



Remote Visual Inspection Applications and Solutions

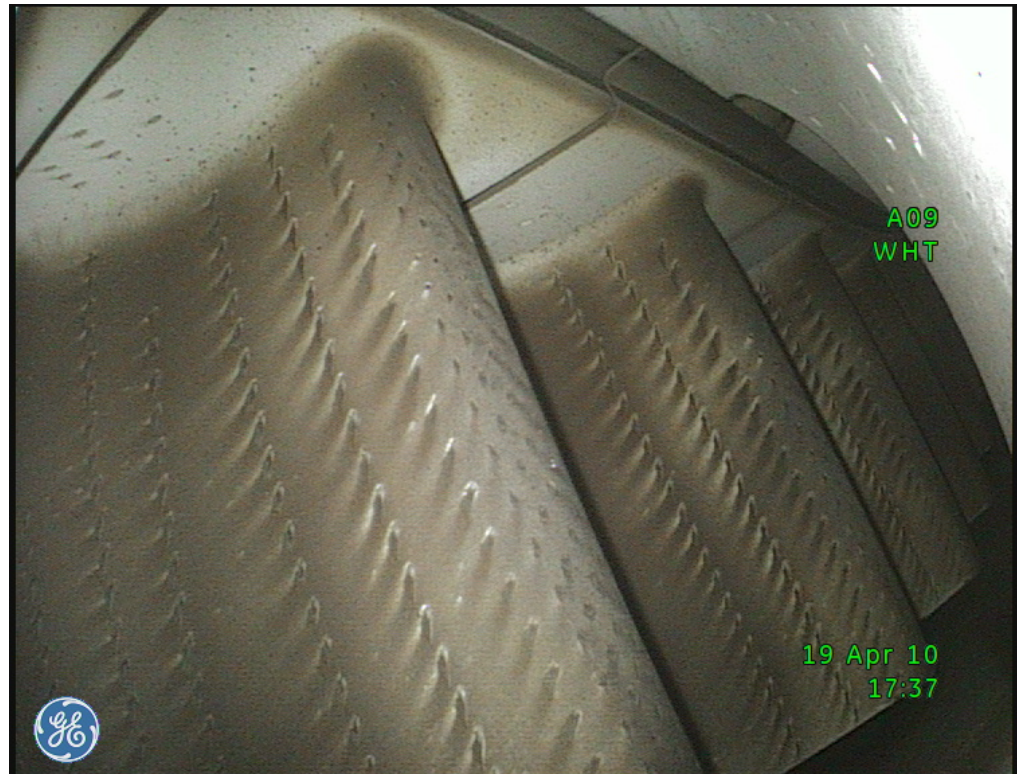
Joshua Scott
February 29, 2012



imagination at work

Remote Visual Inspection - RVI

Indirect Visual Examination
Provide Video and Still Images
Quantify Asset Condition



RVI – Range of Products

Borescopes
&
Fiberscopes



1.7mm 2.4mm

Video
Borescopes



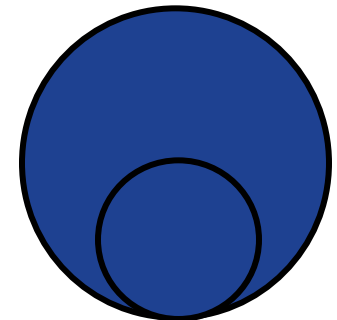
3.9mm 5.0mm 6.1mm 6.2mm 8.4mm

Pan-Tilt-
Zoom
Cameras



70mm 100mm 140mm

Robotic
Crawlers



100 - 225mm

Aerospace

Aviation

Energy/O&G

Anatomy of a Video Borescope

Insertion Tube

Length and diameter vary

Flexible

Can span small gaps

Camera

Display

Controls



Capabilities

Access deep inside equipment

View live video

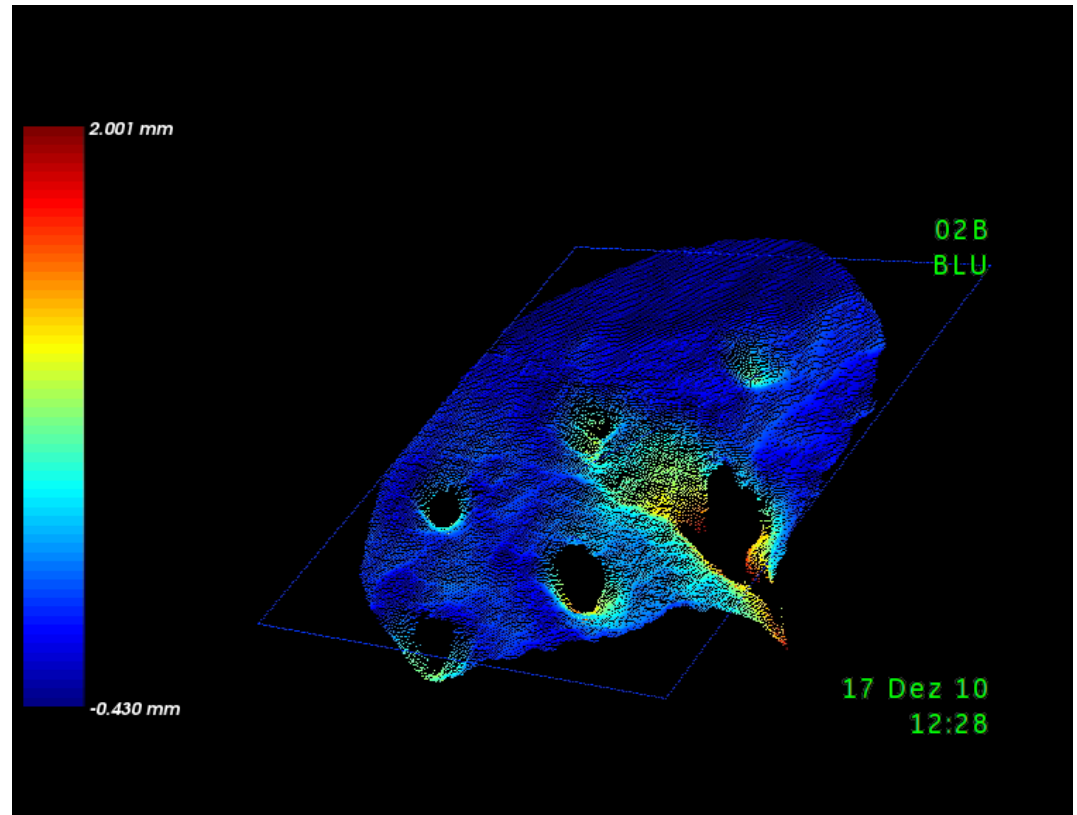
Capture still images

Perform 2D and 3D measurement

Capture 3D Point Cloud data



XLG3 with 3D Capabilities



3D part scanning and measurement

FOD Retrieval

Find object

Extract

Prevent disassembly



Applications



Markets



Energy



Aerospace



Oil & Gas

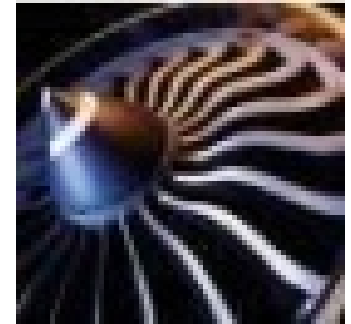


Industrial

Applications



Heat Exchangers



Composites



Rotating Machinery



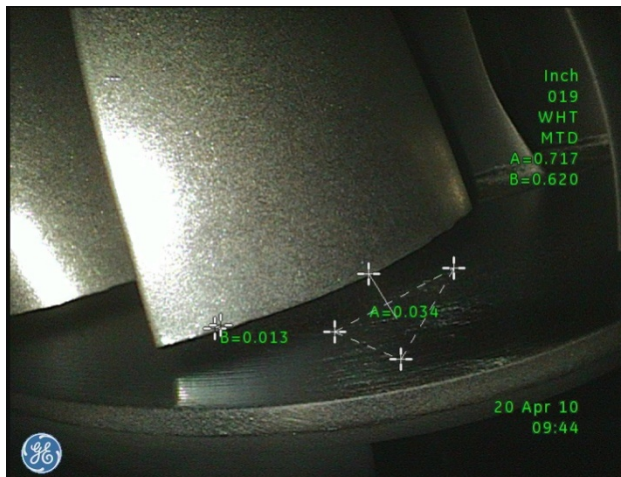
Corrosion



Welds

Aviation Turbine Inspection

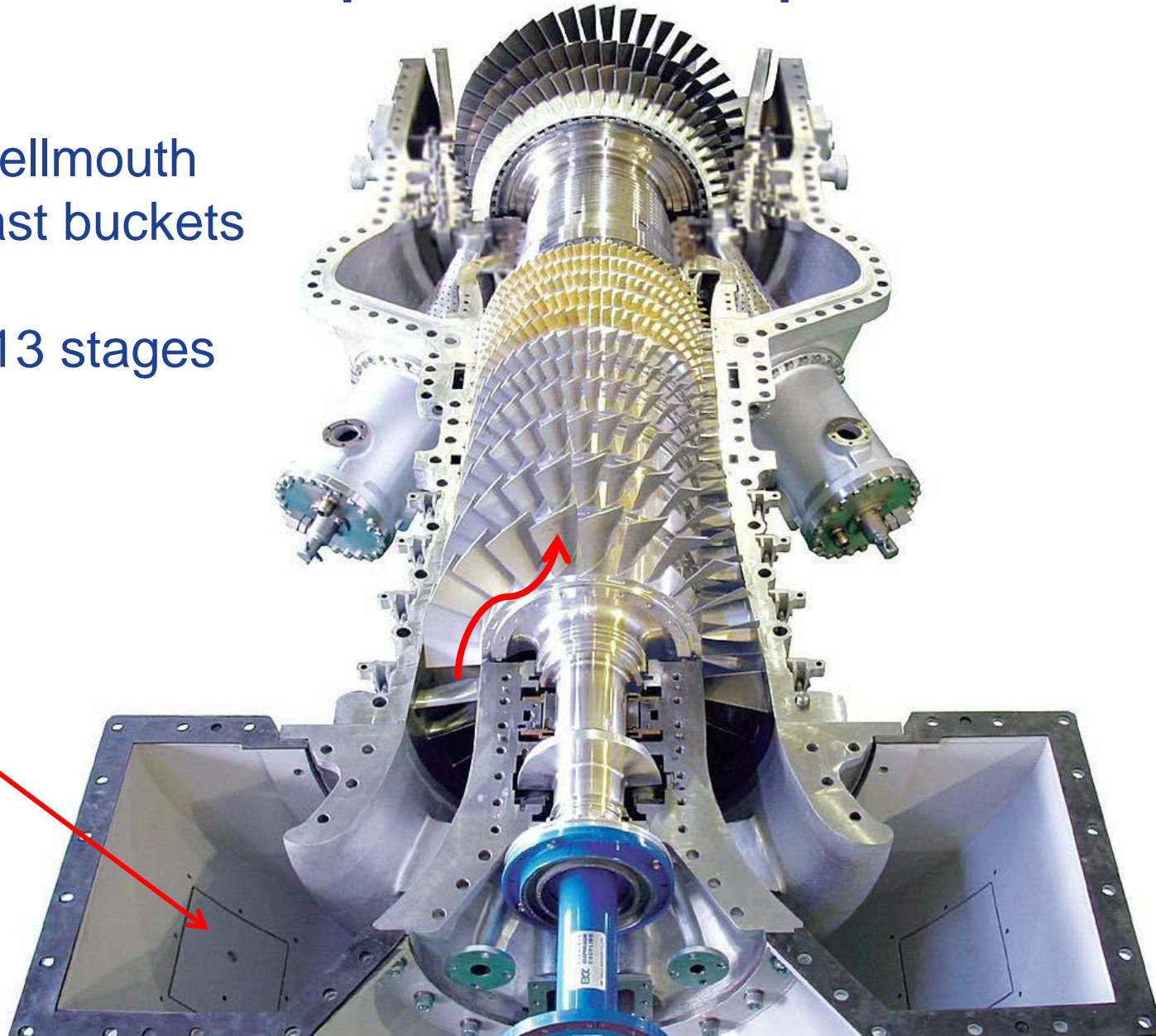
Videoprobes
6 & 4 mm dia.
3 meters



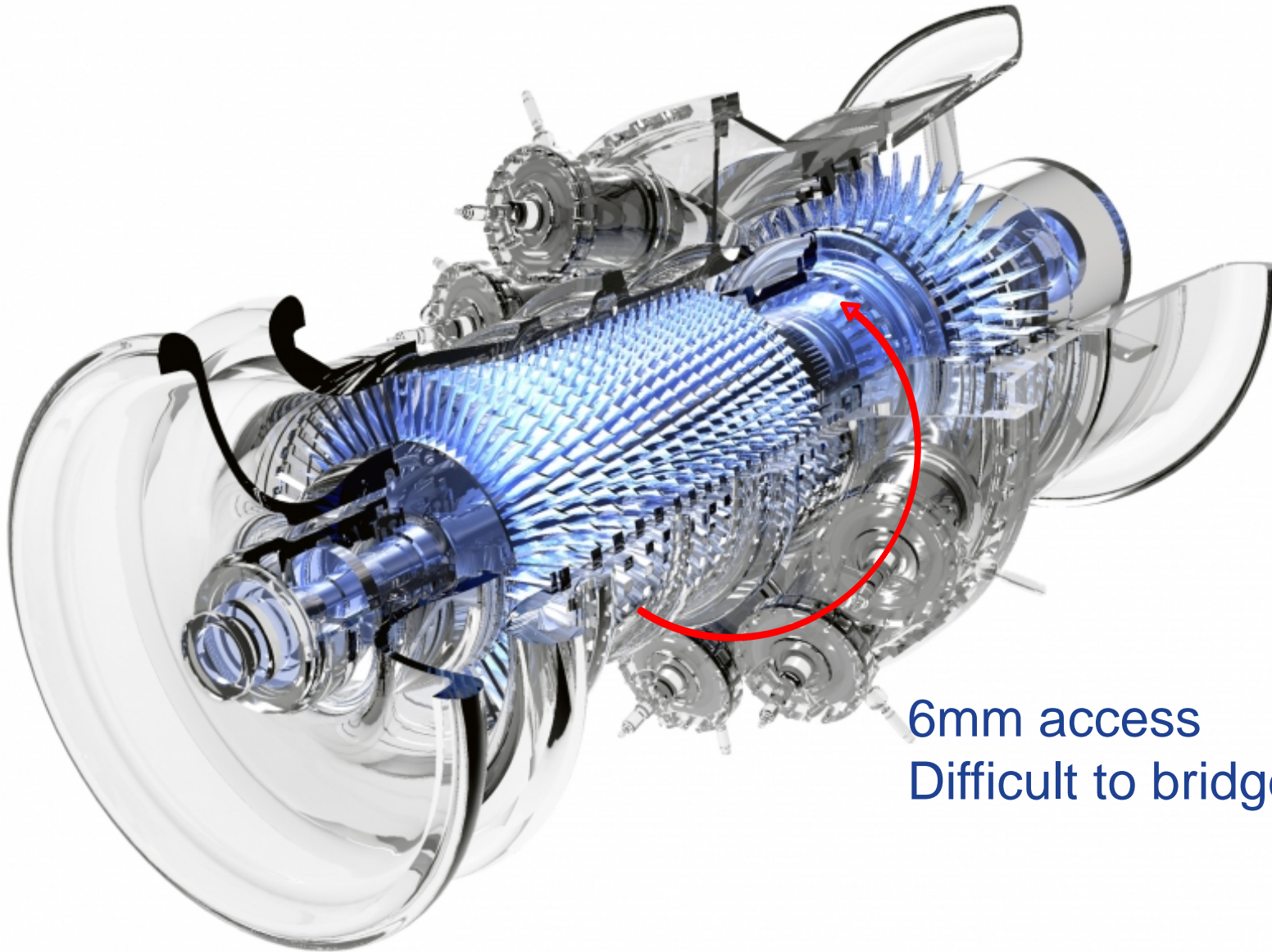
Gas Turbine Compressor Inspection

Enter through bellmouth
Snake probe past buckets
Goal:
100% exam of 13 stages

Man way



Turbine Circumferential Inspection



6mm access
Difficult to bridge gaps

Airframe and Cavity Inspection

Cracking Corrosion



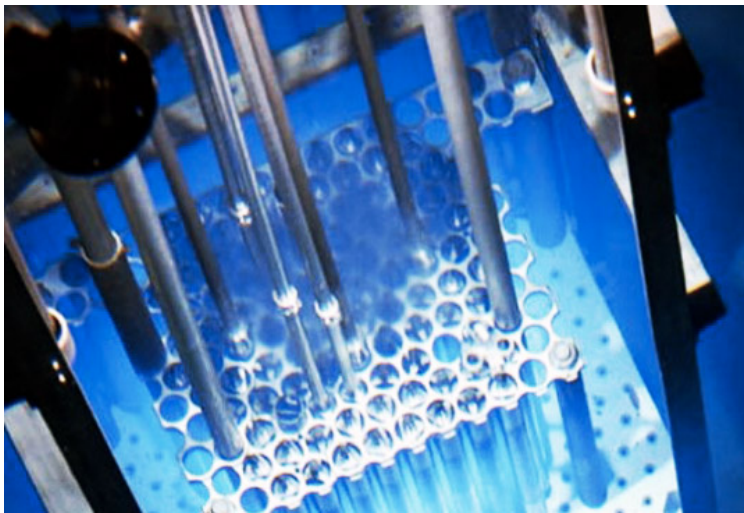
Nuclear Inspection

Small space inspection

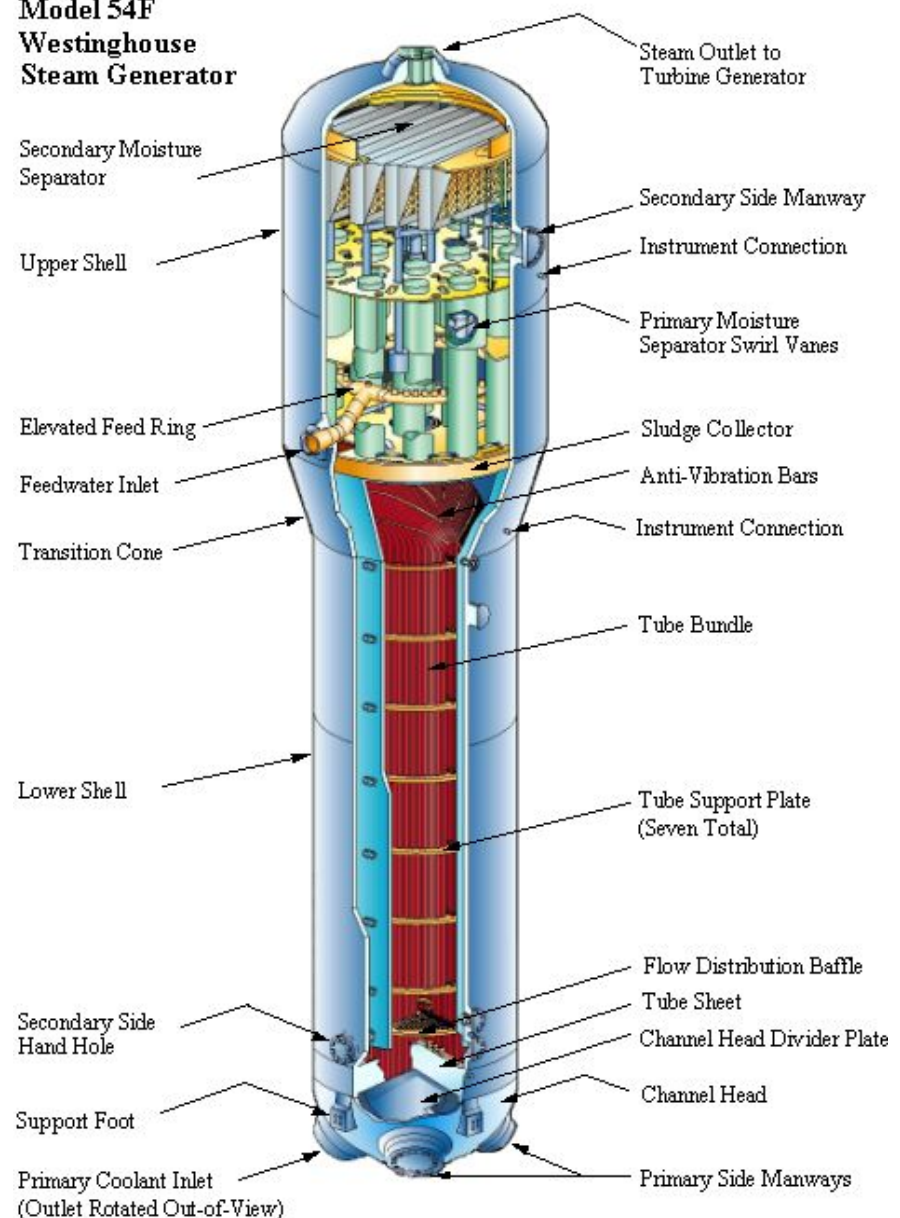
Difficult access

Long probe length

Radiation hardening



**Model 54F
Westinghouse
Steam Generator**



Thank You!

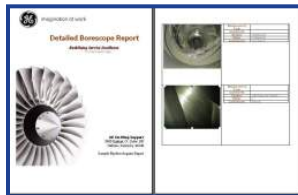
- Unsurpassed expertise and experience
- Products for many industrial applications
- Inspection products that deliver enhanced productivity



Video borescopes



Robotic Crawlers

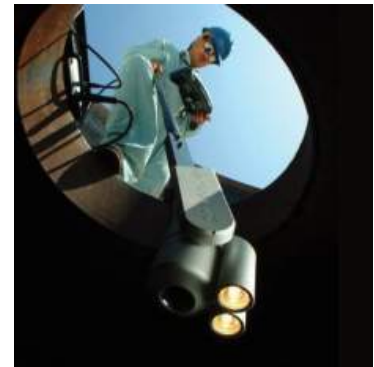


Inspection Services

Software Solutions



Large Diameter Cameras



imagination at work

Aerospace



Applications & Customers

Turbine Engines

Blade defect detection and measurement

Foreign Object Debris (FOD) removal

Commercial Operators

Military – Foreign and Domestic

Engine OEMs

Energy



Applications & Customers

Stationary Gas and Steam turbines

Heat exchangers

Gear boxes

Defect detection and measurement

Foreign Object Debris (FOD) removal

Fossil Fuel

Nuclear Plants

Renewable (Wind, Hydro)

Equipment OEMs

Oil & Gas



Applications & Customers

Gas Compression Equipment

Piping

Heat exchangers

Defect detection and measurement

Foreign Object Debris (FOD) removal

Oil Producers and Refiners

Transmission

Equipment OEMs

XLG3 VideoProbe



Turbine blade image



Camera tip articulation



Interchangeable probes



Most Capable

Joystick controlled articulation

Color CCD at distal end of probe

Integrated 1 or 2-hour battery / UPS

Stereo defect measurement capability

Record still images or video

Embedded PC with Ethernet connectivity

Insertion tube watertight to 30 feet

Execute dedicated application software (MDI)

XL Go VideoProbe



Most Portable

1.7 kg / 3.8 lbs (includes 2-hr battery)

Joystick controlled articulation

Color CCD at distal end of probe

Insertion tube watertight to 30 feet

Integrated 2 or 4-hour battery

Defect measurement capability

Record still images or video

Tested to IP-55

Mil Std 810-F compliant

Dedicated application software (MDI)



Pan-Tilt-Zoom (PTZ) Cameras



PTZ Cameras & controller

Rugged, industrial packaging

Integrated lighting – Quartz / LED / UV / IR options

Up to 36X optical zoom

Sealed for underwater use

Integrated still-image and movie capture

Optional laser measurement system

Confined Space inspection applications

Inspection Service and Equipment Rentals



Global access to knowledge experts

Trained and Certified Technicians

Broadest range and largest supply of
advanced RVI equipment

98% loose parts retrieval success rate

24 x 7 Emergency Response

Same day or Next day delivery –
worldwide

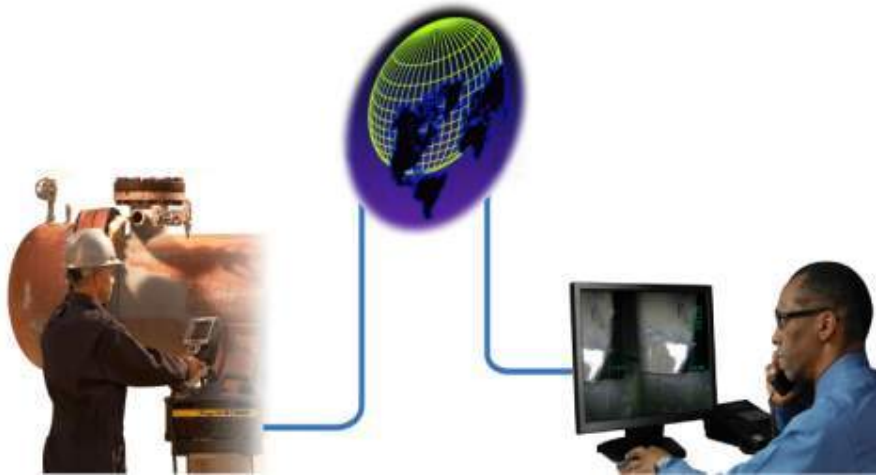
Daily, weekly, monthly rentals

Rent-to-own programs

RVI Software Products

Increase speed and ease of sharing inspection data.

Place decision maker in-the-loop



Guides an inspector and eliminates post inspection consolidation of images and user entered inspection data

Rhythm Visual & Review Database Platform

- Turns inspection images into intelligence.
- Capture, analyze, share, and archive inspection information. .

XLG3 Network and Remote Collaboration

Provides ability to share image with owner, expert, or peer on-the-fly. This suite of software provides connectivity and tools to share live video, send email, and instant message.