

REAR INTAKE CASING

REAR AIR INTAKE AND
LATTICE SUPPORT

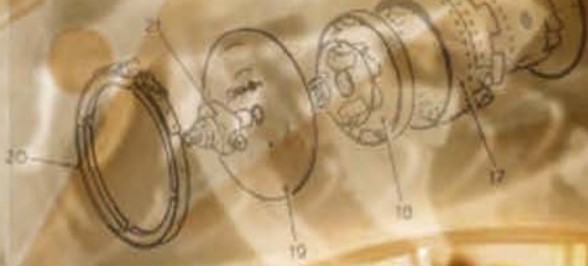
REAR AIR SCREEN

REAR
GUIDE

25

The Gas Turbine Handbook

2006 • U.S. Department of Energy • Office of Fossil Energy • National Energy Technology Laboratory

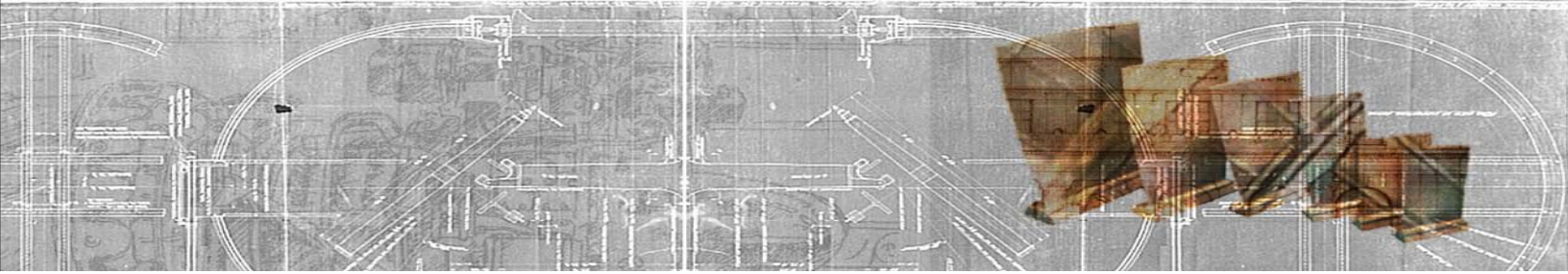


FRONT AIR SCREEN

FRONT INTAKE CASING

RESTRICTOR JET

DRAIN TO ATMOSPHERE



Introduction

The NETL Turbine Handbook has been developed to provide technical information regarding the stationary power generation gas turbine, and other turbine based systems that are relevant to the U.S. DOE Fossil Energy (FE) Advanced Turbine Program. To accomplish this task, an outline of potential topics was developed that would form the basis for input to the handbook. The outline was not comprehensive, but rather intentionally focused on topics relevant to the FE Turbine Program. In formulating an approach to produce this handbook, it also was decided that contributions would be solicited on a voluntary basis.

Once the outline was established, it was easy to identify several prominent researchers for each topic who might be interested in writing the particular section. Other prominent individuals were also identified as potential contributors. The staff that was assembled to produce this handbook sent inquiries to allow potential authors the opportunity to reflect on the outline and consider sections that they might have an interest in writing. Potential authors responded to our request, and identified their priority topics. With topics and authors aligned, the real work began for the authors to produce their sections.

At the end of this process we had most of the intended sections of the handbook addressed. Authors of handbook sections were provided considerable time to produce their sections, and were encouraged to include as much detail as they deemed appropriate. This approach and lack of constraints is manifested in the handbook, with sections of various lengths, level of detail, approach, and writing style. Sections in many ways reflect the opinions and voices of the authors, and this personal touch is accentuated with photographs, linked biographical sketches, and contact information for the authors.

In addition to topical articles, this handbook includes an overview of the FE Advanced Turbine program. The overview includes the DOE Fossil Energy goals that are driving the program, the approach to these goals, and descriptions of the projects that are addressing these goals. The intent was to not only provide a source of information regarding the FE Advanced Turbine program, but to allow the readers to reference more detailed information on specific or related technologies and approaches being pursued in the program.

A great deal of thanks is extended to the authors who volunteered to produce their sections for this handbook. They have done this work with only our thanks and gratitude in return. The work by Cassie Clifton, Drew Barries, and Scott Andrews of Sextant was instrumental in providing the design, layout, and editing for the handbook. Cassie was particularly helpful in providing the schedule and encouraging authors to complete specific tasks within deadlines.

In closure we welcome any feedback on this document. Your constructive input will be incorporated to the extent possible into future editions of this handbook.



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Mr. Richard Dennis is the Turbine Technology Manager at the U.S. Department of Energy's National Energy Technology Laboratory (NETL). Richard has a BS and MS in Mechanical Engineering from West Virginia University. From 1983 to 1992 Mr. Dennis worked in the on-site research group of NETL where he conducted research related to pressurized fluidized bed combustion, coal gasification and gas stream particulate cleanup for advanced coal based power generation. In 1993 Mr. Dennis transferred to the Office of Project Management at NETL where he managed contracted research in advanced coal based power systems. In 2000 Richard joined the Gas Power Projects Division at NETL where he managed fuel cell, heat engine and fuel cell-turbine hybrid related projects. In August of 2002 Richard was selected for his current position as the Turbine Technology Manager where he provides strategic planning for the DOE Fossil Energy Turbine Program.