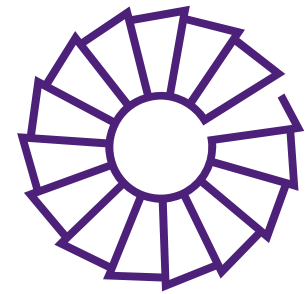


Product Improvement Bulletin

Flexible Performance Enhancement of current
43-47.5MW rated SGT-800 units

E1B100296736 PIB/SGT-800/18-007

Edition: B
Date: 2019-01-07
Document number: E1B100296736 PIB/SGT-800/18-007



Siemens Energy new performance upgrade enables reduction of fuel consumption and CO² emissions. A contribution for a sustainable future!

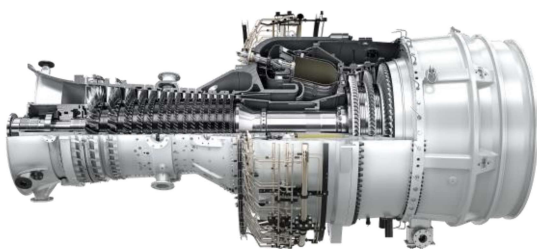
Bulletin applies to

This power and efficiency upgrade is applicable to all existing SGT-800 units with ratings of 43 MW to 47.5 MW in all types of installations.

Reason for bulletin

With more than 350 units sold over 20 years, and seven million operating hours, the SGT-800 is the market-leading gas turbine for combined cycle applications in its power range.

In our constant focus on customer needs, Siemens Energy is introducing an extensive performance boost for parts of the existing fleet. Siemens Energys latest SGT-800 components have been designed in evolutionary steps, proving every stage of the development. The upgrade is using features from existing and proven SGT-800's with higher ratings, which have proven operation records.



You will benefit from

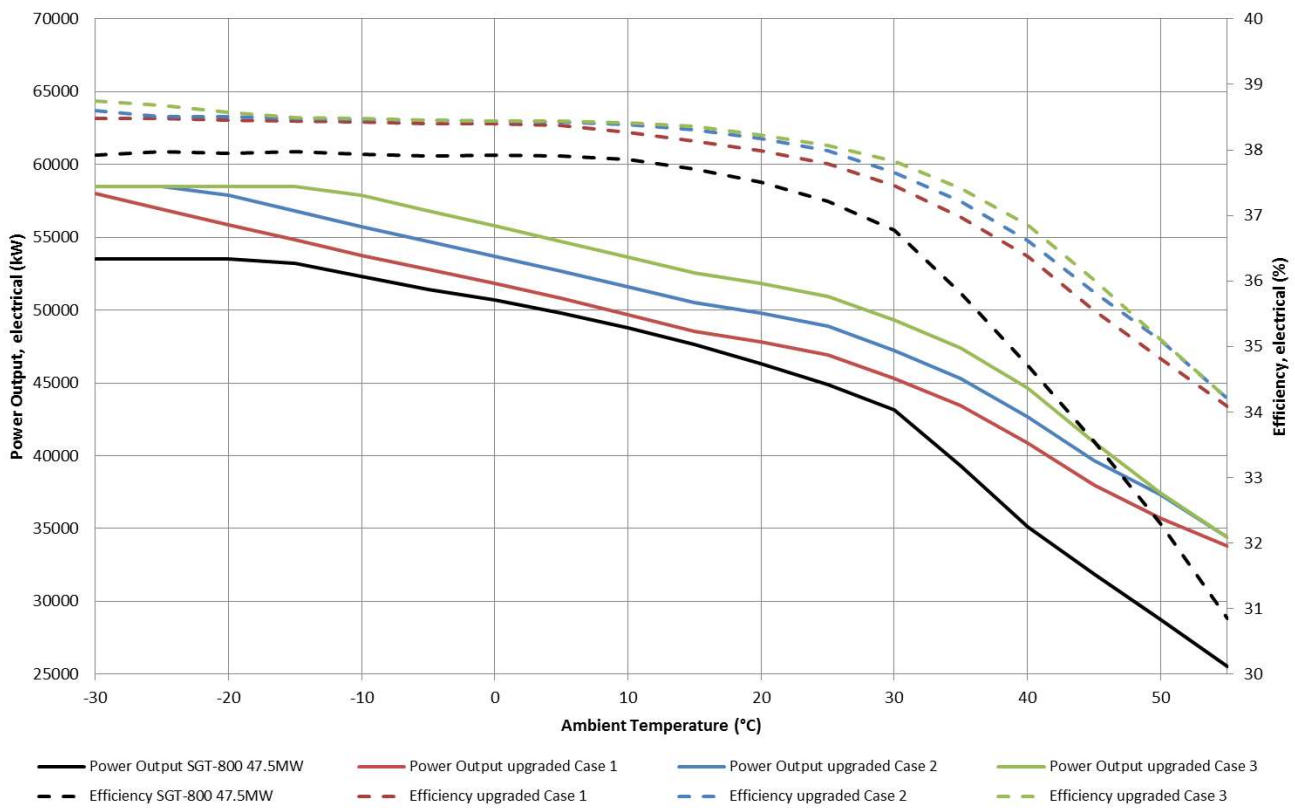
- An easily implementable upgrade that shares most of the scope with a routine major inspection.
- Increased efficiency and profitability (lower fuel consumption).
- Uprate of the power output up to 53 MW (ISO). The output can be adapted to your needs and steam cycle capacity.
- Combined cycle performance increase due to higher mass flow and exhaust gas temperature which boosts performance of downstream equipment.
- Flexible operation depending on operation profile with a possibility to achieve longer maintenance intervals.

Performance improvement

This performance upgrade offers up to 3.5% increase of simple cycle GT efficiency, and up to an additional 10 MW output, enhancing the power of 43-47.5MW units up to 53 MW (ISO). For a combined cycle application this could give a power increase of more than 20 MW and 3.5% lower heat rate. The heat rate improvement will enable reduction of fuel consumption and CO² emissions.

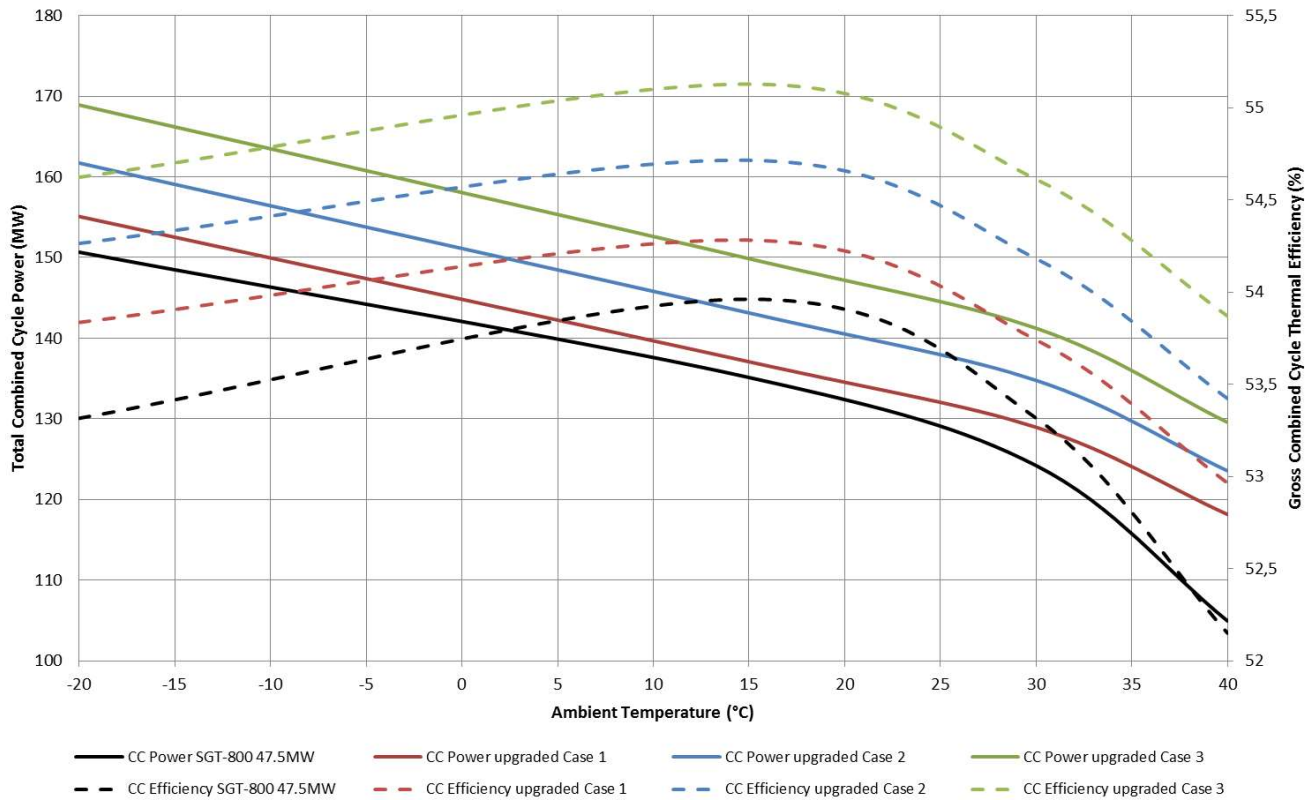
Depending on your needs, the power rating after the upgrade is flexible. You can choose what is best for your plant's situation based on typical example cases in the diagrams below.

Simple Cycle Performance for a range of Ambient Temperatures



Potential simple cycle performance after an upgrade depending on your plant configuration

Combined Cycle Performance for a range of Ambient Temperatures



Potential combined cycle (2 GT x 1ST) performance after an upgrade depending on your plant configuration

What is the upgrade based on?

The power upgrade is based on improvements of aerodynamics in the compressor section plus material/coating/cooling technology of the parts in the turbine section, coupled with updates of the control system.

Compressor

Upgraded with improved airfoil aerodynamics to increase mass flow and improve efficiency.

Combustor

The combustor will be the current reliable system but with a moderate increase of the firing temperature.

Turbine

- Further improved efficiency through tighter clearances and further optimization of component cooling systems
- Improved component coatings to assure sustained high engine reliability

Please note that the scope of the upgrade will vary depending on the current power rating of your unit due to capability of the auxiliary systems, i.e. HRSG cycle, Electrical generators etc.

Customize your own gas turbine based on operational needs

This product is flexible and will be adapted to your specific operational needs in terms of Power output and Time Between Overhauls (EOH and EOC). Siemens Energy has the technology, competence and skills to always offer a unique solution optimized for you.

By selecting our Flex LTP with a Tailored Maintenance Plan in conjunction with this upgrade it will give you the benefit of our specific OEM knowledge and advanced optimization technology. This will also create possibilities for you to extend the time between overhauls.

Planning and Implementation

Initially an engineering study will be performed where the actual site and machine conditions will be investigated for an appropriate scope of supply.

Depending on the limitations of auxiliary systems or the steam cycles in Combined Cycle (CC) and Combined Heat and Power (CHP) installations, the upgrade scope will be adjusted for each specific installation, applications and needs.

The power upgrade can be easily achieved with minimal modification to the existing SGT-800 package during routine unit overhaul. This cost-effective and simple retrofit approach minimizes your plant down-time.

We want to work together with you to create a tailor-made maintenance program that is best suited for your specific needs. Let us help you optimize your operation.

For further information, please contact your Siemens Energy sales representative for an offer.

Trust the SGT-800 performance enhancement to the people who designed and built your gas turbine.

Sincerely yours

Esa Utriainen

SGT-800 Product Manager, Service

Siemens Energy AB
Finspong, Sweden

Published by

Siemens Energy AB
SE-612 83 Finspong, Sweden

For more information, please visit our website:
siemens-energy.com

No warranties, expressed or implied, whether of fitness for purpose or merchantability, from course of dealing or usage of trade, as to the completeness, usefulness, adequacy, or accuracy thereof, or otherwise, are made regarding the information, recommendations, or descriptions contained in this product improvement bulletin.

Any obligation or liability of Siemens Energy shall be solely if and to the extent set forth in existing contracts, if any, and nothing in this Product Improvement Bulletin shall be deemed or construed to give rise to any additional obligation or liability of Siemens Energy.

This Product Improvement Bulletin is confidential to Siemens Energy. Neither this document nor any information contained in it is to be reproduced, transmitted, disclosed or used otherwise in whole or in part without the written authorization of Siemens Energy.

If you require further information or to make the necessary arrangements in respect of your installation please contact your Siemens Energy designated Project Manager or Customer Support Manager or your regional Siemens Energy Representative.

The Bulletin is submitted in confidence and is to be used solely for the purpose for which it is furnished. This Bulletin is not to be reproduced, transmitted, disclosed or used otherwise in whole or in part without the written consent of Siemens Energy AB, Sweden.

Trademarks mentioned in this document are the property of Siemens Energy, its affiliates or their respective owners.

The technical and other data contained in this document is provided for information only. Neither Siemens Energy AB, its offices nor employees, accept responsibility for, nor should be taken as making any representation or warranty (whether expressed or implied) as to the accuracy or completeness of such data or the achievement of any projected performance criteria where these are indicated. Siemens Energy AB reserves the right to revise or change this data at any time without further notice.

Siemens Energy is a trademark licensed by Siemens AG.