

APPLIED SCIENCE AND RESEARCH APPLICATIONS

APPLIED SCIENCE AND RESEARCH APPLICATIONS

APPLIED SCIENCE AND RESEARCH APPLICATIONS

APPLIED SCIENCE AND RESEARCH APPLICATIONS

APPLIED SCIENCE AND RESEARCH APPLICATIONS

RECENT RESEARCH REPORTS

Any opinions, findings, conclusions
or recommendations expressed in this
publication are those of the author(s)
and do not necessarily reflect the views
of the National Science Foundation.

February 1978



Entries
483-558

**Directorate for Applied Science and Research Applications
National Science Foundation
Washington, D.C.**

ia

| | | | | |
|---|--|---------------------------------|---|---|
| BIBLIOGRAPHIC DATA SHEET | | 1. Report No. NSF/RA-7800 02 | 2. | 3. Recipients' Accession No. PB278530 |
| 4. Title and Subtitle Applied Science and Research Applications, Recent Research Reports, February 1978 | | | 5. Report Date February 1978 | |
| 7. Author(s) | | | 6. | |
| 9. Performing Organization Name and Address Capital Systems Group, Inc. 6110 Executive Blvd., Suite 250 Rockville, Maryland 20852 | | | 8. Performing Organization Rept. No. | |
| 12. Sponsoring Organization Name and Address Applied Science and Research Applications National Science Foundation Washington, D.C. 20550 | | | 10. Project/Task/Work Unit No. | |
| | | | 11. Contract/Grant No. CISP7522472 | |
| 15. Supplementary Notes | | | 13. Type of Report & Period Covered Bibliography | |
| | | | 14. | |
| 16. Abstracts This report contains citations of new documents received by the National Science Foundation resulting from research supported by its ASRA (Applied Science and Research Applications) Program. Citations are compiled quarterly to alert members of the scientific and technical community of current research results. Citations are arranged in the following subject categories: environment; exploratory research and technology assessment; intergovernmental science and R&D incentives; productivity; and resources. Indexes following the main body provide access by Subject, Performing Organization, ASRA Number, and Grant/Contract Number, and refer to the entry number of the document. The Appendix lists previous issues published under the title <u>Recent RANN Reports</u> . | | | | |
| 17. Key Words and Document Analysis. 17a. Descriptors Research Bibliographies Document announcement Productivity Resources Energy Research and development | | | | |
| 17b. Identifiers/Open-Ended Terms Citations Intergovernmental science Environment Technology assessment Exploratory research | | | | |
| 17c. COSATI Field/Group | | | | |
| 18. Availability Statement NTIS. | | | 19. Security Class (This Report) UNCLASSIFIED | |
| | | | 21. No. of Pages 41 | |
| | | | 20. Security Class (This Page) UNCLASSIFIED | |
| | | | 22. Price PCA03-A01 | |

CAPITAL SYSTEMS GROUP, INC.
6110 EXECUTIVE BOULEVARD
SUITE 250
ROCKVILLE, MARYLAND 20852

TABLE OF CONTENTS

| | Page |
|---|------|
| Introduction. | i |
| Document Ordering Instructions | iv |
| Bibliographic Entries | 1 |
| Environment | 1 |
| Managing the Natural Environment | 1 |
| Chemical Threats to Man and Environment. | 1 |
| Earthquake Engineering | 2 |
| Regional Environmental Management. | 4 |
| Societal Response to Natural Hazards | 4 |
| Fire Research. | 4 |
| Exploratory Research and Technology Assessment. | 5 |
| Intergovernmental Science and R&D Incentives. | 5 |
| Industrial | 5 |
| Local Government | 6 |
| Productivity. | 6 |
| Private Sector Productivity. | 6 |
| Advanced Industrial Processing. | 6 |
| Public Policy. | 9 |
| Distribution and Equity | 9 |
| Public Sector Productivity | 10 |
| Medical Instrumentation | 10 |
| Service Delivery Technology and Systems | 10 |
| Service Productivity and Intergovernmental Relations. | 11 |
| Telecommunications. | 11 |
| Resources | 13 |
| Non-renewable Resources. | 13 |
| Fossil Energy | 13 |
| Renewable Resources. | 16 |
| Geothermal Energy | 16 |
| Innovative Biosynthesis Techniques. | 16 |
| Solar Energy | 16 |
| Bioconversion to Fuels. | 17 |
| Heating and Cooling of Buildings. | 17 |
| Photovoltaic Conversion | 17 |
| Ocean Thermal Conversion. | 18 |
| Wind Energy | 18 |
| Resource Systems | 18 |
| Energy Systems | 19 |

TABLE OF CONTENTS (Cont'd)

| | Page |
|---|------|
| Appendix, Previous Issues | 21 |
| Performing Organization Index | 23 |
| ASRA Number Index | 25 |
| Contract/Grant Number Index | 27 |
| Subject Index | 29 |

INTRODUCTION

Effective this issue, Recent Research Reports supersedes Recent RANN Reports. The new publication, like its predecessor, contains citations of documents resulting from applied research supported by the National Science Foundation. Recipients of Recent RANN Reports will automatically be placed on the Recent Research Reports distribution list.

This change coincides with the National Science Foundation's establishment of a Directorate for Applied Science and Research Applications (ASRA). The new directorate both replaces and incorporates many of the functions of the Research Applied to National Needs (RANN) program.

The objectives of ASRA are to:

- Foster growth of fundamental scientific understanding and capability relevant to the resolution of emerging or existing national problems;
- Focus U.S. scientific and technological capabilities on selected problems of national significance where NSF can make a unique contribution;
- Encourage the application of fundamental scientific and engineering capabilities to the solution of significant problems in the public and private sectors, and shorten the time between scientific discoveries and the application of these discoveries; and
- Increase the utilization of science and technology in the public and private sectors.

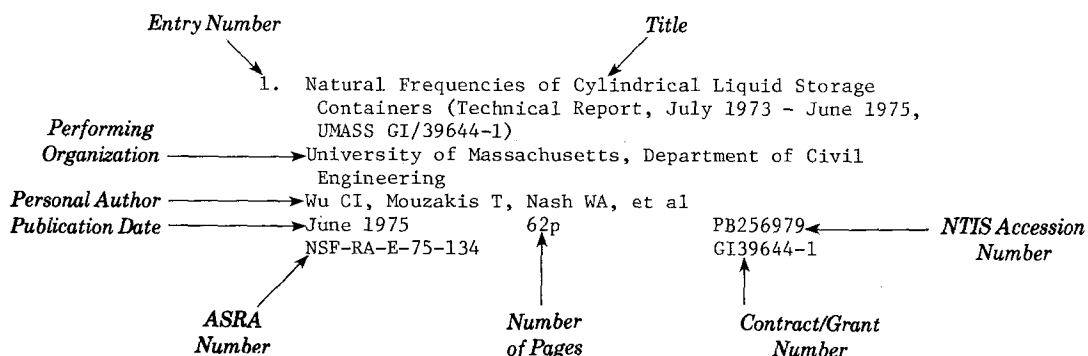
ASRA incorporates five divisions:

- The Problem Analysis Division identifies and analyzes major problems with significant scientific and technological content, and provides an assessment of the appropriate role of science and technology, the Federal Government, and NSF in their solution.

- The Integrated Basic Research Division supports selected areas of basic research which have special relevance to emerging or existing national problems.
- The Applied Research Division provides a source of support for scientifically meritorious research proposals that do not fit within other NSF programs, the programs of other agencies, or the private sector. It also funds scientific research underlying new or developing technologies.
- The Problem-Focused Research Applications Division brings scientific and technological capabilities to bear on selected societal problems where they can make a unique contribution to their timely, practical solution. Programs currently include Earthquake Hazards Mitigation; Chemical Threats to Man and the Environment; Community Water Management; and Alternative Biological Sources of Materials.
- The Intergovernmental Science and R&D Incentives Division encourages the integration of science and technology into program and policy planning and execution by State and local government, and tests and evaluates selected incentives which the Federal Government may use to stimulate the infusion of new technology into the private sector.

How Recent Research Reports is Organized

Each citation is presented in a standard form illustrated below:



Citations are arranged in broad subject categories. Entry numbers are assigned consecutively beginning with the first issue, published in October 1976. Indexes following the main body provide access by subject, performing organization, ASRA number, and contract/grant number, and refer to the entry number of the document.

Documents cited in Recent Research Reports may be ordered from the National Technical Information Service (NTIS). Ordering information is provided on page iv.

Documents from the Applied Science and Research Applications Directorate of the National Science Foundation are available for inspection at the ASRA Information Resources Center, National Science Foundation, 1800 G Street, N.W., Washington, D.C. 20550 (Phone 202-634-4262). Please direct all inquiries to Ms. Carmeen P. Adams.

DOCUMENT ORDERING INSTRUCTIONS

Documents may be obtained from the National Technical Information Service (NTIS), Document Sales, U.S. Department of Commerce, Springfield, Virginia 22161. Please refer to the NTIS accession number when ordering.

NTIS document pricing information may be obtained by utilizing the following formula:

Page-Count Price Schedule
(Current as of October 1977, subject to change)

| <u>Pages</u> | <u>North American Price</u> | <u>Pages</u> | <u>North American Price</u> |
|-------------------|-----------------------------|--------------------|-----------------------------|
| 1-25 | \$ 4.00 | 301-325 | \$11.75 |
| 26-50 | 4.50 | 326-350 | 12.00 |
| 51-75 | 5.25 | 351-375 | 12.50 |
| 76-100 | 6.00 | 375-400 | 13.00 |
| 101-125 | 6.50 | 401-425 | 13.25 |
| 126-150 | 7.25 | 426-450 | 14.00 |
| 151-175 | 8.00 | 451-475 | 14.50 |
| 176-200 | 9.00 | 476-500 | 15.00 |
| 201-225 | 9.25 | 501-525 | 15.25 |
| 226-250 | 9.50 | 526-550 | 15.50 |
| 251-275 | 10.75 | 551-575 | 16.25 |
| 276-300 | 11.00 | 576-600* | 16.50 |

For information on foreign prices, call (703) 557-4785.

* For reports of 601 or more pages, add \$2.50 for each additional 100 page increment. Prices are subject to change.

Microfiche is available at a cost of \$3.00 per document.

ENVIRONMENT

483. Environmental Design Research, NSF Options Programs (Final Report)
Lagorio HJ, Murtha DM, Kohn IR
December 1, 1976 225p PB269683
NSF/RA-760750
484. Summary of Awards: Transition Quarter 1976 (NSF 77-28)
National Science Foundation, Research Applied to National
Needs (RANN), Division of Advanced Environmental Research
and Technology
1977 56p PB270034
NSF/RA-770135

Managing the Natural Environment

485. Twin Rivers, Study of a Planned Community (Final Draft)
Princeton University, School of Architecture and Urban
Planning
Keller S
September 1976 655p PB269404
NSF/RA-760749 GI41311
486. Wind Load Requirements for Buildings (Workshop Proceedings,
June 3-4, 1976, Northwestern University)
Northwestern University
National Bureau of Standards
Wind Engineering Research Council
Parmelee RA
1976 260p PB268547
NSF/RA-760754 ENG7602302

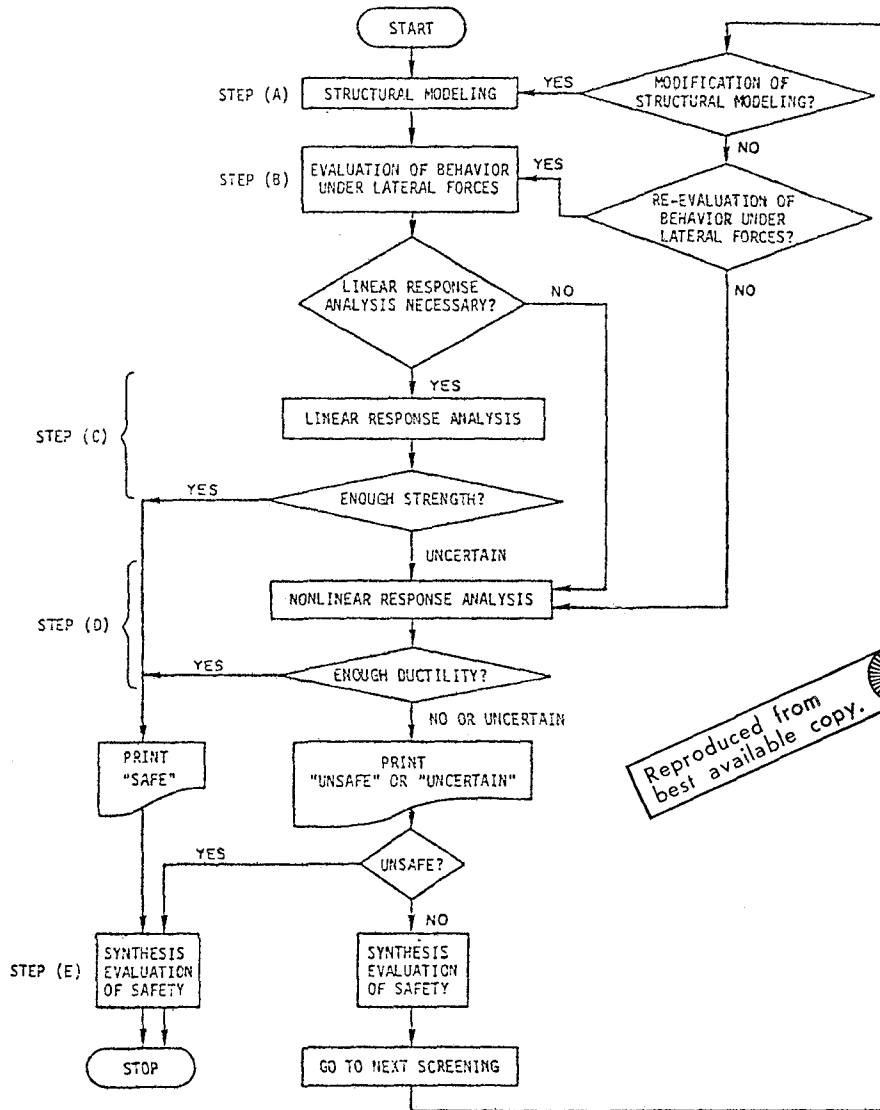
Chemical Threats to Man and Environment

487. Environmental Pollutants and the Urban Economy, Phase 1
(Final Report, June 1972 - October 1975)
University of Chicago, Center for Urban Studies
Argonne National Laboratory, Energy and Environmental
Systems Division
October 1976 86p ANL-76-XX-69
NSF/RA-761022 AG352

488. Management of Residues from Synthetic Fuels Production:
 Proceedings of the First Symposium (May 25-27, 1976,
 Denver, Colorado)
 University of Denver, Denver Research Institute
 Schmidt-Collerus JJ, Bonomo FS
 May 1976 348p PB268464
 NSF/RA-770073 AEN7500175
489. Process Selection for Optimal Management of Regional
 Wastewater Residuals (First Annual Progress Report)
 University of Delaware, Department of Civil Engineering
 Dick RI, Simmons DL, Ball RO, et al
 October 1976 259p PB269572
 NSF/RA-760570 ENV7515751A01
490. Role of Microorganisms in the Decomposition of Deep Well
 Injected Liquid Industrial Wastes (Final Report, July 1,
 1973 - December 31, 1976)
 North Carolina State University, Department of Microbiology
 Elkan GH, Horvath E
 1977 148p PB268646
 NSF/RA-770107 GI39586

Earthquake Engineering

491. Developing Methodologies for Evaluating the Earthquake
 Safety of Existing Buildings (Report No. UCB/EERC-77/06)
 University of California at Berkeley, College of
 Engineering, Earthquake Engineering Research Center
 Bresler B, Okada T, Bertero VV, et al
 February 1977 155p PB267354
 NSF/RA-770106 GI38463
492. Earthquake Surveys of the Roosevelt Hot Springs and the Cove
 Fort Areas, Utah, Volume 4 (Final Report)
 University of Utah, Department of Geology and Geophysics
 Olson TL, Smith RB
 October 1976 82p PB268421
 NSF/RA-760752 AER7401043



Reproduced from
best available copy.

FIGURE 1 FLOW DIAGRAM FOR EVALUATION OF SAFETY OF EXISTING BUILDINGS

See Entry 491

493. Effects of Cracks on the Seismic Analysis of Reinforced Concrete Nuclear Containment Vessels (Interim Report, Report No. 368)
Cornell University, Department of Structural Engineering
Smith JK, Gergely P, White RN
April 1977 167p PB270061
NSF/RA-770118 ATA7303178
494. Evaluation of Seismicity at U.S. Reservoirs
USCOLD, Committee on Earthquakes
Daly W, Judd R, Meade R
May 1977 27p PB270036
NSF/RA-770120 ENV7405163

Regional Environmental Management

495. Managing Suburban Growth: A Modeling Approach, Summary
Harvard University, Graduate School of Design, Landscape Architecture Research Office
Stenitz C, Brown HJ, Goodale P
1977 55p PB270113
NSF/RA-770119 ENV7203372A06

Societal Response to Natural Hazards

496. Limited Knowledge and Insurance Protection: Implications for Natural Hazard Policy
University of Pennsylvania, The Wharton School
Kunreuther H, Ginsberg R, Miller L, et al
March 1977 493p PB270524
NSF/RA-770117 ATA7303064A03

Fire Research

497. Third Full-Scale Bedroom Fire Test of the Home Fire Project, Volume 2, Analysis of Test Results (Technical Report, July 30, 1975, FMRC Serial No. 21011.7)
Factory Mutual Research Corporation, Factory Mutual System, Basic Research Department
Modak AT
November 1976 261p PB267935
NSF/RA-760751 GI34734X

EXPLORATORY RESEARCH AND TECHNOLOGY ASSESSMENT

498. Appropriate Technology - A Directory of Activities and
Projects
Integrative Design Associates, Inc.
Eccli E
1977 66p PB267970
NSF/RA-770064 ERS7621350
499. Hydrogen Economy, A Preliminary Technology Assessment
(Executive Summary, SRI Project EGU-2836)
Stanford Research Institute
Dickson EM, Ryan JW, Smulyan MH
February 1976 14p PB268468
NSF/RA-760743 ERP7302706
500. Utilization Analysis, RANN Research Products (RANN
Utilization Experience)
Research Triangle Institute
Burger RM, Massoglia MF
May 1977 102p PB270087
NSF/RA-770116 C7617165

INTERGOVERNMENTAL SCIENCE AND R&D INCENTIVES

Industrial

501. Preliminary Assessment for Designing Experiments Using
Federal Innovation Processes (Research Report CSSP 4676-14)
Stanford Research Institute, Center for the Study of Social
Policy
Williams C, Milbergs E, Quick R
April 1977 293p PB270089
NSF/RA-770121 C828

Local Government

502. Assessing Personnel Management: Objectives and Performance Indicators, A Guide for City Officials
Georgetown University, Public Services Laboratory
U.S. Conference of Mayors
National League of Cities
International Personnel Management Association
March 1977 32p PB267965
NSF/RA-770091 APR7608199

PRODUCTIVITY

Private Sector Productivity

503. Textile Industry Productivity Workshop (Final Report)
North Carolina State University, School of Textiles
Cooper WD, Hamby DS, Shaw MR, et al
May 1977 76p PB268419
NSF/RA-770112 APR7701604
504. Textile Industry Productivity Workshop, Executive Summary (Final Report)
North Carolina State University, School of Textiles
Cooper WD, Hamby DS, Shaw MR, et al
May 1977 29p PB268554
NSF/RA-770111 APR7701604

Advanced Industrial Processing

505. Automating the Assembly Line, A Science Base for Manufacturing (Mosaic, Volume 7, No. 5, September 1976 - October 1976)
National Science Foundation
October 1976 15p PB270120
NSF/RA-760433

506. Preliminary Investigation of the Job Stream Concept as Applied to Hierarchical Production Control in Integrated Steel Manufacturing (Report No. 83)
Purdue University, Schools of Engineering, Purdue Laboratory for Applied Industrial Control
Rogers DG, Moodie CL
August 1976 88p PB269668
NSF/RA-760746 APR7307822A02
507. State-of-the-Art in Adaptable-Programmable Assembly Systems
Westinghouse R&D Center
Abraham RG, Stewart RJS, Shum LY
May 31, 1977 159p PB270054
NSF/RA-770140 ISP7624164
508. Systems Engineering of Hierarchy Computer Control Systems for Large Steel Manufacturing Complexes, Volume 2, Chapters 5-8 (Annual Report, January 1, 1976 - December 31, 1976, Report No. 84)
Purdue University, Schools of Engineering, Purdue Laboratory for Applied Industrial Control
1976 270p PB270132
NSF/RA-760748 APR7307822A03
509. User's Guide to the Steel Plant Simulation Model (Report No. 85)
Purdue University, Schools of Engineering, Purdue Laboratory for Applied Industrial Control
Rogers DG, Moodie CL
August 1976 185p PB267960
NSF/RA-760598 APR7307822A02
510. User's Manual for GRASP (Graphic Reliability Analysis Program) (Report No. 75)
Purdue University, Schools of Engineering, Purdue Laboratory for Applied Industrial Control
Polito J Jr, Petersen CC, Shulaker ER, et al
April 1976 240p PB269639
NSF/RA-760597 APR7307822

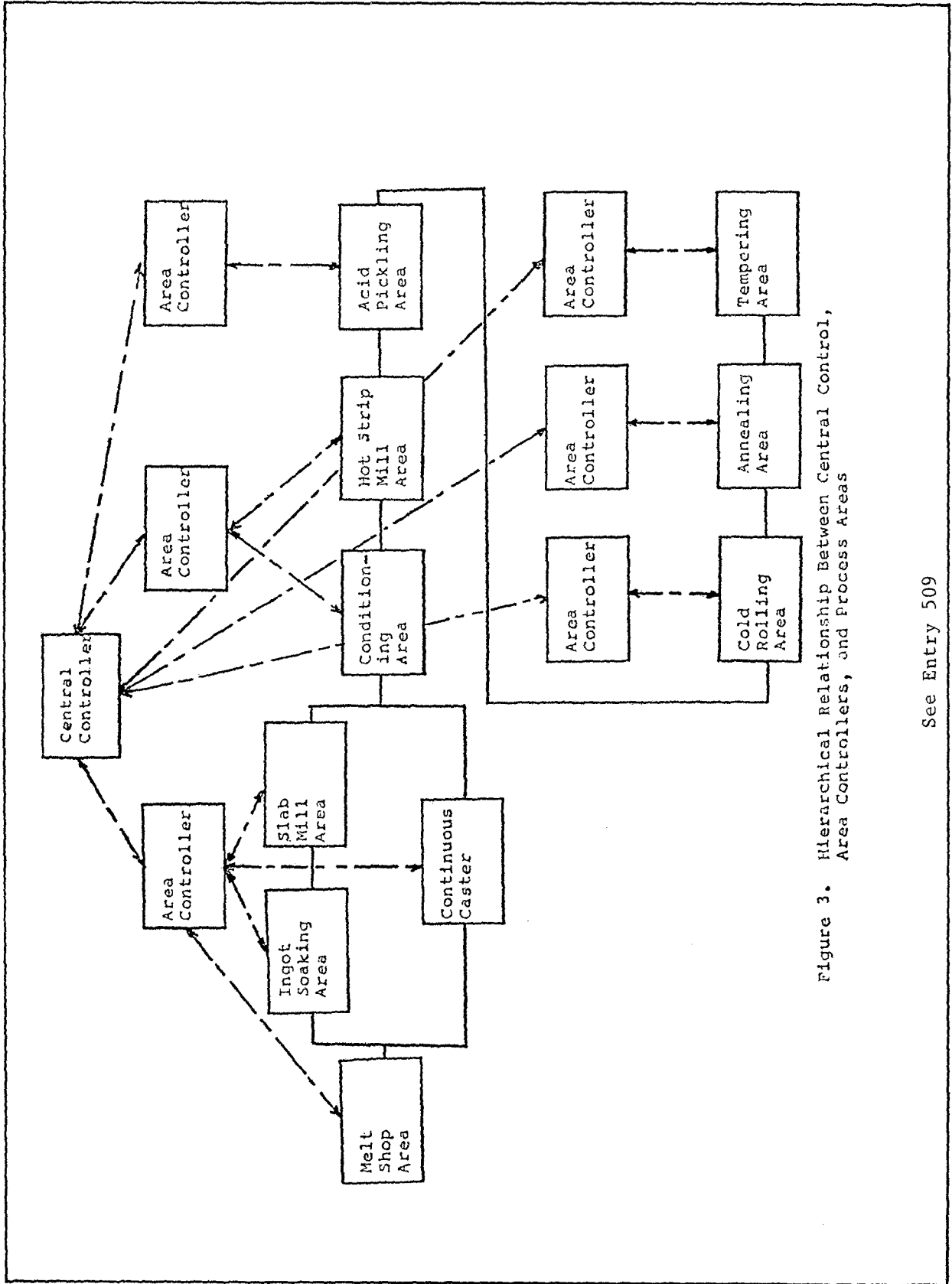


Figure 3. Hierarchical Relationship Between Central Control, Area Controllers, and Process Areas

See Entry 509

Public Policy

Distribution and Equity

511. Demographic Data for Policy Analysis (Urban Travel Demand Forecasting Project, Phase 1, Final Report Series, Volume 8, Special Report UCB-ITS-SR-77-10)
University of California, Institute of Transportation Studies
McFadden D, Cosslett S, Duguay G, et al
June 1977 88p PB270931
NSF/RA-770143 GI43740
512. Disaggregated Supply Data Computation Procedures (Urban Travel Demand Forecasting Project, Phase 1, Final Report Series, Volume 3, Special Report UCB-ITS-SR-77-8)
University of California, Institute of Transportation Studies
Reid FA
June 1977 65p PB270930
NSF/RA-770142 GI43740
513. Economic Model of Federal Milk Marketing Order Policy Simulator--Model A (Station Bulletin No. 158)
Purdue University, Department of Agricultural Economics, Agricultural Experiment Station
Babb EM, Banker DE, Goldman O, et al
April 1977 126p PB267988
NSF/RA-770084 APR7516815
514. User's Manual for Federal Milk Marketing Order Policy Simulator--Model A (Station Bulletin No. 157)
Purdue University, Department of Agricultural Economics, Agricultural Experiment Station
Babb EM, Banker DE, Goldman O, et al
April 1977 34p PB267993
NSF/RA-770090 APR7516815

Public Sector Productivity

515. Conceptualization and Measurement of Consumer Satisfaction and Dissatisfaction, Conference Proceedings (April 11-13, 1976, MSI Report No. 77-103)
Marketing Science Institute
Hunt HK
May 1977 490p PB270059
NSF/RA-770003 APR7522341
516. Research on Productivity Measurement Systems for Administrative Services: Proceedings of the Grantees' Conference
Arizona State University, College of Business Administration
Ruch WA
1977 296p PB268648
NSF/RA-770058 APR7683866
517. What Do We Know About Consumer Behavior? Summary Report
University of Illinois
Frankel M
1977 33p PB267929
NSF/RA-770012 GI38971

Medical Instrumentation

518. To Develop a Pion Facility for Cancer Therapy (Final Technical Report)
Stanford University, High Energy Physics Laboratory
Schwettman HA
February 1977 8p PB267946
NSF/RA-770069 APR7203518

Service Delivery Technology and Systems

519. Rescue Equipment Selection Manual (BDM/W-76-036-TR)
BDM Corporation
March 22, 1977 88p PB268501
NSF/RA-770061 C960

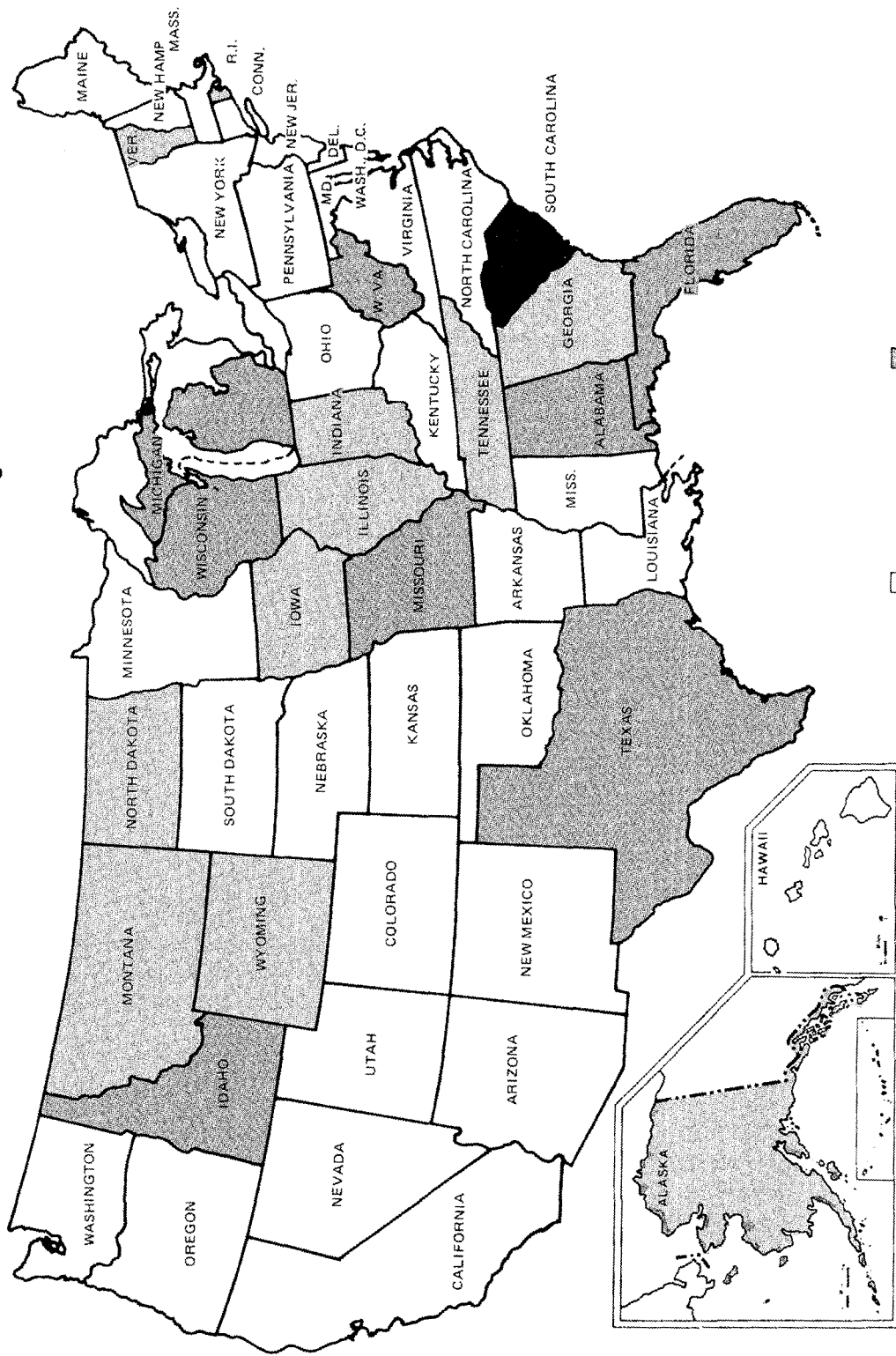
Service Productivity and Intergovernmental Relations

520. Evaluation of Impasse Procedures for Police and Firefighters
in New York State
Cornell University
New York State School of Industrial and Labor Relations
Kochan TA, Ehrenberg RG, Baderschneider J, et al
January 1977 480p PB269663
NSF/RA-770101
521. Policing Metropolitan America
Indiana University
Ostrom E, Parks RB, Whitaker GP
1977 49p PB270028
NSF/RA-770001 GI43949
522. Symposium on Police and Firefighter Arbitration in New York
State (Proceedings, December 1-3, 1976, Albany, New York)
New York State Public Employment Relations Board
Cornell University, New York State School of Industrial
and Labor Relations
1977 224p PB270094
NSF/RA-770102 APR7683865

Telecommunications

523. Human Factors in Teleconferencing Systems (Final Report)
Johns Hopkins University, Department of Psychology
Chapanis A
November 30, 1976 47p PB268453
NSF/RA-760575 APR7518622
524. Impact of Future Cable Television Technology (Final Summary
Report)
Rensselaer Polytechnic Institute, Telecommunications
Research Center, Electrical and Systems Engineering
Department
Ghandi SK, Gutmann RJ, Rose K, et al
February 1976 224p PB268465
NSF/RA-760816 GI36407

Distribution of Intra-state Fresh Pursuit Legislation



See Entry 521

525. Teleconferencing Systems: A State-of-the-Art Survey and Preliminary Analysis (Final Report, SRI Project 3735)
Stanford Research Institute
Hough RW, Panko RR
April 1977 201p PB268455
NSF/RA-770103 SSH7422611

RESOURCES

Non-Renewable Resources

526. Research Frontiers in Exploration for Non-Renewable Resources: Report on the Workshop (October 11-13, 1976)
Pennsylvania State University, College of Earth and Mineral Sciences, Department of Geosciences, Ore Deposits Research Section
Barnes HL, Rose AW, Burnham CW, et al
1976 164p PB269569
NSF/RA-770031 AER7680794

Fossil Energy

527. Energy Conversion Alternatives Study - ECAS - General Electric Phase 2 Final Report, Volume 1 - Executive Summary (NASA-CR 134949)
General Electric Company, Corporate Research and Development
December 1976 38p PB268466
NSF/RA-760582 AG551
528. Energy Conversion Alternatives Study - ECAS - General Electric Phase 2 Final Report, Volume 2 - Advanced Energy Conversion Systems - Conceptual Designs, Part 1, Analytical Approach (NASA-CR 134949, SRD-76-064-2)
General Electric Company, Corporate Research and Development
Corman JC, Robertson AS, Stewart RD
December 1976 74p PB269379
NSF/RA-760583 AG551

529. Energy Conversion Alternatives Study - ECAS - General
 Electric Phase 2 Final Report, Volume 2 - Advanced Energy
 Conversion Systems - Conceptual Designs, Part 2, Closed
 Turbine Cycles (NASA-CR 134949, SRD-76-064-2)
 General Electric Company, Corporate Research and Development
 Brown DH, Pomeroy BD, Shah RP
 December 1976 247p PB268467
 NSF/RA-760584 AG551
530. Energy Conversion Alternatives Study - ECAS - General
 Electric Phase 2 Final Report, Volume 2, Advanced Energy
 Conversion Systems - Conceptual Designs, Part 3, Open Cycle
 Gas Turbines and Open Cycle MHD (NASA-CR 134949, SRD-76-
 064-2)
 General Electric Company, Corporate Research and Development
 Harris LA, Shah RP
 December 1976 250p PB269380
 NSF/RA-760585 AG551
531. Energy Conversion Alternatives Study - ECAS - General
 Electric Phase 2 Final Report, Volume 2 - Advanced Energy
 Conversion Systems - Conceptual Designs, Part 4, Summary of
 Results (NASA-CR 134949, SRD-76-064-2)
 General Electric Company, Corporate Research and Development
 Brown DH, Corman JC, Johnson GG, et al
 December 1976 70p PB269381
 NSF/RA-760586 AG551
532. Energy Conversion Alternatives Study - ECAS - General
 Electric Phase 2 Final Report, Volume 3 - Research and
 Development Plans and Implementation Assessment (NASA-CR
 13949, SRD-76-064-3)
 General Electric Company, Corporate Research and Development
 Bass RR, Brown DH, Corman JC, et al
 December 1976 328p PB269382
 NSF/RA-760587 AG551
533. Energy Conversion Alternatives Study - ECAS - United
 Technologies Phase 2 Final Report, Integrated Coal
 Gasifier/Molten Carbonate Fuel Cell Powerplant Conceptual
 Design and Implementation Assessment (NASA-CR 134955,
 FCR-0237)
 United Technologies Corporation
 Burns and Roe, Inc.
 Institute of Gas Technology
 King JM
 October 19, 1976 169p PB270016
 NSF/RA-760591 AG551

534. Energy Conversion Alternatives Study - ECAS - Westinghouse
Phase 2 Final Report, Volume 2 - Summary and Combined Gas-
Steam Turbine Plant Using Coal Derived Liquid Fuel (NASA-
CR 134942)
Westinghouse Electric Corporation, Research Laboratories
Beecher DT, et al
November 1, 1976 330p PB269378
NSF/RA-760589 AG551
535. Energy Conversion Alternatives Study - ECAS - Westinghouse
Phase 2 Final Report, Volume 3 - Summary and Advanced
Steam Plant with Pressurized Fluidized Bed Boilers (NASA-
CR 134942)
Westinghouse Electric Corporation, Research Laboratories
Beecher DT, et al
November 1, 1976 398p PB268558
NSF/RA-760590 AG551
536. Energy Conversion Alternatives Study - ECAS - Westinghouse
Phase 2 Final Report, Volume 5 - Summary and Combined Gas-
Steam Turbine Plant with an Integrated Low-BTU Gasifier
(NASA-CR 134942)
Westinghouse Electric Corporation, Research Laboratories
Beecher DT, et al
November 1, 1976 495p PB268557
NSF/RA-760588 AG551
537. Evaluation of Phase 2 Conceptual Designs and Implementation
Assessment Resulting from the Energy Conversion
Alternatives Study (ECAS) (NASA TM X-73515)
National Aeronautics and Space Administration, Lewis
Research Center
April 1977 606p PB270017
NSF/RA-770133 AG551
538. Thermodynamic Analysis of an Oil Reclamation Process
(Energy Institute Report (EIR)-77-1)
Drexel University
Jhavar KR, Grossmann ED, Brown HL, et al
January 1977 190p PB268524
NSF/RA-770068 GI36598

Renewable Resources

Geothermal Energy

539. Gravity and Ground Magnetic Surveys of the Central Mineral Mountains, Utah, Volume 6 (Final Report, MS Thesis)
University of Utah, Department of Geology and Geophysics
Grebs TJ, Cook KL
December 1976 135p PB268423
NSF/RA-760753 AER7401043
540. Thermal Gradient and Heat Flow Drilling, Volume 5 (Final Report)
University of Utah, Department of Geology and Geophysics
Whelan JA
January 1977 48p PB268422
NSF/RA-770094 AER7401043

Innovative Biosynthesis Techniques

541. Enzyme Technology in the Utilization of Agricultural Wastes (Final Report, ISU-ERI-Ames-77312, ERI Project 1134S)
Iowa State University, Engineering Research Institute,
Department of Chemical Engineering and Nuclear Engineering
Reilly PJ
March 1977 83p PB268710
NSF/RA-770079 APR7420111
542. Isolation of Lignin Degrading Tropical Microorganisms (Progress Report, May 1, 1976 - December 31, 1976)
National Science Foundation
Scott WE, Roth FJ
1977 14p PB269408
NSF/RA-770100 AER7607622

Solar Energy

543. Solar Energy: Policy and Prospects (First Year Report)
University of New Mexico, Department of Economics, Resource Economics Group
Schulze WD, Ben-David S, Katson R, et al
July 1976 160p PB267986
NSF/RA-760577 APR7518249

Bioconversion to Fuels

544. Biological Solar Energy Conversion: Approaches to Overcome Yield Stability and Product Limitations (Progress Report No. 4, MML TR 77-27C, October 1, 1976 - March 31, 1977)
Martin Marietta Corporation, Martin Marietta Laboratories
Kok B, Fowler CF, Hardt HH, et al
1977 26p PB267937
NSF/RA-770063 AER7303291

Heating and Cooling of Buildings

545. Further Development of the Compressed-Film Floating-Deck Solar Water Heater (Final Report)
Texas A&M University, Department of Chemical Engineering
Davison RR, Harris WB
April 1977 77p PB268514
NSF/RA-770099 AER7303172A01

Photovoltaic Conversion

546. Photochemical Conversion of Solar Energy (Annual Progress Report, January 1, 1976 - December 31, 1976)
Boston University, Department of Chemistry
Lichtin NN
May 31, 1977 62p PB270058
NSF/RA-770145 AER7203579A05
547. Silicon Schottky Photovoltaic Diodes for Solar Energy Conversion (Quarterly Progress Report, January 1, 1977 - March 31, 1977, NSF/RANN/SE/AER7303197/PR/77/1)
Rutgers University, Department of Electrical Engineering
Anderson WA
May 1977 18p PB268457
NSF/RA-770098 AER7303197
548. Ternary Compound Thin Film Solar Cells-II (Second Quarter Report, January 1, 1977 - March 31, 1977)
University of Maine at Orono, Department of Electrical Engineering
Kazmerski LL
1977 38p PB270029
NSF/RA-770144 AER7519576A01

Ocean Thermal Conversion

549. Ocean Thermal Energy Conversion: Resource, Ecological and Environmental Studies (Final Technical Report)
Ocean Data Systems, Inc.
Wolff PM, Hubert WE
March 1976 95p PB269283
NSF/RA-760096 C1020

Wind Energy

550. Sites for Wind Power Installations: Wind Tunnel Simulation of the Influence of Two-Dimensional Ridges on Wind Speed and Turbulence (Annual Report, First Year, ERDA/NSF/00702-75/1)
Colorado State University, Department of Civil Engineering
Meroney RD, Sandborn VA, Bouwmeester RJB, et al
July 1976 80p NSF/RA-760745
NSF/RA-760745 AER7500702
551. Stochastic Modelling of Site Wind Characteristics (Final Report, ERDA/NSF/00357/76/1 UC-60)
Northwestern University, Department of Civil Engineering
Corotis RB
November 1976 298p ERDA-NSF-00357
NSF/RA-760744 AER7500357
552. Wind Energy Conversion (Final Report, February 1975 - October 1976, ASRL TR 184-3, ERDA/NSF/00826/75/3 UC-60)
Massachusetts Institute of Technology, Department of Aeronautics and Astronautics, Aeroelastic and Structures Research Laboratory
Miller RH, Martinez-Sanchez M, Dugundji J, et al
October 1976 430p PB268718
NSF/RA-760569 AER7500826

Resource Systems

553. Midlands Conference: New Concepts for the Rapid Determination of Protein Quality (University of Nebraska, Lincoln, Nebraska, February 20-22, 1977)
University of Nebraska, Food Protein Research Group
1977 127p PB270373
NSF/RA-770122 18 AER7620969

554. Natural Resources Policy 1975-1985 (Journal of Environmental
Economics and Management, Volume 3, No. 4, December 1976)
University of New Mexico, Department of Economics
Kneese AV
May 1976 60p PB267948
NSF/RA-760574 ENV7615306

Energy Systems

555. Documentation of the Regionalized Electricity Model
University of Texas at Austin, Center for Energy Studies
Kamat DP
December 1976 137p PB267972
NSF/RA-760579 AER7604169

556. Energy Utilization Analysis, Chestertown Poultry Plant,
Campbell Soup Co.
Drexel University, Energy Sources and Systems Institute,
Mechanical Engineering and Mechanics Department
Zwillenberg M, Nwude J, Narayanan R, et al
April 1976 130p PB268454
NSF/RA-760600 GI36598

557. Low Energy Utilization School, Energy Conservation Operation
Manual, Phase 2: Report
Richard G. Stein and Partners
New York City Board of Education
Stein RG, Stein C, Nathan DB
March 31, 1977 81p PB268555
NSF/RA-770033 AER7303057A02

558. Research, Design, Construction, and Evaluation of a Low Energy
Utilization School, Phase 2: Report
Richard G. Stein and Partners
New York City Board of Education
Stein RG, Stein C, Deibert PF
March 31, 1977 213p PB269407
NSF/RA-770032 AER7303057A02

APPENDIX

PREVIOUS ISSUES UNDER TITLE RECENT RANN REPORTS

| Date of Publication | Inclusive Entry Numbers | NTIS Number | Price |
|---------------------|-------------------------|-------------|--------|
| October 1976 | 1-67 | PB265973 | \$4.50 |
| January 1977 | 68-175 | PB265989 | 4.50 |
| May 1977 | 176-341 | PB268446 | 5.25 |
| September 1977 | 342-482 | PB274121 | 5.25 |

Preceding page blank

PERFORMING ORGANIZATION INDEX

References Refer to Entry Number

| | |
|---|---|
| Argonne National Laboratory 487 | National Aeronautics and Space Administration 537 |
| Arizona State University 516 | National Bureau of Standards 486 |
| BDM Corporation 519 | National League of Cities 502 |
| Boston University 546 | National Science Foundation 483, 484, 505, 542 |
| Burns and Roe 533 | New York City Board of Education 557, 558 |
| Colorado State University 550 | New York State Public Employment Relations Board 522 |
| Cornell University 493, 520, 522 | New York State School of Industrial and Labor Relations 520 |
| Drexel University 538, 556 | North Carolina State University 490, 503, 504 |
| Factory Mutual Research Corporation 497 | Northwestern University 486, 551 |
| General Electric Company 527, 528, 529, 530, 531, 532 | Ocean Data Systems 549 |
| Georgetown University 502 | Pennsylvania State University 526 |
| Harvard University 495 | Princeton University 485 |
| Indiana University 521 | Purdue University 506, 508, 509, 510, 513, 514 |
| Institute of Gas Technology 533 | Rensselaer Polytechnic Institute 524 |
| Integrative Design Associates 498 | Research Triangle Institute 500 |
| International Personnel Management Association 502 | Richard G. Stein and Partners 557, 558 |
| Iowa State University 541 | Rutgers University 547 |
| Johns Hopkins University 523 | Stanford Research Institute 499, 501, 525 |
| Marketing Science Institute 515 | Stanford University 518 |
| Martin Marietta Corporation 544 | Texas A&M University 545 |
| Massachusetts Institute of Technology 552 | U.S. Conference of Mayors 502 |

Preceding page blank

PERFORMING ORGANIZATION INDEX (Cont'd)

| | |
|--|--|
| United Technologies Corporation 533 | University of Nebraska 553 |
| University of California 511, 512 | University of New Mexico 543, 554 |
| University of California at Berkeley 491 | University of Pennsylvania 496 |
| University of Chicago 487 | University of Texas at Austin 555 |
| University of Delaware 489 | University of Utah 492, 539, 540 |
| University of Denver 488 | USCOLD 494 |
| University of Illinois 517 | Westinghouse Electric Corporation 534, 535, 536 |
| University of Maine at Orono 548 | Westinghouse R&D Center 507 |
| | Wind Engineering Research Council 486 |

References Refer to Entry Number

ASRA NUMBER INDEX

References Refer to Entry Number

| | | | |
|---------------|----------|---------------|----------|
| NSF/RA-760096 |549 | NSF/RA-770032 |558 |
| NSF/RA-760433 |505 | NSF/RA-770033 |557 |
| NSF/RA-760569 |552 | NSF/RA-770058 |516 |
| NSF/RA-760570 |489 | NSF/RA-770061 |519 |
| NSF/RA-760574 |554 | NSF/RA-770063 |544 |
| NSF/RA-760575 |523 | NSF/RA-770064 |498 |
| NSF/RA-760577 |543 | NSF/RA-770068 |538 |
| NSF/RA-760579 |555 | NSF/RA-770069 |518 |
| NSF/RA-760582 |527 | NSF/RA-770073 |488 |
| NSF/RA-760583 |528 | NSF/RA-770079 |541 |
| NSF/RA-760584 |529 | NSF/RA-770084 |513 |
| NSF/RA-760585 |530 | NSF/RA-770090 |514 |
| NSF/RA-760586 |531 | NSF/RA-770091 |502 |
| NSF/RA-760587 |532 | NSF/RA-770094 |540 |
| NSF/RA-760588 |536 | NSF/RA-770098 |547 |
| NSF/RA-760589 |534 | NSF/RA-770099 |545 |
| NSF/RA-760590 |535 | NSF/RA-770100 |542 |
| NSF/RA-760591 |533 | NSF/RA-770101 |520 |
| NSF/RA-760597 |510 | NSF/RA-770102 |522 |
| NSF/RA-760598 |509 | NSF/RA-770103 |525 |
| NSF/RA-760600 |556 | NSF/RA-770106 |491 |
| NSF/RA-760743 |499 | NSF/RA-770107 |490 |
| NSF/RA-760744 |551 | NSF/RA-770111 |504 |
| NSF/RA-760745 |550 | NSF/RA-770112 |503 |
| NSF/RA-760746 |506 | NSF/RA-770116 |500 |
| NSF/RA-760748 |508 | NSF/RA-770117 |496 |
| NSF/RA-760749 |485 | NSF/RA-770118 |493 |
| NSF/RA-760750 |483 | NSF/RA-770119 |495 |
| NSF/RA-760751 |497 | NSF/RA-770120 |494 |
| NSF/RA-760752 |492 | NSF/RA-770121 |501 |
| NSF/RA-760753 |539 | NSF/RA-770122 |553 |
| NSF/RA-760754 |486 | NSF/RA-770133 |537 |
| NSF/RA-760816 |524 | NSF/RA-770135 |484 |
| NSF/RA-761022 |487 | NSF/RA-770140 |507 |
| NSF/RA-770001 |521 | NSF/RA-770142 |512 |
| NSF/RA-770003 |515 | NSF/RA-770143 |511 |
| NSF/RA-770012 |517 | NSF/RA-770144 |548 |
| NSF/RA-770031 |526 | NSF/RA-770145 |546 |



CONTRACT/GRANT NUMBER INDEX

References Refer to Entry Number

| | | | |
|-----------------------------|----------|-----------------------|----------|
| AEN7500175..... | 488 | APR7608199..... | 502 |
| AER7607622..... | 542 | APR7683865..... | 522 |
| AER7203579A05..... | 546 | APR7683866..... | 516 |
| AER7303057A02..... | 557, 558 | APR7701604..... | 503, 504 |
| AER7303172A01..... | 545 | ATA7303064A03..... | 496 |
| AER7303197..... | 547 | ATA7303178..... | 493 |
| AER7303291..... | 544 | C1020..... | 549 |
| AER7401043... 492, 539, 540 | | C7617165..... | 500 |
| AER7500357..... | 551 | C828..... | 501 |
| AER7500702..... | 550 | C960..... | 519 |
| AER7500826..... | 552 | ENG7602302..... | 486 |
| AER7519576A01..... | 548 | ENV7203372A06..... | 495 |
| AER7604169..... | 555 | ENV7405163..... | 494 |
| AER7620969..... | 553 | ENV7515751A01..... | 489 |
| AER7680794..... | 526 | ENV7615306..... | 554 |
| AG352..... | 487 | ERP7302706..... | 499 |
| AG551..... 527, 528, 529 | | ERS7621350..... | 498 |
| 530, 531, 532 | | GI34734X..... | 497 |
| 533, 534, 535 | | GI36407..... | 524 |
| 536, 537 | | GI36598..... 538, 556 | |
| APR7203518..... | 518 | GI38463..... | 491 |
| APR7307822..... | 510 | GI38971..... | 517 |
| APR7307822A02..... 506, 509 | | GI39586..... | 490 |
| APR7307822A03..... | 508 | GI41311..... | 485 |
| APR7420111..... | 541 | GI43740..... 511, 512 | |
| APR7516815..... 513, 514 | | GI43949..... | 521 |
| APR7518249..... | 543 | ISP7624164..... | 507 |
| APR7518622..... | 523 | SSH7422611..... | 525 |
| APR7522341..... | 515 | | |

SUBJECT INDEX

References Refer to Entry Number

- Administrative Services
516
- Aerodynamics
550-552
- Agriculture
513, 514, 541
- Air Pollution
487
- Appropriate Technology
498
- Architecture
485
- Assembly Systems
505, 507
- Bioconversion to Fuels
544
- Biosynthesis
541, 542
- Buildings
486, 491
See also Heating and
Cooling of Buildings
- Cable Television
524
- California, San Francisco
511, 512
- Campbell Soup Company
556
- Cancer Therapy
518
- Cellulose
541, 542
- Chemicals
484, 487-490
- Coal
533, 534, 536
- Communication Systems
523-525
- Community Development
485
- Computer Applications
505, 507-510, 516,
518, 555
- Computer Models
495
- Computer Programs
509-511, 513, 514
- Consumers
515, 517
- Cost-Benefit Analysis
487, 489, 519, 520,
537, 540
- Dairy Products
513, 514
- Demographic Surveys
511
- Diagnostic Techniques
518
- Directories
498
- Distribution and Equity
511-514
- Drilling
540
- Earthquakes
484, 491-494, 496
- Ecology
498, 549
- Economic Analysis
487, 499, 513, 514,
516, 524, 543, 554,
555
- Effluent Analysis
490
- Electric Power
527-537, 555, 556
- Energy
See individual forms of
energy
- Energy Conversion
499, 527-538, 552
- Energy Conservation
526, 557, 558
- Energy Systems
555-558
- Energy Utilization
556-558
- Environment
483, 484
See also Regional Environmental
Management

Preceding page blank

SUBJECT INDEX (Cont'd)

- Environmental Impacts
483, 487, 488, 549,
554
- Enzymes
541, 542
- Fire Departments
520, 522
- Fires
497
- Floods
496
See also Natural Hazards
- Food Chemistry
553
- Fossil Energy
527-538
- Geophysical Prospecting
539
- Geothermal Energy
492, 539, 540
- Government, Federal
See National Government
- Government, Local
See Local Government
- Graphic Reliability
510
- Hazardous Materials
488
See also Chemicals, Nuclear
Energy
- Heat Recovery
556
- Heating and Cooling of
Buildings
543, 545, 557, 558
- Human Factors
523
- Hydrogen Fuels
499
- Industrial Automation
505-510
- Information Sources
498
- Innovation
501
- Insulating Materials
545
- Insurance
496
- Job Streams
506
- Labor Relations
502, 520, 522
See also Personnel Management
- Land Use
495
- Lignin
542
- Local Government
502, 516, 519
- Magnetic Surveys
539
- Manufacturing
505-509
- Marine Maps
549
- Mathematical Models
489, 508, 509, 551,
555
- Measuring Techniques
497, 501, 502, 511,
512, 515, 516, 518,
539, 548, 550, 551,
553
- Medical Instrumentation
518
- Microorganisms
490, 542
- Milk
513, 514
- Mineral Resources
526
- Models
490, 495, 506, 510,
511, 512, 513, 515,
550
See also Computer Models,
Mathematical Models

References Refer to Entry Number

SUBJECT INDEX (Cont'd)

- Municipal Management
 - 502
 - See also individual municipal services
- National Government
 - 499, 513, 514
- Natural Hazards
 - 484, 491-494, 496
 - See also individual hazards
- Natural Resources
 - 526, 543, 554
 - See also individual resources
- New Jersey, Twin Rivers
 - 485
- New York City
 - 557, 558
- New York State
 - 520, 522
- Non-Renewable Resources
 - 526
- Nuclear Energy
 - 493
- Ocean Thermal Conversion
 - 549
- Personnel Management
 - 502, 516
- Petroleum
 - 538
- Photosynthesis
 - 544
- Photovoltaic Conversion
 - 546-548
- Pions
 - 518
- Planned Communities
 - 485
- Police
 - 520-522
- Policy Analysis
 - 487, 511
- Policy Making
 - 501, 513, 514, 543, 554
- Pollution
 - 487
- Poultry Plants
 - 556
- Pricing
 - 543
- Productivity
 - 503, 504, 513, 515-517, 520-522
- Protein
 - 553
- Public Services
 - 519-522
- Radiation Hazards
 - 493
- Radiation Therapy
 - 518
- Regional Environmental Management
 - 484, 489, 495
- Regulations (Law)
 - 524
- Reliability Analysis
 - 508, 510
- Rescue Equipment
 - 519
- Research Applied to National Needs (RANN)
 - 484, 500
- Research Utilization
 - 500
- Reservoirs
 - 494
- Resource Conservation
 - 526, 556
- Resource Systems
 - 553, 554
- Risk Analysis
 - 496
- Robots
 - 505
- Rock Mechanics
 - 494
- Safety Evaluation
 - 491
- Schools (Buildings)
 - 491, 557, 558
- Sludge
 - 489
 - See also Waste Management
- Social Impacts
 - 524

References Refer to Entry Number

SUBJECT INDEX (Cont'd)

| | | | |
|------------------------|---------------|---------------------------------|-------------------|
| Solar Energy | 543, 544-548 | Transportation | 511, 512 |
| Solar Sea Power Plants | 549 | Urban Planning | 485, 495 |
| Steel Industry | 506, 508, 509 | Utah, Central Mineral Mountains | 539 |
| Suburban Areas | 495 | Utah, Roosevelt Hot Springs | 492, 540 |
| Synthetic Fuels | 488 | Waste Management | 488-490, 541, 556 |
| Telecommunications | 523-525 | Weather Modification | 484 |
| Teleconferencing | 523, 525 | Wind Energy | 550-552 |
| Textile Industry | 503, 504 | Wind Load Requirements | 486 |
| Thermodynamics | 538 | | |

References Refer to Entry Number