TBC Literature Study

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Introduction

In the effort to increase the efficiency of a gas turbine, TIT's (Turbine inlet temperatures) of advanced engines are increasing into the melting range of the substrate material of hot gas path components. To avoid possible (partial) melting, measures have been implemented in these components to counteract this phenomenon. These measures consist of a combination of cooling features and/or the application of an isolating layer on the gas path surface of these components, the so-called TBC layer.

This proposal addresses the latter. Although this technology has been in use for several decades in military and civil aviation aero-engines as well as in land-based gas turbines, gas turbine operators expressed their concern that one is not able to address adequately the questions one has with regard to this subject. Questions that arise during the initial acquisition process of the hardware, the decision process before, during the maintenance events and in occurrence of failures as well as the unit forecasting efforts.

It is therefore that it is proposed to perform an in-depth literature survey into thermal barrier coatings. Given the fact that 'thermal barrier coatings' has been an appreciated topic for a large number of papers, the approach suggested differs from the common literature survey method.
It is suggested to collect, based upon operator's feedback, an overview of the TBC related topics of interest to them. This list will be used to collect literature places and to weigh these with regard to their importance to the specific topic.

This project will provide the members the possibility to generate, based upon their own need, from the identified literature places a state-of-the-art review on the specific topic(s).

Project Rationale

1. Initial list will be created on Wiki
Operators and interested parties need to contribute to the list and prioritize
Members knowledge institutes, services providers,…) will contribute literature places (details only)

2. The collective overview of literature places will provide insight which topics have been or are part of recent and/or current research fields. Based upon this, one can establish the knowledge gaps.
This information can be used to set up research projects within the ETN community.

3. Parallel to the literature survey, the European TBC-related (knowledge) market will be assessed to provide the operators as well as interested parties entrances to the academic world on specific topics. This means contact details and field of expertise will be collected.

Ideal Consortium

Any ETN members with an interest for TBCs: OEMs, GT Users and Research Institutes active in the field of TBCs.