



GENERATOR & MOTOR SERVICES, LLC  
601 BRADDOCK AVENUE  
TURTLE CREEK, PA 15145  
PHONE: (412) 829-7500  
FAX: (412) 829-1692  
E-MAIL: info@gmsinternational.com  
WEBSITE: www.gmsinternational.com

# GMS NEWS

## GMS Brushless Exciter Refurbishment Program

Brushless rotating exciters became increasingly popular with major OEMs in the late 60's and early 70's as attractive alternatives to existing brush-type rotating exciter systems were developed. New brushless exciter designs eliminate the need for high-maintenance components such as commutators or brushes. Thus brushless exciters offer the promise of lower maintenance costs associated with the production of DC current required to excite the main field.



Brushless Exciter

Brushless exciters are very reliable components if they are maintained in a proper way. But extended time between routine outages and a general lack of scheduled brushless exciter maintenance have caused instances of severe exciter damage resulting in forced power plant outages.



Diode Wheel Component Contamination Results in Reduced System Reliability

In many cases, operational problems can be directly traced to contamination of diode wheel components. This condition, which can be addressed by cleaning and by a straightforward modification to the exciter housing, can lead to serious damage that can cause a forced outage.



Example of Diode Wheel Damage Resulting in Forced Outage

Many OEMs are now recommending that utilities replace existing brushless exciters with static excitation systems, which utilize slip rings or collector rings. This changeout, however, is very costly and introduces a new set of additional issues, such as the following:

- Brushes, brush rigging, collector rings, an excitation transformer and a means for air cooling must be provided.
- Bus work sizing and concerns about transmitted harmonics need to be addressed.
- If the excitation power were taken from the generator output, then demolition and rework is extensive and a location for the power potential transformer (PPT) and static exciter control cabinet must be selected.
- Costs and lead-time for a new static system normally far exceed the price and time required for a complete brushless exciter rehabilitation.

Given these considerations, GMS recommends a much more cost-effective option – complete exciter refurbishment.

The money saved by refurbishing the rotating brushless exciter is substantial compared to the cost of retrofitting to full static excitation. The reliability of an exciter with new parts and removed design flaws has increased substantially. Unscheduled outages due to equipment failure can result in extensive revenue losses and today's utilities must provide the most economical means to achieve the greatest reliability of their machines.

GMS is a full service shop rebuilding excitation systems for Westinghouse and other OEM exciters. In its 20-year history, GMS has developed engineering, shop service capabilities and manufacturing processes rivaling that of anyone in the industry, including the OEMs. GMS can now offer new manufactured brushless exciters to the market.

Also, GMS maintains an extensive inventory of exciter spare parts including bearing pedestals, diode wheel forgings, PMG assemblies, standard copper leads as well as assorted electrical components (diodes, fuses and capacitors). Swap-out exciters or mobile DC power supplies are also available to customers for use during refurbishment operations.



GMS Swap-Out Exciter

*Exciter Experts*

# GMS Brushless Exciter Refurbishment Program Elements

(1) Incoming Inspection



Recording of Total Indicated Runouts During Incoming Inspection

(4) PMG Inspection, Testing & Rewind



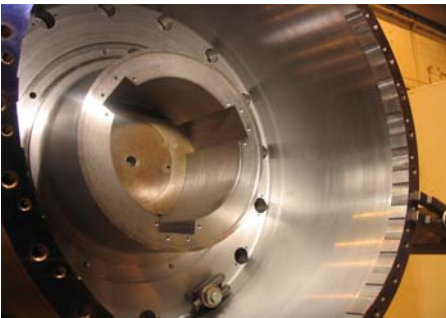
PMG Rewind

(7) High Speed Rotor Balancing



Exciter Rotor During Balancing

(2) Disassembly, Cleaning and Change Out of Diode Wheel Components, up to and including replacement of the Diode Wheel



Machining of New Diode Wheel

(5) Overhauling of the Exciter Base and Refurbishment of Stationary Parts to Improve Vibration Performance



Exciter Base, Bearing and Pedestal Modification

(8) Rental 6000A Power Supply for Continued Operation during Outage for Exciter Replacement or Repair.



Mobile 6000A DC Power Supply

(3) Rewinding of the AC Armature and DC Field



AC Armature during Rewind

(6) Modification of the Exciter House to Provide Positive Internal Pressure and Reduce Dirt Contamination



Positive Pressure Housing Modification

(9) Rental Collector Ring Assemblies Available for Operation with Mobile DC Power Supply.



GMS Collector Ring Assemblies

**GMS is your one-stop shop for rebuilding Westinghouse Excitation Systems and supplying Emergency Excitation Systems. We have demonstrated many times that brushless exciters can be refurbished in an economical way within the time window of a standard planned outage.**