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POWER INFORMATION CENTER

CONTRACT NASW-3219
15 SEPTEMBER 1982 TO 14 SEPTEMBER 1983

NASA HEADQUARTERS
WASHINGTON, DC

ANNUAL REPORT, NUMBER V

10.0 10.1 10.2 10.3 10.4 10.5 10.6 10.7 10.8 10.9
11.0 11.1 11.2 11.3 11.4 11.5 11.6 11.7 11.8 11.9
12.0 12.1 12.2 12.3 12.4 12.5 12.6 12.7 12.8 12.9
13.0 13.1 13.2 13.3 13.4 13.5 13.6 13.7 13.8 13.9
14.0 14.1 14.2 14.3 14.4 14.5 14.6 14.7 14.8 14.9
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16.0 16.1 16.2 16.3 16.4 16.5 16.6 16.7 16.8 16.9

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NATIONAL BUREAU OF STANDARDS
STANDARD REFERENCE MATERIAL 1010a
(ANSI and ISO TEST CHART No 2)
OPERATION OF THE POWER INFORMATION CENTER

ANNUAL REPORT NUMBER V

CONTRACT NASW-3219

Period Covered:
15 September 1982 to 14 September 1983

Prepared for:
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
NASA HEADQUARTERS, CODE RTS-6
Washington, DC 20546

Performance of Secretariat Functions and Information Exchange Activities in the Advanced Power Field for the Interagency Advanced Power Group

SYSTEMS TECHNOLOGY DEPARTMENT
of the
FRANKLIN RESEARCH CENTER
A Division of The Franklin Institute

20th & Race Streets - Philadelphia, Pennsylvania 19103
(215) 448-1145  TWX 710 670 1889
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<td>Description</td>
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<td>Distribution of Active Project Briefs by Working Group</td>
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<td>Distribution of Active Project Briefs by Directing Agency</td>
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<td>5</td>
<td>Distribution of Overdue Project Briefs by Working Group</td>
</tr>
<tr>
<td>6</td>
<td>Distribution of Overdue Project Briefs by Directing Agency</td>
</tr>
</tbody>
</table>
SUMMARY

The Franklin Research Center (FRC), a division of The Franklin Institute, operates the Power Information Center (PIC) of the Interagency Advanced Power Group (IAPG). The PIC facilitates the exchange of technical information among scientists and engineers both within the federal government and within industry by serving as the technical secretariat to the IAPG.

For the reporting period 15 September 1982 to 14 September 1983, activities of the PIC in its function as secretariat include the following highlights:

- Conducted two Steering Group meetings, and 17 Working Group and Panel meetings.
- Published 24 meeting agendas and 19 sets of minutes for IAPG meetings.
- Processed 332 project briefs.
- Prepared press releases for dissemination to 2,027 organizations. These include engineering companies, government contractors, print media, research facilities, and technical and college libraries.
- Wrote several new computer programs to assist in record maintenance and material distribution.
- Sent 95 promotional packages to selected government employees in an effort to increase Working Group and Panel Membership.
- Expanded the Subject Index to include the title of every project brief listed under each term.
- Increased representation on IAPG working groups and panels by 31.
INTRODUCTION

Background Information

The Franklin Research Center (FRC), a division of The Franklin Institute, was awarded the contract for the operation of the Power Information Center (PIC) of the Interagency Advanced Power Group (IAPG) in September 1978. This fifth Annual Report, submitted under the provisions of contract NASW-3219, describes the work performed during the contract period 15 September 1982 to 14 September 1983. The IAPG is supported by the following member agencies: United States Army, United States Navy, United States Air Force, National Aeronautics and Space Administration (NASA), and United States Department of Energy (DOE). The IAPG Organization Chart is included in the Appendix.

Function

The primary function of the PIC is to facilitate the exchange of technical information in the advanced power field. The PIC, serving as the IAPG technical secretariat, accomplishes this information exchange among scientists and engineers, both within the federal government and within industry, as directed by the IAPG Steering Group or by the Chairman acting for the Steering Group by the following activities:

- Acts as a technical information center for power research, development, and engineering.
- Publishes and distributes monthly project briefs reporting on new and updated research and development in the various technical areas covered by the member agencies.
- Assists in the arrangements for, and in the operation of, IAPG Steering Group, Working Group, and Panel meetings and symposia.
- Provides technical and administrative services as required, and publishes proceedings of meetings and symposia.
- Provides the necessary technical and administrative services to manage Steering Group and Working Group functions between meetings in order to maintain the required continuity in IAPG operations.
- Prepares reports summarizing IAPG and PIC activities.
Meetings Held

Between 15 September 1982 and 14 September 1983, the Steering Group held two meetings and the Working Groups and Panels held a total of 17 meetings. Table 1 lists these meetings, with locations and dates. The PIC published agendas and minutes for each meeting. All publications related to these meetings are listed in the Appendix.

Meetings Planned

For the period 15 September 1983 to 31 December 1983, the Steering Group has planned one meeting and the Working Groups and Panels have scheduled a total of eight meetings. Meetings for the remainder of the upcoming contract year will be scheduled in mid-December. Table 2 lists the meetings scheduled and the planned dates and locations.

Electrical Working Group Chairmanship

The position of Chairman of the Electrical Working Group has been vacant for some time. At the 21 October 1982 Steering Group meeting, the IAPG Steering Group approved of Mr. Timothy J. Doyle's announced interest to run for the vacant position. Mr. Doyle had asked that the Steering Group state its expectations for the prospective new Chairman. The Steering Group voiced the need for better coordination between the Power Conditioning and Superconductivity Panels, which have been operating independently since the position became vacant.

In addition, the Steering Group voiced the need to poll the working group membership for topic areas that are not being adequately reviewed by the current panels, and suggested that one or more new panels might have to be added to the working group. A letter was sent to all working group members on 14 February 1983 asking for additional panel topics. The results of this poll were a major topic at the Electrical Working Group meeting on 19 April 1983 at the David Taylor Naval Ship Research and Development Center in Annapolis, MD.

Mr. Doyle determined from the responses that two areas generated the most interest: pulsed power and rotating machinery. However, much power work is classified and there are already active interagency groups covering that area. Mr. Doyle suggested that the IAPG sponsor a topical meeting on rotating machinery. However, no meeting Chairman or sponsoring facility could be found. This suggested to Mr. Doyle that there was not a high enough level of interest in this topic in the IAPG to consider it any further, as no panel with such a low level of interest would be viable. As a result of this meeting, no new panels were added to the Electrical Working Group. However, Mr. Doyle will continue as the Electrical Working Group Chairman.
<table>
<thead>
<tr>
<th>Meeting</th>
<th>Date Held</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar Working Group</td>
<td>1 October 1982</td>
<td>Town &amp; Country Hotel San Diego, CA</td>
</tr>
<tr>
<td>Solar Photovoltaic Panel</td>
<td>13 October 1982</td>
<td>AFWAL Wright-Patterson AFB, OH</td>
</tr>
<tr>
<td>Electrical Working Group</td>
<td>20 October 1982</td>
<td>NRL Washington, DC</td>
</tr>
<tr>
<td>Systems Working Group</td>
<td>21 October 1982</td>
<td>MERADCOM Fort Belvoir, VA</td>
</tr>
<tr>
<td>Steering Group</td>
<td>27 October 1982</td>
<td>DOE Germantown, MD</td>
</tr>
<tr>
<td>Nuclear, TE, TI Working Group</td>
<td>4 November 1982</td>
<td>DOE Germantown, MD</td>
</tr>
<tr>
<td>MHD Working Group</td>
<td>9 November 1982</td>
<td>AFWAL Wright-Patterson AFB, OH</td>
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<tr>
<td>Mechanical Working Group</td>
<td>10 November 1982</td>
<td>AFWAL Wright-Patterson AFB, OH</td>
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<td>Heat Engines Panel</td>
<td>19 November 1982</td>
<td>NASA Goddard SFC Greenbelt, MD</td>
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<td>Mechanical Working Group</td>
<td>5 April 1983</td>
<td>SANDIA Albuquerque, NM</td>
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<tr>
<td>Auxiliary Components Panel</td>
<td>13-14 April 1983</td>
<td>NSWC Silver Spring, MD</td>
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<tr>
<td>Chemical Working Group</td>
<td>15 April 1983</td>
<td>Franklin Research Center</td>
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<td>IR&amp;D Meeting</td>
<td>19 April 1983</td>
<td>DTNSRDC Annapolis, MD</td>
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<td>Solar Working Group</td>
<td>20 April 1983</td>
<td>MERADCOM Annapolis, MD</td>
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<tr>
<td>Solar Photovoltaic Panel</td>
<td>25 April 1983</td>
<td>DOE Washington, DC</td>
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<tr>
<td>Meeting</td>
<td>Date Held</td>
<td>Location</td>
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<td>-------------------------------</td>
<td>----------------</td>
<td>------------------</td>
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<tr>
<td>Mechanical Working Group</td>
<td>25 Apr 11 1983</td>
<td>DOE, Washington, DC</td>
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<td>Auxiliary Components Panel</td>
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<td></td>
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<tr>
<td>Steering Group</td>
<td>27 April 1983</td>
<td>NSWC, Silver Spring, MD</td>
</tr>
<tr>
<td>MHD Working Group</td>
<td>3-4 May 1983</td>
<td>MIT, Boston, MA</td>
</tr>
<tr>
<td>Solar Working Group</td>
<td>15 June 1983</td>
<td>SERI, Golden, CO</td>
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<tr>
<td>Solar Thermal Panel</td>
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### TABLE 2. MEETINGS SCHEDULED FOR 15 SEPTEMBER 1983 TO 31 DECEMBER 1983

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Date Scheduled</th>
<th>Location</th>
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<tr>
<td>Mechanical Working Group</td>
<td>3 October 1983</td>
<td>MERADCOM Fort Belvoir, VA</td>
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<td>Heat Engines Panel</td>
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<tr>
<td>Mechanical Working Group</td>
<td>4 October 1983</td>
<td>MERADCOM Fort Belvoir, VA</td>
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<td>Auxiliary Components Panel</td>
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<tr>
<td>Solar Working Group</td>
<td>6 October 1983</td>
<td>SERI Golden, CO</td>
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<tr>
<td>Solar Photovoltaic Panel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systems Working Group</td>
<td>12-13 October 1983</td>
<td>NASA Lewis Cleveland, OH</td>
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<tr>
<td>IR&amp;D Meeting</td>
<td></td>
<td></td>
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<tr>
<td>Electrical Working Group</td>
<td>19 October 1983</td>
<td>JPL Pasadena, CA</td>
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<td>Power Conditioning Panel</td>
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<tr>
<td>Steering Group</td>
<td>26 October 1983</td>
<td>MERADCOM Fort Belvoir, VA</td>
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<tr>
<td>MHD Working Group</td>
<td>2 November 1983</td>
<td>DOE Germantown, MD</td>
</tr>
<tr>
<td>Nuclear, TE, TI Working Group</td>
<td>3 November 1983</td>
<td>DOE Germantown, MD</td>
</tr>
</tbody>
</table>
Chemical Working Group IR&D Meeting

The Chemical Working Group sponsored an internal research and development (IR&D) meeting on 19 November 1982 at NASA Goddard Space Flight Center, Greenbelt, MD.

Every second fall this working group invites contractors to give proprietary presentations on their internal R&D programs to an all-government audience. Presentations are timed so contractors do not meet each other, nor do the contractors receive the minutes of the meeting or a list of the presentations given. IAPG members find IR&D meetings a useful way to learn the technical developments that might be worthy of their agencies support in the future.

Presentations at the fall 1982 meeting ranged from lithium battery safety to combined battery/fuel cell space-based power systems. Presentations were thirty minutes long, plus an additional five minutes for questions. A total of ten battery contractors participated.

Distribution of Unclassified CIA Documents to IAPG Members

One of the topics discussed at the 21 October 1982 Steering Group meeting was the possibility of greater involvement by the CIA in the activities of the IAPG. The distribution of unclassified CIA documents of interest to IAPG members was considered as one possible avenue of CIA cooperation.

Mr. William Sadler, the CIA liaison representative, obtained a copy of CIA Publications Released to the Public (PB82-929022) and sent it to the PIC staff for review. This document lists unclassified CIA documents dated between 1972 and 1981 available through the National Technical Information Service.

A review of the documents listed showed them to be of an economic and political nature, with no technical documents that would be of interest to IAPG members.

MHD Working Group Meeting

The spring MHD Working Group meeting was held on 3 and 4 May 1983 at the Francis Bitter National Magnet Laboratory at MIT in Boston, MA. This meeting was especially notable for the opportunity it gave the attendees to see experimental fusion and MHD hardware. Attendees saw parts of the TARA tandem machine and the Alcator C on 3 May. On 4 May the attendees toured the AVCO MHD facility at Everett, MA and saw the Mark VI and Mark VII MHD machines, as well as parts of MHD channels tested on these machines. Both the Mark VI and the Mark VII are 20 megawatt machines.
Nuclear, TE, TI Working Group Meeting

The spring Nuclear, TE, TI Working Group meeting was held on 15 April 1983 at the Franklin Research Center in Philadelphia, PA. This meeting was especially interesting because of the demonstration of a 500 watt, portable, silent, thermoelectric generator developed for the U.S. Army Electronics Research and Development Command. The generator burns a variety of fuels (gasoline, kerosene, methanol, etc.), weighs only 78 pounds, and is ideal for communication equipment and mobile power applications.
Project Briefs Processed

The PIC processed a total of 332 project briefs during the contract period 15 September 1982 to 14 September 1983. Of these, 82 were completed or cancelled, 180 were continuing, and 70 were new. Table 3 shows the distribution of active project briefs by working group and Table 4 shows the distribution by directing agency (that is, agency of the designated project engineer). Table 5 and Table 6 show the distribution of overdue briefs by agency and by working group.

Processing involves five basic tasks: 1) requesting updates of existing project briefs; 2) receiving updates and new briefs at the PIC; 3) keying changes/additions on both the Wang word processor and the DECsystem-20 computer; 4) receiving printouts and proofreading changes/additions; and 5) printing and distributing briefs.

Subject Index

Index terms have been assigned to all project briefs published since November 1979, and the automated production of a camera-ready yearly index was implemented. This cumulative alphabetized listing previously consisted of the designated subject terms and the associated project brief number. The index has now been expanded to include the title of every project brief number listed under each term. This additional information will assist the reader in his selection of appropriate programs to request for review, making the document a more useful information tool.

Microfiching of Completed Project Briefs

Hard-copy files of completed and cancelled project briefs are periodically microfiched to reduce storage space. All briefs completed or cancelled through August 1982 have been microfiched. Currently, approximately 3,000 briefs appear on microfiche.
### TABLE 3. DISTRIBUTION OF ACTIVE PROJECT BRIEFS BY WORKING GROUP

<table>
<thead>
<tr>
<th>Working Group</th>
<th>Number of Project Briefs*</th>
<th>Percent of 416 Briefs</th>
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<tbody>
<tr>
<td>CHEMICAL</td>
<td>116</td>
<td>27.9</td>
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<tr>
<td>ELECTRICAL</td>
<td>94</td>
<td>22.6</td>
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<tr>
<td>MECHANICAL</td>
<td>74</td>
<td>17.8</td>
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<tr>
<td>MHD</td>
<td>36</td>
<td>8.7</td>
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<tr>
<td>NUCLEAR</td>
<td>17</td>
<td>4.1</td>
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<td>SOLAR</td>
<td>68</td>
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<tr>
<td>SYSTEMS</td>
<td>11</td>
<td>2.6</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>416</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

*A project brief may be assigned to multiple working groups.*
### Table 4. Distribution of Active Project Briefs by Directing Agency

<table>
<thead>
<tr>
<th>Directing Agency</th>
<th>Number of Project Briefs</th>
<th>Percent of 404 Briefs</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR FORCE</td>
<td>61</td>
<td>15.1</td>
</tr>
<tr>
<td>ARMY</td>
<td>41</td>
<td>10.1</td>
</tr>
<tr>
<td>DOE</td>
<td>124</td>
<td>30.7</td>
</tr>
<tr>
<td>NASA</td>
<td>83</td>
<td>20.5</td>
</tr>
<tr>
<td>NSF</td>
<td>36</td>
<td>9.0</td>
</tr>
<tr>
<td>NAVY</td>
<td>59</td>
<td>14.6</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>404</strong></td>
<td><strong>100.0</strong></td>
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</table>
**TABLE 5. DISTRIBUTION OF OVERDUE* PROJECT BRIEFS BY WORKING GROUP**

<table>
<thead>
<tr>
<th>Working Group</th>
<th>Number of Active Briefs</th>
<th>Number of Overdue Briefs</th>
<th>Percent of Briefs Overdue</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEMICAL</td>
<td>116</td>
<td>63</td>
<td>54.3</td>
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<td>ELECTRICAL</td>
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<td>67.6</td>
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<td>MHD</td>
<td>36</td>
<td>21</td>
<td>58.3</td>
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<tr>
<td>NUCLEAR</td>
<td>17</td>
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<td>SOLAR</td>
<td>68</td>
<td>52</td>
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<tr>
<td>SYSTEMS</td>
<td>11</td>
<td>7</td>
<td>63.6</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>416</strong></td>
<td><strong>267</strong></td>
<td><strong>64.1</strong></td>
</tr>
</tbody>
</table>

*Overdue refers to briefs that have not been updated in the last six months.*
TABLE 6. DISTRIBUTION OF OVERDUE* PROJECT BRIEFS BY DIRECTING AGENCY

<table>
<thead>
<tr>
<th>Agency</th>
<th>Number of Active Briefs</th>
<th>Number of Overdue Briefs</th>
<th>Percent of Briefs Overdue</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR FORCE</td>
<td>61</td>
<td>11</td>
<td>18.0</td>
</tr>
<tr>
<td>ARMY</td>
<td>41</td>
<td>25</td>
<td>60.9</td>
</tr>
<tr>
<td>DOE</td>
<td>124</td>
<td>105</td>
<td>84.7</td>
</tr>
<tr>
<td>NASA</td>
<td>83</td>
<td>56</td>
<td>67.4</td>
</tr>
<tr>
<td>NSF</td>
<td>36</td>
<td>15</td>
<td>41.6</td>
</tr>
<tr>
<td>NAVY</td>
<td>59</td>
<td>43</td>
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<tr>
<td>TOTAL</td>
<td>404</td>
<td>255</td>
<td>63.1</td>
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</table>

*Overdue refers to briefs that have not been updated in the last six months.
DEVELOPMENT

Enlargement of Working Group and Panel Membership

IAPG promotional kits were mailed to 53 government employees who expressed an interest in joining the IAPG. These persons were sent kits containing the "Joining the Interagency Advanced Power Group (IAPG)" letter, the organizational chart, the Interagency Advanced Power Group brochure, the Power Information Center brochure, and the Project Brief listing. The aim of this mailing was to encourage these individuals, some of whom have attended previous meetings, to join the IAPG and thus build the Working Group and Panel membership.

Press Releases

At the October 31, 1982 Steering Group meeting, the distribution of two new press releases was approved. One aims to encourage project brief subscriptions and was sent to 2,000 members of the private sector technical community; the other release aims to develop more interest in the IAPG and was sent to editors of 27 government publications. The overall purpose of these releases is to increase the public's awareness of the PIC and the IAPG, and to encourage Project Brief subscriptions. Mailing lists for these press releases have been categorized, and are maintained on the DECsystem-20 computer and the Wang word processor.

Expansion of the IAPG Membership

During the period of September 15, 1982 to September 14, 1983, representation on working groups and panels increased by 31. Twenty-seven of these additions are held by new IAPG members (the remaining four additions represent IAPG members who decided to join additional working groups or panels). A breakdown of new additions to IAPG membership is included in the Appendix.
CONCLUSIONS AND RECOMMENDATIONS

The visibility of the PIC and the IAPG continues to increase. New audiences have been targeted and audience-tailored publications prepared. We need to continue the promotion of the IAPG to strengthen and increase working group and panel membership and to obtain additional support from non-participating agencies. To achieve this goal, the PIC makes the following recommendations:

1. Promote the IAPG among the engineering community and high-level government officials.
2. Solicit additional contacts from IAPG members.
3. Prepare an invitational letter oriented toward high-level government officials for a Steering Group member's signature.

Delayed receipt of sufficient information for both new and updated project briefs is a continuing problem. The use of project brief coordinators has improved delivery to the PIC of the updates from some facilities, but the receipt of information on new projects still lags considerably behind the initiation of new work. To make improvements in this area, the PIC makes the following recommendations:

1. Request updates from project engineers and coordinators four times a year instead of two times a year.
2. Stress the need for updates at each meeting.
3. Obtain additional project brief coordinators.
4. Track new projects and request briefs from the project engineer.
5. Use the DO 1498 system to obtain supplemental information.

The PIC looks forward to increasing the distribution and exchange of information by implementing these recommendations in the ensuing contract period.
IAPG ORGANIZATION CHART

STEERING GROUP MEMBERS

Mr. Richard T. Sale (Chairman)  
Mr. Richard H. Bell  
Mr. Glenn R. Spalding  
Dr. Carl E. Mueller  
Mr. Roney J. Fassel  
Mr. James D. Reams  
Mr. Jerome P. Mullin  
Dr. Judith H. Ambrus  
Mr. George B. Manning

Army — 703-684-5830
Army — 703-684-5878
Navy — 202-696-4844
Navy — 202-394-2472
Air Force — 301-691-2972
Air Force — 513-255-5228
NASA — 202-755-3278
NASA — 202-755-3127
DOE — 301-553-2828

FRANKLIN RESEARCH CENTER — SECRETARIAT
POWER INFORMATION CENTER

Director — William H. McKenzie — 215-448-1403
Deputy Director — Joyce E. Michelfelder — 215-448-1145
Meetings Coordinator — Sanford Z. Meschbow — 215-448-1506

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216-433-4000, ext. 314

ELECTRICAL WORKING GROUP
Chairman
Mr. Timothy J. Doyle  
(NAVY)  
301-297-2851

MECHANICAL WORKING GROUP
Chairman
Mr. Robert A. Williams  
(NAVY)  
703-884-5724

POWER CONDITIONING PANEL
CHAIRMAN
Mr. Robert A. Williams  
(NAVY)  
703-884-5724

HEAT ENGINES PANEL
Chairman
Mr. Patrick L. Sutton  
(DOE)  
202-252-8012

SUPERCONDUCTIVITY PANEL
Chairman
Mr. Donald S. Beard  
(DOE)  
301-353-4858

AUXILIARY COMPONENTS PANEL
Chairman
Mr. Donald S. Beard  
(DOE)  
301-353-4858

MHD WORKING GROUP
VACANT

NUCLEAR, TE, TI WORKING GROUP
Acting Chairman
Dr. Guido Guazzone  
(NAVY)  
202-544-4508

SOLAR WORKING GROUP
Acting Chairman
Capt. William A. Tolbert  
(USAF)  
301-231-7186

SYSTEMS WORKING GROUP
Chairman
Mr. Floyd E. Ford  
(NASA)  
301-344-5645

SOLAR PHOTOVOLTAIC PANEL
Chairman
Mr. Richard L. Stabler  
(NAVY)  
202-767-2446

SOLAR THERMAL PANEL
Chairman
Capt. William A. Tolbert  
(USAF)  
301-231-7186

Revised 9/83
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[Note: The text for Project Brief Subject Index is not clearly visible in the image.]
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Publication

IAPG Membership Roster

Publication Date
October 1982
January 1983
April 1983
July 1983

Organization and Procedures


12 October 1982


15 April 1983

IAPG Meeting Schedule Calendar - Fall 1982

September 1982

IAPG Meeting Schedule Calendar - Spring 1983

February 1983

IAPG Monthly Project Briefs

Monthly

September 1982 through
August 1983

Press Releases:

Intergency Advanced Power Group Invites New Members to Keep Up With Power Research

October 1982

March 1983

Dear Colleague

Reports on Government-Funded R&D Now Available to the Public

February 1983

September 1982
NEW ADDITIONS TO IAPG MEMBERSHIP

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<td>Mr. David Buden</td>
<td>Nuclear Working Group</td>
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<td>Los Alamos National Laboratory</td>
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<td>Mr. Floyd W. Crouse, Jr.</td>
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<td>Mr. Timothy Doyle*</td>
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<td>Captain Johnnie L. Hansen</td>
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*A current member who has joined an additional working group or panel.
NEW ADDITIONS TO IAPG MEMBERSHIP (Continued)

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