TECHNICAL PROGRESS REPORT

Quarterly

Reporting Period start date: October 1, 2000

Reporting Period end date: December 31, 2000

Principal Author: Dr. Lawrence P. Golan

Date report was issued: January 2001

DOE Award No. DE-FC21-92MC29061

Submitting Organization:
South Carolina Institute for Energy Studies
Advanced Gas Turbine Systems Research Program
Clemson University Research Foundation
386-2 College Ave
Clemson, SC 29634-5712
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ABSTRACT:

The activities of the Advanced Gas Turbine Systems Research (AGTSR) program for this reporting period are described in this quarterly report. As this program administers research, we have included all program activity herein within the past quarter dated. More specific research progress reports are provided weekly at the request of the AGTSR COR and are being sent to NETL. As for the administration of this program, items worthy of note are presented in extended bullet format following the appropriate heading.

TABLE OF CONTENTS:

- Executive Summary:
  - Membership
  - Administration
  - Technology Transfer
- Experimental
- Results and Discussion: Research Items
- Conclusion
- References
- Attachments
EXECUTIVE SUMMARY:

MEMBERSHIP

- No new Performing member contacts were made this reporting period. At the close of the period, the membership base was 100 universities represented in 38 states.
- At the close of the reporting period, the constituency of the Industrial Review Board remained fixed as given here:

<table>
<thead>
<tr>
<th>Full Member</th>
<th>Associate Member</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar</td>
<td>Southern Company Services</td>
</tr>
<tr>
<td>Siemens Westinghouse</td>
<td>Parker Hannifin</td>
</tr>
<tr>
<td>Rolls-Royce Allison</td>
<td>Woodward FST</td>
</tr>
<tr>
<td>Pratt &amp; Whitney</td>
<td>EPRI</td>
</tr>
<tr>
<td>General Electric</td>
<td></td>
</tr>
</tbody>
</table>

- Ramgen Power Systems has expressed interest in AGTSR IRB membership and has been sent appropriate information. In the previous reporting period, Wood Group Heavy Industrial Turbines and Precision Combustion, Incorporated expressed interest in IRB membership. Follow-up with all three of these companies will occur in the next reporting period.
- No other membership activities occurred during this reporting period.

ADMINISTRATION

- The AGTSR Quarterly Report for the reporting period, July 1 to September 30, 2000, was submitted to NETL on October 17, 2000.
- The AGTSR program continuation request for the twelve-month period January 1, 2001 to December 31, 2001 was submitted to NETL on October 31, 2000. For this continuation period, $3.0M in financial assistance was requested. SCIES committed an additional $300K in IRB funds as cost sharing. Major items to be supported during the continuation period are as follows:

  Research:
  - RFP00 - $855.16K 1<sup>st</sup> year
  - RFP99 - $446.31K 2<sup>nd</sup> year
  - RFP98 - $839.95K 3<sup>rd</sup> year

  Interns - $118K
  NGGT - $100K transition funds

- As requested by NETL, the AGTSR PI and SCIES Financial Coordinator responded to the NETL COR and Procurement Office regarding the AGTSR continuation request. At the close of the reporting period, SCIES received fax notification that the AGTSR continuation request was approved December 29,
2000. NETL advised that the signed copy of the original Financial Assistance award was in the mail.

- Normal administrative function continued throughout the reporting period.
- SCIES submitted information to NETL for use in the DOE brochure titled “Advanced Turbine Systems” being prepared for distribution at the Annual ATS Meeting.

**TECHNOLOGY TRANSFER (Workshops and Education)**

- Combustion Workshop VII was held September 6-8, 2000. During this reporting period, SCIES continued to urge speakers to submit their presentations so that the Workshop proceedings could be published in toto. A deadline of January 12, 2001 has been established—papers not received by then will be so noted in the proceedings and publication will begin.
- On October 11, 12, and 13, AGTSR hosted Aero-Heat Transfer Workshop IV at the University of Minnesota Gateway Facility. Assistance was provided by Professors Goldstein and Simon of the University of Minnesota. A total of 52 individuals attended this workshop, including several students from the University of Minnesota and North Dakota. The presentation material continues to be collected. The proceedings will be released after the combustion proceedings.
- The AGTSR Industrial Internship brochure was prepared with the date of intended release set for early January 2001. Application deadline has been set for February 28, 2001.
- On October 26, 2000, the SCIES Director presented a seminar at the Clemson University Environmental Science Department on “Power in the Future and How Does SCIES/AGTSR Fit In?” Approximately 75 graduate students and faculty attended this well received presentation.
- AGTSR coordinated the Performing Member Poster Session for the Annual ATS Meeting held in Alexandria, Virginia on December 4-6, 2000. This included 28 poster session presentations of on going research activity. In addition to the poster session, the AGTSR Program Manager presented an AGTSR summary paper and AGTSR had an exhibit in the conference exhibit hall.
EXPERIMENTAL:

No experimental data to include from the administration of this program. At the request of the AGTSR COR, weekly research progress reports are being sent to NETL.

RESULTS AND DISCUSSION:

RESEARCH

- During the September 27-28, 2000 IRB meeting held at SCIES, the following proposals were approved for funding pending receipt of AGTSR continuation by DOE.
  
<table>
<thead>
<tr>
<th>Proposal</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHT18</td>
<td>Louisiana State University</td>
</tr>
<tr>
<td>C2</td>
<td>Penn State</td>
</tr>
<tr>
<td>M6</td>
<td>University of Connecticut</td>
</tr>
<tr>
<td>AHT19</td>
<td>University of Texas, Austin</td>
</tr>
<tr>
<td>M3</td>
<td>University of California, Santa Barbara</td>
</tr>
<tr>
<td>AHT2</td>
<td>Texas A&amp;M</td>
</tr>
</tbody>
</table>

  These universities will be notified immediately on receipt of AGTSR continuation.

- During this reporting period, all toll, 32 reports were received: 26 Semi-Annual, 2 Annual and 4 Final.

- During this reporting period, SCIES submitted the Research Success stories of AGTSR sponsored programs to NETL shown in Attachment I.

- To date, only seven universities have submitted information for “fact” sheets for the individual project fact sheets NETL requested AGTSR to develop. AGTSR will “encourage” the Performing Members to submit the information necessary to develop the project fact sheets.

- No difficulties in technical performance of any AGTSR research subcontract was observed in this reporting period.

RELATED MISCELLANEOUS ACTIVITY

The items reported here are related to the AGTSR but not necessarily supported by the program. However, these items augment the AGTSR and are worthy of note.

- An ATS developed Solar Mercury 50 Turbine was received on the Clemson campus during this reporting period. The first day of operation was December 5, 2000. On that first day of operation, it was necessary to remove the Solar Taurus System from operation because of oil pump problems. The Mercury 50 came online very easily, performed quite well, saving an estimated $40K in demand charges for the University.
• Dr. Steven Weiner of the PNL Washington Office visited Clemson University to present a seminar on the DOE Industries of the Future Program (October 17, 2000). During Dr. Weiner’s visit to CU, he also visited SCIES for a briefing on the AGTSR.

CONCLUSION:

This quarter ended with continued success in the administration of the Advanced Gas Turbine Systems Research Program. At the request of the AGTSR COR, weekly research progress reports are being sent to NETL. Individual conclusions on those projects are included at that time.

REFERENCES:

All references to specific projects are included at the end of each projects specific progress report. At the request of the AGTSR COR, weekly research progress reports are being sent to NETL. Individual reference listings on those projects are included at that time.
ATTACHMENT I

Research Success Stories

October – December 2000

• Mississippi State University (MSU) and Air Force Institute of Technology (AFIT)
• University of Minnesota
• Virginia Commonwealth University (VCU) and the University of Cincinnati (UC)
• Virginia Tech (VT) and the University of Texas (UT)
• University of Connecticut (UConn)
• Penn State University
• Penn State University

New Projects:

• Louisiana State University
• Penn State University
• University of Connecticut
• University of Texas, Austin
• University of California, Santa Barbara
• Texas A&M