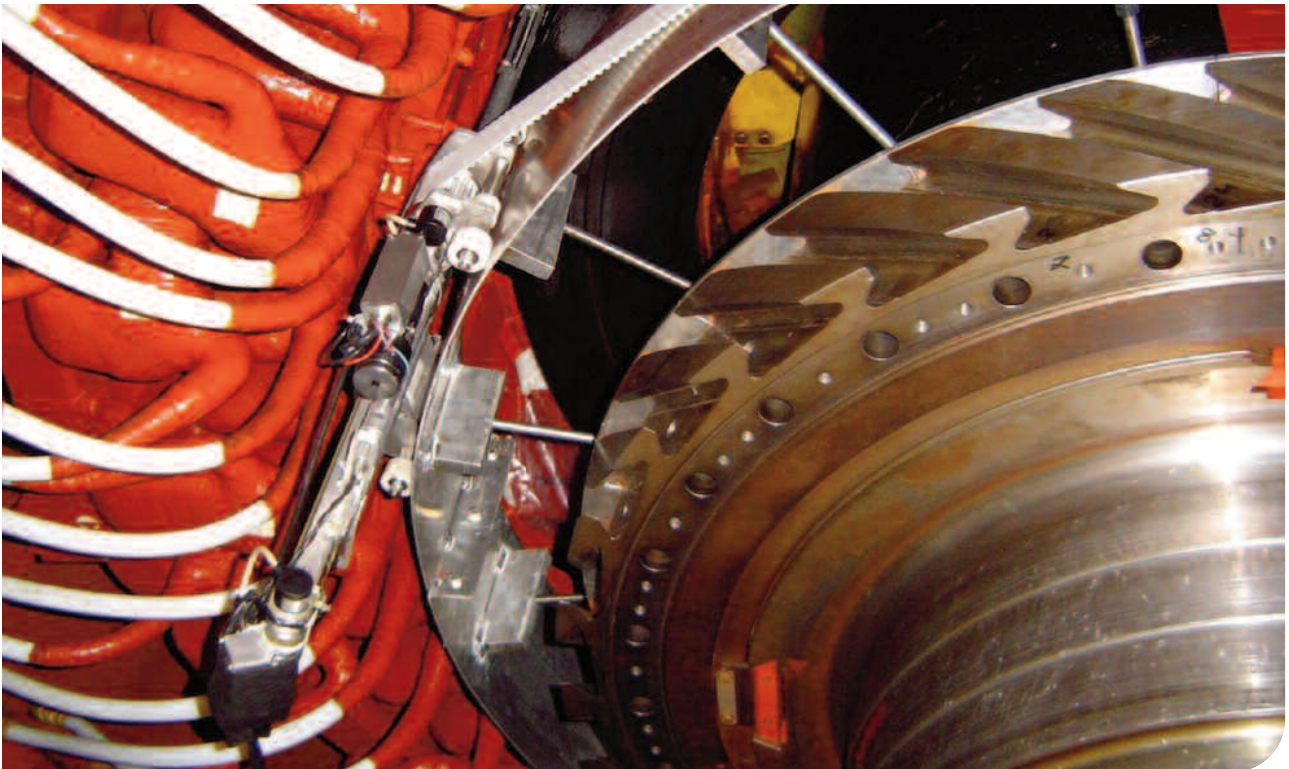


KIRR.

KEMA Inspection system for Retaining Rings.



The generator is one of the most crucial parts of a power plant: this is where the electric energy is generated. It is therefore of major importance that the generator is always in a perfect condition. Among the critical components are the retaining rings at each end of the rotor. As a result of specific mechanical, chemical and electrical circumstances flaw indications may appear in these rings. Replacing these rings involves substantial costs. KEMA has a much cheaper alternative, which is just as good: KEMA Inspection system for Retaining Rings (KIRR). Over 200 generators in 15 countries worldwide have already been inspected.

Background

A retaining ring has a long lifespan; it can even be used throughout the life of the generator. But no matter how small a risk it is, even a small crack in the retaining ring may have

disastrous consequences and will result in safety risks and damage that involves major costs. In order to prevent such, retaining rings are, often on advice of the manufacturer, replaced by new ones. Quite an expensive operation, since replacing them may cost up to EUR 1,000,000. KIRR offers a perfect solution to these problems. This system detects and characterizes flaw indications in the retaining ring and will enable you to determine whether the retaining ring needs to be replaced. Furthermore, you will be able to continue monitoring newly detected flaw indications that are still acceptable to be worked with. This means that you can regularly keep an eye on the condition of the retaining rings. A crucial advantage is that it is not necessary to disassemble the rotor and the retaining ring. This will mean a cost reduction up to EUR 200,000. Moreover, it takes less than 24 hours to measure two retaining rings.

Service

Initially KEMA will try to obtain as much information about the ring's geometry and the actual access to the rotor as possible; sometimes there is hardly any information available; the ring's geometry is then first measured using an ultrasonic C-scan mapping technique. With this information an inspection plan is issued. Inspection is conducted within the time limits



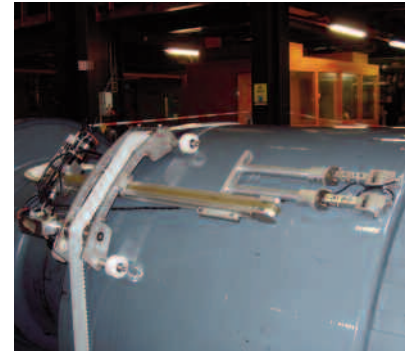
provided (within 24 hours, if required). Ultrasonic crack detection is focused on the shrunk connections and wall thickness steps. In addition, whenever

necessary, eddy current scanning is added to accurately map the outer surface. The ring's coating is left in place. Geometry and flaw data are then fed into a computer model. The residual life span is embedded in the analysis. Furthermore, it is established when new measurements will have to be undertaken in order to monitor the flaw indications found.

Specifications

The KIRR system can be applied on generators with a ring diameter from 500-2,000 mm. In-situ test characteristics:

- Minimum gap height between rotor and stator: 9 mm
- Technique: UT and ET scanning
- Surface: 360° circle and 5-100 mm pitch per step
- Defects as small as 1 mm can be detected: guaranteed
- Test duration: 24 hours effectively.



Benefits

KIRR will be of considerable benefit to you:

- Major savings, since rotor rings will not have to be replaced
- You will constantly be aware of the condition of the retaining rings and you can continue monitoring them
- A cost reduction because the rotor and the retaining rings do not need to be disassembled
- The measuring does not take long
- The system has a short delivery time.

For more information:

KEMA
P.O. Box 9035
6800 ET Arnhem
The Netherlands
T +31 26 3 56 35 00
F +31 26 4 42 87 13
contact.tos@kema.com
www.kema.com