

SUBPANEL 6
CONVERSION TECHNIQUES
APPENDIX D.
LIST OF PROPOSALS

LIST OF PROPOSALS

The attached listing includes the project titles and submitting organization of the proposals considered by the Conversion Techniques Subpanel.

Each of the nine recommended subprograms contains research and development projects comparable to those identified in the proposals although in many cases, the timing, magnitude, or prime emphasis of the proposed projects will require modification to fit the subprogram. No effort has been made to choose between comparable overlapping projects.

The distribution of the proposals among the subprograms is summarized below.

The numbers refer to entries in the attached listing of titles:

- | | |
|------------------------------------|--|
| 1. Coal Gasification -
(Lu BTU) | 37, 41, 70, 71, 72, 73, 74, 75,
76, 77, 78, 79, 80, 81, 91, 101,
102, 103, 104, 105, 106, 107, 109,
113, 114, 115, 116, 117 |
| 2. Gas Turbine - | 1, 2, 3, 11, 23, 36, 38, 47, 67, 92,
95, 110, 111, 112, 123, 124, 125, 126,
127, 128 |
| 3. MHD - | 4, 5, 6, 8, 10, 12, 13, 14, 15, 16, 17,
18, 19, 20, 25, 26, 33, 34, 39, 40, 44,
89, 96, 97, 100, 106, 119, 108 |
| 4. Potassium Topping Cycle - | 21, 28, 45 |
| 5. Fuel Cells - | 24, 29, 30, 31, 35, 49, 50, 51, 55,
56, 57, 59, 61, 63, 64, 90, 93 |
| 6. Low Temp. Cycles - | 42, 69, 85, 122 |
| 7. Waste Heat - | 1, 22, 25, 55, 83, 84, 85, 86, 87, 88,
94, 121, 122 |

8. Advanced Concepts -

7, 9, 43, 53, 66, 82

9. Enabling Technology -

13, 27, 32, 44, 68, 97, 99, 118,
119

LIST OF REJECTED PROPOSALS

Subprogram 3

MHD -

- 46 - Non viable concepts
- 48 - Non viable concept

Subprogram 5

Fuel Cells -

- 52 - Basic Directed Research in a
Disciplinary Field
Efficiency of ozone production by
radiation too low to make project
worthwhile.
- 58 - Develop Processes and Machinery to
Manufacture Second Group of Production
Multi-Megawatt Power Plants
Government involvement in second
generation commercial power plants
does not seem to be warranted.
- 60 - Service and Maintenance Support for
the Initial Production Multi-Megawatt
Generators
Maintenance and servicing of commercial
power plants is not a research and
development function and in any event
does not appear appropriate for govern-
ment funding.
- 62 - Field Retrofit of Improved Power Plant
Components
Retrofit of commercial plants is not
an R&D function and may not be appro-
priate for government funding.
- 65 - Advanced Fuel Conditioning Technologies
This sort of product improvement in
second generation commercial power
plants should be funded by industry
since there is a high incentive for
this sort of activity in the private
sector.
- 120 - Duplication

Subprogram 8

Advanced Concepts -

- 54 - Proposed work is not appropriate for commercial power production.
- 98 - Proposed concept is not viable for power production.

PROPOSALS

UBPANEL 6

Sub-Program: Conversion Techniques

<u>Sub-Program Title</u>	<u>Identification Number</u>	<u>Proponent</u>
1. 500KW-1000KW Closed Gas Turbine Powerplant for Advanced MHD Applications	0604-0007-1255-0302-0222	NASA
2. Nuclear Closed Cycle Gas Turbine	0614-0005-1285-0301-0221	UAC
3. High Temperature Gas Turbine Systems for Fossil Fueled Plants	0604-1105-1155-0202-0219	NASA
4. Clean-Fuel Combustion MHD Topping Cycle	0604-0005-1155-0201-0218	NASA
5. Improved Materials for Energy Conversion Systems - Magneto-hydrodynamics	0602-0005-1055-0102-0217	DOI
6. Ten Megawatt Mobile MHD Power Systems	0633-0007-1255-0302-0215	DOD/USAF/AFAPL
7. Thermal Oscillator Power Generator	0633-0007-1255-0302-1214-	AFAPL/POP-1
8. Improvement of MHD Direct Coal Fired Energy Conversion	0621-1405-1055-0403-0213	DOI
9. Advanced Power Conversion System Supercritical CO ₂ Heat Engine	0621-0005-1285-0301-0212	DOI
10. MHD Program Long-Duration Channel Tests, High Performance Channel Test Plant Design Studies, High Temperature Refractory Air Heater and Coal Burning Technique Analysis	0621-1405-1055-0302-0211	DOI
11. Improved Materials for Energy Conversion Systems - Gas Turbine Components	0621-3305-1055-0102-0210	DOI
12. MHD Program - Phenomena at High Magnetic Fields	0621-0005-1055-0302-0209	DOI
13. Improved Materials for Energy Conversion Systems - Magneto-hydrodynamics	0622-0005-2055-0402-0208	DOI

<u>Subprogram Title</u>	<u>Identification Number</u>	<u>Proponent</u>
14. Coal Fired Magneto-hydrodynamic (MHD) Power Generation	0622-1405-2085-0301-0207	DOI
15. MHD Program - Realistic Modeling & Performance Prediction of MHD Generator Channels	0621-0005-5555-0102-0206	DOI
16. MHD Program - Three Stage Combustor for MHD Power Generation	0621-1405-1155-0301-0205	DOI
17. MHD Program - Development of Design Criteria, Cost Estimates, & Operation of an MHD High Performance Demonstration Equipment	0621-1405-1055-0301-0204	DOI
18. US-USSR Cooperative Program in MHD	0621-1405-1285-0301-0204	DOI
19. Overall Plan for MHD Power Generation	0621-1405-1285-0301-0203	DOI
20. Overall Plan for MHD Power Generation	0621-1405-1285-0301-0202	DOI
21. Alkali Metal Topping Cycles for Central Station Steam Power Plant	0621-0005-1285-5501-0201	DOI
22. Energy Depot	0631-4407-1285-0301-0198	DOD
23. Hydrogen-Oxygen Combustion Steam Generator for Electric Generating Plants	0604-0005-1155-0101-0196	NASA
24. Hydrogen-Air Fuel Cells	0604-0005-1155-0102-0195	NASA
25. Magneto-hydrodynamic Power Generation	0633-4305-2055-0101-0372	DOD
26. MHD Laboratory Experimentation of Hot Electrodes & Long Durability	0621-0005-1055-5502-0200	DOI
27. Superconducting Electrical Power Generation	0633-0005-1255-0302-0233	AF Aero Propulsion Laboratory
28. Potassium Rankine Topping Cycle	0604-1405-1155-0201-0268	NASA
29. Fuel Cell Technology & Research	0614-0007-1055-0302-0709	Team to Advance Resch for Gas Energy Transformation, INC. (TARGET)

<u>Subprogram Title</u>	<u>Identification Number</u>	<u>Proponent</u>
30. Fuel Cell Powerplant Development	0614-0007-1055-0302-0708	TARGET
31. Air Pollution Control Technology Evaluation & Demonstration of Low Emission Advanced Clean Systems for Non-Utility (Area) Sources of Pollution	0605-6507-1279-5502-0703	EPA
32. Superconducting Electrical Machinery	0603-0005-1055-0102-0702	DOC
33. Magnetohydrodynamics & High Temperature Gas Turbines as Topping Cycles for Thermal Plants	0603-0006-2055-0102-0701	DOC
34. Open-Cycle, Coal-Fired MHD	0603-1406-2055-0102-0700	DOC
35. Advanced Energy Conversion by Fuel Cells & Batteries	0603-0007-2055-0102-0699	DOC
36. Reliability of Ceramic Components for High Temperature Gas Turbines	0603-0005-1055-0102-0698	DOC
37. Molten-Iron Gasification Process	0605-1403-1283-5501-0748	EPA
38. Power Generation from Coal Derived Fuel Using a Gas Turbine	0614-1405-1055-0302-0910	IND
39. Nonequilibrium Plasma Magneto-hydrodynamics	0611-0032-1055-0302-0714	DOD
40. Development of a Liquid-Metal MHD Energy-Conversion System for Central Station Application	0601-2105-1288-0201-0272	AEC
41. Low BTU Coal Gasification/Retrofitting Power Plants for Combustion of Low BTU Gas	0601-1103-1279-0201-0269	AEC
42. Low Temperature Cold Vapor (e.g., Bottoming) Cycles	0601-0005-1278-0302-0270	AEC
43. Advanced Power Cycles Analysis	0601-0005-2055-0102-0271	AEC
44. Materials Development for Advanced Power Cycles	0601-0005-1055-0202-0273	AEC
45. Potassium Topping Cycle	0601-0005-1286-0301-0274	AEC
46. Nuclear MHD Demonstration in the Engineering Test Reactor (ETR)	0614-0005-1195-0303-0266	Aerojet Nuclear Co.

<u>Subprogram Title</u>	<u>Identification Number</u>	<u>Proponent</u>
47. Multi-Fuel Closed Gas Turbine	0614-0005-1188-0301-0267	Garrett Corp.
48. Nuclear Magneto-Plasma-Dynamic Power Generation	0615-0010-1285-0101-0265	J. R. Williams
49. Engineering Support for Early Multi-Megawatt Powerplants	0614-3305-1278-0301-0264	Pratt & Whitney Aircraft
50. Government Procurement of Initial Production Multi-Megawatt Powerplants	0614-3307-1278-0301-0263	Pratt & Whitney Aircraft
51. Research in Manufacturing, Processing, and Initial Development of Production Type Machinery	0614-3305-1077-0302-0262	Pratt & Whitney Aircraft
52. Basic Directed Research in a Disciplinary Field	0636-0010-1055-0302-0715	DOD
53. 2KW(e) Radioisotope Thermo-electric Generator (RTG)	0634-4407-1055-0302-0712	DOD
54. Radioisotope Fuel for Small Thermolectric Generators	0634-4407-1055-0302-0711	DOD
55. Demonstration of On-Site Fuel Cell Powerplants	0614-0007-1255-0302-0707	TARGET
56. Introduction of Initial On-Site Powerplants Into Service	0614-0005-1278-0303-0705	TARGET
57. Fuel Cells	0621-0006-1055-0302-0704	DOI
58. Develop Processes & Machinery to Manufacture Second Group of Production Multi-Megawatt Powerplants	0614-3305-1080-0302-0260	Pratt & Whitney Aircraft
59. Field Testing of On-Site Fuel Cell Demonstrator Powerplants	0614-3305-1277-0301-0259	Pratt & Whitney Aircraft
60. Service & Maintenance Support for the Initial Production Multi-Megawatt Generators	0614-3305-5578-0302-0257	Pratt & Whitney Aircraft
61. Fuel Cell Technology - Advanced Cell Technologies	0614-3305-5555-0302-0256	Pratt & Whitney Aircraft
62. Field Retrofit of Improved Powerplant Components	0614-3305-1079-0303-0255	Pratt & Whitney Aircraft
63. Field Testing of Multi-Megawatt Demonstrator Powerplants	0614-3305-1277-0301-0254	Pratt & Whitney Aircraft

<u>Subprogram Title</u>	<u>Identification Number</u>	<u>Preponent</u>
64. Powerplant Component Testing	0614-3305-1055-0303-0253	Pratt & Whitney Aircraft
65. Advanced Fuel Conditioning Technologies	0614-3305-1079-0302-0252	Pratt & Whitney Aircraft
66. Thermionic Power Conversion	0604-0007-1055-5503-0251	NASA
67. Cycles Maximizing Thermal Efficiency: Joule-Rankine Combination Cycles	0631-0005-1255-0303-0249	DOD
68. Component Development, "Superconducting Generator Development"	0631-0005-1298-0302-0248	DOD
69. Rankine Bottoming Cycles for Increased Power Plant Efficiency in Cold Regions	0631-0005-1255-0302-0247	DOD
70. Commercial Demonstration of the IGT U-GAS Process for production of Low-BTU Gas from Coal. Target Date - 1978	0615-1103-1278-0301-0246	Inst. of Gas Technology
71. Low-BTU, Fixed Bed, Coal Gasification & Desulfurization Test Program	0607-1102-1255-0101-0245	TVA
72. Three-Stage Atmospheric Fluidized Bed Reactor	0621-1103-1055-0102-0244	DOI
73. Other Exploratory Research	0622-1103-1155-0102-0243	DOI
74. Entrained Bed Atmospheric Gasification System	0621-1103-1180-5501-0242	DOI
75. High Temperature Cleanup via Fixed Hot Bed	0621-1110-1282-0101-0241	DOI
76. Fluid Bed (Pressure + Hydro)	0621-1103-1255-5501-0240	DOI
77. Slurry Firing with Cleanup	0621-1103-1285-0101-0239	DOI
78. Design & Construction of Pressurized Fixed Bed Stirred Gasifier	0621-1103-1255-0101-0238	DOI
79. Development of the Sealed Circular, Traveling Grate Process for Conversion of Coal into Low BTU Gas and a Sulfur Free Char.	0621-1103-1180-5501-0237	DOI

PROGRAMS

<u>Sub-Program Title</u>	<u>Identification Number</u>	<u>Proposed</u>
80. Technical and Engineering Evaluation and Services Directed to Conversion of Heat to Electric Power	0621-1101-2055-5501-0235	DOI
81. Synthene Utilization for Low-BTU Gas	0622-1103-1255-0101-0234	DOI
82. Thermodynamic Energy Converter	0635-0007-1079-0102-0231	DOD
83. Small High-Sulfur Coal Burning Gas Turbines for MHS (Fluidized Bed Combustion)	0612-1407-1279-5501-0229	HUD
84. Advanced Technology Integrated Utility System (AIUS) Product Development	0612-0007-1279-5501-0228	HUD
85. Gas Turbine-Organic Rankine Combined Cycle for Advanced Integrated Utilities System (AIUS)	0612-1407-1255-5501-0227	HUD
86. Small Solid Waste Burning Gas Turbine System for Advanced Integrated Utilities System (AIUS)	0612-8209-1255-5501-0226	HUD
87. Coal Burning Sterling Engine System for Advanced Integrated Utilities System (AIUS)	0612-1407-1255-5501-0225	HUD
88. Small Low-Sulfur Coal Burning Gas Turbine System-Conventional Furnace Combustion for Advanced Integrated Utilities System (AIUS)	0612-1407-1255-5501-0224	HUD
89. Long Duration Direct Coal-Fired MHD Power Generation (A Joint OCR-IVA Development Program Conducted at the University of Tennessee Space Institute (USI))	0615-1405-1285-0402-0223	TVA
90. Electrochemical Fuel Cell for Use on Electric Utility Systems	0616-0005-1000-5503-0206	ANS
91. Low BTU Gas from Coal	0614-1103-1155-0303-1078	ANS

<u>Subproject Title</u>	<u>Identification Number</u>	<u>Prorogent</u>
92. Development and Demonstration of Catalytic Converters for Commercial Boilers and Residential Heating	0605-0005-1278-0203-1084	EPA
93. Evaluation, Development, and Demonstration of Advance Fuel Cell Technology for Providing Low Cost, Highly Efficient Clean Energy Small Sources	0605-0007-1279-0203-1085	EPA
94. Solid Waste Control Technology Extraction and Reclamation Technology to Recover Fuel Energy from Solid Wastes, Including Low-Grade Coal Mine Wastes	0605-1409-1255-0103-0660	EPA
95. Radiolytic Hydrogen Production	0631-0003-1185-5503-1042	DOD
96. MHD Component Modeling Tech.	0633-0010-1055-0302-2585	DOD
97. Materials Research	0621-0003-2055-5502-0613	DOI
98. Space Charge Neutralized Electro-Fluid Dynamic (EFD) Direct Energy Conversion Generators	0633-0010-1255-0302-0592	DOD
99. Superconducting Synchronous Generator Development	0616-0005-1080-5503-0963	AES
100. Liquid Metal Magneto-hydro-dynamics	0632-0005-1055-0102-1102	DOD
101. Entrained Bed	0621-1103-1179-0301-0125	DOI
102. Fluidized Bed Pressure Gasification System	0621-1103-1280-0301-0114	DOI
103. Stirred Fixed Bed Gas Producer	0622-1103-1280-0101-0115	DOI
104. Suspension Bed Process	0621-1103-1180-0301-0116	DOI
105. Agglomerating Bed Fuel Gas Process	0621-1103-1280-0301-0117	DOI
106. Pulverized Sulfur Coal Combustion Gasification	0621-1103-1182-0301-0118	DOI

<u>Program Title</u>	<u>Identification Number</u>	<u>Proponent</u>
7. High Temperature Gas Clean-Up	0621-1103-1280-0301-0119	DOI
8. MHD Program - Technical Surveillance of Overall MHD Programs	0621-0010-1055-0172	DOI
9. Air Pollution Control Tech. - Coal Processing Development of HE-Temp, High Pressure Fuel Gas Clean-Up with Zeolite Adsorber	0605-1403-1284-5501-0749	EPA
10. Coal Fired Closed Cycle Gas Turbine Power Generation System (Closed Brayton Cycle)	0605-1405-1281-5503-0731	EPA
11. Air Pollution Control Tech. - Combined Cycle Power Plant of Higher Efficiency Adapted to Burn Coal	0605-1405-1283-5501-0732	EPA
12. Catalytic Combustion	0604-2105-1055-0103-0745	NASA
13. Air Pollution Control Tech. - Coal Processing - Control of Particulates from High Temperature-High Pressure Energy Process	0605-1403-1280-5503-0747	EPA
114. Air Pollution Control Tech. - Combustion Control - Environmentally Sound Application of Low BTU Gas to Non-Utility Boilers & Industrial Furnaces	0605-3107-1279-5503-0725	EPA
115. Phases I and II of OCR Contract Develop the Multiple Fluidized Bed Gasification	0614-1103-1085-0302-0921	ANS
116. Phase III of the OCR Contract Design, Build & Operate a 5/Ton Hr Gasifier Pilot Plant	0614-1103-1185-0302-0920	ANS
117. Phases IV, V, & VI of OCR Contract	0614-1103-1281-0302-0919	ANS
118. Component Development Subprograms Include the Two Self-Sufficient Ceramic Gas Turbine - Superconductive Generator Packages	0635-0006-1077-0302-0608	DOD
119. MHD Program High Temperature Material Research	0605-1055-1002	DOI
120. Alternative Energy Source	0605-0907-1279-5502-0797	EPA

<u>Subprogram Title</u>	<u>Identification Number</u>	<u>Proponent</u>
21. Restudy Energy Depot Approach	0631-0001-1055-5503-0053	DOD
22. HTGR Direct Cycle - Bottoming Cycle	0616-4205-1285-5501-0303	ANS/GGA
23. Photon Converter - Segmented Magnet - Homopolar Machine	0631-0007-1077-0103-0066	DOD
24. Energy Conservation in Small Power Plants	0632-0008-1055-0102-1148	DOD
25. HTGR Gas Turbine Development	0616-4205-1285-5501-0304	ANS/GEA
26. Nuclear Gas Turbine-Generator Development for High Temperature Gas-Cooled Reactor (HTGR) Application	0614-4205-1286-0301-1138	GE
27. Ultra High Temperature Gas Turbine-Water Cooled	0614-4205-1278-0301-1139	GE
28. Closed Cycle Gas Turbine System Development and Prototype Test for HTGR	0604-4205-1255-0201-0220	NASA