Project #: E-21-636
Center #: 10/24-6-R6877-0A0
Contract#: ECS-9002777
Prime 
Subprojects ? : N
Main project #: 

Project unit: EE
Project director(s): 
MELIPOULOS A P 

Sponsor/division names: NATL SCIENCE FOUNDATION / GENERAL
Sponsor/division codes: 107 / 000

Award period: 900101 to 910630 (performance) 910930 (reports)

Sponsor amount
Contract value 8,000.00
Funded 8,000.00
Cost sharing amount 0.00

Does subcontracting plan apply ?: N

Title: BLOCK TRAVEL GRANT FOR INTERNATIONAL CONFERENCE ON HARMONICS IN POWER SYSTEMS

PROJECT ADMINISTRATION DATA

OCA contact: David B. Bridges 894-4820
Sponsor technical contact
GERALD HEYDT (202)357-9618 NSF
1800 G STREET, N.W. WASHINGTON, D.C. 20550

Security class (U,C,S,TS) : U
Defense priority rating : N/A
Equipment title vests with: Sponsor GIT

ONR resident rep. is ACO (Y/N): N
NSF supplemental sheet
NONE PROPOSED

Administrative comments -
PROJECT INITIATION, $8000 FUNDED FOR GROUP TRAVEL TO HUNGARY; SPECIAL GRANTS CONDS. UNDER NSF PUBL. F.L.26 APPLY AS WELL AS GC-1; NO 0/H IS TO BE CHARGED;
GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION

NOTICE OF PROJECT CLOSEOUT

Closeout Notice Date 11/21/91

Project No. E-21-636 Center No. 10/24-6-R6877-0A0
Project Director MELIOPoulos A P School/Lab ELEC ENGR
Sponsor NATL SCIENCE FOUNDATION/GENERAL
Contract/Grant No. ECS-9002777 Contract Entity GTRC
Prime Contract No.

Title BLOCK TRAVEL GRANT FOR INTERNATIONAL CONFERENCE ON HARMONICS IN POWER SYS

Effective Completion Date 910630 (Performance) 910930 (Reports)

Closeout Actions Required:  

<table>
<thead>
<tr>
<th>Action</th>
<th>Y/N</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Invoice or Copy of Final Invoice</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Final Report of Inventions and/or Subcontracts</td>
<td>Y</td>
<td>911108</td>
</tr>
<tr>
<td>Government Property Inventory &amp; Related Certificate</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Classified Material Certificate</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Release and Assignment</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>

Comments: BILLING VIA LETTER OF CREDIT. 98A SATISFIES REQUIREMENT FOR PATENT REPORTING

Subproject Under Main Project No.  

Continues Project No.  

Distribution Required:  

- Project Director: Y
- Administrative Network Representative: Y
- GTRI Accounting/Grants and Contracts: Y
- Procurement/Supply Services: Y
- Research Property Management: Y
- Research Security Services: N
- Reports Coordinator (OCA): Y
- GTRC: Y
- Project File: Y
- Other: N

NOTE: Final Patent Questionnaire sent to PDPI.
### PART I - PROJECT IDENTIFICATION INFORMATION

<table>
<thead>
<tr>
<th>1. Program Official/Org.</th>
<th>KEVIN A. CLEMENTS - ECS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Program Name</td>
<td>ENGINEERING SYSTEMS PROGRAM</td>
</tr>
<tr>
<td>3. Award Dates (MM/YY)</td>
<td>From: 01/80 To: 06/81</td>
</tr>
<tr>
<td>4. Institution and Address</td>
<td>Georgia Tech Research Corp Administration Building Atlanta GA 30332</td>
</tr>
<tr>
<td>5. Award Number</td>
<td>9002777</td>
</tr>
<tr>
<td>6. Project Title</td>
<td>Block Travel Grant for International Conference on Harmonics in Power Systems, Budapest, Hungary, October 4-6, 1980</td>
</tr>
</tbody>
</table>

This Packet Contains
NSF Form 98A
And 1 Return Envelope
NSF Grant Conditions (Article 17, GC-1, and Article 9, FDP-II) require submission of a Final Project Report (NSF Form 98A) to the NSF program officer no later than 90 days after the expiration of the award. Final Project Reports for expired awards must be received before new awards can be made (NSF Grant Policy Manual Section 677).

Below, or on a separate page attached to this form, provide a summary of the completed project and technical information. Be sure to include your name and award number on each separate page. See below for more instructions.

### PART II - SUMMARY OF COMPLETED PROJECT (for public use)

The summary (about 200 words) must be self-contained and intelligible to a scientifically literate reader. Without restating the project title, it should begin with a topic sentence stating the project's major thesis. The summary should include, if pertinent to the project being described, the following items:

- The primary objectives and scope of the project
- The techniques or approaches used only to the degree necessary for comprehension
- The findings and implications stated as concisely and informatively as possible

Advances and product development in power electronics resulted in increased levels of harmonics in power systems and the associated problems. Substantial research activities are underway to study harmonics from a systems point of view, as well as at device levels. To meet the need for exchange for ideas among researchers in this area, the International Conference on Harmonics in Power Systems, ICHPS was established in 1984. ICHPS is a biennial conference. The fourth such conference was held Oct. 4-6, 1990 in Budapest, Hungary. The NSF Block Travel Grant was used to subsidize the travel expenses of the following persons, who are recognized leaders in power system harmonic problems: 1. Dr. W. Mack Grady, U of TX; 2. Dr. Rambabu Adapa, Electric Power Research Inst.; 3. Dr. G. T. Heydt, Purdue U; 4. Dr. T. H. Ortmeyer, Clarkston U; 5. Dr. Ned Mohan, U of Wis.; 6. Dr. A. E. Emanuel, Worster Polytechnic U; 7. Dr. John A. Orr, Worster Polytechnic U; 8. Dr. G. Cokkinides, U Sc. Carolina; 9. Dr. A. P. Sakis Meliopoulos, Ga Tech. The overall conference was attended by 171 experts from 25 countries.

### PART III - TECHNICAL INFORMATION (for program management use)

List references to publications resulting from this award and briefly describe primary data, samples, physical collections, inventions, software, etc. created or gathered in the course of the research and, if appropriate, how they are being made available to the research community. Provide the NSF Invention Disclosure number for any invention.

The NSF Block Travel Grantees presented several technical papers which were published in Conference Proceedings. A copy of the proceedings is attached.

---

**Principal Investigator/Project Director Signature**  
**Date**  

**IMPORTANT:**  
MAILING INSTRUCTIONS  
Return this *entire* packet plus all attachments in the envelope attached to the back of this form. Please copy the information from Part I, Block I to the Attention block on the envelope.
The data requested below are important for the development of a statistical profile on the personnel supported by Federal grants. The information on this part is solicited in response to Public Law 99-383 and 42 USC 1885C. All information provided will be treated as confidential and will be safeguarded in accordance with the provisions of the Privacy Act of 1974. You should submit a single copy of this part with each final project report. However, submission of the requested information is not mandatory and is not a precondition of future award(s). Check the “Decline to Provide Information” box below if you do not wish to provide the information.

Please enter the numbers of individuals supported under this grant. Do not enter information for individuals working less than 40 hours in any calendar year.

<table>
<thead>
<tr>
<th>Category</th>
<th>Male</th>
<th>Fem.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-Doctoral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduate Students</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under-Graduates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Participants&lt;sup&gt;1&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Total, U.S. Citizens</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>B. Total, Permanent Residents</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>U.S. Citizens or Permanent Residents&lt;sup&gt;2&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Indian or Alaskan Native</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black, Not of Hispanic Origin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pacific Islander</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White, Not of Hispanic Origin</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>C. Total, Other Non-U.S. Citizens</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Specify Country</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Total, All participants</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>(A + B + C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disabled&lt;sup&gt;3&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup> Category includes, for example, college and precollege teachers, conference and workshop participants.

<sup>2</sup> Use the category that best describes the ethnic/racial status for all U.S. Citizens and Non-citizens with Permanent Residency. (If more than one category applies, use the one category that most closely reflects the person's recognition in the community.)

<sup>3</sup> A person having a physical or mental impairment that substantially limits one or more major life activities, who has a record of such impairment, or who is regarded as having such impairment. (Disabled individuals also should be counted under the appropriate ethnic/racial group unless they are classified as “Other Non-U.S. Citizens.”)

AMERICAN INDIAN OR ALASKAN NATIVE: A person having origins in any of the original peoples of North America, and who maintains cultural identification through tribal affiliation or community recognition.

ASIAN: A person having origins in any of the original peoples of East Asia, Southeast Asia and the Indian subcontinent. This area includes, for example, China, India, Indonesia, Japan, Korea and Vietnam.

BLACK, NOT OF HISPANIC ORIGIN: A person having origins in any of the black racial groups of Africa.

HISPANIC: A person of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin, regardless of race.

PACIFIC ISLANDER: A person having origins in any of the original peoples of Hawaii; the U.S. Pacific Territories of Guam, American Samoa, or the Northern Marianas; the U.S. Trust Territory of Palau; the islands of Micronesia or Melanesia; or the Philippines.

WHITE, NOT OF HISPANIC ORIGIN: A person having origins in any of the original peoples of Europe, North Africa, or the Middle East.
PART I—PROJECT IDENTIFICATION INFORMATION

1. Institution and Address
Georgia Institute of Technology
School of Electrical Engineering
Atlanta, Georgia 30332

2. NSF Program
3. NSF Award Number
ECS 9002777

4. Award Period
From To

5. Cumulative Award Amount
$8,000

6. Project Title
Block Travel Grant for International Conference on Harmonics in Power Systems

PART II—SUMMARY OF COMPLETED PROJECT (FOR PUBLIC USE)

The block travel grant was announced to about 90 individuals who are active in research in power systems. 21 have submitted applications to participate in the program. A committee consisting of Drs. Emanuel, Heydt, and Meliopoulos and Mr. R. Adams selected 11 applicants to be the grantees, and they were informed so. Due to unforeseen circumstances, two of the grantees did not travel to Hungary. The 9 grantees who traveled are:

Dr. W. Mack Grady
Dr. Rambabu Adapa
Dr. G.T. Heydt
Dr. T.H. Ortmeyer
Dr. Ned Mohan
Dr. A.E. Emanuel
Dr. John A. Orr
Dr. G.J. Cokkinides
Dr. A.P. Sakis Meliopoulos

The International Conference on Harmonics in Power Systems, ICHPS-IV was held in Budapest, Hungary, October 4-6, 1990. The conference was a success by all accounts and fostered international cooperation.

PART III—TECHNICAL INFORMATION (FOR PROGRAM MANAGEMENT USES)

1. ITEM (Check appropriate blocks)
   NONE ATTACHED PREVIOUSLY FURNISHED TO BE FURNISHED SEPARATELY TO PROGRAM
   a. Abstracts of Theses X
   b. Publication Citations X
   c. Data on Scientific Collaborators X
   d. Information on Inventions X
   e. Technical Description of Project and Results
   f. Other (specify)

2. Principal Investigator/Project Director Name (Typed)
   Dr. A.P. Sakis Meliopoulos

3. Principal Investigator/Project Director Signature

4. Date
   Nov. 15, 1990