VOLUME II

MHD and Other Topping Cycles 769176-769185 1003

Nuclear Power 769186-769198, 769315 1057

Rankine Cycle Power 769199-769211 1145

Solar Power 769212-769234, 769317 1207

Space Power 769236-769256 1367

Stirling Cycle Engines 769257-769262 1495

Thermoelectrics 769263-769277 1523

Thermionics 769278-769284 1623

Urban Energy Management 769285-769298 1661

Wind Power 769299-769311 1733

Index and Data Retrieval 1803

MHD and Other Topping Cycles

Session Chairman: W. E. Amend, Argonne National Laboratory, Argonne, IL

PART I - MHD

Session Chairman: M. Petrick, Argonne National Laboratory, Argonne, IL

Executive Summary: W. E. Amend, Page 1004

		PAGE
769176	MHD POWER GENERATION: 1976 STATUS REPORT W.D. Jackson, Energy Research and Development Administration (ERDA), Washington, D.C., P.S. Zygielbaum, Electric Power Research Institute (EPRI), Palo Alto, CA, R.V. Shanklin, ERDA, Washington, D.C., H.R. Graham and J.E. Scheppan, TRW Energy Systems, McLean, VA	1006
769177	INVESTIGATION OF DIRECT COAL-FIRED MHD POWER GENERATION J.B. Dicks, K.E. Tempelmeyer, Y.C.L. Wu, L.W. Crawford, Energy Conversion Division, The University of Tennessee Space Institute, Tullahoma, TN	1015
769180	LIQUID-METAL MAGNETOHYDRODYNAMIC SYSTEM EVALUATION R.R. Holman, Westinghouse Advanced Energy Systems Division, and T.E. Lippert, Westinghouse Research & Development Center, Pittsburgh, PA	1020
769179	LIQUID-METAL MHD - CYCLE STUDIES AND GENERATOR EXPERIMENTS E.S. Pierson, A.R. Brunsvold, G. Fabris, R.G. Hantman, and R.L. Cole, Engineering Division, Argonne National Laboratory, Argonne, IL	1027
769181	SYSTEM STUDIES OF COAL FIRED-CLOSED CYCLE MHD FOR CENTRAL STATION POWER PLANTS B. Zauderer, General Electric Company, Space Sciences Laboratory, Philadelphia, PA	1033

PART II - Other Topping Cycles

Session Chairman: W. E. Amend

		PAGE
769183	THERMIONIC TOPPING FOR CENTRAL STATION FOWER PLANTS E.J. Britt and G.O. Fitzpatrick, Rasor Associates, Incorporated, Synnyvale, CA	1040
769184	PULSAR, AN UNCOVENTIONAL TOPPING STAGE W.K. Tucker, W.B. Leisher, M. Cowan, D.L. Wesenberg , and E.C. Cnare, Sandia Laboratories, Albuquerque, NM	1046
769185	THERMIONIC TOPPING OF A STEAM POWER PLANT G. Miskolczy and T.O.P. Speidel, Thermo Electron Corporation, Waltham, MA	1050

NUCLEAR POWER

Session Organizer: A.P. Fraas, ORNL, Oak Ridge, TN

Part I - Industrial Applications

Session Chairman: L.A. Feathers, General Electric, Sunnyvale, CA

Executive Summary: A. P. Fraas, Page 1059

		PAGE
769315	THE LIQUID METAL FAST BREEDER REACTOR - A FRIEND TO THE ENVIRONMENT W.H. Hannum, Deputy Manager, U.S. ERDA, Idaho Falls, ID	1060
769186	NUCLEAR DUAL-PURPOSE PLANTS FOR INDUSTRIAL ENERGY O.H. Klepper, Oak Ridge National Laboratory, Oak Ridge, TN	1065
769187	ASSESSMENT OF VERY HIGH TEMPERAUTRE REACTORS IN PROCESS APPLICATIONS J.E. Jones Jr., Irving Spiewak and Wallace R. Gambill, Oak Ridge National Laboratory, Oak Ridge, TN	1073
769188	THE PE-CNSG: A SMALL PWR TO PROVIDE INDUSTRIAL PROCESS ONSITE ENERGY W.R. Smith, Babcock and Wilcox, Nuclear Power Generation Division, Lynchburg, VA	1080
769189	NUCLEAR POWER FOR THE PRODUCTION OF SYNTHETIC FUELS AND FEEDSTOCKS M. Steinberg, Bookhaven National Laboratory, Upton, NY	1086
769190	NUCLEAR DRIVEN WATER DECOMPOSITION PLANT FOR HYDROGEN PRODUCTION G.H. Parker, L.E. Brecher and G.H. Farbman, Westinghouse Electric Corporation, Advanced Energy Systems Division, Pittsburgh, PA	1095
769193	SUBSEA NUCLEAR POWER SYSTEMS FOR FUTURE OFFSHORE PRODUCTION OPERATIONS A.B. Martin, Atomics International, A Division of Rockwell International Canoga Park, CA	1102

14

Part II - Advanced Nuclear Power Plants

Session Chairman: A.P. Fraas, Oak Ridge National Laboratory, Oak Ridge, TN

		PAGE
769191	CURRENT STATUS OF THE MAGNETIC FUSION PROGRAM J.M. Williams and S. Locke Bogart, Division of Magnetic Fusion Energy, U.S. Energy Research and Development Administration, Washington, D.C.	1110
769195	PACER--A PRACTICAL FUSION POWER CONCEPT H.W. Hubbard and R.P. Hammond, R & D Associates, Marina del Rey, CA	1118
769196	THE MIGMA HIGH ENERGY ADVANCED FUEL DIRECT CONVERSION FUSION POWER PLANT B.C. Maglich, M.Mazarakis, R.A. Miller, J. Nering,A. Whittemore J.E. Golden, S. Menasian, A. Pritzker, J. Sandberg, J. Ferrer, Fusion Energy Corporation, Princeton, NJ , S. Channon, Rutgers University, New Brunswick, NJ, R. Ho, Princeton University, Princeton, NJ, C. Powell and J. Treglio, Stevens Institute of Technology, Hoboken, NJ	1123

PAGE

769197 RADIOLYTIC HYDROGEN PRODUCTION FROM A LASER FUSION SYSTEM 1130

V.C. Rogers and R. Baird, Ford Bacon and Davis Utah, Incorporated, and G.M. Sandquist, University of Utah, Salt Lake City, UT

769198 ISOTOPE HEAT SOURCE FOR DYNAMIC POWER SYSTEMS 1136

A. Schock, Fairchild Space and Electronics Company, Germantown, MD

PAGE

769194 HEAT PIPE NUCLEAR REACTOR FOR SPACE POWER 1139

D.R. Koenig, University of California, Los Alamos Scientific Laboratory, Loa Alamos, NM

RANKINE CYCLE ENGINES

Session Organizer: L.C. Hoagland, CTi-Cryogenics, Waltham, MA

Part I - Rankine Cycle Engines

Session Chairman: L.C. Hoagland

Executive Summary: L. C. Hoagland, Page 1146

		PAGE
769199	DEVELOPMENT OF A 1-KW, ORGANIC RANKINE CYCLE POWER PLANT FOR REMOTE APPLICATIONS J. Monahan and R. McKenna, Sundstrand Energy Systems, Rockford, IL	1148
769200	SOLAR POWERED ORGANIC RANKINE CYCLE ENGINES-CHARACTERISTICS AND COSTS R.E. Barber, Barber-Nichols Engineering Company, Arvada, CO	1151
769201	A UNIQUE RANKINE-CYCLE HEAT PUMP SYSTEM F.R. Biancardi and M.D. Meader, United Technologies Research Center, East Hartford, CT	1157
769202	SOLAR-POWERED RANKINE-CYCLE HEAT PUMP SYSTEM J. Rousseau and J.C. Noe, AiResearch Manufacturing Company of California, Los Angeles, CA	1163
769205	TEST RESULTS FOR A RANKINE ENGINE POWERED VAPOR COMPRESSION AIR-CONDITIONER FOR 366° K HEAT SOURCE S.E. Eckard, General Electric Company, Space Division, Evendale, OH	1169

Part II - Rankine Cycle Engines

Session Chairman: F. Pompei, Scientific Energy Systems, Natick, MA

		PAGE
769208	ADAPTATION OF A LOW EMISSION RANKINE CYCLE AUTOMOTIVE ENGINE TO A COAL MINE FACE HAULAGE VEHICLE APPLICATION W.F. Dawson, Y. Friedman, Scientific Energy Systems Corporation, J.C.Ault, U.S. Bureau of Mines, R.J. Gunderman, Jeffrey Mining Manufacturing Division of Dresser Industries	1174
769209	SULFURIC ACID PLANT RANKINE CYCLE WASTE HEAT RECOVERY G.P. Lewis, R.D. Smith, W.P. Harkness, Allied Chemical Corporation, Morristown, NJ, M. Yamada, and N. Ichiki, Ishikawajima-Harima Heavy Industries Company, Ltd, Tokyo, Japan	1182
769210	ROTARY PISTON EXPANDER ENGINE G.A. Brown, U.S. Naval Underwater Systems Center, Newport, RI, and University of Rhode Island, Kingston, RI, Daniel A. Bowlus, U.S. Naval Underwater Systems Center, Newport, RI	1187
769211	ALTERNATE FUEL CAPABILITY OF RANKINE CYCLE ENGINES R.D. Burtz, Steam Power Systems, Incorporated, San Diege, CA and T.E. Duffy, Solar Division of International Harvestor, San Diego, CA	1192
769203	THE USE OF UNCONVENTIONAL FLUIDS FOR SINGLE STAGE SUPERSONIC TURBINES OF LOW POWER OUTPUT V. Maizza, Istituto di Macchine, University of Bari, Italy	1198

SOLAR POWER

Session Organizer: C.E. Backus, Arizona State University, Tempe, AZ

Part I - Solar Thermal-Electric Generation

Session Chairman: J. Bigger, EPRI, Palo Alto, CA

		PAGE
769212	COMPARATIVE PERFORMANCE OF SOLAR THERMAL POWER GENERATION CONCEPTS L. Wen and Y.C. Wu, Jet Propulsion Laboratory, Pasadena, CA	1209
769213	SOLAR THERMAL ELECTRIC POWER PLANTS: THEIR PERFORMANCE CHARACTERISTICS AND TOTAL SOCIAL COSTS R.S. Caputo and V.C. Truscello, Jet Propulsion Laboratory, Pasadena, CA	1216
769214	SOLAR ENERGY PROSPECTS FOR ELECTRIC POWER GENERATION IN BRAZIL D. Magnoli, Centro de Tecnologia Promon, Rio de Janeiro, Brazil	1224
769215	CENTRAL STATION SOLAR ELECTRIC POWER USING LIQUID METAL HEAT TRANSPORT T.H. Springer and W.B. Thomson, Atomics International, A Division of Rockwell International, Canoga Park, CA	1232
769216	ECONOMIC OPTIMIZATION OF THE ENERGY TRANSPORT COMPONENT OF A LARGE DISTRIBUTED COLLECTOR SOLAR POWER PLANT R.H. Turner, Jet Propulsion Laboratory, Pasadena, CA	1239
769217	WINDOWED VERSUS WINDOWLESS SOLAR ENERGY CAVITY RECEIVERS P.O. Jarvinen, M.I.T. Lincoln Laboratory, Lexington, MA	1244

Part II - Solar Concentrator Systems

Session Chairman: S. Zwerdling, Argonne National Laboratory, Argonne, IL

Executive Summary: S. Zwerdling, Page 1253

		PAGE
769218	THE ROLE OF SIMULATION IN THE DEVELOPMENT OF SOLAR-THERMAL ENERGY CONVERSION SYSTEMS G.L. Schrenk, University of Pennsylvania, Philadelphia, PA	1256
769219	TRANSIENT PERFORMANCE CHARACTERISTICS OF A HIGH TEMPERATURE DISTRIBUTED SOLAR COLLECTOR FIELD D.L. Black and J.F. Ellis, Westinghouse Electric Corporation, Advanced Energy Systems Division, Pittsburgh, PA	1264
769220	COLLECTOR FIELD OPTIMIZATION FOR A SOLAR THERMAL ELECTRIC POWER PLANT C.R. Easton, J.E. Raetz, McConnell Douglas, Astronautics Company, Huntington Beach, CA and L.L. Vant-Hull, University of Houston, Houston, TX	1272
769221	DEVELOPMENT OF COMPOUND PARABOLIC CONCENTRATORS FOR SOLAR-THERMAL ELECTRIC AND PROCESS HEAT APPLICATIONS N. Levits, J. Allen, A. Rabl, K. Reed, R. Rush, W. Schertz, A. Wantroba, and R. Winston, Solar Energy Group, Argonne National Laboratory, Argonne, IL	1278
769222	A FIXED COLLECTOR EMPLOYING REVERSIBLE VEE-TROUGH CONCENTRATOR AND A VACUUM TUBE RECEIVER FOR HIGH TEMPERATURE SOLAR ENERGY SYSTEMS M. K. Selcuk, Jet Propulsion Laboratory, Pasadena, CA	1284
769223	CALORIMETRY OF LARGE SOLAR CONCENTRATORS D. Waddington, Staff Engineer Martin Marietta Corporation, Denver, CO	1291

16

Part III - Photovoltiac Conversion

Session Chariman: C.E. Backus, Arizona State University, Tempe, AZ

Executive Summary: C. E. Backus, Page 1296

PAGE

769317 THE ERDA PHOTOVOLTAIC SYSTEMS DEFINITION PROJECT 1297

D.G. Schueler, Sandia Laboratories, Albuquerque, NM

769224 PERFORMANCE AND COST ANALYSIS OF PHOTOVOLTAIC POWER SYSTEMS FOR ON-SITE RESIDENTIAL APPLICATIONS 1300

A. Kirpich, N.F. Shepard, Jr. and S.E. Irwin, General Electirc Space Division, Valley Forge, PA

769225 NEW CONCEPTS IN SOLAR PHOTOVOLTAIC ELECTRIC POWER SYSTEMS DESIGN 1308

E.F. Federmann, R.R. Ferber, P.F. Pittman, and C.R. Chowaniec, Westinghouse Electric Corporation Pittsburgh, PA

PAGE

769226 AN INTEGRATED PHOTOVOLTAIC/THERMAL HIGH INTENSITY SOLAR ENERGY SYSTEM (HISES) CONCEPT FOR RESIDENTIAL APPLICATIONS 1316

B.L. Sater, Olmsted Falls, OH, and Chandra Goradia, The Cleveland State University, Cleveland, OH

769227 ALTERNATIVE STRATEGIES FOR IMPLEMENTING SILICON-RIBBON TECHNOLOGY FOR PHOTOVOLTAIC APPLICATIONS 1324

A. Kran, IBM East Fishkill Laboratories, Hopewell Junction, NY

769228 COMPUTER PROGRAM FOR DESIGN AND PERFORMANCE ANALYSIS OF NAVIGATION AID POWER SYSTEMS 1330

H. Weiner, P. Wiener, Jet Propulsion Laboratory, Pasadena, CA, and Ken Williams, U.S. Coast Guard R & D Center, Groton, CT

Part IV - Solar Heating and Cooling of Buildings

Session Chariman: H.F. Liers, Intertechnology Corporation, Warrenton, VA

PAGE

769229 A SUMMARY OF SOLAR HEATING AND COOLING OF BUILDINGS (SHACOB) - PHASE I DEMONSTRATION PLANNING STUDIES 1338

A.D. Cohen, General Electric Company Space Division, King of Prussia, PA

769231 LONG TERM PERFORMANCE PREDICTION OF RESIDENTIAL SOLAR ENERGY HEATING SYSTEMS 1345

J.M. Nash, J.C. Bartlett, N.J.Caiola, and J.E. Irby, International Business Machines Corporation, Huntsville, AL

769232 EXPERIMENTAL EVALUATION OF THE UNIVERSITY OF FLORIDA SOLAR POWERED AMMONIA/WATER ABSORPTION AIR CONDITIONING SYSTEM 1349

E.A. Farber, C.A. Morrison, and H.A. Ingley, Solar Energy and Energy Conversion Laboratories, Department of Mechanical Engineering, University of Florida, Gainesville, FL

PAGE

769233 SHORT AND LONG TERM COMPARISON OF SOLAR ABSORPTION AIR-CONDITIONING SYSTEM PERFORMANCE USING REAL AND SYNTHETIC WEATHER DATA 1354

D.K. Anand, R.W. Allen, and E.O. Bazques, Department of Mechanical Engineering, Universit of Maryland, College Park, MD

769234 ANALYTICAL CONSIDERATIONS FOR SPECIFYING NATURAL CONVECTION LIMITING STRUCTURES 1362

M.C. Keeling, Solar Energy Department , Semiconductor Produc Group, Motorola Incorporated, Phoenix, AZ

SPACE POWER

Session Organizer: W.J. Billerbeck, Comsat Labs, Clarksburg, MD

Part I - Space Photovoltiac and Powersat Systems

Session Co-Chairman: D. Briggs, Aeronutronics-Ford, Palo Alto, CA
W. Winkler, Grumman Aerospace Company, Bethpage, NY

Executive Summary: W. J. Billerbeck, Page 1369

		PAGE
769236	SEP SOLAR ARRAY TECHNOLOGY DEVELOPMENT R.V. Elms Jr., Lockheed Missiles and Space Company, Incorporated, Sunnyvale, CA and L.E. Young, NASA, Marshall Space Flight Center, Huntsville, AL	1372
769237	SYNCHRONOUS ORBIT PERFORMANCE OF HUGHES AIRCRAFT COMPANY SOLAR ARRAYS L.J. Goldhammer and S.W. Gelb, Hughes Aircraft Company, Space and Communications Group, El Segundo, CA	1379
769238	IN-ORBIT CHARACTERISTICS OF THE COMMUNICATIONS TECHNOLOGY SATELLITE DEPLOYABLE SOLAR ARRAY T.D. Harrison, V. Gore, F.Vigneron, Communications Research Centre, Ottawa, Canada, G.B. Lang, and E. Quittner, SPAR Aerospace Products Ltd, Toronto, Canada	1387
769239	ULTRALIGHTWEIGHT SOLAR ARRAY FOR NAVAL SEA CONTROL SYSTEMS W. Luft, TRW Defense and Space Systems Group, Redondo Beach, CA, and H. Crecraft, Naval Research Laboratory, TEW Division, Washington, D.C.	1395
769240	TRANSPORTATION OPTIONS FOR SOLAR POWER SATELLITES F.R. Woodcock and E.E. Davis, Boeing Aerospace Company, Seattle, WA	1400

Part II - Spacecraft Power Systems

Session Chairman: W.J. Billerbeck, COMSAT Labs, Clarksburg, MD

		PAGE
769242	ELECTRICAL POWER SUBSYSTEM FOR THE NATO III COMMUNICATIONS SATELLITE H.N. McKinney and D.C. Briggs, Aeronutronic Ford Corporation, Palo Alto, CA	1408
769244	THE ATS-6 POWER SYSTEM: HARDWARE IMPLEMENTATION AND ORBITAL PERFORMANCE T.A. LaVigna, NASA Goddard Space Flight Center, Greenbelt, MD, and F.L. Hornbuckle, Fairchild Space and Electronics Company, Germantown, MD	1414
769245	DESIGN OF THE HIGH ENERGY ASTRONOMY OBSERVATORY (HEAO) POWER SUBSYSTEM G.M. Reppucci, TRW Defense and Space Systems Group, Redondo Beach, CA	1422
769246	POWER SOURCE REQUIREMENTS OF ELECTRIC PROPULSION SYSTEMS USED FOR NORTH-SOUTH STATIONKEEPING OF COMMUNICATION SATELLITES D. Rusta, TRW Defense and Space Systems Group, Redondo Beach, CA	1429

17

		PAGE
769247	A SIMPLIFIED MINIMUM POWER DISSIPATION APPROACH TO REGULATE THE SOLAR ARRAY OUTPUT POWER IN A SATELLITE POWER SUBSYSTEM A.A. Salim, Martin Marietta Corporation, Denver, CO	1437
769248	SMALL SPACE STATION ELECTRICAL POWER SYSTEM DESIGN CONCEPTS G. Merrill Jones and L.N. Mercer, Sperry Rand Corporation, Systems Management Division, Sperry Support Services, Huntsville, AL	1443
769249	COMPARISON OF CANDIDATE SOLAR ARRAY MAXIMUM POWER UTILIZATION APPROACHES E.N. Costogue, Jet Propulsion Laboratory, Pasadena, CA and S. Lindena, Electro-Optical Systems, Incorporated, Pasadena, CA	1449

Part III - Nuclear

Session Chairman: R. Carpenter, ERDA, Germantown, MD

		PAGE
769251	KIPS KILOWATT ISOTOPE POWER SYSTEM R.C. Brouns, ERDA-Nuclear Research and Applications Division, Washington, D.C., E.C. Kruger, R.F. McKenna, R.E. Niggermann, Sundstrand Advanced Technology Group, Rockford, IL, and F.A. Russo, Teledyne Energy Systems, Timonium, MD	1457
769252	THE NUCLEAR SPINNER FOR SATCOM APPLICATIONS J. J. Karlin and B. Raab, Fairchild Space and Electronics Company, Germantown, MD	1462
769254	INDUCTIVELY COUPLED TI-MPD SPACECRAFT ELECTRIC PROPULSION E.J. Britt, Rasor Associates Incorporated, Sunnyvale, CA, K.E. Clark, Princeton University, Princeton, NJ, and E.V. Pawlik, Jet Propulsion laboratory, Pasadena, CA	1471
769255	SNAP 19 VIKING RTG MISSION PERFORMANCE W.M. Brittain, Teledyne Energy Systems, Timonium, MD	1479
769256	NUCLEAR THERMIONIC POWER SYSTEM FOR SPACECRAFT W.M. Phillips, W.C. Estabrook, and T.M. Hsieh, Jet Propulsion Laboratory, Pasadena, CA	1487

STIRLING CYCLE ENGINES

Session Organizer: W. H. Percival, Manchester, MO

Session Chairman: W.H. Percival

Executive Summary: W. H. Percival, Page 1496

		PAGE
769257	THE STIRLING ENGINE - ENGINEERING CONSIDERATIONS IN VIEW OF FUTURE NEEDS R.I. Pedroso, Florida International University, Miami, FL	1498
769258	THE PHILIPS STIRLING ENGINE: A STUDY OF ITS EFFICIENCY AS A FUNCTION OF OPERATING TEMPERATURES AND WORKING FLUIDS A.P.J. Michels, Philips Laboratories, Briarcliff Manor, NY	1506
769259	SELF-STARTING INTRINSICALLY CONTROLLED STIRLING ENGINE N.E. Polster, Research Engineering Consultant, Argenta, British Columbia, Canada, and W.R. Martini, Joint Center for Graduate Study, Richland, WA	1511
769262	EXPLORATORY STUDY OF THE RAINBOW VARIANT STIRLING CYCLE ENGINE K.S. Burn and G. Walker, Department of Mechanical Engineering, University of Calgary, Calgary, Alberta, Canada	1519

THERMOELECTRICS

Session Co-Organizers: V.C. Truscello, Jet Propulsion Laboratory, Pasadena, CA
P. A. O'Riordan, ERDA, Washington, DC

Part I - Materials

Session Chairman: P.A. O'Riordan,

Executive Summary: P. A. O'Riordan, Page 1525

PAGE

769263 THE TIME AND TEMPERATURE BEHAVIOR OF THE THERMOELECTRIC PROPERTIES OF 78 a/o Si - 22 a/o Ge ALLOY 1527
V. Raag, Syncal Corporation, Sunnyvale, CA

769264 THE LONG-TERM PERFORMANCE DEGRADATION OF A RADIOISOTOPE THERMOELECTRIC GENERATOR USING SILICON GERMANIUM 1533
G. Stapfer and V.C. Truscello, Jet Propulsion Laboratory, Pasadena, CA

769265 TRANSPORT THEORY OF 3M HIGH-PERFORMANCE THERMOELECTRIC MATERIALS 1539
W.C. Mitchell, R.B. Ericson, E.F. Hampl, Jr., R.M. Swinehart, K.C. Thompson, S.J. Thompson, and G.R. Wyberg, Pioneering Laboratory, Electrical Products Group, 3M Company, St. Paul, MN

769266 ELEVATED TEMPERATURE STABILITY OF TPM-217 P TYPE MATERIAL 1546
N.B. Elsner, J. Chin, and H.G. Staley, General Atomic Company, San Diego, CA

769267 THE PREPARATION OF GADOLINIUM METAL FOR THERMOELECTRIC DEVICES 1556
B.J. Beaudry, P.E. Palmer, and K.A. Gschneidner, Jr., Iowa State University, Ames, IA

769268 THE INTEGRAL FORMULATION OF THE THERMOELECTRIC FIGURE-OF-MERIT: EFFECTS OF LATTICE THERMAL CONDUCTION 1561
J.F. Goff and J.R. Lowney, U.S. Naval Surface Weapons Center/ White Oak Laboratory, Silver Spring, MD

769269 EFFECTS OF COATINGS AND TEMPERATURE ON LONG TERM PERFORMANCE OF TAGS THERMOELEMENTS 1567
E.A. Skrabek, Teledyne Energy Systems, Timonium, MD

Part II - Devices

Session Chairman: V.C. Truscello, Jet Propulsion Laboratory, Pasadena, CA

PAGE

769270 DEVELOPMENT OF A SMALL RADIOISOTOPIC HEAT SOURCE 1572
G.J. Jones, Sandia Laboratories, Albuquerque, NM

769271 TEST AND EVALUATION OF THE NAVY HALF-WATT RTG 1578
F.E. Rosell, Jr., S.D. Lane, Naval Nuclear Power Unit, Port Hueneme, CA, P.E. Eggers, Ridihalgh and Associates, Columbus, OH, W.E. Gawthrop, Battelle Columbus Labs, Columbus, OH, R.G. Rouklove and V.C. Truscello, Caltech Jet Propulsion Laboratory, Pasadena, CA

PAGE

769273 THE USE OF SILICON-GERMANIUM ALLOYS IN RADIOISOTOPE THERMOELECTRIC GENERATORS 1586

V. Raag, Syncal Corporation, Sunnyvale, CA

769275 THE LOW COST HIGH PERFORMANCE GENERATOR (LCHPG) 1591

A.R. Lieberman, W.E. Osmeyer, T.E. Hammel, Teledyne Energy Systems, Timonium, MD, and R.T. Carpenter, U.S. Energy Research and Development Administration, Washington, D.C.

769272 THERMOELECTRIC MODULE DESIGNED FOR A WIDE RANGE OF APPLICATIONS USING HIGH PERFORMANCE SELENIDE MATERIALS 1599

R.S. Reylek, E.F. Hampl, Jr., J.D. Hinderman, R.L. Smith, and D.A. Wald, Pioneering Laboratory, Electrical Products Group, 3M Company, St. Paul, MN

PAGE

769276 SPERICAL RADIOISOTOPE THERMOELECTRIC GENERATORS--AN APPROACH TO HIGH SPECIFIC POWER DEVICES 1606

P.E. Eggers, Ridihalgh and Associates, Incorporated, Columbus, OH

769274 THERMOELECTRIC GENERATOR FOR AN AUTOMOTIVE CHARGING SYSTEM 1614

A.W. Serksnis, University of Arizona, Tucson, AZ

769277 A NEW CONCEPT FOR IMPROVING THERMOELECTRIC HEAT PUMP EFFICIENCY 1619

R.J. Buist, J.W. Fenton, and J.S. Lee, Borg-Warner Thermoelectrics, Des Plaines, IL

THERMIONICS

Session Organizer: F.N. Huffman, Thermo Electron, Waltham, MA

Session Co-Chairmen: F.N. Huffman
N.S. Rasor, Rasor Associates, Sunnyvale, CA

Executive Summary: F. N. Huffman, Page 1624

		PAGE
769278	N_2 - Cs THERMIONIC CONVERTER DEVELOPMENT D.T. Shaw, C.H. Lee and C.N. Manikopoulos, State University of New York at Buffalo, Buffalo, NY	1625
769279	THE PLASMATRON AS AN ADVANCED PERFORMANCE THERMIONIC CONVERTER L.K. Hansen, G.L. Hatch, G.O. Fitzpatrick, and N.S. Rasor, Rasor Associates, Incorporated, Sunnyvale, CA	1630
769280	ERDA'S BICENTENNIAL THERMIONIC RESEARCH AND TECHNOLOGY PROGRAM O.S. Merrill and J.J. Cuttica, U.S. Energy Research and Development Administration, Washington,D.C.	1635
769282	ADVANCED THERMIONIC CONVERTER DEVELOPMENT F.N. Huffman, D. Lieb, T.R. Briere, A.H. Sommer, and F. Rufeh, Thermo Electron Corporation, Waltham, MA	1645
769283	NASA THERMIONIC-CONVERSION PROGRAM J.F. Morris, NASA Lewis Research Center, Cleveland, OH, and J.G. Lundholm, NASA Headquarters, Washington, D.C.	1652
769284	FLAME-HEATED THERMIONIC DIODES WITH CERMET EMITTERS AND LOW WORK FUNCTION COLLECTORS R. Henne and M.v. Bradke, Deutsche Forschungs - und Versuchsanstalt fur Luft- und Raumfahrt, Federal Republic of Germany	1656

URBAN ENERGY MANAGEMENT

Session Co-Organizers: G. S. Leighton, ERDA, Washington, D.C.
N. Cox, ERDA, Washington, D.C.

Part I

Session Chariman: G.S. Leighton

Executive Summary: N. Cox

		PAGE
769285	FEASIBILITY OF USING POWER PLANT REJECT HEAT FOR URBAN FOOD AND METHANE PRODUCTION M. Olszewski, Oak Ridge National Laboratory, Oak Ridge, TN, and L.F. Diaz, University of California, Berkeley, CA	1664
769286	TECHNICAL AND ECONOMIC ASPECTS OF POTENTIAL U.S. DISTRICT HEATING SYSTEMS J. Karkheck, E. Beardsworth, and J.R. Powell, Department of Applied Science, Brookhaven National Laboratory, Upton, NY	1669
769287	DISTRICT HEATING - METHODS AND SYSTEMS William Diskant, American Hydrotherm Corporation, New York, NY	1675
769290	TOTAL ENERGY SYSTEMS OPERATION M.G. Gamze, Gamze-Korobkin-Caloger, Incorporated, Chicago, IL	1683
769291	ESTIMATION OF TARGET DEGREE-DAY ENERGY DENSITIES FOR BUILDINGS A. Gregory Gargus, H. Eugene Shull, and Robert H. Essenhigh, The Pennsylvania State University. University Park, PA	1688

Part II

Session Chariman: N. Cox

		PAGE
769292	NUCLEAR POWER FOR AN URBAN CENTER V. E. de Pass, Consolidated Edison Company of New York, Incorporated, New York, NY	1695
769295	DETAILED GEOGRAPHIC ANALYSIS OF RESIDENTIAL ENERGY CONSUMPTION T. Alereza, P. McCarthy, H. Bernstein, and M. Miller, Hittman Associates, Incorporated, Columbia, MD	1703
769296	POWER AND HEAT PRODUCTION FORM A COMBINED DIESEL-RANKINE POWER PLANT H.P. Thogersen, N.E. Andersen, E.B. Qvale, Laboratory for Energetics, Technical University of Denmark, Lyngby, Denmark, O. Ilum, South Jutland Power Company, Denmark, and T. Riber, West Jutland Power Company, Denmark	1711
769297	THE MODULAR INTEGRATED UTILITY SYSTEMS (MIUS) PROGRAM J.H. Rotherberg, Department of Housing and Urban Development, Washington, D.C.	1719
769298	COMPUTER PROGRAM FOR ENERGY ANALYSIS OF CENTRAL HEATING AND COOLING PLANT W.C. Rochell, D.K. Liu, and W.J. Nunnery, Jr., Applied Mechanics Department, Lockheed Electronics Company, Incorporated, Houston, TX	1726

WIND POWER

Session Organizer: P. B. S. Lissaman, AeroVironment, Pasadena, CA

Part I

Session Chariman: P.B.S. Lissaman

Executive Summary: P.B.S. Lissaman, Page 1734

		PAGE
69299	SITING OF WIND DRIVEN APPARATUS F.C. Radice, Jr., Hooker Chemicals ans Plastics Corporation, Niagara Falls, NY	1736
769300	THE EVALUATION AND USE OF THE WIND ENERGY IN NORTH EAST BRAZIL A. A. de Souza, Instituto de Atividades Espacials, Brazil	1741
769301	THE CONSUMER'S COST OF ELECTRICITY FROM WINDMILLS B. Quinn, Air Force Office of Scientific Research, Bolling Air Force Base, Washington, D.C.	1746
769302	OPERATIONAL, COST, AND TECHNICAL STUDY OF LARGE WINDPOWER SYSTEMS INTEGRATED WITH EXISTING ELECTRIC UTILITY R.T. Smith, R.K. Swanson, C.C. Johnson, Southwest Research Institute, San Antonio, TX, C. Ligon, Southwestern Public Service Company, Amarillo, TX, J. Lawrence and D. Jordan, Texas Tech University, Lubbock, TX	1754
769303	A NEW GENERATION SCHEME FOR LARGE WIND ENERGY CONVERSION SYSTEMS S.R. Yadavalli and T.S.Jayadev, University of Wisconsin-Milwaukee, Milwaukee, WI	1761
769304	WIND DRIVEN FIELD MODULATED GENERATOR SYSTEMS R. Ramakumar, Oklahoma State University, Stillwater, OK	1766
769305	VORTEX KINETIC ENERGY CONCENTRATOR R. Huq and J.L. Loth, Department of Aerospace Engineering, West Virginia University, Morgantown, WV	1773

Part II

Session Chairman: L. V. Divone, Chief, Wind Energy Systems, ERDA, Washington, D.C.

		PAGE
769306	NUMERICAL SOLUTION FOR THE UNSTEADY LIFTING CHARACTERISTICS OF VARIABLE PITCH CROSS-FLOW WIND TURBINES P.G. Migliore, J.B. Fanucci, and William Squire, Department of Aerospace Engineering, West Virginia University, Morgantown, WV	1779
769307	DESIGN CONSIDERATION FOR THE DARRIEUS ROTOR R.W. Thresher and R.W. Wilson, Oregon State University, Corvallis, OR	1787
769310	OPERATIONAL EXPERIENCE WITH SMALL WIND UNITS J. Park, Helion Company, Sylmar, CA	1795
769311	AN EXPERIMENTAL 200 kW VERTICAL AXIS WIND TURBINE FOR THE MAGDALEN ISLANDS R.D. McConnell, J.H. VanSant, M. Fortin, and B. Piche, Institut de recherche de 'Hydro-Quebec Varennes, Quebec, Canada	1798

22