

# THYRIPART®-S

## SPPA-E3000 Compound Excitation Systems

[www.siemens-energy.com](http://www.siemens-energy.com)



### Compound excitation systems (CES)

are excitation systems for synchronous generators and emergency diesel generators. They are suitable for lower and upper performance classes with a generator power of up to approximately 50 MVA in hydroelectric, gas, steam and nuclear plants (emergency diesel) and are characterized by maximum safety and absolute availability. CES excitation systems are available as load dependent static and brushless versions.

#### The Task

Sooner or later, the existing excitation system will reach the end of its service life. This may be because some modules have been discontinued, or simply because they can no longer operate economically. This is the case if, for example, spare parts are only available at high prices, or grid operators impose new requirements for control dynamics which the systems are unable to meet, or for some other reason the statistical risk of failures exceeds beyond acceptable levels.

What is then required is a solution that perfectly fits the existing situation in the plant and ensures reliable, continuous operation based on innovative technology.

#### Our Solution

CES is a tried-and-tested solution for synchronous generators of any manufacturer and can be used both as a static excitation system for generators and for excitation of rotating excitation machines. Over 300 installations in operation have demonstrated the unconditional reliability and robustness for years.

The solution adapts to the conditions in each individual power plant regardless of the available footprint, which generator is used and which power supply and control system is available.

CES have been designed to meet the highest demands without compromising on safety and reliability. This concept is unique in the market: It is essentially based on the use of the Harz Circuit with a resonant circuit, thus reducing the number of components required to operate the excitation to a minimum. Basic excitation is ensured even in the event of controller failure by using purely passive components. This also complies with the demands of emergency diesel generators in nuclear plants.

CES uses only proven, tried-and-tested industry standard components and can be integrated into the existing plant without any problems.

Of course, Siemens Energy ensures a smooth transition, encompassing everything from project planning and commissioning to ongoing service support for CES.

#### Your Benefits

- Uncompromisingly high safety and absolute reliability of the excitation system due to the unique safety concept
- Low maintenance costs through the use of proven industry components and modular structure
- Simple exchange of the existing excitation system in minimum time and without interface problems

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