

# THE PATENTED TWO-PIECE CLIP

## Global Generator Clip Replacement For Water-Cooled Stator Windings

Leaks in the cast water box components and associated braze joints on inner water-cooled stator bar connections can eventually cause irreparable damage to the bar insulation system. Wet bars may lead to an unexpected and catastrophic failure of the winding. Early leak detection and corrective action can significantly prolong the life of water-cooled windings and can potentially avert an unplanned outage.

The patented MD&A two-piece clip, by design, addresses all known leakage and porosity issues with General Electric's water-cooled stator bars as stated in Technical Information Letter 1098 (TIL-1098).

For those units that are susceptible, the potential for crevice corrosion and associated leaks exists in virtually every factory brazed clip-to-strand and strand-to-strand joint.

Although leak testing is not always an exact science, tracer gas tests have proven to be highly effective and reliable in locating leaks that, when repaired with MD&A's two-piece clip, yield both accurate and reliable pressure and vacuum decay test results.



Depending on the number and location of leaks, it may be more economical to remove the field prior to installing two-piece clips. However, in many cases the MD&A two-piece clip can be installed with the generator field still in place.

Installation of the two-piece clip can be tailored to accommodate specific utility and plant needs. The MD&A two-piece clip can be applied as a retrofit item and installed on leaking bars during an outage. The two-piece clip can also be installed as a global replacement on all bars in the machine.

Through proper job scope evaluation, MD&A can assist utilities in reducing costs and the outage duration associated with leaking stator bars. With thousands of successful two-piece clip installations, the MD&A patented two-piece clip has proven itself to be a reliable, effective and economically flexible option for repairing leaking bars and as a key component in successful stator winding life extension programs.

### The Patented MD&A Two-Piece Clip Offers Inner Water-Cooled Generator Owners The Following Benefits:

- The two-piece clip eliminates cast components and therefore also eliminates any remaining concerns associated with future porosity issues
- MD&A's two-piece clip has no window box and therefore eliminates any associated window braze issues
- The two-piece clip corrects, by design, any clip-to-strand braze leak concerns
- The two-piece clip also corrects the strand-to-strand braze leak issues associated with the OEM strand package braze
- The MD&A two-piece clip allows for crevice-free brazes that virtually eliminate the possibility of any post-repair crevice corrosion issues

### The MD&A Two-Piece Clip Also Addresses Serviceability Issues That Can Extend An Outage Schedule Unexpectedly, Including:

- Both upper and lower half clips can often be installed with the rotor in place, thereby reducing the necessity to remove the generator field
- Upper half clips can almost always be installed with the field in place
- Clients can replace a single clip or all clips in accordance with individual needs
- No re-flow of previous braze joints is required when using the clip
- In-process / multiple pressure tests are conducted to assure integrity and quality
- No low temperature resins / epoxies are ever used as part of the repair
- Installation steps are reversible and follow clear procedures
- Installing the two-piece clip, where needed, is more economical than a complete water-cooled stator rewind
- The MD&A two-piece clip is a permanent fix that has been proven to be reliable over the course of thousands of installations on a multitude of machines



## MD&A TURBINE-GENERATOR REPAIR FACILITY

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