Synchronous Condenser Conversions

EME evaluates Synchronous Condenser Conversions at existing power plants on a case-by-case basis to help determine which solution is best for the plant. EME dedicates a project team to the project that is involved from sale to implementation. The design/build portion of the project is based out of our Pittsburgh, PA facility and EME can support the installation of the equipment anywhere in the world. We have our own dedicated field tooling to ensure the right equipment is there and the installation is smooth and successful.

Converting a turbine driven generator to synchronous condenser operation involves changes to the control, protection and operating systems in addition to mechanical changes. However, one of the first decisions that needs to be made is "How Will We Get the Generator Up To Speed for Synchronous Condensing Operation?" EME supports both starting package technologies, whether a Pony Motor or High-Voltage VFD is used.

Additionally, the common modifications with that go along with the conversion, EME supplies as well. These can include:

1. Decoupling the turbine from the generator rotor, whether demolition in place or removal of the turbine.
2. New thrust bearing—With the decoupling of the turbine, the thrust bearing is typically lost in the new drivetrain arrangement.
3. Lube Oil Changes—The main shaft driven pump is typically lost and changes need to be made to the lube oil system. These usually include the addition of an AC motor driven pump and an external lube oil heating skid.
4. Turning Gear—Depending on the existing turning gear placement, EME can help determine whether it is best to replace the turning gear of modify the existing one.
5. Cooling Water—Some plant cooling systems may need to be modified depending on the plant arrangement, such as the hydrogen coolers, lube oil coolers, seal oil coolers, GSU transformer coolers, etc.

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EME utilizes multiple software tools to facilitate engineering analysis. Commercially available engineering and design technical support software includes:

- Solid Works
- Simulation Advanced Professional (FEA)
- ME Scope
- Matlab
- Ez-TOMAS
- Microsoft Office Professional
- AutoCAD
- XLRotor
- MathCad
- Ltsplce
- Ez-Analyst
- Microsoft Project

EME proprietary engineering and design software suites:

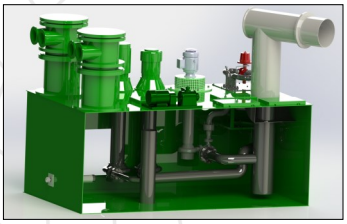
- EMEGEN - Salient pole synchronous machine design and analysis.
- EMETURBO - Cylindrical rotor synchronous machine design and analysis.
- EMEINDUCT - Induction motor design and analysis

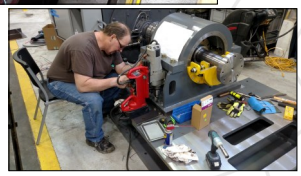
Design · Build · Install

Synchronous Condenser Conversions

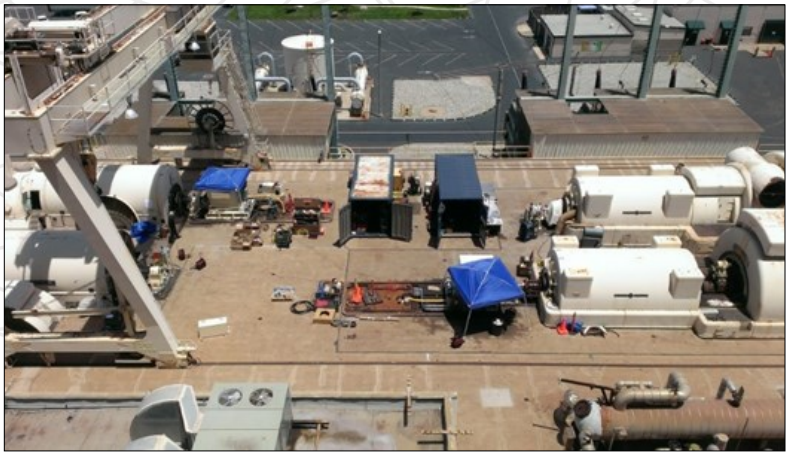
EME has been part of teams that have successfully converted two (2) cross compound units at a west coast utility. One being a 128MVA GE unit and the other a 128MVA Westinghouse unit. We have just completed the conversion of a GE 140MVA generator at a Midwest utility. This is part of a three (3) unit conversion with the other two (2) units scheduled for completion in early 2016.

Each starting package is customized for the project. The manufacturing, assembly, and testing is based at our Pittsburgh, PA facility.





Full Service Field Modifications and Installation of equipment with dedicated Field Tool Trailers.



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