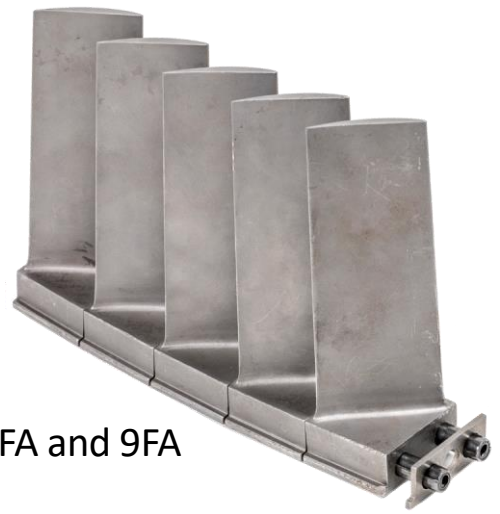




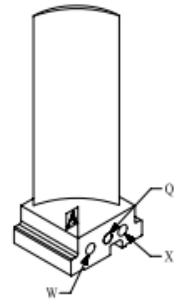
Proven and Cost Effective

- 20+ years of vane pinning experience
- 200+ gas turbines are running with pinned vanes
- Frame 3 (new in 2024), 5, 6B, 7B/E/EA, 9E, 6FA, 7FA and 9FA are operating with pins



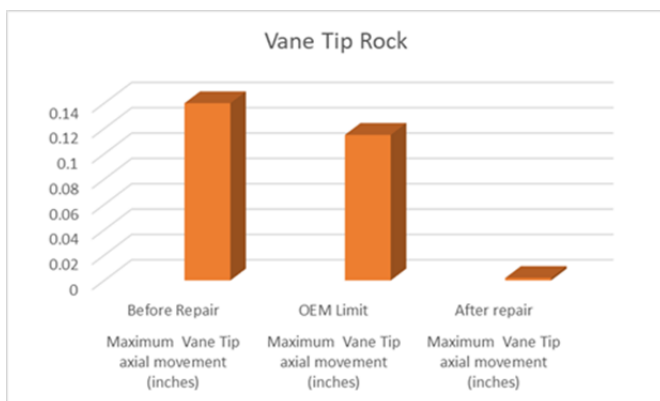
VANE PINNING NEWSLETTER –2024

This past year CTTS Pinning has been performed on 4 different **7FA Big Foot designed units (Stages 14-16) with more to come.** While clearly a more robust vane base design, this OEM solution fails to address the need for dampening of the individual vanes and therefore fretting and twisting remains a problem. There is good news for customers who have the OEM Big Foot solution. The casing and vanes themselves can continue to be used assuming the fretting is caught in time.



Compressor vane looseness and failures remain a hot topic in our industry:

- Stage 5 and Stage 14 through EGV's on 7E and 7FA are common areas of looseness and fretting...even in segmented designs.
- **Starts and time are the enemy...***vibration increases with looseness and looseness increases with vibration.*
- Fretting is the primary failure mechanism for vane bases...this is the good news in that often moderately fretted bases can be reused if pinned.
- **Dampening** is the most effective approach to dealing with aerodynamic instability...relying on casing to vane friction is not reliable. Dampening also helps vane root failure modes.



- Loose vanes are most vulnerable...as evidenced by circumferential location of issues (e.g. horizontal joint).... **Check vane tip rock and inspect for fretting at every casing removal...it only takes one loose vane!**
- Addressing tip rock not only reduces risk but also puts vanes in their aerodynamic as designed condition which helps compressor **efficiency.**

We Stock Pins, Shims, Tools and Fixtures to Support Your Outage!

e-mail: info@cttsus.com phone : +1 518 288 5262

website : www.cttsus.com