

Advanced Turbine Support, Inc.

Inspection & Technical
Services

The bottom right corner of the page features a decorative graphic consisting of several overlapping, wavy, horizontal lines in a lighter shade of blue, creating a sense of motion or a stylized wave pattern.

Compressor Borescope Inspection Uses

- GE Recommended TILS:
 - ◆ TIL 1562-Stator Vane Shim Migration
- Condition Trending:
 - ◆ Corrosion & Erosion Issues
 - ◆ Stator Vane Movement-Stepping
- Predictive / Condition Based Maintenance
- Trouble Shooting
 - ◆ Increased Vibration
- Final Cleanliness After Major Outage
 - ◆ FOD-Excessive Dirt & Debris

OEM Recommended Inspections

General Electric TILs

- Critical to perform the inspection properly.
- Critical to perform the inspection in a timely manner.
- Important to document findings properly to get correct engineering disposition.

Trending Compressor Condition

- Baseline Inspections - Allows for identification of the unit condition after major overhauls. (Proper Component Installation & Warranty Issues) Shim Mapping
- Annual / Bi-Annual Inspections - Identify the following conditions that can change due to different operational parameters.
Base Loaded vs. Start Based
(Blade Tip Rubs, Shim Migration, Impact Damage, Corrosion Pitting, Deposits, Cracks, Movement, or Loss)

Inlet Condition Assessment

General Condition Assessment With Focus On
Inlet Guide Vanes (TIL 1132-2R1)

Stage R-1 Rotor Blades
(Tip Rubs & Impact Damage)



**Inlet Bellmouth & Variable
Inlet Guide Vanes:**

TIL 1132-2R1



**Variable Inlet Guide Vanes &
R-1 Rotor Blades**

Advanced Turbine Support, Inc.

Compressor Damage

TIL 1132-2R1: IGV Spring & Thrust Washers 'X' Gap Measurement



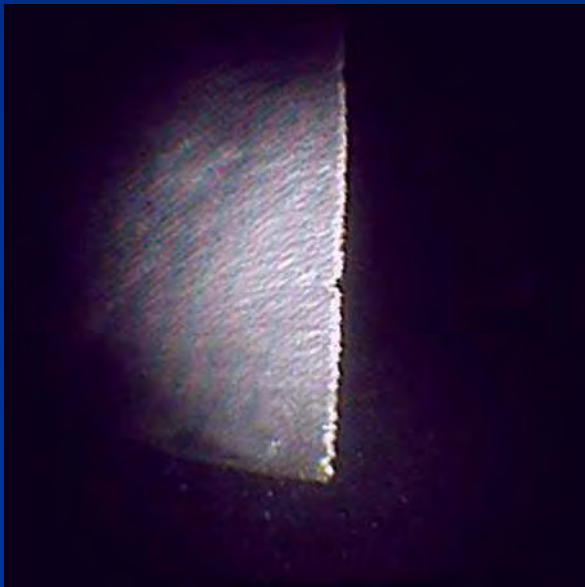
**Variable Inlet Guide Vane
Rubbing Against Inlet
Bellmouth**



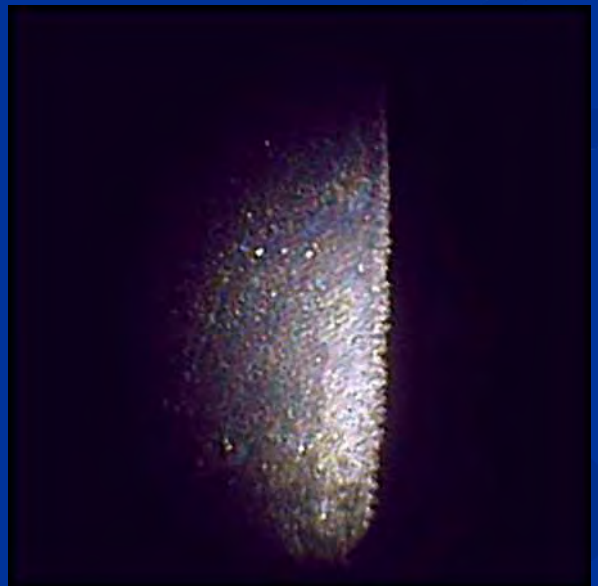
**Bent Variable Inlet Guide
Vane**

Compressor Blade Erosion

Degraded Rotor Blades

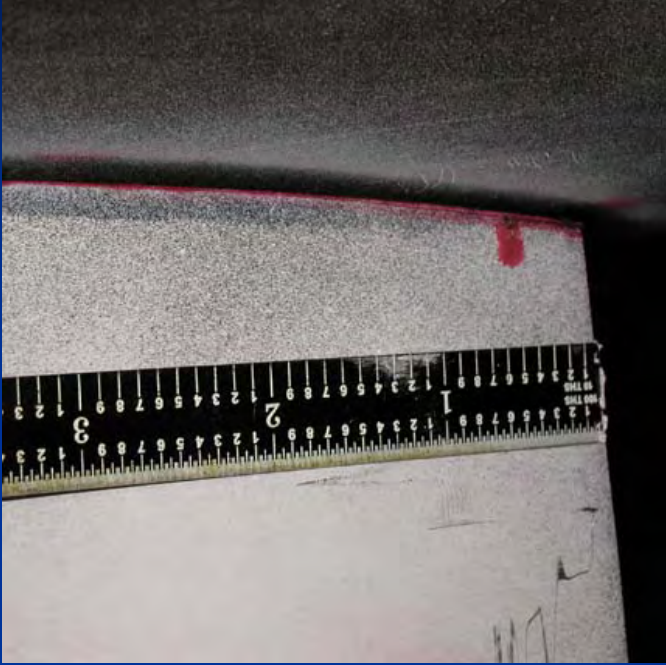


**Leading Edge Erosion On
A Stage R-1 Rotor Blade**

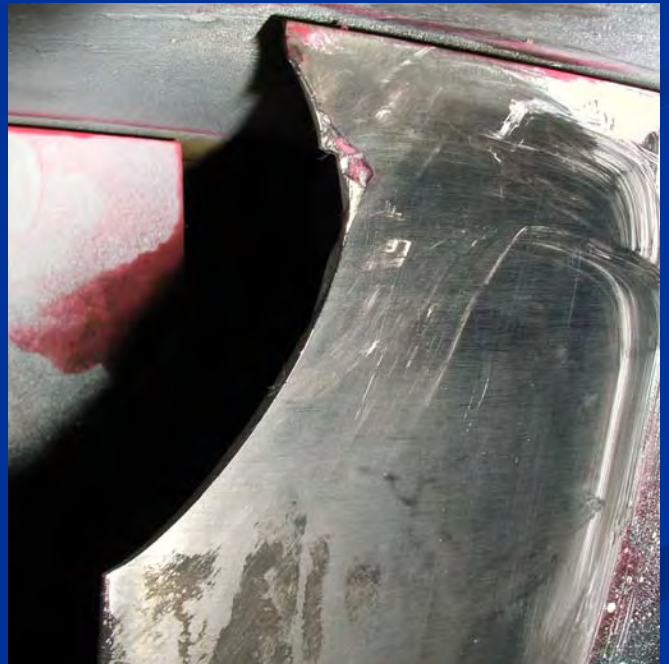


**Leading Edge Erosion On
A Stage R-2 Rotor Blade**

(In-situ) Remote TIL 1509-1 Inspections in 12 Hours



WITH OUR 1509-1



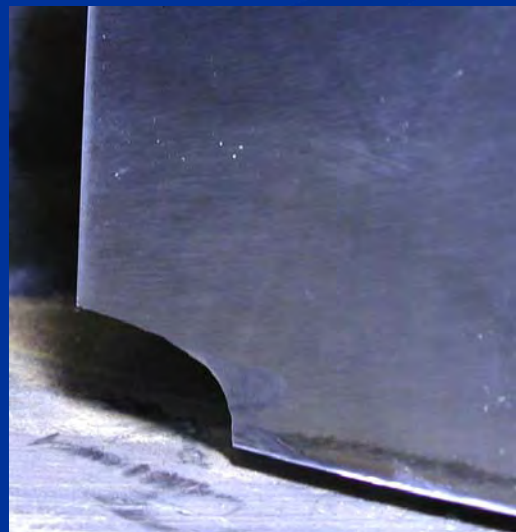
WITHOUT OUR 1509-1

Blade Tip Cracks & Removal

- In-situ Compressor Stage R-1 & R-2 Blade Blending To Remove Radial Cracks & Impact Damage
- No Unit Disassembly Required:
 - Significant Reduction Of Unit Down Time
 - Significant Reduction In Maintenance Cost



**Radial Tip Crack
Identified By A 1509-1
PT Examination**



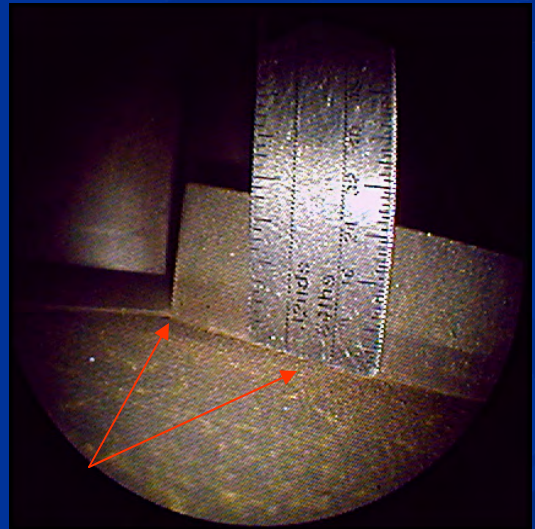
**Same Blade Tip After
Crack Removal &
Blade Blending**

Compressor Stator Vane Ring Segment Shim Issues

TIL 1562: Stages S-1 Thru S-4 Shim Migration



**Stage S-1 Shim
Protruding Into Air Path**



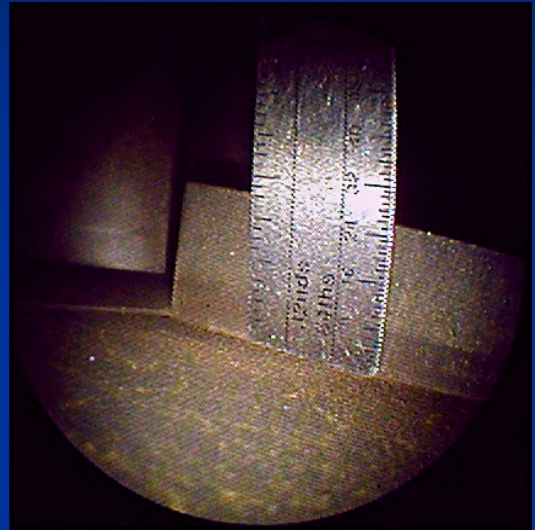
**Measurement Of
Protruding Shim**

Compressor Inspections (In-Situ)

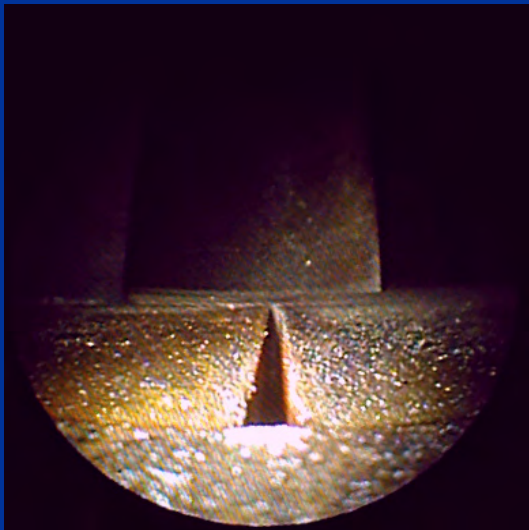
TIL 1562: Shim Migration With Shim Removal



Stage S-1 Shim Protruding Into Air Path



Measurement Of Protruding Shim



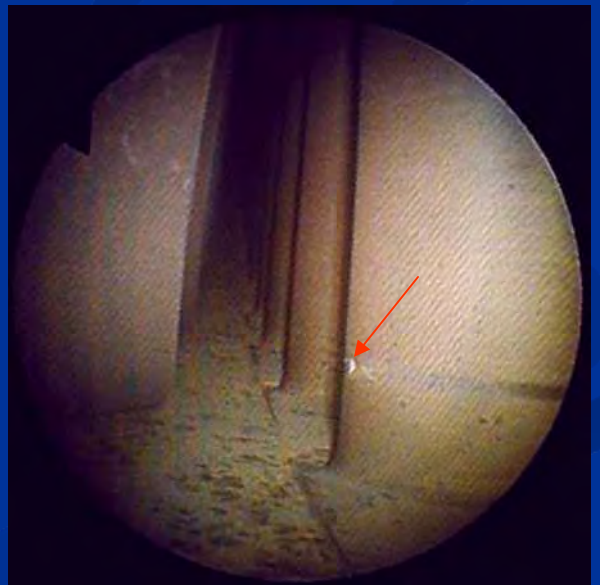
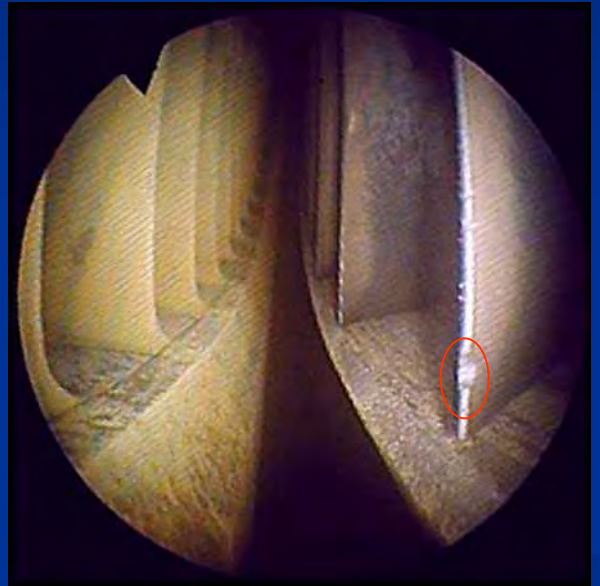
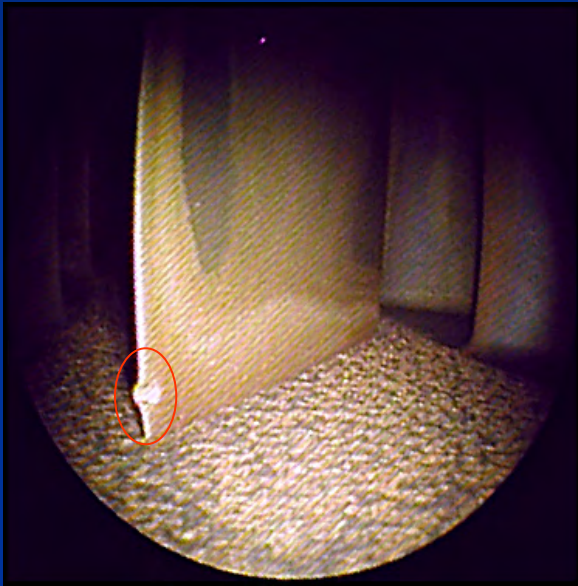
Empty Slot After Shim Removal



Photograph Of Shim After Removal

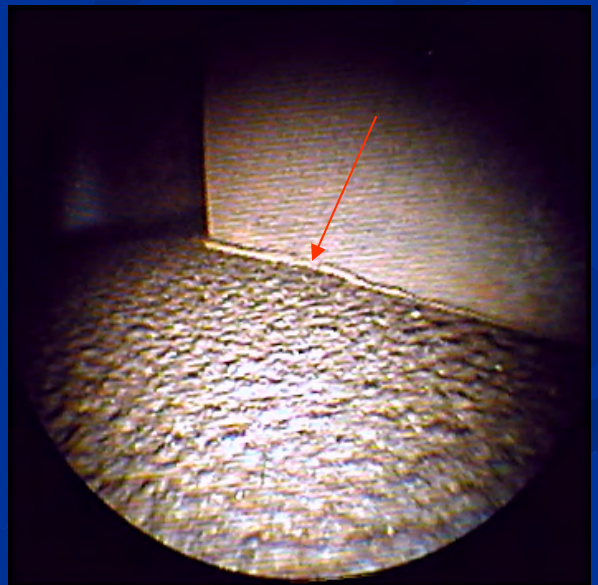
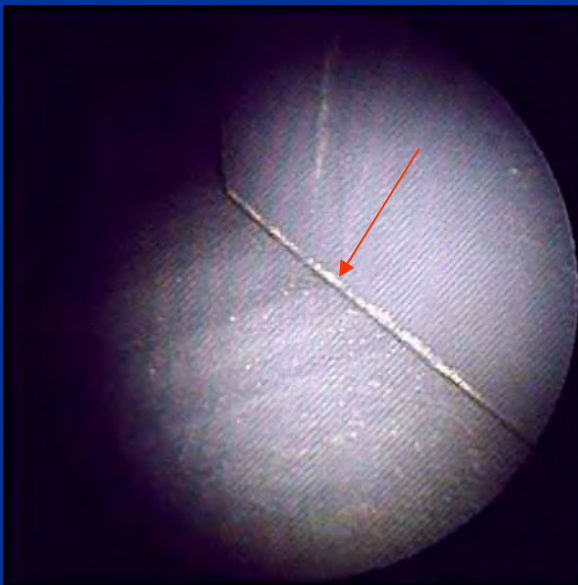
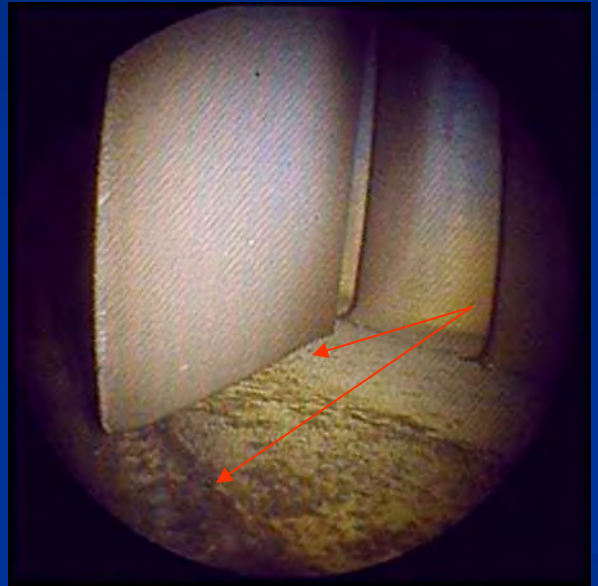
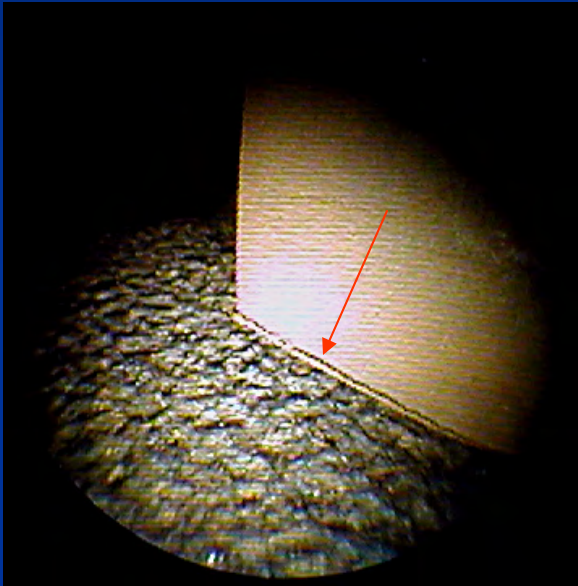
Compressor Damage

Impact Damage On Rotor Blades & Stator Vanes



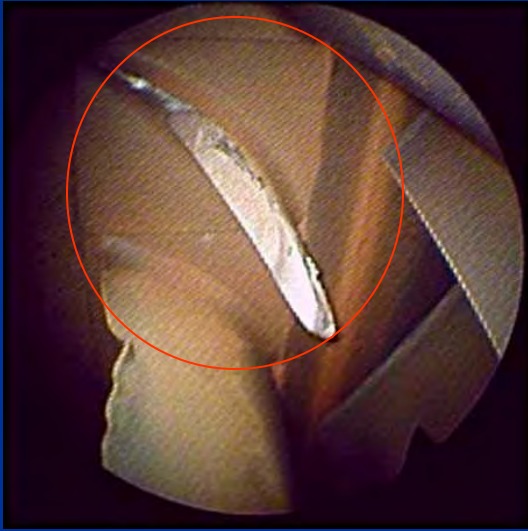
Compressor Damage

Compressor Rubs & Rotor Blade Tip Damage



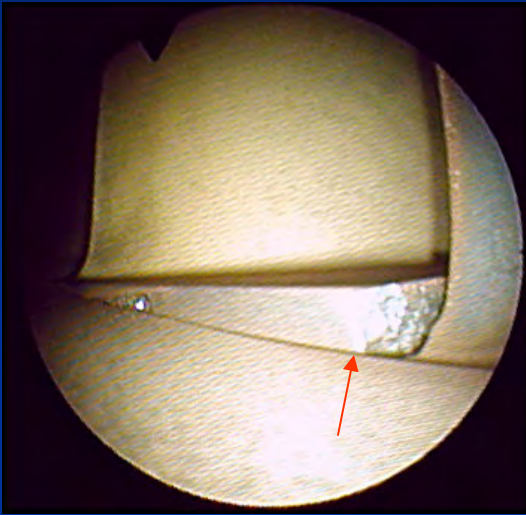
Aft-Compressor Stator Vane Issues

Liberated Stage S-14 Stator Vane & Collateral Damage



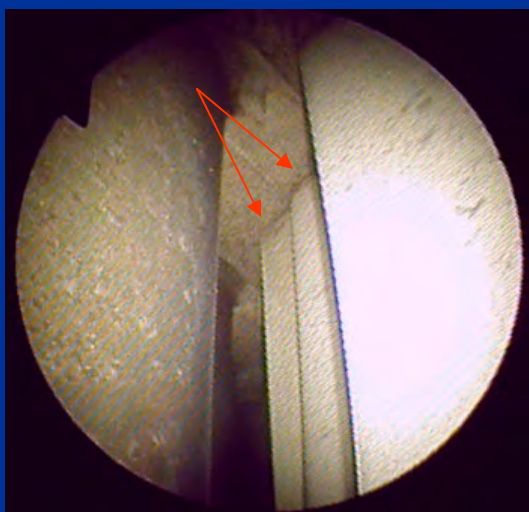
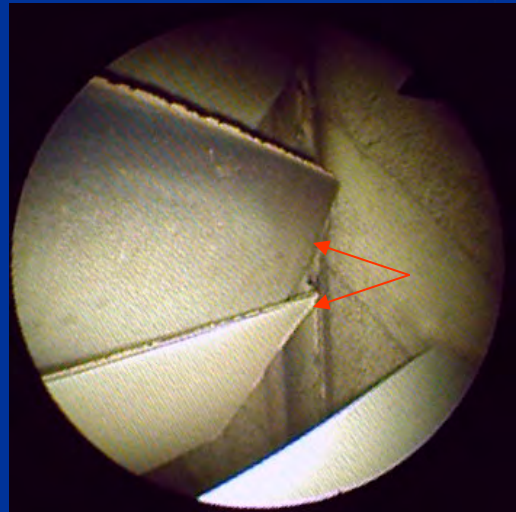
Aft-Compressor Stator Vane Issues

Distressed Stage S-16 Stator Vane



Leading Edge of a Distressed S-16 Stator Vane Platform Lifting from the Compressor Case.

Leading Edge of a Distressed S-16 Stator Vane Tip that is Against the Adjacent Vane.



Trailing Edge of a Distressed S-16 Stator Vane Tip that is Against the Adjacent Vane.

Unit Cleanliness

- Final inspection before unit assembly after outage or maintenance work.
- Keeps component cooling passages clean.
- Stops FOD from tooling or fasteners.



Questions?

Open Discussion / Recent Issues