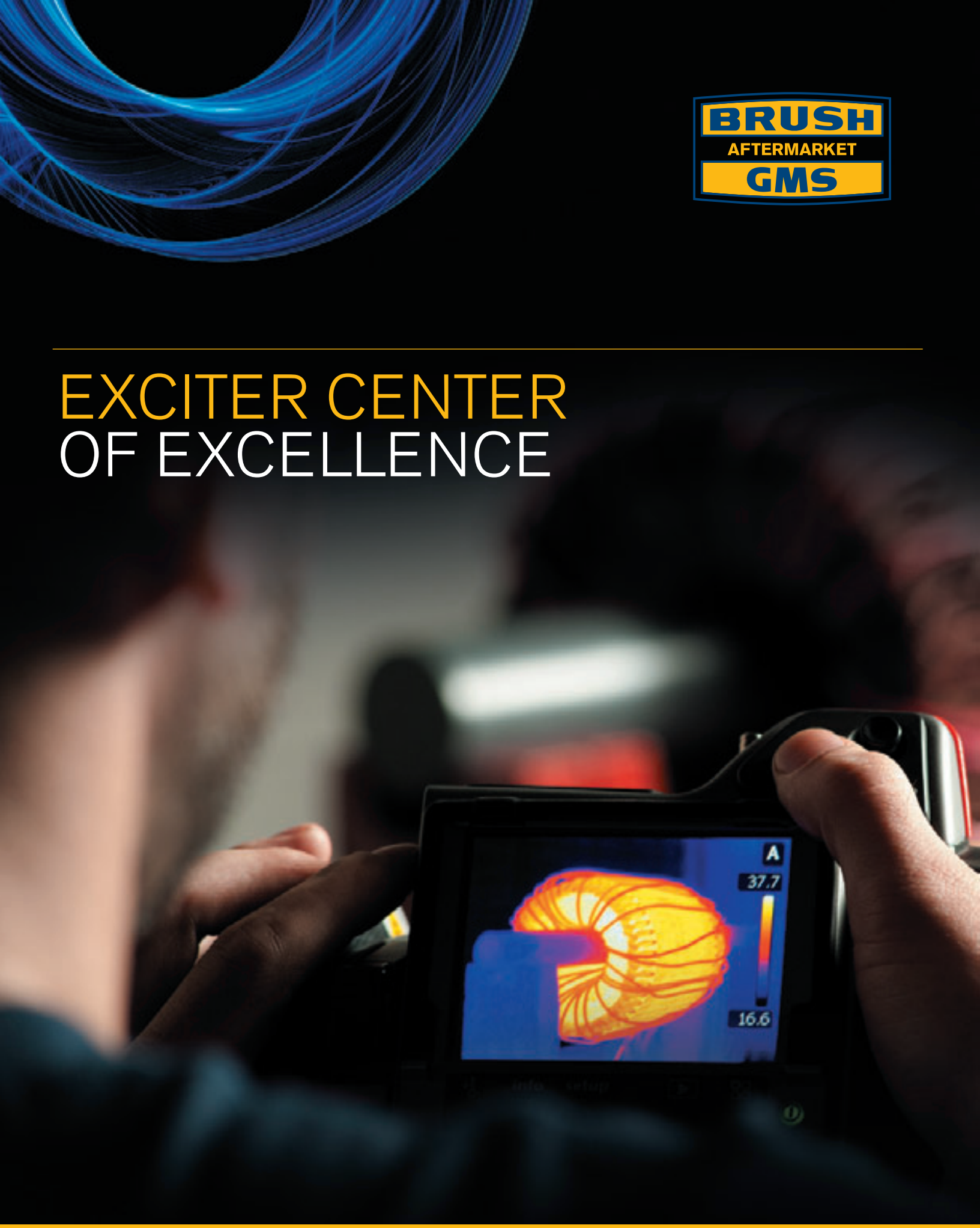
BRUSH AFTERMARKET GMS

EXCITER CENTER OF EXCELLENCE



Parts and Service for the **Global Power Industry**

24 HOUR GLOBAL SUPPORT FOR ALL GENERATORS

BRUSH IN THE UNITED STATES

Established in 1879, BRUSH has always been intrinsically linked with the USA. Charles Francis Brush formed the Brush Electric Company in Cleveland Ohio at the same time forming the Anglo-American Electric Light Company in London, England. Since those early days BRUSH has grown to become the largest independent manufacturer of turbo generators in the world with the greatest concentration of our machines installed in the United States.

We offer worldwide support for all BRUSH products and equipment which includes three manufacturing sites in Europe, a major repair facility in Pittsburgh, PA and sales support offices in Houston, TX, Abu Dhabi and Malaysia.

Our Aftermarket sales support provides fast responsive support anywhere in the world. The comprehensive services we offer concentrate on maximizing the performance of your generator regardless of it being an original BRUSH machine or that of any other OEM.

CONTENTS

BRUSH AFTERMARKET GMS

WHAT MAKES A CENTER OF EXCELLENCE?
WE HAVE ALL THE SKILLS YOU'LL EVER NEED AND PROBABLY A WHOLE LOT MORE...

A HISTORY OF EXCELLENCE

BRUSH GMS has become an industry leader in demonstrating that brushless exciters, some in operation for up to 40 years, may be overhauled and retrofitted allowing up to 20 years of extended, reliable operation.

Over the past 5 years BRUSH GMS has overhauled, repaired and rewound over 50 BRUSH, Westinghouse, GE and EM exciters. Service personnel have carried out inspection and testing on many more with outputs ranging from 100KW - 5000KW. BRUSH GMS can also recondition, modify or replace all exciter components as well as improve the exciter environment by performing a positive pressure vent modification of the brushless exciter housing.

Our expert teams are highly experienced in the design, manufacture, maintenance and testing of rotating exciters. Our engineers have improved exciter component design to improve reliability.

If your exciter is scheduled for an upgrade, BRUSH GMS solutions may include temporary replacement excitation or the supply of a brushless exciter from our extensive seed inventory.

BRUSH GMS services include:

- Repairs of all types.
- Rebuilding components.
- Refurbishment program to disassemble all removable components, testing each electrical component to identify its status.
- Component replacement including diode wheels and diode modules.
- Rebanding services.
- Complete rewinds of the stator and rotor winding assemblies.
- PMG rewinds.
- Full speed balance of all exciter rotors in a state-of-the-art balance facility.
- Emergency excitation services, including a mobile exciter, which can be brought to site, and swap-out brushless exciters for use during refurbishments.
- Electrical testing, including:
  - Hi POT testing.
  - Thermocouple continuity.
  - Core testing.
  - PMG magnet testing.
  - Resistance testing.
- Supply of new brushless exciters.
- Exciter housing modifications.

EXCITER REPAIRS, EXCITER SERVICES & MOBILE EXCITATION SERVICES

Housing upgrade/modification reduces risks and improves operation.

Brush GMS can carry out a Positive Pressure Vent Modification (PPVM) to your existing exciter housing. This program has proven to significantly reduce the rate of dirt contamination and mitigate the potential hazard of hydrogen gas ingress.

Housings are modified so the inside air pressure surrounding the diode wheel zone is at a higher pressure level than the outside. This higher pressure reduces the intake of dirt and contamination during operation.

Cooler repairs

Forced outages can be caused by water leaks caused by pipe corrosion and joint failure in exciter cooling systems. When required, coolers are refurbished to avoid cooler induced outages. Piping may be cleaned and relined, coolers may be cleaned and their water boxes relined. The entire cooling system is pressure tested and readied for long term use.

Base wiring up-grades

Base wiring on many older exciters contains asbestos insulation. During exciter overhauls BRUSH GMS tests and replace connections, terminal blocks and wiring with new, high quality materials.

High speed balance and over speed testing

BRUSH GMS will balance rotors at 3600 rpm after overhauls and over speed test at 3960 rpm. Experienced BRUSH GMS engineers can reliably balance even the largest of rotors within several days.

PMG output testing

The primary purpose of high speed testing is to record displacement data used to balance the exciter rotor. We also conduct PMG output testing, which is also conducted with the unit at rated speed. This running test can be done after the high speed balance with the PMG attached to the exciter shaft or with the PMG removed from the exciter shaft using a tolling shaft. The purpose of this testing is to verify adequacy of all repairs completed on the PMG stator or magnets to insure trouble free start up.

Transportation of equipment

BRUSH GMS will pick up and deliver your exciter and doghouse. If you have any logistic requirement in moving your existing equipment to our facility and back, Brush GMS will provide a complete turnkey solution.

OUR EXPERT TEAMS ARE HIGHLY EXPERIENCED IN THE DESIGN, MANUFACTURE, MAINTENANCE AND TESTING OF BRUSHLESS EXCITERS.

CASE STUDIES
BRUSH GMS TO THE RESCUE

AN ENERGY SUPPLIER'S COAL FIRED GENERATING STATION WERE PURSUING A CONTRACTOR TO REFURBISH THEIR EXISTING EXCITER TO ORIGINAL EQUIPMENT SPECIFICATIONS.

BRUSH GMS were selected to rewind and refurbish their AC armature and make repairs to the exciter and permanent magnet generator.

The power station's unit was a Westinghouse turbine generator and was placed in service in 1968. The turbine was a tandem compound, four flow, reheat, type steam turbine and the generator a hydrogen inner cooled design. The latter was coupled to a brushless exciter and a permanent magnet generator (PMG).The exciter model a MARK II, double wheel, air cooled brushless exciter, frame 121C offering 2900KW at 560 volts.

The work began with the pick-up of the exciter at the customer location just days after their fall outage began and the refurbishment process was scheduled to be complete in 36 days.

The work scope was extensive and included:

— Complete disassembly of exciter and housing.

— All incoming electrical and NDE inspections and tests carried out.

— TIR was done in the lathe.

— OMM 057 was performed on the pole support mounting bolts.

— Diode wheels were completely stripped down and all components cleaned and tested.

— All contact surfaces were re-plated with silver plate and all components completely refurbished and re-installed.

— Old armature coils were stripped, core tested for tightness and new coils installed.

— New insulation for radial leads.

— New axial lead insulation installed.

— New neutral rings and parallel rings installed

— New banding was wound over phase lead section and coil ends.

— Unit was readied and placed at the balance pit for over speed & balance.

— Base of the exciter was completely disassembled and each component cleaned, insulation replaced, painted and reassembled.

— All testing of electrical components performed

— Exciter rotor was installed in base complete after balancing procedure.

— Doghouse was refurbished in our paint shop.

THE CONTRACT UTILIZED BRUSH GMS'S EXPERTISE AND EXTENSIVE EXPERIENCE OF WORKING ON EXCITERS. TODAY THE UNIT IS 43 YEARS OF AGE AND STILL GOING STRONG.

A LARGE UTILITY IN ISRAEL WAS OPERATING A COAL FIRED POWER STATION UTILIZING SIEMENS GENERATOR AND EXCITER EQUIPMENT.

Cracks in the banding material of the exciter had been repaired annually for some years and finally a recommendation was made to replace the banding at the next opportunity.

BRUSH GMS was selected to replace the banding on the unit and review for other recommendations.

The exciter rotor was transported from Israel to Pittsburgh, USA. The rotor was inspected and tested to ascertain the physical condition of armature assembly including coils. A full inspection report to the customer revealed that coils had lifted, ground wall insulation was brittle, one phase had high resistance and the diode wheels were extremely dirty. Upon our recommendation, the client elected to proceed to a complete rewind of the armature.

The lead time quoted to complete the rewind was 47 days and customer requested temporary solutions to their excitation needs in the interim. BRUSH GMS offered them a fully operational brushless exciter as a replacement from the inventory of seed exciters in Pittsburgh. All that was needed was for a new coupling to be installed to mate with the client's generator. BRUSH GMS engineered and modified the backup unit for deployment and parallel work proceeded to rewind the client's exciter rotor.

The complete rewind of the client's rotor including high speed balance and shipment back to the client was expedited in such a timely manner that it allowed for the client to suspend any need of the temporary seed exciter.

The BRUSH GMS seed is a valuable asset for supporting temporary excitation during repair efforts on original equipment. From repair expertise to rewind capabilities to engineered alternative excitation. BRUSH GMS inventory may have the solution required for many customers.

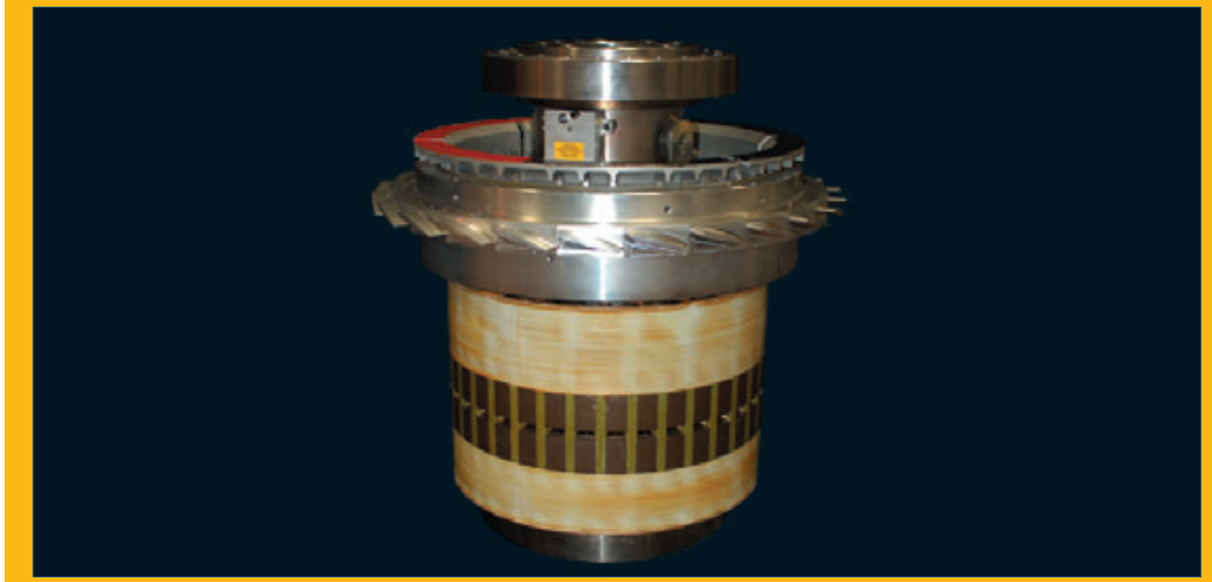
THE CUSTOMER COMMENTED ON THE "ON TIME PERFORMANCE" AND EXCELLENT TECHNICAL AND COMMERCIAL SUPPORT FROM BRUSH GMS.

REPLACEMENT PARTS

BRUSH GMS OFFERS A COMPLETE LINE OF PARTS TO SUPPORT BOTH OEM AND NON-BRUSH UNITS.

EXCITER FRAME	FUSES	CAPACITORS	DIODES	HEAT SINKS	PMG	MAGNETS	TC'S	GROUND DETECTION	TERMINAL BLOCKS	HOUSING GASKETS
Westinghouse										
A041C	Stocked	Available	Stocked	Stocked	Available	Available	Stocked	Available	Available	Stocked
A051C	Stocked	Available	Stocked	Stocked	Available	Available	Stocked	Available	Available	Stocked
A061C	Stocked	Available	Stocked	Stocked	Available	Available	Stocked	Available	Available	Stocked
A081C	Stocked	Available	Stocked	Stocked	Available	Available	Stocked	Available	Available	Stocked
A101C	Stocked	Available	Stocked	Stocked	Available	Available	Stocked	Available	Available	Stocked
A121C	Stocked	Available	Stocked	Stocked	Available	Available	Stocked	Available	Available	Stocked
A141C	Stocked	Available	Stocked	Stocked	Available	Available	Stocked	Available	Available	Stocked
A161C	Stocked	Available	Stocked	Stocked	Available	Available	Stocked	Available	Available	Stocked
FRAME 6	Stocked	Available	Stocked	Stocked	Available	Available	Stocked	Available	Available	Stocked
FRAME 8	Stocked	Available	Stocked	Stocked	Available	Available	Stocked	Available	Available	Stocked
FRAME 12	Stocked	Available	Stocked	Stocked	Available	Available	Stocked	Available	Available	Stocked
FRAME 16	Stocked	Available	Stocked	Stocked	Available	Available		Available	Available	Stocked
BRUSH										
BXJ-40	Stocked		Stocked	Available		Available		Available		
BXJ-21	Stocked		Stocked	Available		Available		Available		
BX-10	Stocked		Stocked	Available		Available		Available		
BX-11	Stocked		Stocked	Available		Available		Available		

WE HAVE AN EXTENSIVE INVENTORY IN OUR PITTSBURGH FACILITY AND IF YOUR PART ISN'T STOCKED WE HAVE THE DESIGN AND ACCESS CAPABILITIES TO MAKE THE PARTS YOU REQUIRE AVAILABLE.



BRUSHLESS EXCITERS

Swap-out brushless exciters are available to customers for use during refurbishment operations. The below models are regularly available to rent or buy.

MANUFACTURER	Westinghouse Brushless	Westinghouse Brushless	BRUSH Brushless x2	EM Brushless x2	BRUSH Brushless	Elin (GE) Brushless
MODEL	A081C Fully Operational Brushless Exciter	A141C/141C Fully Operational Brushless Exciter	BXJ-40 Armature Only	7A6 frame Complete Armature & Stator	BXJ-40 Armature	Full Assy. 50 Hertz
GENERATOR OR TURBINE PACKAGE REFERENCE	Westinghouse Generator Frame 2-102x170	Westinghouse Generator Frame 2-104x245	BDAX 7.290ER 72.290ER 72.340ER 8.335ER	GE 7EA Series and BRUSH BDAX- 8.365ER	BDAX- 8.365	BDAX 9 or GE 9A5

Mobile exciter

Mobile exciters are either skid mounted or trailer mounted. This includes PPT and provides DC excitation current in various amperage ratings depending on need and equipment availability. The units are properly installed and their on-board AVR system is calibrated at site to operate successfully.

Collector ring assemblies

Rental Collector Ring Assemblies are available for operation with mobile DC power supply with an option to purchase.

PPV MODIFICATION FOR DRAMATIC DIRT CONTAMINATION REDUCTION

The BRUSH GMS PPV (Positive Pressure Vent) upgrade significantly reduces dirt contamination, whilst also reducing the potential hazard of hydrogen ingress.

Lacking external blowers and motors, the BRUSH GMS PPV gives a passive upgrade to the existing exciter housing. Many BRUSH customers undergoing an initial PPV upgrade have returned to us for additional unit upgrades because of the many benefits that such a procedure can bring.

Dirt contamination–affecting brushless exciters

Dirt contamination is a common problem for brushless exciters, with unfiltered ambient air being ingested by the exciter fan to replenish air that leaks out of the exciter housing. Typical leakage areas include door seals, base seal and the shaft seal. Miscellaneous openings, which also contribute to dirt contamination, include those for entry of the cooling water piping, as well as oil piping, electrical wiring and conduit into the housing.

Make-up air vents – a major cause of dirt-laden air ingress

Adding to the problem of dirt ingress is the exciter's ventilation scheme. There are three zones in the OEM brushless exciter – the fan, bearing and diode wheel zones; and because the make-up air vents are located in the diode wheel zone, it will inherently operate at negative pressure (below atmospheric pressure), providing a virtually unlimited opportunity for dirt-laden air to enter the exciter. The PPV upgrade reduces the rate of air exchange and provides a hydrogen-free exciter environment.

BRUSH GMS PPV, DELIVERING AN IDEAL SOLUTION

By providing manageable control of the make-up air and improved sealing the BRUSH GMS PPV can provide the following benefits.

Both the diode wheel and bearing zones operate with positive pressure.

The fan zone is now the only area with negative pressure, so it's the only zone in which make-up air can enter. This reduces the potential for air to enter the housing via the door, base and bulkhead interface seals by around 75%.

With the potential for air entering the system limited to the fan zone, it is now possible to control air quality, whilst also minimizing the volume of make-up air via use of a properly designed filtration unit and improved sealing. The make-up air enters the filter unit, passes through the pre-filter and primary filter and then through a pressure-actuated flow control valve, which uses static pressure in the diode wheel zone to maintain approximately 1 inch water gauge.

Improved compression

As well as changing the air intake locations, the BRUSH GMS PPV completely strips the existing rubber seals throughout the housing and installs new seals. In addition, the doors are fitted with latches to provide greater seal compression, and all penetrations into the housing area are sealed as well. The housing is cleaned, re-assembled and then painted to match the existing color.

Reducing

As an effective means of reducing dirt ingress into the OEM's brushless exciters, the BRUSH GMS PPV offers the opportunity to reduce exciter maintenance and the risk of electrical failures arising from dirt accumulation on the electrical components. In addition, the PPV upgrade decreases the risk of hydrogen ingress.

SERVICE RECOMMENDATIONS FOR THE BEST PERFORMANCE

MINOR BRUSHLESS EXCITATION INSPECTIONS

A proper maintenance plan will use predictive and diagnostic findings to ensure the maintenance performed on an exciter is optimized.

The most effective predictive set of data will result from vibration monitoring, lube oil monitoring, annual electrical testing, temperature data and thermography.

Collecting data from minor inspections and reviewing monitored data will help determine the planned major inspection work interval and requirement.

On a minor inspection basis, BRUSH GMS can perform the following work in a short outage.

Limited access to components with housing in place may allow for minor inspections and cleaning which may include:

- Cleaning components inside housing and diode wheel.
- Perform electrical testing on PMG and exciter field.
- Visual inspection of any heat affected areas.
- Inspect ground detection system for wear.
- Check insulation for deterioration.
- Visual inspection for movement of components.
- Inspect banding risers and channels.
- Inspect bearing insulation.

Removing exciter housing and disconnecting generator leads.

- Perform all the visual and electrical inspections referenced above.
- Perform additional electrical testing on fuses, diodes, windings.
- Replace any components testing outside of acceptable measurement criteria..
- Perform additional cleaning and inspection of bearings and wear components.
- Replace gaskets, filters, brushes, terminal blocks as necessary.
- Inspect magnets.
- Perform AC stator winding resistance testing and AC stator pole balance test.
- Perform additional PMG testing.
- Inspect and report on doghouse heat exchanger piping and coolers condition.

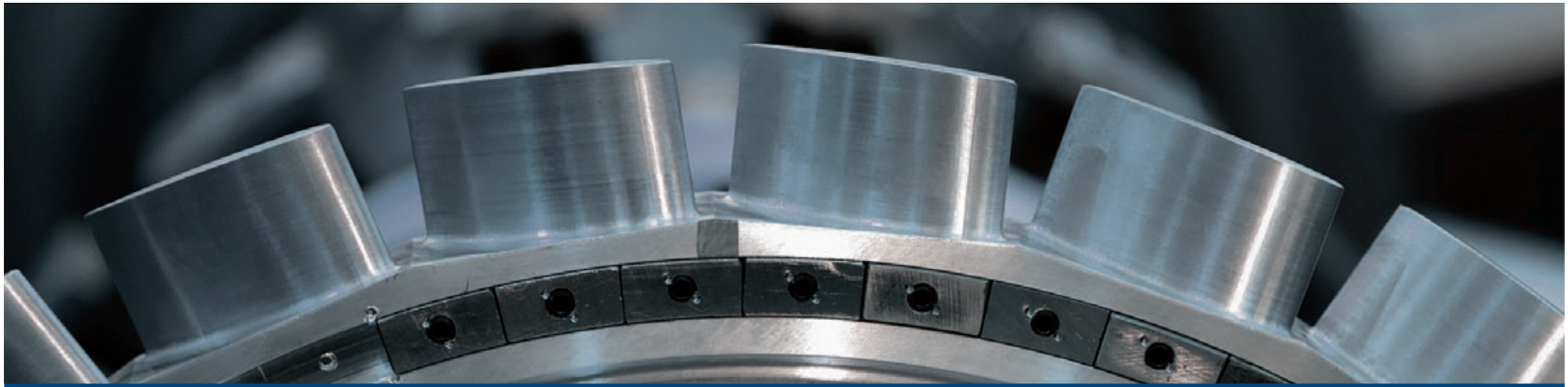
MAJOR BRUSHLESS EXCITATION INSPECTIONS

BRUSH GMS Major Inspection Package.

- A complete disassembly of the housing from the base unit.
- Removal of the red iron and rotor from base.
- Complete removal of all diode wheel components for complete testing and cleaning.
- Replacement any components including fuses, diodes, capacitors, heat sinks, old wiring harness, gauges, TC's and terminal blocks.
- Repair work on banding if necessary. Repair work on bearing if necessary.
- NDE examination of journals, coupling, diode wheels.
- All electrical testing performed.
- Phase lead risers inspected and replaced if necessary.
- Cleaning of entire exciter and doghouse.
- Coolers removed and pressure tested and repaired if necessary.
- Ground detection system components may be tested, replaced if necessary. Ground rings inspected and improved if necessary. Wiring to ground rings inspected and repaired if necessary.
- If necessary, unit may be sent to balance pit for high speed balancing or balanced on turning gear.

These are inspections, tests and repairs that may be performed in the field. BRUSH GMS can provide an extensive list of field service work recommendations for any given outage opportunity and work to your schedule.

If you want to extend the time between major overhauls, consult with BRUSH GMS on performing minor and major field inspections.



NERC REQUIREMENTS KEY PURPOSE FROM NERC PERSPECTIVE

Key purpose from NERC perspective

"...to ensure that generators will not trip off line during specified voltage and frequency excursions or as a result of improper coordination between generator protective relays and generator voltage regulator controls and limit functions."
From NERC PRC-024-1

Verification requirement

MOD-026 will require owners to verify coordination of protection systems for all generators every 10 years (identical units on the same site: verification only on one unit)

— Reactive power problems are mostly local in nature and it is therefore crucial to provide a necessary level of reactive power support and voltage control in a distributed manner on all network levels and especially at the sending and receiving ends of transmission lines. Voltage and reactive power problems cannot be resolved centrally.

— It has become standard industry practice for transmission operators to require generating facilities to provide a level of reactive power support and to maintain voltage schedules.

— This is especially important for large generating facilities (20 megawatts and above) that generally supply power at a significant distance from load centres.

At BRUSH GMS we understand the ongoing regulatory requirements and can support your business needs by providing most modeling and test requirements as well as through the built in features in many of our products.

THE PRISMIC® A50 EXCITATION SYSTEM

The PRISMIC® A50 excitation system delivers unsurpassed levels of power and flexibility. This makes it ideal for hydroelectric, coal, steam, gas and nuclear power plants, plus it's equally suited to synchronous motors and condensers.

The PRISMIC® A50 is also suitable for new installations, and it lets you upgrade outdated equipment without incurring the cost and downtime of installing a complete new system.

The PRISMIC® A50's strikingly compact and elegant design requires few additional components, allowing for a control panel design that's both simple to use and easy to maintain. In addition, the A50 comes with all the necessary firmware and application logic, so a microsystem or programmable logic controller is not required.

The PRISMIC® A50 boosts performance in several key areas:

Synchronization
You can synchronize generators to a power distribution system which can replace conventional stand-alone synchronizers.

Interfacing
Advanced digital technology allows for distributed control, high-speed parameter setting and remote diagnostics.

Regulation
Secure the stable regulation of synchronous machines in a variety of operating modes – in both steady-state and transitional conditions.

EXCITATION SYSTEM	D (DC)	B (BRUSHLESS)	S (STATIC)	A (AUXILLIARY)
Response speed	Low	Low	High	High
PSS efficiency	Low	Low	High	High
Fast de-excitation	Yes	No	Yes	Yes
Steady state short circuit current	Yes	Yes	No	No
Suitable for new generators	No	Yes	Yes	Yes
Output		Low/Medium	Full Range	High
Refurbishment	B,S	S		A,S

SPAIN - SEED ROTOR REPLACEMENT

A CUSTOMER'S WESTINGHOUSE A161C EXCITER WAS REBANDED IN EUROPE AND WAS ONLY IN OPERATION FOR A FEW HOURS BEFORE SUFFERING A CRITICAL BAND FAILURE.

Banding failure inspection

— The band failure caused damage to the Inconel resistor assemblies and exciter armature coil ends. It was determined that the unit needed to be completely rewound and rebanded.

— Full inspection and testing of all components took place at this time.

Exciter rewind

— The exciter was stripped and rewound with new coils and new class F insulation.

— All exciter bands were replaced.

— All components were cleaned.

— Electrical contact surfaces were silver plated.

— All diode wheel fuses were replaced.

— Following the rewind the exciter was balanced at 3000 RPM operating speed.

Inconel resistor removal

The unit was designed with Inconel resistors to balance phase resistance. Through experience it was known these had been a component prone to failure and were determined to not be necessary. BRUSH GMS replaced the Inconel resistor assembly with a flexible phase comprised of laminated copper.

The diodes in the rotating rectifier were replaced by stud diodes with a faster reaction time and higher voltage rating. The existing heat sinks were modified to accept the stud diodes.

Seed exciter installation

An A061 seed exciter was modified to be installed at the customers site while the rewind took place. The higher power rating of the A061 exciter allowed for the generator to run at the same rating.

The two exciters have different couplings and means of transmitting power to the generator rotor so an adapter was manufactured to convert the coupling leads to a butterfly style main lead.

The exciter base plate was modified on-site to be installed on the current sole plate.

After the customer witnessed final completion of tests including high pot testing of the rewound rotor the exciter was shipped back to Spain.

THE SEED ROTOR WAS REPLACED WITH THE CUSTOMER ONLY LOSING POWER WHEN THE CHANGEOVERS TOOK PLACE.

PITTSBURGH, PA
OUR HUB IN THE USA

BASED IN PITTSBURGH : SERVICING THE WORLD

From our Pittsburgh base BRUSH has provided engineering driven solutions for generation equipment in electric utility and industrial plants for over 20 years. With a full range of inspection, testing, repair and patented retrofits, BRUSH ensure our customers receive a timely and quality service incorporating custom engineering for life extension and maintenance of a wide range of generators and excitation systems.

BRUSH is dedicated to upholding our high standards of excellence and we offer value solutions for all 3rd party generators providing technical qualifications in line with the OEM and utilizing our own OEM expertise and support network for BRUSH generators and control systems.

Our highly skilled and uniquely qualified service engineers are dedicated to providing timely service to meet both scheduled and emergency outage needs. Our support teams can answer any queries you have about our capabilities and deliver quotations and technical advice.

Our comprehensive capabilities focus on maximizing the performance of your generator, with the ultimate aim of extending its life, and include:

Rotor repairs
BRUSH-offer complete rotor servicing including: inspection, testing, rewind, machining, life extension and engineering. BRUSH has experience rewinding the fields of all the major OEMs. BRUSH has capability in its 50,000 sq ft manufacturing plant to handle rotors up to 100 tons. With two heavy duty lathes and a complete compliment of milling machines, BRUSH can perform any necessary machine operation.

Stator repairs
BRUSH can offer complete stator services from a visual inspection and testing by experienced personnel to a complete rewind. BRUSH provides all the standard electrical and mechanical testing and inspections plus EL-CID, loop test and end winding stiffness (“Bump”) testing and analysis.

With manufacturing plants worldwide, we have the capability to reach you anywhere in the world.

BRUSH FACILITIES

— 50,000 sq ft of high bay space
— Capable of 100 Ton lift
— Clean environment
— 24/7 security
— Truck and rail access

BRUSH SHOP TOOLING

— Two 50” x 72” horizontal boring mills
— Two lathes
— 60” swing and 600” centers
— 90” swing and 480” centers (transportable)
— Two vertical boring mills
— Rotor winding clean room
  — 1800 sq ft clean room
  — Air conditioning & humidity controls

For more information about **BRUSH** Aftermarket, please call us direct, email or visit our website.

BRUSH Aftermarket
601 Braddock Ave.
Turtle Creek, PA.
15145, USA

T +1 412 829 7500
F +1 412 829 1692
E marketing@brushgms.com

BRUSH Aftermarket
Nottingham Road,
Loughborough, Leicestershire,
LE11 1EX, United Kingdom

T + 44 (0) 1509 611511
F + 44 (0) 1509 612436
E serviceuk@brush.eu

BRUSH Aftermarket
P.O. Box 111209, Abu Dhabi,
United Arab Emirates

T + 971 4362 6391
F + 971 2550 1920
E serviceme@brush.eu

BRUSH Aftermarket
P.O. Box 3007, 2980 DA,
Ridderkerk, The Netherlands

T + 31 (0) 180 445500
F + 31 (0) 180 445445
E servicenl@brush.eu

BRUSH Aftermarket
Lot 7 Jalan Majustret U1/26,
Hicom Glenmarie Ind. Park,
40150 Shah Alam,
Selangor DE, Malaysia

T + 60 3 7805 3736
F + 60 3 7803 9625
E servicemy@brush.eu

BRUSH Aftermarket
Tř. Edvarda Beneše 39/564,
301 00 Plzeň,
Czech Republic

T + 420 37 8210717
F + 420 37 8210337
E servicecz@brush.eu

BRUSH AFTERMARKET GMS

www.brush.eu