A Bibliography for the Satellite Power System (SPS) Concept Development and Evaluation Program

April 1981

R 4154

MASTER

Prepared for:

U.S. Department of Energy

Office of Energy Research

Solar Power Satellite Project Division

Under Contract No. 31-109-ENG-38

DOE/NASA

Satellite Power System

Concept Development

and

Evaluation Program

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

NOTICE

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Department of Energy, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, mark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

Available from:

National Technical Information Service (NTIS)
U.S. Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22161

Price:	Printed Copy:	\$21.50
	Microfiche:	\$4.00

A Bibliography for the Satellite Power System (SPS) Concept Development and Evaluation Program

April 1981

Prepared by:

M. Abromavage, R. Calzadilla and Mark Murray
Argonne National Laboratory
Argonne, IL 60439

Under Contract No. ^WA31-109-ENG-38

Prepared for:

U.S. Department of Energy
Office of Energy Research
Solar Power Satellite Project Division
Washington, D.C. 20585

DOE/NASA
Satellite Power System
Concept Development
and
Evaluation Program

DISCLAIMER

This book was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

FOREWORD

This bibliography is the final publication in the Department of Energy and the National Aeronautics and Space Administration series on the Satellite Power System Concept Development and Evaluation Program. The Satellite Power System Concept was initially developed by Peter Glaser in 1968. Commencing in 1977 and continuing through 1980, a comprehensive assessment of this concept was conducted using a Reference System as a "straw man", and encompassed systems definition and engineering aspects; environmental assessment of microwave health and ecology, risks to space workers and atmospheric effects; a societal assessment covering resource requirements (land and materials), international and institutional issues; and a comparative assessment of the SPS Reference System relative to other advanced energy technologies such as fusion and improved current energy technologies.

The National Aeronautics and Space Administration and its contractors investigated various system design concepts and initiated some preliminary work in critical technological and engineering areas. The Department of Energy, assisted by several national laboratories, other government organizations such as the Environmental Protection Agency and the Institute for Telecommunications Sciences, and independent contractors performed the environmental, societal, and comparative assessments.

This bibliography, prepared by Martin Abromavage, Rosa Calzadilla and Mark Murray, includes the many reports written during the three-year SPS Concept Development and Evaluation Program. A large quantity of professional papers were also written by both contributing and independent investigators in the United States and abroad.

It is hoped that this bibliography will be useful to those who are interested in the concept of collecting energy in space and using it on Earth.

F. A. Koomanoff, Director
Solar Power Satellite Projects Division
Office of Energy Research

THIS PAGE
WAS INTENTIONALLY
LEFT BLANK

CONTENTS

FOREWORD	i	
CONTENTS	iii	
INTRODUCTION AND USERS' GUIDE	v	
Subject Categories	vi	
Relationships Between Subject Categories	viii	
Key Words	ix	
Acquisition Numbers and Sources	ix	
ATMOSPHERIC EFFECTS	1	
BIOLOGIC EFFECTS	21	
COMPARATIVE ASSESSMENT	51	
ENERGY ALTERNATIVES AND POLICY	69	
ELECTROMAGNETIC COMPATIBILITY	79	
ENVIRONMENTAL EFFECTS	87	
ECONOMICS AND FINANCES	101	
PROGRAM PLANS	109	
POWER GENERATION AND TRANSMISSION	119	
RESOURCES AND MATERIALS	139	
SYSTEMS ANALYSES	147	
SYSTEMS ENGINEERING	173	
SOCIAL ISSUES	195	
SPACE TRANSPORTATION	215	
SPACE UTILIZATION	223	
AUTHOR INDEX	239	
ACQUISITION SOURCES	247	
ORDER FORMS	253	

THIS PAGE
WAS INTENTIONALLY
LEFT BLANK

INTRODUCTION AND USERS' GUIDE

The Satellite Power System Concept Development and Evaluation Program (SPS-CDEP) jointly conducted by the U. S. Department of Energy (DOE) and the National Aeronautics and Space Administration (NASA) was completed in late 1980. A large number of reports were prepared under the auspices of the SPS Project Division, Office of Energy Research, during the three-year program. Many domestic and foreign organizations (industries, governments, and professional and trade groups) also studied the SPS energy concept independently and prepared reports and papers on the subject. Literally hundreds of professional papers on SPS have appeared in engineering and scientific journals, and popular magazines and newspapers have reported extensively on SPS.

The results of the three-year CDEP have been reported by the Department of Energy and NASA. Reports also are being prepared independently by the Congress' Office of Technology Assessment (OTA) and the National Research Council (NRC) of the National Academy of Sciences, but are not yet complete.

All reports prepared under the auspices of DOE and NASA during the CDEP are traceable and available to the public, and are listed here. Some especially important reports prepared by NASA and its contractors prior to 1978 also are included. Citation cards also are included for the OTA and NRC reports expected to be completed by mid - 1981, as is a card for the final comparative assessment report prepared for SPS-CDEP which is expected to be available in the early spring of 1981.

A sampling of professional papers is included to illustrate the wide interest in SPS among scientists and engineers. Those which are cited should not be regarded as more noteworthy than others which may have been prepared but not included here.

Two rules were followed in preparing this bibliography. Each report or paper had to be on file in the SPS Project Division, and each had to be traceable to a source readily available to the public. Reports with restrictions on distribution and copyrighted papers not traceable to a publishing source were therefore excluded.

Finally, a note about cited authors is appropriate. Many investigators who contributed significant work during SPS-CDEP may not be listed. There are several reasons for this. Government regulations concerning acknowledgements have changed from time to time, and in some cases individuals who contributed to reports through subcontracts with national laboratories or prime contractors could not be listed among principal authors. Some organizations issue reports as corporate documents without listing individual authors. Conference and workshop proceedings may include papers by dozens of contributors, but a citation to the entire document usually attributes the work to the editors of the proceedings. Thus the author index should not be regarded as an exclusive list of important contributors to SPS-CDEP.

Subject Categories

Reports and articles are categorized in fifteen subject areas. The areas were selected according to major interest in aspects of SPS illustrated during the CDEP. The CDEP, like any assessment process, had to be wide-ranging and well-integrated in order to be successful. For example, investigators concerned with microwave power generation and transmission had to be aware of its environmental implications. Those concerned with societal assessment had to be aware of microwave exposure rules and regulations. Thus the issue of microwave biologic effects may be addressed in reports in all three categories, but with different emphasis on aspects of the issue.

<u>CATEGORY</u>	<u>EMPHASIS</u>
AE - Atmospheric Effects	Effects which SPS activities might have on the atmosphere from near the earth's surface to geostationary earth orbit altitudes, including effects due to ionospheric heating.
BE - Biologic Effects	Potential health and safety effects on humans, animals and plants which might be produced directly by SPS activities or indirectly by support activities (mining, manufacturing, etc.), including effects due to ionizing radiation in space.
CA - Comparative Analysis	Information which is useful for comparing SPS performance, cost and residual effects with other selected current and emerging energy technologies.

<u>CATEGORY</u>	<u>EMPHASIS</u>
EA - Energy Alternatives and Policy	Information which provides a useful perspective of SPS and several other energy technologies vis-a-vis national and international energy concerns.
EC - Electromagnetic Compatibility	Telecommunications interference effects and other systems performance degradations potentially caused by radio wave propagation disturbances or direct energy coupling with SPS microwave energy, except for interference due to ionospheric heating.
EE - Environmental Effects	A wide range of potential environmental effects which might be produced by SPS. Documents generally cover generic environmental issues or more than one particular type of effect.
EF - Economics and Finances	Documents which primarily discuss costs of fully developing an operational SPS and methods for financing operations. Does not include socio-economic effects which might accompany the development and operation of SPS.
PP - Program Plans	Plans and planning concepts for SPS/CDEP and other selected energy alternatives.
PT - Power Generation and Transmission	Technical reports and papers which principally address engineering concepts, designs, theoretical and experimental analysis and the engineering economics of generating and transmitting useful energy from space to earth. Does not include terrestrial power transmission and generation.
RM - Resources and Materials	Reports and papers identifying, inventorying and evaluating the need for and potential effects on resources and materials which may be required to fully develop SPS, including land.
SA - Systems Analyses	Documents which present either brief overview analyses or descriptions of SPS, or provide somewhat detailed evaluations of SPS and its broad characteristics. Does not include engineering evaluations of specific SPS components.

<u>CATEGORY</u>	<u>EMPHASIS</u>
SE - Systems Engineering	Engineering reports on particular SPS components, characteristics, parameters and technology issues, including rectenna engineering but excluding space transportation.
SI - Social Issues	Reports and articles concerning significant social issues, international concerns and interests, institutional concerns and issues and public concerns and interest in and about SPS.
ST - Space Transportation	Technical and scientific information on SPS space transportation requirements, concepts (including earth-to-space and return), operating scenarios and economics, and similar information on other space ventures germane to SPS.
SU - Space Utilization	Principally a collection of papers from the technical and scientific space community on the potential, benefits and adverse effects which might accompany society's exploitation of space.

Relationships between Subject Categories

The nature of conceptual programs and evaluation processes makes it virtually impossible to classify documents according to distinct categories. Program work must be integrated and coordinated among participating groups in order to be effective, and it follows that many reports resulting from the work could be classified in a number of different ways. The judgments used for classifying documents included in this bibliography were based mainly on the principal content or intent of a particular document, but some arbitrary classification was occasionally necessary. The chief criterion in these cases was to classify the document in the most definitive category. For example, a document which might include substantial information on microwave biologic effects and was somewhat less definitive on other environmental issues was classified in the Biologic Effects category rather than in the broader Environmental Effects category.

The foregoing suggests the user should not concentrate on only one particular category of documents in using this bibliography. While it would be worthwhile to concentrate initially on a particular category of interest, a

review of related subject categories is encouraged to ensure a comprehensive understanding of SPS/CDEP. Related categories are listed in each section of this bibliography for convenience.

Key Words

Key words are listed for each citation. A maximum of six key words is provided for each document. A list of key words is included for each subject category and page numbers are provided for each citation for which the key word applies in each category. A universal system of key words is not used. They were selected to portray specific SPS/CDEP issues and interests, and should not be used to correlate with other bibliographies. It should be recognized that the practical limit of six key words should not lead the user to presume that no other information is included in a particular document. The six key words do highlight the most definitive information in a document, however.

Acquisition Number and Sources

Acquisition numbers are included for each citation. Multiple acquisition numbers should be used (where listed) when requesting documents from identified sources.

ATMOSPHERIC EFFECTS (CATEGORY AE)

Documents in this subject category cover potential atmospheric effects which might be produced by SPS launch and space vehicle exhaust effluents, microwave power transmission and rectenna operations. The effects of the atmosphere on SPS parameters also are included in this category, as are documents which describe atmospheric characteristics and effects of other space activities on the atmosphere.

KEY WORDS:	PAGE NUMBER:
Analysis Methods	5, 6, 10, 13, 14, 15, 16, 17, 18
Astronomy	8
Atmospheric Models	3, 5, 7, 10, 16, 18, 19
Biologic Effects	11
Climate Effects	3, 4, 5, 6, 11, 12, 14, 15, 16
Construction Effects	3
Ecology Impacts	10
Electric Charge	7, 8
Exhaust Emissions	3, 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, 19
Experiments	4, 6, 9, 11, 12, 13, 14, 18, 19
Frequency Scaling	9, 14, 17
Geophysics	7, 8
Heater Facilities	4, 9, 14
Heating Effects	3, 10, 17
Heating Theory	9, 10, 17
Interference Effects	4, 9, 10, 11, 13, 14, 17
Ionosphere Heating	4, 9, 10, 11, 14, 17, 18
Ionosphere Predictions	3, 4, 5, 9, 10, 11, 15, 17, 18, 19
Laser Transmission	5
Launch Effects	6, 10, 13, 14, 16
Lightning	15
Magnetosphere Effects	4, 7, 8, 12, 15
Mesospheric Effects	6
Microwave Heating	3, 4, 8
Microwave Propagation	8, 12
Models	7, 8
Particulate Exhausts	11, 14
Physical Processes	3, 4, 5, 7, 12, 13, 15, 16, 18, 19
Pilot Signal	11
Plasma Effects	4, 5, 7, 9

**(Atmospheric Effects -
Category AE continued)**

KEY WORDS:	PAGE NUMBER:
Plasmasphere Effects	15
Power Losses	5, 11, 15
Propellant Characteristics	7, 11, 14
Rectenna Heating	3, 12
Rectenna Protection	15
Reflected Light	8
Satellite Drag	8
Space Shuttle	10, 11
Stratospheric Effects	6, 11
Transportation Effects	3, 5, 6, 13, 14, 15, 16, 18, 19
Troposphere Effects	10
Weather Effects	5, 15

RELATED CATEGORIES:

Electromagnetic Compatibility (EC)

Environmental Effects (EE)

Power Generation and Transmission (PT)

Systems Engineering (SE)

Space Transportation (ST)

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-4
AUTHOR(S): Allen, N. C.			
AUTHOR AFFILIATION: NASA Johnson Space Center			
TITLE: A Preliminary Study of Possible Weather Effects due to Solar Power Satellite Rectenna Operation			
DATE: February 1977	VOLUMES:	PAGES: 37	REFERENCES: 19
ACQUISITION NO: JSC-12519			SOURCE: 4
KEY WORDS: Climate Effects Microwave Heating Construction Effects Rectenna Heating Heating Effects			

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-19
AUTHOR(S): Ames Research Center			
AUTHOR AFFILIATION: National Aeronautics and Space Administration			
TITLE: Environmental Impacts of the Satellite Power System (SPS) on the Middle Atmosphere			
DATE: October 1980	VOLUMES:	PAGES: 36	REFERENCES: 68
ACQUISITION NO: DOE/ER/110035-01			SOURCE: 5
KEY WORDS: Atmospheric Models Ionosphere Predictions Climate Effects Physical Processes Exhaust Emissions Transportation Effects			

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-24
AUTHOR(S): (1) Basu, S. (2) Klobuchar, J. A. (2) Johnson, A. L. (3) Rush, C. M.			
AUTHOR AFFILIATION: (1) Emmanuel College (3) U. S. Department of Commerce (2) U. S. Air Force			
TITLE: Preliminary Results of Scintillation Measurements Associated with Ionosphere Heating and Possible Implications for the Solar Power Satellite			
DATE: August 1980	VOLUMES:	PAGES: 4	REFERENCES: 25
ACQUISITION NO: 0094-8276/80/0080L-0880			SOURCE: 36
KEY WORDS: Experiments Interference Effects Heater Facilities Ionosphere Heating Heating Effects Microwave Heating			

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-17
AUTHOR(S): Bauer, E. (Ed.)			
AUTHOR AFFILIATION: La Jolla Institute			
TITLE: Proceedings of the Workshop on the Modification of the Upper Atmosphere by Satellite Power System (SPS) Propulsion Effluents			
DATE: June 1980	VOLUMES:	PAGES: 136	REFERENCES: 133
ACQUISITION NO: CONF-7906180			SOURCE: 5
KEY WORDS: Climate Effects Magnetosphere Effects Experiments Physical Processes Ionosphere Predictions Plasma Effects			

SUBJECT: ATMOSPHERIC EFFECTS		SPSPO INDEX NO: AE-16	
AUTHOR(S): Bernhardt, P. A. Price, K. M. da Rosa, A. V.			
AUTHOR AFFILIATION: Stanford University			
TITLE: Ionospheric Modification by Rocket Effluents			
DATE: June 1980	VOLUMES:	PAGES: 66	REFERENCES: 23
ACQUISITION NO: ANL/EES-TM-100			SOURCE: 5
KEY WORDS: Atmospheric Models Exhaust Emissions Ionosphere Predictions		Physical Processes Plasma Effects Transportation Effects	

SUBJECT: ATMOSPHERIC EFFECTS		SPSPO INDEX NO: AE-29	
AUTHOR(S): Beverly, R. E.			
AUTHOR AFFILIATION: Rockwell International			
TITLE: Satellite Power Systems (SPS) Laser Studies; Volume II: Meteorological Effects on Laser Beam Propagation and Direct Solar Pumped Lasers for the SPS			
DATE: November 1980	VOLUMES:	PAGES: 141	REFERENCES: 31
ACQUISITION NO: NASA CR 3347 NAS 8 - 32475			SOURCE: 4
KEY WORDS: Analysis Methods Climate Effects Laser Transmission		Physical Processes Power Losses Weather Effects	

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-11	
AUTHOR(S): Brubaker, K. L.				
AUTHOR AFFILIATION: Argonne National Laboratory				
TITLE: Proceedings of the Workshop on Stratospheric and Mesospheric Impacts of Satellite Power Systems (SPS)				
DATE: December 1979		VOLUMES:		PAGES: 112
				REFERENCES: 43
ACQUISITION NO: CONF-7809197				SOURCE: 5
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Climate Effects Exhaust Emissions Launch Effects </div> <div> Mesospheric Effects Stratospheric Effects Transportation Effects </div> </div>				

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-30	
AUTHOR(S): Chacko, C. C. Mendillo, M.				
AUTHOR AFFILIATION: Boston University				
TITLE: A Search of Archived Data Sources For Rocket Exhaust-Induced Modifications of the Ionosphere				
DATE: September 1980		VOLUMES:		PAGES: 49
				REFERENCES: 23
ACQUISITION NO: ANL/EES-TM-122				SOURCE: 5
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Analysis Methods Exhaust Emissions Experiments </div> </div>				

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-18	
AUTHOR(S): Chiu, Y. T. Luhmann, J. G. Schulz, M.				
AUTHOR AFFILIATION: The Aerospace Corporation				
TITLE: Magnetospheric Effects of Ion and Atom Injections by the Satellite Power System				
DATE: July 1980		VOLUMES:		PAGES: 118
				REFERENCES: 61
ACQUISITION NO: ANL/EES-TM-94				SOURCE: 5
KEY WORDS: Atmospheric Models Exhaust Emissions Magnetosphere Effects Physical Processes Plasma Effects Propellant Characteristics				

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-32	
AUTHOR(S): Criswell, D. R. De, B. R.				
AUTHOR AFFILIATION: Lunar Science Institute				
TITLE: Intense Localized Photoelectric Charging in the Lunar Sunset Terminator Region - 2. Supercharging at the Progression of Sunset				
DATE: March 1977		VOLUMES:		PAGES: 3
				REFERENCES: 5
ACQUISITION NO: 6A 0968				SOURCE: 36
KEY WORDS: Electric Charge Geophysics Models				

SUBJECT ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-33
AUTHOR(S): De, B. R. Criswell, D. R.			
AUTHOR AFFILIATION: Lunar Science Institute			
TITLE: Intense Localized Photoelectric Charging in the Lunar Sunset Terminator Region - 1. Development of Potentials and Fields			
DATE: March 1977	VOLUMES:	PAGES: 6	REFERENCES: 15
ACQUISITION NO: 6A0967			SOURCE: 36
KEY WORDS: Electric Charge Geophysics Models			

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-10
AUTHOR(S): Douglas, M. Warshaw, H. LaQuey, R. DeForest, S. Lindsey, C.			
AUTHOR AFFILIATION: Maya Development Corporation			
TITLE: Identification and Preliminary Discussion of Potential Interaction of Space Power Satellites with the Earth's Magnetosphere			
DATE: May 1977	VOLUMES:	PAGES: 154	REFERENCES: 39
ACQUISITION NO: 77-1-1 NAS7-100 JPL 954663			SOURCE: 4
KEY WORDS: Astronomy Microwave Propagation Exhaust Emissions Reflected Light Magnetosphere Effects Satellite Drag			

SUBJECT: ATMOSPHERIC EFFECTS		SPSPO INDEX NO: AE-1	
AUTHOR(S): Duncan, L. M. Gordon, W. E.			
AUTHOR AFFILIATION: Rice University			
TITLE: Ionosphere/Microwave Beam Interaction Study			
DATE: September 1977	VOLUMES:	PAGES: 117	REFERENCES: 9
ACQUISITION NO: NAS9-15212 DRL No. T-1349 DRD No. MA-183TA			SOURCE: 4
KEY WORDS: Experiments Heater Facilities Frequency Scaling Ionosphere Heating Interference Effects Ionosphere Predictions			

SUBJECT: ATMOSPHERIC EFFECTS		SPSPO INDEX NO: AE-5	
AUTHOR(S): Duncan, L. M. Zinn, J.			
AUTHOR AFFILIATION: Los Alamos Scientific Laboratory			
TITLE: Ionosphere-Microwave Interactions for Solar Power Satellite			
DATE: March 1978	VOLUMES:	PAGES: 38	REFERENCES: 19
ACQUISITION NO: LA-UR-78-758			SOURCE: 5
KEY WORDS: Experiments Ionosphere Heating Heating Effects Ionosphere Predictions Heating Theory Plasma Effects			

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-25
AUTHOR(S): (1) Duncan, L. M. (2) Behnke, R. A.			
AUTHOR AFFILIATION: (1) Rice University (2) National Astronomy and Ionospheric Center			
TITLE: Observations of Self-Focusing Electromagnetic Waves in the Ionosphere			
DATE: October 1978	VOLUMES:	PAGES: 4	REFERENCES: 10
ACQUISITION NO: Physical Review Letters, Vol. 41, No. 14, pp. 998-1001			SOURCE: 36
KEY WORDS: Heating Effects Ionosphere Heating Heating Theory Ionosphere Predictions Interference Effects			

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-9
AUTHOR(S): Goldford, A. I.			
AUTHOR AFFILIATION: Science Applications, Inc.			
TITLE: Proceedings of the Heavy Lift Launch Vehicle Tropospheric Effects Workshop			
DATE: December 1979	VOLUMES:	PAGES: 104	REFERENCES: 5 Bibliography
ACQUISITION NO: CONF-7809192			SOURCE: 5
KEY WORDS: Analysis Methods Launch Effects Atmospheric Models Space Shuttle Ecology Impacts Troposphere Effects			

SUBJECT: ATMOSPHERIC EFFECTS		SPSPO INDEX NO: AE-2	
AUTHOR(S): Gordon, W. E. Duncan, L. M.			
AUTHOR AFFILIATION: Rice University			
TITLE: Ionosphere/Microwave Beam Interaction Study Statement of Work			
DATE: July 1978	VOLUMES:	PAGES: 47	REFERENCES: 35
ACQUISITION NO: NAS9-15212 DRL No. T-1349 DRD No. MA-183TA		SOURCE: 4	
KEY WORDS: Experiments Interference Effects Ionosphere Heating Ionosphere Predictions Pilot Signal Power Losses			

SUBJECT: ATMOSPHERIC EFFECTS		SPSPO INDEX NO: AE-3	
AUTHOR(S): Johnson Space Center			
AUTHOR AFFILIATION: National Aeronautics and Space Administration			
TITLE: Proceedings of the Space Shuttle Environmental Assessment Workshop on Stratospheric Effects			
DATE: September 1976	VOLUMES:	PAGES: 213	REFERENCES: 156
ACQUISITION NO: JSC-11633		SOURCE: 4	
KEY WORDS: Biologic Effects Climate Effects Particulate Exhausts Propellant Characteristics Space Shuttle Stratospheric Effects			

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-7	
AUTHOR(S): Lee, J. L.				
AUTHOR AFFILIATION: Argonne National Laboratory				
TITLE: Proceedings of the Workshop on Meteorological Effects of Satellite Power System Rectenna Operation and Related Microwave Transmission Problems				
DATE: December 1979		VOLUMES:		PAGES: 48
				REFERENCES: 16
ACQUISITION NO: CONF-7808114				SOURCE: 5
KEY WORDS: Climate Effects Rectenna Heating Microwave Propagation Physical Processes				

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-14	
AUTHOR(S): (1) Markson, R. (2) Muir, M.				
AUTHOR AFFILIATION: (1) Massachusetts Institute of Technology (2) University of Natal (South Africa)				
TITLE: Solar Wind Control of the Earth's Electric Field				
DATE: May 1980		VOLUMES:		PAGES: 12
				REFERENCES: 90
ACQUISITION NO: 0036-8075/80/0530-0979				SOURCE: 7
KEY WORDS: Climate Effects Experiments Physical Processes				

SUBJECT: ATMOSPHERIC EFFECTS		SPSPO INDEX NO: AE-6	
AUTHOR(S): Mendillo, M. (1) Hermite, B. (1) Rote, D. M. (2)			
AUTHOR AFFILIATION: (1) Boston University (2) Argonne National Laboratory			
TITLE: Modification of the Aerospace Environment by Large Space Vehicles			
DATE: January 1979	VOLUMES:	PAGES: 7	REFERENCES: 17
ACQUISITION NO: 79-0391			SOURCE: 2
KEY WORDS: Exhaust Emissions Physical Processes Satellite Power System Transportation Effects			

SUBJECT: ATMOSPHERIC EFFECTS		SPSPO INDEX NO: AE-21	
AUTHOR(S): Mendillo, M. (Ed.) Baumgardner, B. (Ed.)			
AUTHOR AFFILIATION: Boston University			
TITLE: Proceedings of the Workshop/Symposium on the Preliminary Evaluation of the Ionospheric Disturbances Associated with the HEAO-C Launch, with Applications to the SPS Environmental Assessment.			
DATE: August 1980	VOLUMES:	PAGES: 258	REFERENCES: 89
ACQUISITION NO: CONF-7911108			SOURCE: 5
KEY WORDS: Analysis Methods Experiments Interference Effects Launch Effects			

SUBJECT: ATMOSPHERIC EFFECTS		SPSPO INDEX NO: AE-23	
AUTHOR(S): National Telecommunications and Information Administration			
AUTHOR AFFILIATION: U. S. Department of Commerce			
TITLE: Environmental Assessment for the Satellite Power System - Concept Development and Evaluation Program - Effects of Ionospheric Heating on Telecommunications			
DATE: August 1980	VOLUMES:	PAGES: 94	REFERENCES: 42
ACQUISITION NO: DOE/ER/10003-T2			SOURCE: 5
KEY WORDS: Analysis Methods Heater Facilities Experiments Interference Effects Frequency Sealing Ionosphere Heating			

SUBJECT: ATMOSPHERIC EFFECTS		SPSPO INDEX NO: AE-12	
AUTHOR(S): Radke, L. F. Hegg, D. A. Eltgroth, M.W. Hobbs, P.V.			
AUTHOR AFFILIATION: University of Washington			
TITLE: Measurements of the Particles and Gases in the Ground Cloud from an Atlas/Centaur Rocket			
DATE: February, 1979	VOLUMES:	PAGES: 70	REFERENCES: 6
ACQUISITION NO: By Title			SOURCE: 5
KEY WORDS: Climate Effects Particulate Exhausts Exhaust Emissions Propellant Characteristics Launch Effects Transportation Effects			

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-28
AUTHOR(S): Rice University			
AUTHOR AFFILIATION: Rice University			
TITLE: Electrostatic Protection of the Solar Power Satellite and Rectenna; Part II-Lightning Protection of the Rectenna.			
DATE: November 1980	VOLUMES:	PAGES: 122	REFERENCES: None
ACQUISITION NO: NASA CR 3345 NAS 8 - 33023			SOURCE: 4
KEY WORDS: Analysis Methods Power Losses Lightning Rectenna Protection Physical Processes Weather Effects			

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-8
AUTHOR(S): Rote, D. M.			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: Proceedings of the Workshop on Ionospheric and Magnetospheric Effects of the Satellite Power Systems (SPS)			
DATE: December 1979	VOLUMES:	PAGES: 97	REFERENCES: 29
ACQUISITION NO: CONF-7808115			SOURCE: 5
KEY WORDS: Climate Effects Plasmasphere Effects Exhaust Emissions Transportation Effects Ionosphere Predictions Magnetosphere Effects			

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-15
AUTHOR(S): Rote, D. M. Lee, J. L. Brubaker, K. L. Valentino, A. R.			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: An Assessment of the Atmospheric Effects of a Satellite Power System			
DATE: December 1979	VOLUMES:	PAGES: 29	REFERENCES: 36
ACQUISITION NO: By Title (Second Miami International Conference on Alternative Energy Sources)			SOURCE: 37
KEY WORDS: Atmospheric Models Launch Effects Climate Effects Physical Processes Exhaust Emissions Transportation Effects			

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-27
AUTHOR(S): Rote, D. M. Brubaker, K. L. Lee, J. L.			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: Environmental Assessment for the Satellite Power System - Concept Development and Evaluation Program - Atmospheric Effects			
DATE: November 1980	VOLUMES:	PAGES: 126	REFERENCES: 144
ACQUISITION NO: DOE/ER-0090			SOURCE: 5
KEY WORDS: Atmospheric Models Launch Effects Climate Effects Physical Processes Exhaust Emissions Transportation Effects			

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-22
AUTHOR(S): Rush, C. M. Carroll, J. C. Violette, E. J. Allen, K. C. Espeland, R. H.			
AUTHOR AFFILIATION: U. S. Department of Commerce			
TITLE: Impact of SPS Heating on VLF, LF, and MF Telecommunications Systems Ascertained by Experimental Means			
DATE: July 1980	VOLUMES:	PAGES: 105	REFERENCES: 15
ACQUISITION NO: DOE/ER/10003-T1			SOURCE: 5
KEY WORDS: Analysis Methods Heating Effects Experiments Interference Effects Frequency Scaling Ionosphere Heating			

SUBJECT: ATMOSPHERIC EFFECTS			SPSPO INDEX NO: AE-26
AUTHOR(S): Showen, R. L.			
AUTHOR AFFILIATION: SRI International			
TITLE: Measurements of Possible D- and E- Region Telecommunications Effects During Ionospheric Heating			
DATE: November 1980	VOLUMES:	PAGES: 38	REFERENCES: None
ACQUISITION NO: Contract NT79RAC96007			SOURCE: 13
KEY WORDS: Heating Effects Ionosphere Heating Heating Theory Ionosphere Predictions Interference Effects			

SUBJECT: ATMOSPHERIC EFFECTS		SPSPO INDEX NO: AE-31	
AUTHOR(S): Zinn, J. Sutherland, C. D.			
AUTHOR AFFILIATION: Los Alamos Scientific Laboratory			
TITLE: Effects of Rocket Exhaust Products in the Thermosphere and Ionosphere			
DATE: 1980	VOLUMES:	PAGES: 24	REFERENCES: 20
ACQUISITION NO: 0191-9067/80/010109-24 Space Solar Power Review, Vol. 1, pp. 109-132			SOURCE: 33
KEY WORDS: Atmospheric Models Exhaust Emissions Experiments		Ionosphere Heating Physical Processes Transportation Effects	

SUBJECT: ATMOSPHERIC EFFECTS		SPSPO INDEX NO: AE-13	
AUTHOR(S): Zinn, J. Sutherland, C. D.			
AUTHOR AFFILIATION: Los Alamos Scientific Laboratory			
TITLE: Effects of Rocket Exhaust Products in the Thermosphere and Ionosphere			
DATE: February 1980	VOLUMES:	PAGES: 22	REFERENCES: 20
ACQUISITION NO: LA-8233-MS			SOURCE: 5
KEY WORDS: Analysis Methods Atmospheric Models Exhaust Emissions		Ionosphere Predictions Launch Effects Transportation Effects	

SUBJECT: ATMOSPHERIC EFFECTS		SPSPO INDEX NO: AE-20	
AUTHOR(S): (1) Zinn, J. (1) Stone, S. N. (2) Behnke, R. A. (1) Sutherland, C. D. (1) Duncan, L. M.			
AUTHOR AFFILIATION: (1) Los Alamos Scientific Laboratory (2) Arecibo Observatory			
TITLE: Ionospheric Effects of Rocket Exhaust Products (HEAO-C, Skylab and SPS-HLLV)			
DATE: October 1980	VOLUMES:	PAGES: 32	REFERENCES: 28
ACQUISITION NO: DOE/ER-0082			SOURCE: 5
KEY WORDS: Atmospheric Models Exhaust Emissions Experiments		Ionosphere Predictions Physical Processes Transportation Effects	

THIS PAGE
WAS INTENTIONALLY
LEFT BLANK

BIOLOGIC EFFECTS (CATEGORY BE)

Document in this category cover potential biologic effects which might be produced by solar energy or SPS microwave energy in space or on earth, and biologic effects which might be produced by SPS launch and space vehicles, electric transmission lines, or SPS-related industrial and manufacturing processes. Health, safety and other biologic effects (e.g., physiological, behavioral, etc.) on humans, animals and plants are included. Biologic and occupational safety issues related to working in the space ionizing radiation environment are included. They describe and evaluate what is known about the radiation environment in space, its effects on humans and space equipment, and possible ameliorative measures which may be useful in controlling such effects.

KEY WORDS:	PAGE NUMBER:
Avian Species	34, 36, 46
Behavior Effects	23, 33, 34, 35, 36, 37, 39
Blood-Brain Barrier	24, 38, 47
Charged Particles	28, 41
Cosmic Rays	41, 49
Data Review	24, 25, 26, 32, 33, 35, 36, 37, 38, 39, 40, 42, 44, 45, 46, 47, 49
Dose Levels	41, 49
Dosimetry	24, 30, 31, 34, 36, 37, 39, 41, 43, 48
Electron Flux	49
Experimental Data	23, 34, 35, 36, 46, 47, 50
Exposure	23, 26, 27, 29, 33, 35, 36, 37, 41, 43, 44, 46, 47, 48
Extremely Low Frequency	24, 34, 38, 42, 46, 47, 48
Eye Hazards	49,
Geophysics	28
Growth and Development	23, 49
Health Risks	41, 44
Human Absorption	32, 35, 36, 40, 41, 43, 47, 50
Infrared	37
Insects	23, 35
Ionizing Radiation	26, 27, 28, 44
Lasers	38

(Biologic Effects -
Category BE continued)

KEY WORDS:	PAGE NUMBER:
Mammal Studies	35, 37, 38, 39, 46, 49
Measurement Methods	24, 32, 34, 36, 37, 38, 39, 42, 44, 50
Measurements	27
Microwave	23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 35, 38, 39, 40, 41, 42, 43, 45, 47, 48, 50
Mitigating Strategy	39, 45, 46
Occupational Exposure	23, 24, 25, 26, 27, 28, 29, 33, 35, 37, 39, 41 44, 45, 48
Proton Flux	49
Public Concern	25, 26, 30, 31, 43, 47, 48
Public Health	24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 37 38, 40, 41, 43, 44, 45, 48
Radiation Exposure	28, 41, 44
Reflected Light	49
Regulation	25, 26, 27, 28, 29, 32, 33, 42, 45, 46, 48
Reptiles	34
Research	23, 24, 26, 27, 30, 31, 32, 33, 34, 35, 36, 37 39, 40, 42, 43, 44, 50
Shielding	28, 41
Solar Effects	37
Solar Flares	49
Space Flight	39
Space Instruments	28
Space Lab	49
Space Workers	39
Specific Absorption	34, 36, 45
Standards	23, 27, 28, 29, 30, 31, 32, 33, 38, 42, 43, 45, 4
Theory	23, 25, 32, 35, 36, 40, 42, 43, 47
Thermal Effects	25, 34, 47
Transmission Line	34, 46, 47
Ultrasonics	38
Ultraviolet	37
Vegetation Effects	46, 49
Zero Gravity	39

RELATED CATEGORIES:

Atmospheric Effects (AE)

Environmental Effects (EE)

Power Generation and Transmission (PT)

Systems Analyses (SA)

Social Issues (SI)

Space Transportation (ST)

SUBJECT: BIOLOGIC EFFECTS		SPSPO INDEX NO: BE-50	
AUTHOR(S): Gary, N. E. Westerdahl, B. B.			
AUTHOR AFFILIATION: University of California			
TITLE: Environmental Assessment for the Satellite Power System (SPS): Studies of Honey Bees Exposed to 2.45 GHz Continuous-Wave Electromagnetic Energy			
DATE: December 1980	VOLUMES:	PAGES: 149	REFERENCES: 55
ACQUISITION NO: DOE/ER-0095			SOURCE: 5
KEY WORDS: Behavior Effects Experimental Data Growth and Development Insects Microwave Research			

SUBJECT: BIOLOGIC EFFECTS		SPSPO INDEX NO: BE-12	
AUTHOR(S): Baranski, S. (1) Czerski, P. (2)			
AUTHOR AFFILIATION: (1) Institute of Aviation Medicine (Warsaw) (2) Institute of Mother and Child (Warsaw)			
TITLE: Biological Effects of Microwaves			
DATE: 1976	VOLUMES:	PAGES: 234	REFERENCES: 614
ACQUISITION NO: Library of Congress 74-7837 ISBN: 0-87933-145-3			SOURCE: 23
KEY WORDS: Experimental Data Exposure Microwave Occupational Exposure Standards Theory			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-13
AUTHOR(S): Benedick, M. H.			
AUTHOR AFFILIATION: IIT Research Institute			
TITLE: Blood-Brain Barrier Workshop			
DATE: May 1979	VOLUMES:	PAGES: 16	REFERENCES: 25
ACQUISITION NO: IITRI - E6456 NMRDC - N00014-79-M-005			SOURCE: 5
KEY WORDS: Blood-Brain Barrier Data Review Measurement Methods Microwave			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-33
AUTHOR(S): Bridges, J. E.			
AUTHOR AFFILIATION: IIT Research Institute			
TITLE: Biological Effects of High Voltage Electric Fields			
DATE: November 1975	VOLUMES:	PAGES: 190	REFERENCES: 92
ACQUISITION NO: EPRI 381-1			SOURCE: 26
KEY WORDS: Data Review Dosimetry Extremely Low Frequency Occupational Exposure Public Health Research			

SUBJECT: BIOLOGIC EFFECTS		SPSPO INDEX NO: BE-17	
AUTHOR(S): Brodeur, P.			
AUTHOR AFFILIATION: New Yorker Magazine			
TITLE: The Zapping of America			
DATE: 1977	VOLUMES:	PAGES: 343	REFERENCES: 75
ACQUISITION NO: By Title			SOURCE: 32
KEY WORDS: Data Review Public Concern Microwave Public Health Occupational Exposure Regulation			

SUBJECT: BIOLOGIC EFFECTS		SPSPO INDEX NO: BE-7	
AUTHOR(S): Cleary, S. F.			
AUTHOR AFFILIATION: Virginia Commonwealth University			
TITLE: Survey of Microwave and Radio Frequency Biological Effects and Mechanisms			
DATE: June 1977	VOLUMES:	PAGES: 33	REFERENCES: 72
ACQUISITION NO: By Title			SOURCE: 17
KEY WORDS: Data Review Thermal Effects Microwave Theory			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-41
AUTHOR(S): Committee on Commerce, Science and Transportation			
AUTHOR AFFILIATION: U. S. Senate			
TITLE: Report on Radiation Health and Safety			
DATE: December 1978	VOLUMES:	PAGES: 106	REFERENCES: None
ACQUISITION NO: 34 949			SOURCE: 20
KEY WORDS: Ionizing Radiation Public Health Microwave Regulation Occupational Exposure Research			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-15
AUTHOR(S): Committee on Commerce, Science and Transportation			
AUTHOR AFFILIATION: United States Senate			
TITLE: Microwave Irradiation of the U. S. Embassy in Moscow			
DATE: April 1979	VOLUMES:	PAGES: 26	REFERENCES: None
ACQUISITION NO: 96USC-43-949			SOURCE: 20
KEY WORDS: Data Review Occupational Exposure Exposure Public Concern Microwave			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-43
AUTHOR(S): Committee on Governmental Affairs			
AUTHOR AFFILIATION: U. S. Senate			
TITLE: Federal Regulation of Radiation Health and Safety: Organizational Problems and Possible Remedies			
DATE: August 1978	VOLUMES:	PAGES: 180	REFERENCES: None
ACQUISITION NO: 31-471-0			SOURCE: 20
KEY WORDS: Exposure Ionizing Radiation Microwave Occupational Exposure Public Health Regulation			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-2
AUTHOR(S): Community and Economic Development Division			
AUTHOR AFFILIATION: (U.S.) General Accounting Office			
TITLE: Efforts by the Environmental Protection Agency to Protec the Public from Environmental Nonionizing Radiation Exposure			
DATE: March 1978	VOLUMES:	PAGES: 11	REFERENCES: None
ACQUISITION NO: B-166506			SOURCE: 9
KEY WORDS: Exposure Measurements Regulation Research Standards			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-44
AUTHOR(S): Comptroller General of the U. S.			
AUTHOR AFFILIATION: U. S. General Accounting Office			
TITLE: More Protection from Microwave Radiation Hazards Needed			
DATE: November 1978	VOLUMES:	PAGES: 80	REFERENCES: Bibliography
ACQUISITION NO: HRD-79-7			SOURCE: 9
KEY WORDS: Microwave Regulation Occupational Exposure Standards Public Health			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-52
AUTHOR(S): Curtis, S. B. Schimmerling, W.			
AUTHOR AFFILIATION: Lawrence Berkeley Laboratory			
TITLE: Workshop on the Radiation Environment of the Satellite Power System			
DATE: December 1979	VOLUMES:	PAGES: 261	REFERENCES: 134
ACQUISITION NO: CONF-7809164			SOURCE: 5
KEY WORDS: Charged Particles Radiation Exposure Geophysics Shielding Ionizing Radiation Space Instruments			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-20
AUTHOR(S): Electromagnetic Radiation Management Advisory Council			
AUTHOR AFFILIATION: Office of Telecommunications Policy			
TITLE: Program for Control of Electromagnetic Pollution of the Environment: The Assessment of Biological Hazards of Nonionizing Electromagnetic Radiation			
DATE: December 1971	VOLUMES:	PAGES: 42	REFERENCES: 9
ACQUISITION NO: By Title			SOURCE: 5
KEY WORDS: Dosimetry Microwave Public Concern		Public Health Research Standards	

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-25
AUTHOR(S): Electromagnetic Radiation Management Advisory Council			
AUTHOR AFFILIATION: Office of Telecommunications Policy			
TITLE: Program for Control of Electromagnetic Pollution of the Environment: The Assessment of Biological Hazards of Nonionizing Electromagnetic Radiation			
DATE: March 1973	VOLUMES:	PAGES: 44	REFERENCES: 9
ACQUISITION NO: By Title			SOURCE: 5
KEY WORDS: Dosimetry Microwave Public Concern		Public Health Research Standards	

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-29
AUTHOR(S): Electromagnetic Radiation Management Advisory Council			
AUTHOR AFFILIATION: Office of Telecommunications Policy			
TITLE: Program for Control of Electromagnetic Pollution of the Environment: The Assessment of Biological Hazards of Nonionizing Electromagnetic Radiation			
DATE: June 1976	VOLUMES:	PAGES: 213	REFERENCES: Bibliography
ACQUISITION NO: By Title			SOURCE: 5
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Data Review Microwave Public Health </div> <div> Regulation Research Standards </div> </div>			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-32
AUTHOR(S): Environmental Health Directorate			
AUTHOR AFFILIATION: Minister of National Health and Welfare (Canada)			
TITLE: Health Aspects of Radio Frequency and Microwave Radiation Exposure Part 1.			
DATE: November 1977	VOLUMES:	PAGES: 80	REFERENCES: 115
ACQUISITION NO: 77-EHD-13			SOURCE: 16
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Data Review Human Absorption Measurement Methods </div> <div> Microwave Public Health Theory </div> </div>			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-27
AUTHOR(S): Environmental Health Directorate			
AUTHOR AFFILIATION: Minister of National Health and Welfare (Canada)			
TITLE: Health Aspects of Radio Frequency and Microwave Radiation Exposure, Part 2			
DATE: March 1978	VOLUMES:	PAGES: 115	REFERENCES: 313
ACQUISITION NO: 78-EHD-22			SOURCE: 16
KEY WORDS: Behavior Effects Regulation Data Review Research Microwave Standards			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-45
AUTHOR(S): Environmental Protection Agency			
AUTHOR AFFILIATION: U. S. Environmental Protection Agency			
TITLE: Environmental Assessment for the Satellite Power System - Concept Development and Evaluation Program - Microwave Health and Ecological Effects			
DATE: November 1980	VOLUMES:	PAGES: 143	REFERENCES: Bibliography
ACQUISITION NO: DOE/ER/10035-2			SOURCE: 5
KEY WORDS: Data Review Occupational Exposure Exposure Public Health Microwave Regulation			

SUBJECT: BIOLOGIC EFFECTS		SPSPO INDEX NO: BE-22	
AUTHOR(S): Formanek, V. C. Gauger, J. R. Emerle, E.			
AUTHOR AFFILIATION: IIT Research Institute			
TITLE: Susceptibility of Cardiac Pacemakers to Modulated ELF Magnetic Fields			
DATE: June 1977	VOLUMES:	PAGES: 34	REFERENCES: 6
ACQUISITION NO: IITRI - E6357-TR-5			SOURCE: 5
KEY WORDS: Experimental Data Extremely Low Frequency Measurement Methods Public Health Research Transmission Line			

SUBJECT: BIOLOGIC EFFECTS		SPSPO INDEX NO: BE-10	
AUTHOR(S): Gandhi, O. P.			
AUTHOR AFFILIATION: University of Utah			
TITLE: 2450 MHz Microwave Absorption in Large and Small Animals and its Biochemical Effects on Birds and Reptiles			
DATE: February 1978	VOLUMES: 1	PAGES: 99	REFERENCES: 22
ACQUISITION NO: NAS2-9555 UTEC ND 78-015			SOURCE: 4
KEY WORDS: Avian Species Behavior Effects Dosimetry Reptiles Specific Absorption Thermal Effects			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-40
AUTHOR(S): Gordon, Z. V.			
AUTHOR AFFILIATION: Israel Program for Scientific Translations, Ltd.			
TITLE: Biological Effect of Microwaves, in Occupational Hygiene (Translated from Russian)			
DATE: 1970	VOLUMES:	PAGES: 102	REFERENCES: Bibliography
ACQUISITION NO: TT70-50087 NASA TTF-633			SOURCE: 5
KEY WORDS: Data Review Mammal Studies Exposure Microwave Human Absorption Occupational Exposure			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-21
AUTHOR(S): Gould, J. L. Kirschvink, J. L. Deffeyes, K. S.			
AUTHOR AFFILIATION: Princeton University			
TITLE: Bees Have Magnetic Remanence			
DATE: April 1978	VOLUMES:	PAGES: 3	REFERENCES: 20
ACQUISITION NO: 0036-8075/78/0915-1026			SOURCE: 2
KEY WORDS: Behavior Effects Research Experimental Data Theory Insects			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-34
AUTHOR(S): Gould, James L.			
AUTHOR AFFILIATION: Princeton University			
TITLE: The Case for Magnetic Sensitivity in Birds and Bees (Such as It Is)			
DATE: May-June 1980	VOLUMES:	PAGES: 12	REFERENCES: 42
ACQUISITION NO: ISSN-0003-0996			SOURCE: 35
KEY WORDS: Avian Species Behavior Effects Experimental Data		Exposure Research Theory	

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-42
AUTHOR(S): Guy, A. W. Webb, M. D. McDougall, J. A.			
AUTHOR AFFILIATION: University of Washington			
TITLE: R F Radiation Absorption Patterns: Human and Animal Modeling Data			
DATE: September 1977	VOLUMES:	PAGES: 77	REFERENCES: 11
ACQUISITION NO: DHEW (NIOSH) 77-183			SOURCE: 20
KEY WORDS: Data Review Dosimetry Human Absorption		Measurement Methods Research Specific Absorption	

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-14
AUTHOR(S): Ham, W. T. Slincy, D. H.			
AUTHOR AFFILIATION: Electric Power Research Institute			
TITLE: Physiological Effects of Redirected Solar Radiation			
DATE: August 1978	VOLUMES:	PAGES: 56	REFERENCES: 27
ACQUISITION NO: EPRI ER-651			SOURCE: 26
KEY WORDS: Data Review Public Health Exposure Solar Effects Infrared Ultraviolet			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-38
AUTHOR(S): Hazzard, D. G.			
AUTHOR AFFILIATION: U. S. Public Health Service			
TITLE: Symposium on Biological Effects and Measurement of Radio Frequency/ Microwaves			
DATE: February 1977	VOLUMES:	PAGES: 387	REFERENCES: 282
ACQUISITION NO: FDA-77-8026			SOURCE: 5
KEY WORDS: Behavior Effects Measurement Methods Dosimetry Occupational Exposure Mammal Studies Research			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-8
AUTHOR(S): International Radiation Protection Association			
AUTHOR AFFILIATION: International Radiation Protection Association			
TITLE: Overviews on Non-Ionizing Radiation			
DATE: April 1977	VOLUMES:	PAGES: 75	REFERENCES: 165
ACQUISITION NO: By Title			SOURCE: 20
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Data Review Lasers Microwave </div> <div> Public Health Standards Ultrasonics </div> </div>			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-37
AUTHOR(S): Ishimaru, A; (Ed)			
AUTHOR AFFILIATION: The American Geophysical Union			
TITLE: Biological Effects of EM Waves			
DATE: November - December 1979	VOLUMES:	PAGES: 354	REFERENCES: 707
ACQUISITION NO: RASCAD 14 (6S) 1S-351S (1979) ISSN 0048-6604			SOURCE: 36
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Behavior Effects Blood-Brain Barrier Extremely Low Frequency </div> <div> Mammal Studies Measurement Methods Microwave </div> </div>			

SUBJECT: BIOLOGIC EFFECTS		SPSPO INDEX NO: BE-39	
AUTHOR(S): (1) Johnson, C. C. (Ed.) (2) Shore, M. L. (Ed.)			
AUTHOR AFFILIATION: (1) University of Utah (2) Bureau of Radiological Health			
TITLE: Biological Effects of Electromagnetic Waves			
DATE: October 1975	VOLUMES: 2	PAGES: 955	REFERENCES: 1089
ACQUISITION NO: FDA-77-8010 (Vol. 1) FAD-77-8011 (Vol. 2)			SOURCE: 5
KEY WORDS: Behavior Effects Measurement Methods Dosimetry Microwave Mammal Studies Research			

SUBJECT: BIOLOGIC EFFECTS		SPSPO INDEX NO: BE-48	
AUTHOR(S): Johnson Space Center			
AUTHOR AFFILIATION: National Aeronautics and Space Administration			
TITLE: Assessment of Zero Gravity Effects on Space Worker Health and Safety			
DATE: November 1980	VOLUMES:	PAGES: 122	REFERENCES: 63
ACQUISITION NO: DOE/ER/10025-TI			SOURCE: 5
KEY WORDS: Data Review Space Flight Mitigating Strategy Space Workers Occupational Exposure Zero Gravity			

SUBJECT: BIOLOGIC EFFECTS		SPSPO INDEX NO: BE-54	
AUTHOR(S): Lawrence Berkeley Laboratory			
AUTHOR AFFILIATION: Lawrence Berkeley Laboratory			
TITLE: Ionizing Radiation Risks to Satellite Power Systems (SPS) Workers in Space			
DATE: December 1980	VOLUMES:	PAGES: 58	REFERENCES: 58
ACQUISITION NO: DOE/ER-0094			SOURCE: 5
KEY WORDS: Charged Particles Health Risks Cosmic Rays Radiation Exposure Dose Levels Shielding			

SUBJECT: BIOLOGIC EFFECTS		SPSPO INDEX NO: BE-19	
AUTHOR(S): Mallalieu, R. C.			
AUTHOR AFFILIATION: The Johns Hopkins University			
TITLE: A Model of the Microwave Intensity Distribution within the US Embassy in Moscow, 1966 to 1977			
DATE: August 1980	VOLUMES:	PAGES: 81	REFERENCES: 53
ACQUISITION NO: FS-80-166			SOURCE: 5
KEY WORDS: Dosimetry Microwave Exposure Occupational Exposure Human Absorption Public Health			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-4
AUTHOR(S): Massey, K. A.			
AUTHOR AFFILIATION: Natural Resources Defense Council			
TITLE: The Challenge of Nonionizing Radiation: A Proposal for Legislation			
DATE: 1979	VOLUMES:	PAGES: 85	REFERENCES: None
ACQUISITION NO: Duke Law Journal Vol. 1979: 105			SOURCE: 14
KEY WORDS: Data Review Extremely Low Frequency Microwave Regulation			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-35
AUTHOR(S): Michaelson, S. M.			
AUTHOR AFFILIATION: University of Rochester			
TITLE: Analysis of Studies Related to Biologic Effects and Health Implications of Exposure to Power Frequencies			
DATE: 1979	VOLUMES:	PAGES: 16	REFERENCES: 43
ACQUISITION NO: 0191-5398/79/030217-16			SOURCE: 33
KEY WORDS: Data Review Extremely Low Frequency Measurement Methods Research Standards Theory			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-28
AUTHOR(S): National Research Council			
AUTHOR AFFILIATION: National Academy of Sciences			
TITLE: Analysis of the Exposure Levels and Potential Biologic Effects of the PAVE PAWS Radar System			
DATE: 1979	VOLUMES:	PAGES: 102	REFERENCES: 170
ACQUISITION NO: By Title			SOURCE: 27
KEY WORDS: Exposure Human Absorption Microwave		Public Concern Public Health Theory	

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-30
AUTHOR(S): National Telecommunications and Information Administration			
AUTHOR AFFILIATION: U. S. Department of Commerce			
TITLE: Fifth Report on Program for Control of Electromagnetic Pollution of the Environment: The Assessment of Biological Hazards of Nonionizing Electromagnetic Radiation.			
DATE: March 1979	VOLUMES:	PAGES: 266	REFERENCES: Bibliography
ACQUISITION NO: NTIA 79-19			SOURCE: 5
KEY WORDS: Dosimetry Microwave Public Concern		Public Health Research Standards	

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-31	
AUTHOR(S): Ozerski, P. Silverman, C. Ostrowski, K. Suess, M. J. Shore, M. L. Waldeskog, B.				
AUTHOR AFFILIATION: World Health Organization U. S. Dept. Health, Education and Welfare			Minister, Health and Social Welfare (Poland)	
TITLE: Biologic Effects and Health Hazards of Microwave Radiation				
DATE: October 1974	VOLUMES:	PAGES: 350	REFERENCES: 556	
ACQUISITION NO: 05-609-4			SOURCE: 34	
KEY WORDS: Data Review Exposure Measurement Methods			Occupational Exposure Public Health Research	

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-53	
AUTHOR(S): Poon, P. T. Y. Baker, L. R. Kuo, T. J.				
AUTHOR AFFILIATION: Jet Propulsion Laboratory				
TITLE: Preliminary Examination of Satellite Power System (SPS) Occupational Health Impacts				
DATE: October 1978	VOLUMES:	PAGES: 40	REFERENCES: 12	
ACQUISITION NO: 900-820 Rev. A.			SOURCE: 4	
KEY WORDS: Health Risks Ionizing Radiation Radiation Exposure				

SUBJECT: BIOLOGIC EFFECTS		SPSPO INDEX NO: BE-6	
AUTHOR(S): Radiation Protection Bureau			
AUTHOR AFFILIATION: Canadian Department of Health and Welfare			
TITLE: Recommended Installation and Safety Procedures for All Open Beam Microwave Devices			
DATE: July 1976	VOLUMES:	PAGES: 21	REFERENCES: None
ACQUISITION NO: RPB-SC-11			SOURCE: 16
KEY WORDS: Microwave Public Health Mitigating Strategy Standards Occupational Exposure			

SUBJECT: BIOLOGIC EFFECTS		SPSPO INDEX NO: BE-47	
AUTHOR(S): Repacholi, M. H.			
AUTHOR AFFILIATION: Department of Health and Welfare (Canada)			
TITLE: Proposed Exposure Limits for Microwave and Radiofrequency Radiations in Canada			
DATE: 1978	VOLUMES:	PAGES: 13	REFERENCES: 51
ACQUISITION NO: By Title; Journal of Microwave Power, 13 (2)			SOURCE: 39
KEY WORDS: Data Review Regulation Microwave Specific Absorbtion Occupational Exposure Standards			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-3
AUTHOR(S): Rish, W. R. Morgan, M. G.			
AUTHOR AFFILIATION: Carnegie-Mellon University			
TITLE: Regulating Possible Health Effects from AC Transmission Line Electro-magnetic Fields			
DATE: October 1979	VOLUMES:	PAGES: .12	REFERENCES: 47
ACQUISITION NO: 0018-9219/79/1000-1416			SOURCE: 6
KEY WORDS: Data Review Mitigating Strategy Exposure Regulation Extremely Low Frequency Transmission Line			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-36
AUTHOR(S): (1) Rogers, L. E. (2) Lee, J. M. (1) Gilbert, R. O. (2) Bracken, T. D.			
AUTHOR AFFILIATION: (1) Battelle Pacific Northwest Laboratories (2) Bonneville Power Administration			
TITLE: BPA 1100 kV Transmission System Development-Environment Studies			
DATE: February 1979	VOLUMES:	PAGES: 9	REFERENCES: 20
ACQUISITION NO: 1979 IEEE Winter PES			SOURCE: 6
KEY WORDS: Avian Species Mammal Studies Experimental Data Transmission Line Extremely Low Frequency Vegetation Effects			

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-16							
AUTHOR(S): Ruderman, M. A. MacDonald, G. J.										
AUTHOR AFFILIATION: SRI International										
TITLE: On the Interaction of Non-Ionizing Radiation with People										
DATE: February 1980		VOLUMES:	PAGES: 40	REFERENCES: 24						
ACQUISITION NO: J S R - 79-14			SOURCE: 5							
KEY WORDS: <table border="0"> <tr> <td>Blood-Brain Barrier</td> <td>Human Absorption</td> </tr> <tr> <td>Data Review</td> <td>Theory</td> </tr> <tr> <td>Experimental Data</td> <td>Thermal Effects</td> </tr> </table>					Blood-Brain Barrier	Human Absorption	Data Review	Theory	Experimental Data	Thermal Effects
Blood-Brain Barrier	Human Absorption									
Data Review	Theory									
Experimental Data	Thermal Effects									

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-5							
AUTHOR(S): Schiefelbein, S.										
AUTHOR AFFILIATION: Saturday Review Magazine										
TITLE: The Invisible Threat										
DATE: September 1979		VOLUMES:	PAGES: 5	REFERENCES: None						
ACQUISITION NO: Saturday Review Vol. 6, No. 18 pp. 16-20			SOURCE: 15							
KEY WORDS: <table border="0"> <tr> <td>Data Review</td> <td>Microwave</td> </tr> <tr> <td>Exposure</td> <td>Public Concern</td> </tr> <tr> <td>Extremely Low Frequency</td> <td>Transmission Line</td> </tr> </table>					Data Review	Microwave	Exposure	Public Concern	Extremely Low Frequency	Transmission Line
Data Review	Microwave									
Exposure	Public Concern									
Extremely Low Frequency	Transmission Line									

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-18
AUTHOR(S): Steneck, N. H. Kane, G. L. Cook, H. J. Vander, A. J.			
AUTHOR AFFILIATION: University of Michigan			
TITLE: The Origins of U. S. Safety Standards for Microwave Radiation			
DATE: June 13, 1980	VOLUMES:	PAGES: 8	REFERENCES: 54
ACQUISITION NO: Science - Vol. 208. No. No. 4449			SOURCE: 7
KEY WORDS: Exposure Microwave Occupational Exposure		Public Concern Public Health Regulation	

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-26
AUTHOR(S): Valentino, A. R.			
AUTHOR AFFILIATION: IIT Research Institute			
TITLE: A Tutorial: Non-Ionizing Electromagnetic Fields-Biological Effects Terminology			
DATE: 1979	VOLUMES:	PAGES: 4	REFERENCES: 5
ACQUISITION NO: 0191-5398/79/020155-04			SOURCE: 33
KEY WORDS: Dosimetry Exposure Extremely Low Frequency		Microwave Regulation Standards	

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-51	
AUTHOR(S): Watts, J. W. Wright, J. J.				
AUTHOR AFFILIATION: NASA Marshall Space Flight Center				
TITLE: Charged Particle Radiation Environment for the Spacelab and Other Missions in Low Earth Orbit				
DATE: June 1975		VOLUMES:		PAGES: 68
				REFERENCES: 17
ACQUISITION NO: NASA TM X-64936				SOURCE: 4
KEY WORDS: Cosmic Rays Dose Levels Electron Flux Proton Flux Solar Flares Spacelab				

SUBJECT: BIOLOGIC EFFECTS			SPSPO INDEX NO: BE-55	
AUTHOR(S): White, M.				
AUTHOR AFFILIATION: Lawrence Berkeley Laboratory				
TITLE: Effects on Biological Systems of Reflected Light from the Satellite Power System				
DATE: March 1981		VOLUMES:		PAGES: 54
				REFERENCES: 19
ACQUISITION NO: Not Available				SOURCE: 5
KEY WORDS: Data Review Eye Hazards Growth and Development Mammal Studies Reflected Light Vegetation Effects				

SUBJECT: BIOLOGIC EFFECTS		SPSPO INDEX NO: BE-11	
AUTHOR(S): Yamaura, I.			
AUTHOR AFFILIATION: Electrotechnical Laboratory (Japan)			
TITLE: Measurements of 1.8 - 2.6 GHz Microwave Attenuation in the Human Torso			
DATE: August 1977	VOLUMES:	PAGES: 4	REFERENCES: 8
ACQUISITION NO: MTT-25, No. 8			SOURCE: 6
KEY WORDS: Experimental Data Microwave Human Absorption Research Measurement Methods			

COMPARATIVE ASSESSMENT (CATEGORY CA)

Documents in this category include information which is useful for comparing various energy options with the SPS concept. Existing energy options are included as are emerging energy technologies. Some documents characterize technologies, while others only provide information on certain aspects of a technology (such as performance or related environmental effects, for example). Methods which have been developed for comparing options also are included.

KEY WORDS:	PAGE NUMBER:
Applications	54, 57, 58, 60, 64
Atmospheric Effects	63, 68
Central Solar	53, 54, 55, 56, 57, 58, 60, 62, 67
Climate Effects	63
Economics	54, 55, 56, 57, 58, 59, 60, 61, 62, 64, 65, 66, 67, 68
Electric Distribution	60
Energy Conversion	56, 61, 66
Environmental Effects	55, 59, 63, 64, 66, 67, 68
Fossil Systems	53, 56, 59, 62, 63, 64, 66, 67, 68
Health Effects	53, 55, 59, 62, 63, 66, 67
Heliostats	66
Land Use	57, 64
Line Collectors	65
Methodology	54, 55, 57, 58, 60, 61, 62, 63, 64
Models	54, 57, 58, 60, 61
Net Energy	56, 59, 60, 62, 65
Nuclear Systems	53, 56, 59, 61, 62, 63, 64, 66, 67, 68
Photovoltaic	54, 56, 57, 58, 59, 63, 64,
Plate Collectors	65
Power Tower	66
Resources	55, 58, 59, 61, 66, 67
Safety	53, 62
Societal Effects	67
Solar Energy	53, 54, 55, 56, 57, 60, 65, 68
Solar Performance	54, 55, 56, 65, 66, 67
Storage	57, 61

**(Comparative Assessment
Category CA continued)**

KEY WORDS:

Terrestrial Solar

Waste Heat

PAGE NUMBER:

53, 54, 55, 56, 57, 58, 59, 62, 64, 65, 66, 67

63

RELATED CATEGORIES:

Energy Alternatives and Policy (EA)

All other categories include information on SPS

SUBJECT: COMPARATIVE ASSESSMENT		SPSPO INDEX NO: CA-29	
AUTHOR(S): Argonne National Laboratory			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: Comparative Health and Safety Assessment of the Satellite Power System and Other Electrical Generation Alternatives			
DATE: December 1980	VOLUMES:	PAGES: 154	REFERENCES: 133
ACQUISITION NO: DOE/ER-0091			SOURCE: 5
KEY WORDS: Central Solar Fossil Systems Health Effects		Nuclear Systems Safety Terrestrial Solar	

SUBJECT: COMPARATIVE ASSESSMENT		SPSPO INDEX NO: CA-31	
AUTHOR(S): Argonne National Laboratory			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: <i>NOT AVAILABLE - Final Comparative Assessment of SPS and Six Other Energy Technologies expected to be published in March 1981</i>			
DATE:	VOLUMES:	PAGES:	REFERENCES:
ACQUISITION NO:			SOURCE: 5
KEY WORDS:			

SUBJECT: COMPARATIVE ASSESSMENT		SPSPO INDEX NO: CA-27	
AUTHOR(S): (1) Ayres, R. U. (4) Arnold, J. (2) Ridker, R. G. (1) Tayi, G. (3) Watson, W. D.			
AUTHOR AFFILIATION: (1) Carnegie-Mellon University (3) U.S. Geological Survey (2) Resources for the Future, Inc. (4) Variflex Corporation			
TITLE: Alternative Future Scenarios for the SPS Comparative Assessment			
DATE: August 1980	VOLUMES:	PAGES: 151	REFERENCES: 58
ACQUISITION NO: ANL/EES-TM-120			SOURCE: 5
KEY WORDS: Applications Models Economics Methodology			

SUBJECT: COMPARATIVE ASSESSMENT		SPSPO INDEX NO: CA-5	
AUTHOR(S): Bell, C. R.			
AUTHOR AFFILIATION: Jet Propulsion Laboratory			
TITLE: Assessment of a Solar Photovoltaic Power Conversion System for Central Station Application			
DATE: June 1975	VOLUMES:	PAGES: 57	REFERENCES: 22
ACQUISITION NO: 900-702 EM 342 294			SOURCE: 4
KEY WORDS: Central Solar Solar Performance Photovoltaic Terrestrial Solar Solar Energy			

SUBJECT: COMPARATIVE ASSESSMENT		SPSPO INDEX NO: CA-22	
AUTHOR(S): Caputo, R. S.			
AUTHOR AFFILIATION: Jet Propulsion Laboratory			
TITLE: An Initial Study of Solar Power Plants Using A Distributed Network of Point Focusing Collectors			
DATE: July 1975	VOLUMES:	PAGES: 122	REFERENCES: 14
ACQUISITION NO: JPL 900-724 EM 342-308			SOURCE: 4
KEY WORDS: Central Solar Economics Solar Performance Terrestrial Solar			

SUBJECT: COMPARATIVE ASSESSMENT		SPSPO INDEX NO: CA-1	
AUTHOR(S): Caputo, R. S.			
AUTHOR AFFILIATION: Jet Propulsion Laboratory			
TITLE: An Initial Comparative Assessment of Orbital and Terrestrial Central Power Systems			
DATE: March 1977	VOLUMES:	PAGES: 119	REFERENCES: 60
ACQUISITION NO: 900-780			SOURCE: 4
KEY WORDS: Economics Environmental Effects Health Effects Methodology Resources Solar Energy			

SUBJECT: COMPARATIVE ASSESSMENT		SPSPO INDEX NO: CA-12	
AUTHOR(S): Cirillo, R. R. Levine, E. P. Cho, B. S. Monarch, M. R.			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: Comparative Analysis of Net Energy Balance of Satellite Power Systems (SPS) and Other Energy Systems			
DATE: April 1980	VOLUMES:	PAGES: 136	REFERENCES: 74
ACQUISITION NO: DOE/ER-0056			SOURCE: 5
KEY WORDS: Energy Conversion Nuclear Systems Fossil Systems Photovoltaic Net Energy Terrestrial Solar			

SUBJECT: COMPARATIVE ASSESSMENT		SPSPO INDEX NO: CA-21	
AUTHOR(S): Claverie, M. J. Dupas, A. P.			
AUTHOR AFFILIATION: Centre National de la Recherche Scientifique			
TITLE: Preliminary Evaluation of Ground and Space Solar Electricity Market in 2025			
DATE: October 1978	VOLUMES:	PAGES: 19	REFERENCES: 8
ACQUISITION NO: IAF78-187			SOURCE: 42
KEY WORDS: Central Solar Solar Energy Economics Solar Performance Photovoltaic Terrestrial Solar			

SUBJECT: COMPARATIVE ASSESSMENT			SPSPO INDEX NO: CA-28	
AUTHOR(S): Claverie, M. J. Dupas, A. P.				
AUTHOR AFFILIATION: Centre National de la Recherche Scientifique				
TITLE: Terrestrial Versus Space Baseload Solar Electricity				
DATE: September 1979		VOLUMES:	PAGES: 22	REFERENCES: 18
ACQUISITION NO: IAF 79-172			SOURCE: 42	
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Central Solar Economics Land Use </div> <div> Photovoltaics Storage Terrestrial Solar </div> </div>				

SUBJECT: COMPARATIVE ASSESSMENT			SPSPO INDEX NO: CA-8	
AUTHOR(S): Coates, V. T.				
AUTHOR AFFILIATION: George Washington University				
TITLE: A Handbook of Technology Assessment				
DATE: March 1978		VOLUMES:	PAGES: 102	REFERENCES: 25
ACQUISITION NO: TID-28503			SOURCE: 5	
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Applications Economics Methodology </div> <div> Models Solar Energy </div> </div>				

SUBJECT: COMPARATIVE ASSESSMENT			SPSPO INDEX NO: CA-17
AUTHOR(S): Crowley, J. H. Ziegler, E. J.			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: Satellite Power Systems (SPS) Cost Review			
DATE: May 1980	VOLUMES:	PAGES: 88	REFERENCES: 26
ACQUISITION NO: DOE/TIC-11190			SOURCE: 5
KEY WORDS: Economics Photovoltaic Resources			

SUBJECT: COMPARATIVE ASSESSMENT			SPSPO INDEX NO: CA-23
AUTHOR(S): Doane, J. W. O'Toole, R. P.			
AUTHOR AFFILIATION: Jet Propulsion Laboratory			
TITLE: Baseline Economic Analysis for Solar and Conventional Central Power Plants			
DATE: November 1975	VOLUMES:	PAGES: 28	REFERENCES: 12
ACQUISITION NO: JPL 900-727 EM 342-323			SOURCE: 4
KEY WORDS: Applications Central Solar Economics Methodology Models Terrestrial Solar			

SUBJECT: COMPARATIVE ASSESSMENT			SPSPO INDEX NO: CA-2	
AUTHOR(S): Fraley, D. W. McDonald, C. L. Carter, N. E.				
AUTHOR AFFILIATION: Pacific Northwest Laboratory				
TITLE: A Review of Issues and Applications of Net Energy Analysis				
DATE: May 1978		VOLUMES:	PAGES: 48	REFERENCES: 21
ACQUISITION NO: PNL-SA-6619			SOURCE: 13	
KEY WORDS: Applications Economics Methodology Models Net Energy Solar Energy				

SUBJECT: COMPARATIVE ASSESSMENT			SPSPO INDEX NO: CA-24	
AUTHOR(S): Fujita, T.				
AUTHOR AFFILIATION: Jet Propulsion Laboratory				
TITLE: Preliminary Studies of Electrical and Hydrogen Pipeline Distribution and Cost Optimization of Electrical Transmission Lines				
DATE: March 1976		VOLUMES:	PAGES: 124	REFERENCES: 46
ACQUISITION NO: JPL 900-734 EM 342-332			SOURCE: 4	
KEY WORDS: Central Solar Economics Electric Distribution Methodology Models				

SUBJECT: COMPARATIVE ASSESSMENT			SPSPO INDEX NO: CA-25	
AUTHOR(S): Fujita, T.				
AUTHOR AFFILIATION: Jet Propulsion Laboratory				
TITLE: Preliminary Data on Electrical Energy Storage Systems Utility Applications				
DATE: April 1976	VOLUMES:	PAGES: 48	REFERENCES: 9	
ACQUISITION NO: JPL 900-738 EM 342-333			SOURCE: 4	
KEY WORDS: Economics Energy Conversion Storage Systems				

SUBJECT: COMPARATIVE ASSESSMENT			SPSPO INDEX NO: CA-19	
AUTHOR(S): Gallagher, J. M. Carasso, M.		Barany, R. Zimmermann, R. G.		
AUTHOR AFFILIATION: Bechtel Corporation				
TITLE: Direct Requirements of Capital, Manpower, Materials and Equipment for Selected Energy Futures				
DATE: April 1976	VOLUMES:	PAGES: 131	REFERENCES: None	
ACQUISITION NO: ERDA Contract E (49-1)-3794			SOURCE: 13	
KEY WORDS: Methodology Models Nuclear Systems Resources				

SUBJECT: COMPARATIVE ASSESSMENT 1			SPSPO INDEX NO: CA-11	
AUTHOR(S): Habegger, L. J. Gasper, J. R. Brown, C. D.				
AUTHOR AFFILIATION: Argonne National Laboratory				
TITLE: Health and Safety: Preliminary Comparative Assessment of the Satellite Power System (SPS) and Other Energy Alternatives				
DATE: April 1980		VOLUMES:		PAGES: 123
				REFERENCES: 69
ACQUISITION NO: DOE/ER-0053				SOURCE: 5
KEY WORDS: Central Solar Fossil Systems Health Effects Nuclear Systems Safety Terrestrial Solar				

SUBJECT: COMPARATIVE ASSESSMENT			SPSPO INDEX NO: CA-20	
AUTHOR(S): Energy Analysis, Institute for				
AUTHOR AFFILIATION: Oak Ridge Associated Universities				
TITLE: Net Energy Analysis of Five Energy Systems				
DATE: April 1977		VOLUMES:		PAGES: 55
				REFERENCES: 11
ACQUISITION NO: ORAU/IEA (R)-77-12				SOURCE: 13
KEY WORDS: Economics Fossil Systems Methodology Net Energy				

SUBJECT: COMPARATIVE ASSESSMENT			SPSPO INDEX NO: CA-16
AUTHOR(S): Kellermeyer, D. A.			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: Climate and Energy: A Comparative Assessment of the Satellite Power System (SPS) and Alternative Energy Technologies			
DATE: January 1980	VOLUMES:	PAGES: 73	REFERENCES: 88
ACQUISITION NO: DOE/ER-0050			SOURCE: 5
KEY WORDS: Atmospheric Effects Climate Effects Fossil Systems		Nuclear Systems Photovoltaic Waste Heat	

SUBJECT: COMPARATIVE ASSESSMENT			SPSPO INDEX NO: CA-10
AUTHOR(S): Levine, E. P. Senew, M. J. Cirillo, R. R.			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: Comparative Assessment of Environmental Welfare Issues Associated with the Satellite Power System (SPS) and Alternative Technologies			
DATE: April 1980	VOLUMES:	PAGES: 87	REFERENCES: 53
ACQUISITION NO: DOE/ER-0055			SOURCE: 5
KEY WORDS: Environmental Effects Fossil Systems Health Effects		Methodology Nuclear Systems Photovoltaic	

SUBJECT: COMPARATIVE ASSESSMENT		SPSPO INDEX NO: CA-13	
AUTHOR(S): Newsom, D. E. Wolsko, T. D.			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: Preliminary Comparative Assessment of Land Use for the Satellite Power System (SPS) and Alternative Electric Energy Technologies			
DATE: April 1980	VOLUMES:	PAGES: 22	REFERENCES: 17
ACQUISITION NO: DOE/ER-0054			SOURCE: 5
KEY WORDS: Fossil Systems Nuclear Systems Land Use Photovoltaic Methodology Terrestrial Solar			

SUBJECT: COMPARATIVE ASSESSMENT		SPSPO INDEX NO: CA-15	
AUTHOR(S): Samsa, M. E.			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: Selection of Alternative Central-Station Technologies for the Satellite Power System (SPS) Comparative Assessment			
DATE: April 1980	VOLUMES:	PAGES: 15	REFERENCES: None
ACQUISITION NO: DOE/ER-0052			SOURCE: 5
KEY WORDS: Applications Fossil Systems Economics Nuclear Systems Environmental Effects Photovoltaic			

SUBJECT: COMPARATIVE ASSESSMENT		SPSPO INDEX NO: CA-4	
AUTHOR(S): Selcuk, M. K.			
AUTHOR AFFILIATION: Jet Propulsion Laboratory			
TITLE: Preliminary Assessment of Flat Plate Collector Solar Thermal Power Plants			
DATE: March 1975	VOLUMES:	PAGES: 104	REFERENCES: 76
ACQUISITION NO: 900-692 EM 342-283			SOURCE: 4
KEY WORDS: Economics Net Energy Plate Collectors Solar Energy Terrestrial Solar			

SUBJECT: COMPARATIVE ASSESSMENT		SPSPO INDEX NO: CA-7	
AUTHOR(S): Selcuk, M. K.			
AUTHOR AFFILIATION: Jet Propulsion Laboratory			
TITLE: A Preliminary Technical and Economic Assessment of Solar Power Plants Using Line Concentrators			
DATE: July 1975	VOLUMES:	PAGES: 71	REFERENCES: 34
ACQUISITION NO: 900-704 EM 342-302			SOURCE: 4
KEY WORDS: Economics Line Collectors Net Energy Solar Energy Solar Performance Terrestrial Solar			

SUBJECT: COMPARATIVE ASSESSMENT		SPSPO INDEX NO: CA-6	
AUTHOR(S): Selcuk, M. K.			
AUTHOR AFFILIATION: Jet Propulsion Laboratory			
TITLE: Survey of Several Central Receiver Solar Thermal Power Plant Design Concepts			
DATE: August 1975	VOLUMES:	PAGES: 82	REFERENCES: 20
ACQUISITION NO: 900-714 EM 342-311		SOURCE: 4	
KEY WORDS: Economics Energy Conversion Heliostats		Power Tower Solar Performance Terrestrial Solar	

SUBJECT: COMPARATIVE ASSESSMENT		SPSPO INDEX NO: CA-3	
AUTHOR(S): Smith, K. R. Weyant, J. Holdren, J. P.			
AUTHOR AFFILIATION: Jet Propulsion Laboratory			
TITLE: Evaluation of Conventional Power Systems			
DATE: July 1975	VOLUMES:	PAGES: 187	REFERENCES: 236
ACQUISITION NO: ERG-75-5		SOURCE: 4	
KEY WORDS: Economics Environmental Effects Fossil Systems		Health Effects Nuclear Systems Resources	

SUBJECT: COMPARATIVE ASSESSMENT		SPSPO INDEX NO: CA-26	
AUTHOR(S): TRW Energy Systems Planning Division			
AUTHOR AFFILIATION: TRW, Inc.			
TITLE: Characterization of Alternative Electric Generation Technologies for the SPS Comparative Assessment			
DATE: August 1980	VOLUMES: 2	PAGES: 282	REFERENCES: 81
ACQUISITION NO: ANL/EES-TM-121 V. 1, Summary, 28 pp.		SOURCE: V. 2, Technologies, 254 pp. 5	
KEY WORDS: Central Solar Economics Environmental Effects		Fossil Systems Nuclear Systems Terrestrial Solar	

SUBJECT: COMPARATIVE ASSESSMENT		SPSPO INDEX NO: CA-14	
AUTHOR(S): Wolsko, T. D. Buehring, W. Cirillo, R. R. Gasper, J. R.		Habegger, L. J. Hub, K. Newsom, D. E. Samsa, M. E. Stenehjem, E. J. Whitfield, R.	
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: A Methodology for the Comparative Assessment of the Satellite Power System (SPS) and Alternative Technologies			
DATE: January 1980	VOLUMES:	PAGES: 72	REFERENCES: 63
ACQUISITION NO: DOE/ER-0051		SOURCE: 5	
KEY WORDS: Economics Environmental Effects Health Effects		Resources Societal Effects Solar Performance	

SUBJECT: COMPARATIVE ASSESSMENT		SPSPO INDEX NO: CA-30	
AUTHOR(S): Wolsko, T. D. Gasper, J. R. Levine, E. P. Tanzman, E. Brown, C. D. Habegger, L. J. Newsom, D. E. Van Kuiken, J. Cirillo, R. R. Hub, K. Samsa, M. E. Whitfield, R.			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: A Preliminary Assessment of the Satellite Power System (SPS) and Six Other Energy Technologies			
DATE: Apr11 1980	VOLUMES:	PAGES: 189	REFERENCES: 145
ACQUISITION NO: ANL/AA-20			SOURCE: 5
KEY WORDS: Atmospheric Effects Fossil Systems Economics Nuclear Systems Environmental Effects Solar Energy			

ENERGY ALTERNATIVES AND POLICY (CATEGORY EA)

This category is a collection of reports and papers that deals with (1) SPS as a future energy alternative, (2) the role of SPS in national and/or international energy policy matters, or (3) other major energy technologies of interest to the development of SPS and their relationships with energy alternatives and policy.

KEY WORDS:	PAGE NUMBER:
Comparative Methods	76
Concepts	71, 73, 75, 77, 78
Economics	72, 73, 75, 76
Energy Options	71, 72, 73, 74, 75, 77, 78
Energy Ratio	72, 74
Environmental Effects	73
Feasibility	71, 77
Fossil Fuels	71, 73, 78
Geothermal	71
Hydroelectric	71
Inexhaustible Resources	72, 73
International Interest	75
Issues	77
Legislation	77
Net Energy Analysis	72, 74
Nuclear Power	71, 73, 77
Ocean Conversion	76
Policy Analysis	72, 73, 75, 77
Political Process	71
Recommendations	71
Risks	71
Social Issues	72
Solar Conversion	76
Solar Power	71, 73, 75, 76, 77, 78
Technology Requirements	72, 76, 77, 78
Utility Decisions	76

(Energy Alternatives and Policy
Category EA continued)

KEY WORDS:

Wind Conversion

PAGE NUMBER:

76

RELATED CATEGORIES:

Comparative Analysis (CA)

Social Issues (SI)

All other categories include information on SPS

SUBJECT: ENERGY ALTERNATIVES AND POLICY		SPSPO INDEX NO: EA-1	
AUTHOR(S): American Institute of Aeronautics and Astronautics			
AUTHOR AFFILIATION: American Institute of Aeronautics and Astronautics			
TITLE: Solar Power Satellites			
DATE: January 1979	VOLUMES:	PAGES: 4	REFERENCES: None
ACQUISITION NO: Astronautics and Aeronautics January 1979 pp. 14-17			SOURCE: 2
KEY WORDS: Concepts Energy Options Feasibility		Recommendations Risks Technology Requirements	

SUBJECT: ENERGY ALTERNATIVES AND POLICY		SPSPO INDEX NO: EA-9	
AUTHOR(S): Babcock, W. H. Siegel, S. B. Swanson, C. A.			
AUTHOR AFFILIATION: PRC Energy Analysis Company			
TITLE: Energy Demands, 1972 - 2000			
DATE: April 1979	VOLUMES:	PAGES: 150	REFERENCES: 21
ACQUISITION NO: HCP/R4024-01			SOURCE: 5
KEY WORDS: Energy Options Fossil Fuels Geothermal		Hydroelectric Nuclear Power Solar Power	

SUBJECT: ENERGY ALTERNATIVES AND POLICY		SPSPO INDEX NO: EA-7	
AUTHOR(S): Energy Research and Development Administration			
AUTHOR AFFILIATION: Energy Research and Development Administration			
TITLE: Proceedings of the Public Meeting to Review the Status of the Inexhaustible Energy Resources Study			
DATE: July 1977	VOLUMES:	PAGES: 52	REFERENCES: None
ACQUISITION NO: CONF-770715			SOURCE: 5
KEY WORDS: Economics Inexhaustible Resources Political Process Social Issues Technology Requirements			

SUBJECT: ENERGY ALTERNATIVES AND POLICY		SPSPO INDEX NO: EA-12	
AUTHOR(S): General Accounting Office			
AUTHOR AFFILIATION: U. S. General Accounting Office			
TITLE: Net Energy Analysis: Little Progress and Many Problems			
DATE: August 1977	VOLUMES:	PAGES: 15	REFERENCES: None
ACQUISITION NO: EMD-77-57			SOURCE: 9
KEY WORDS: Energy Options Energy Ratio Net Energy Analysis Policy Analysis			

SUBJECT: ENERGY ALTERNATIVES AND POLICY			SPSPO INDEX NO: EA-8	
AUTHOR(s): Glaser, P. E.				
AUTHOR AFFILIATION: Arthur D. Little, Inc.				
TITLE: Satellite Solar Power--An Option for Power Generation on Earth				
DATE: June 1977	VOLUMES:	PAGES: 25	REFERENCES: 11	
ACQUISITION NO: By Title (World Electrotechnical Congress, Moscow)			SOURCE: 23	
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Concepts Economics Energy Options </div> <div> Environmental Effects Solar Power </div> </div>				

SUBJECT: ENERGY ALTERNATIVES AND POLICY			SPSPO INDEX NO: EA-13	
AUTHOR(s): Grey, J.				
AUTHOR AFFILIATION: American Institute of Aeronautics and Astronautics				
TITLE: Energy Since the Oil War				
DATE: November 1975	VOLUMES:	PAGES: 37	REFERENCES: 25	
ACQUISITION NO: By Title, Aeronautics and Astronautics			SOURCE: 2	
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Energy Options Fossil Fuels Inexhaustible Resources </div> <div> Nuclear Power Policy Analysis Solar Power </div> </div>				

SUBJECT: ENERGY ALTERNATIVES AND POLICY			SPSPO INDEX NO: EA-10
AUTHOR(S): Herendeen, R. A.			
AUTHOR AFFILIATION: University of Illinois			
TITLE: Two Technologies Near the Net Energy Limit: Gasohol and Solar Satellite Power Station			
DATE: August 1978	VOLUMES:	PAGES: 18	REFERENCES: 20
ACQUISITION NO: By Title			SOURCE: 28
KEY WORDS: Net Energy Analysis			

SUBJECT: ENERGY ALTERNATIVES AND POLICY			SPSPO INDEX NO: EA-3
AUTHOR(S): Herendeen, R. A. Kary, T. Rebitzer, J.			
AUTHOR AFFILIATION: University of Illinois			
TITLE: Energy Analysis of the Solar Power Satellite			
DATE: 3 August 1979	VOLUMES:	PAGES: 4	REFERENCES: 26
ACQUISITION NO: 0036-8075/79/0803-0451 Science, Vol. 205, No. 4405			SOURCE: 7
KEY WORDS: Energy Options Energy Ratio Net Energy Analysis			

SUBJECT: ENERGY ALTERNATIVES AND POLICY			SPSPO INDEX NO: EA-14
AUTHOR(S): Kassing, D. Reinhartz, K. K.			
AUTHOR AFFILIATION: European Space Technology and Engineering Center			
TITLE: Energy for Europe from Space			
DATE: 1978	VOLUMES:	PAGES: 9	REFERENCES: 20
ACQUISITION NO: By Title, ESA Journal, Vol. 2, pp. 179-187			SOURCE: 1
KEY WORDS: Concepts Economics Energy Options International Interest Solar Power			

SUBJECT: ENERGY ALTERNATIVES AND POLICY			SPSPO INDEX NO: EA-5
AUTHOR(S): Levinson, R. J.			
AUTHOR AFFILIATION: Polytechnic Institute of New York			
TITLE: Orbital Power Generation			
DATE: November 1977	VOLUMES:	PAGES: 6	REFERENCES: 2
ACQUISITION NO: The Polytechnic Engineer Vol. XVIII, No. 1 pp. 48-52, 56			SOURCE: 11
KEY WORDS: Concepts Energy Options Solar Power Technology Requirements			

SUBJECT: ENERGY ALTERNATIVES AND POLICY			SPSPO INDEX NO: EA-15
AUTHOR(S): Leon, H. I. Gorman, R. Dawley, R.			
AUTHOR AFFILIATION: TRW Systems Group			
TITLE: Solar Energy Options for Electric Utilities			
DATE: April 1976	VOLUMES:	PAGES: 3	REFERENCES: 4
ACQUISITION NO: PB6-231			SOURCE: 13
KEY WORDS: Comparative Methods Ocean Conversion Solar Conversion Utility Decisions Wind Conversion			

SUBJECT: ENERGY ALTERNATIVES AND POLICY			SPSPO INDEX NO: EA-6
AUTHOR(S): Machol, R. E.			
AUTHOR AFFILIATION: Northwestern University			
TITLE: Solar Energy - A Subjective Assessment for NASA			
DATE: March 1977	VOLUMES:	PAGES: 23	REFERENCES: None
ACQUISITION NO: By Title			SOURCE: 4
KEY WORDS: Economics Solar Power Technology Requirements			

SUBJECT: ENERGY ALTERNATIVES AND POLICY			SPSPO INDEX NO: EA-11
AUTHOR(S): Myers, D. H.			
AUTHOR AFFILIATION: U. S. Department of Energy			
TITLE: The Energy Research and Development Program of the United States			
DATE: December 1978	VOLUMES:	PAGES: 25	REFERENCES: None
ACQUISITION NO: By Title; Anglo-American Workshop on Energy and Aerospace, London			SOURCE: 2
KEY WORDS: Energy Options Nuclear Power Feasibility Policy Analysis Issues Solar Power			

SUBJECT: ENERGY ALTERNATIVES AND POLICY			SPSPO INDEX NO: EA-2
AUTHOR(S): Smith, M.S.			
AUTHOR AFFILIATION: Congressional Research Service Library of Congress			
TITLE: Solar Energy from Space: Satellite Power Stations			
DATE: March 1979	VOLUMES:	PAGES: 12	REFERENCES: 21
ACQUISITION NO: Issue Brief No. IB 78012			SOURCE: 3
KEY WORDS: Concepts Legislation Feasibility Policy Analysis Issues Technology Requirements			

ELECTROMAGNETIC COMPATIBILITY (CATEGORY EC)

This category is concerned with reports and papers which address the possibility that SPS might produce electromagnetic incompatibilities (radio interference) with other electric or electronic systems in any portion of the frequency spectrum, and mitigating practices which might be useful in the event that interference problems were encountered.

KEY WORDS:

PAGE NUMBER:

Aeronomy	81, 82
Antenna Characteristics	81, 82, 83
Astronomy	82
Energy Distribution	82, 83, 84
Equipment Susceptibility	81, 83, 85
Field Enhancement	82
Harmonics	81, 82, 83, 85
Ionosphere Effects	84, 85
Measurements	81, 82, 83, 84
Mitigation	81, 82, 84
Noise Interference	84
Rules and Regulations	81, 82, 84
Sidebands	83, 84, 85
Spurious Emissions	82, 83, 84
Troposphere Effects	85

RELATED CATEGORIES:

Atmospheric Effects (AE)

Environmental Effects (EE)

Power Generation and Transmission (PT)

Systems Engineering (SE)

THIS PAGE
WAS INTENTIONALLY
LEFT BLANK

SUBJECT: ELECTROMAGNETIC COMPATIBILITY		SPSPO INDEX NO: EC-7	
AUTHOR(S): Anderson, B. Lovell, B.			
AUTHOR AFFILIATION: University of Manchester (England)			
TITLE: Effect of Solar Power Satellite Transmissions on Radio Astronomical Research			
DATE: December 1978	VOLUMES:	PAGES: 11	REFERENCES: 6
ACQUISITION NO: By Title; Anglo-American Workshop on Energy and Aerospace, Royal Aeronautical Society (London)			SOURCE: 2
KEY WORDS: Astronomy Equipment Susceptibility Rules and Regulations			

SUBJECT: ELECTROMAGNETIC COMPATIBILITY		SPSPO INDEX NO: EC-9	
AUTHOR(S): Davis, K. A. (1) Morrison, E. L. (2) Grant, W. B. (2) Juroshek, J. R. (2)			
AUTHOR AFFILIATION: Pacific Northwest Laboratory (1) Institute for Telecommunications Sciences (2)			
TITLE: Environmental Assessment for the Satellite Power System Concept Development and Evaluation Program-Electromagnetic Systems Compatibility.			
DATE: January 1981	VOLUMES:	PAGES: 91	REFERENCES: 30
ACQUISITION NO: DOE/ER-0096			SOURCE: 5
KEY WORDS: Antenna Characteristics Measurements Equipment Susceptibility Mitigation Harmonics Rules and Regulations			

SUBJECT: ELECTROMAGNETIC COMPATIBILITY			SPSPO INDEX NO: EC-3
AUTHOR(S): National Research Council			
AUTHOR AFFILIATION: National Academy of Sciences			
TITLE: Radiation Intensity of the PAVE PAWS Radar System			
DATE: 1979	VOLUMES:	PAGES: 46	REFERENCES: 5
ACQUISITION NO: Contract F49620-78-C-0118			SOURCE: 27
KEY WORDS: Antenna Characteristics Measurements Energy Distribution Sidebands Harmonics Spurious Emissions			

SUBJECT: ELECTROMAGNETIC COMPATIBILITY			SPSPO INDEX NO: EC-4
AUTHOR(S): Ott, R. H. Morrison, E. L. Grant, W. B.			
AUTHOR AFFILIATION: U. S. Department of Commerce			
TITLE: Antenna Patterns for the Solar Power Satellite			
DATE: January 1979	VOLUMES:	PAGES: 21	REFERENCES: 12
ACQUISITION NO: NTIA-TM-79-5			SOURCE: 5
KEY WORDS: Antenna Characteristics Harmonics Energy Distribution Sidebands Equipment Susceptibility Spurious Emissions			

SUBJECT: ELECTROMAGNETIC COMPATIBILITY			SPSPO INDEX NO: EC-1	
AUTHOR(S): Pacific Northwest Laboratory				
AUTHOR AFFILIATION: Pacific Northwest Laboratory				
TITLE: Initial Assessment--Electromagnetic Compatibility Aspects of Proposed SPS Microwave Power Transmission System (MPTS) Operations				
DATE: February 1978		VOLUMES:	PAGES: 133	REFERENCES: Bibliography
ACQUISITION NO: PNL-2482			SOURCE: 13	
KEY WORDS: Energy Distribution Ionosphere Effects Mitigation			Rules and Regulations Sidebands Spurious Emissions	

SUBJECT: ELECTROMAGNETIC COMPATIBILITY			SPSPO INDEX NO: EC-8	
AUTHOR(S): Spaulding, A. D.				
AUTHOR AFFILIATION: U. S. Department of Commerce				
TITLE: Man-Made Noise: The Problem and Recommended Steps Toward Solution				
DATE: April 1976		VOLUMES:	PAGES: 185	REFERENCES: 166
ACQUISITION NO: OT-76-85			SOURCE: 5	
KEY WORDS: Measurements Mitigation Noise Interference			Rules and Regulations Spurious Emissions	

SUBJECT: ELECTROMAGNETIC COMPATIBILITY		SPSPO INDEX NO: EC-2	
AUTHOR(S): Telecommunications Sciences, Institute of			
AUTHOR AFFILIATION: U. S. Department of Commerce			
TITLE: Electromagnetic Compatibility, Tropospheric and Ionospheric Aspects of SPS MPTS Operations			
DATE: March 1978	VOLUMES:	PAGES: 34	REFERENCES: 22
ACQUISITION NO: PNL-2616			SOURCE: 13
KEY WORDS: Equipment Susceptibility Sidebands Harmonics Troposphere Effects Ionosphere Effects			

THIS PAGE
WAS INTENTIONALLY
LEFT BLANK

ENVIRONMENTAL EFFECTS (CATEGORY EE)

Reports, articles and papers in this category cover all environmental concerns about SPS, and generally do not emphasize one particular environmental issue. Multiple issues and inter-relationships between potential effects of SPS on the environment are included in most citations.

KEY WORDS:	PAGE NUMBER:
Air Quality	92, 93, 94, 95, 98, 100
Atmospheric Effects	89, 90, 91, 92, 94, 96, 99
Atmospheric Heating	89
Ecosystem Impacts	90, 92, 93, 97, 98, 100
Electromagnetic Compatibility	89, 91, 92, 94, 97, 98, 99
Health Maintenance	93, 95, 97, 98, 100
Hearing Effects	96
Ionospheric Effects	89, 90, 91, 92, 94, 99
Ionospheric Perturbations	89
Land Use	92, 93, 94, 95, 98
Laser Effects	89, 90
Microwave Effects	89, 91, 92, 94, 98, 99
Noise	94, 95, 96, 97, 100
Nuclear Effects	97
Occupational Effects	90, 91, 93, 95, 96, 98, 100
Operations Effects	90, 94, 95, 96, 97, 98, 99
Ozone	97
Photovoltaics	93, 98
Public Welfare	96, 99
Reflected Light	90, 96
Safety Issues	90, 92, 93, 97, 98
Societal Effects	91, 92, 98
Solid Waste	93, 95, 97
Space Effects	89, 90, 91, 92, 95, 99, 100
Space Habitat	95
Space Health	91, 95
Terrestrial Effects	89, 91, 92, 94
Water Resources	92, 93, 94, 95
Wildlife Effects	89, 94, 96

(Environmental Effects
Category EE Continued)

RELATED CATEGORIES:

Atmospheric Effects (AE)

Biologic Effects (BE)

Electromagnetic Compatibility (EC)

Power Generation and Transmission (PT)

Systems Analyses (SA)

Systems Engineering (SE)

Space Transportation (ST)

SUBJECT: ENVIRONMENTAL EFFECTS			SPSPO INDEX NO: EE-22
AUTHOR(S): (1) Abromavage, M. M. (2) Valentino, A. R.			
AUTHOR AFFILIATION: (1) IIT Research Institute (2) Argonne National Laboratory			
TITLE: Environmental Assessment for the Satellite Power System Concept Development and Evaluation Program			
DATE: January 1981	VOLUMES:	PAGES: 8	REFERENCES: 8
ACQUISITION NO: 81-0244			SOURCE: - 2
KEY WORDS: Atmospheric Effects Electromagnetic Compatibility Ionospheric Effects		Microwave Effects Space Health Terrestrial Effects	

SUBJECT: ENVIRONMENTAL EFFECTS			SPSPO INDEX NO: EE-3
AUTHOR(S): Beverly, R. E.			
AUTHOR AFFILIATION: None			
TITLE: Satellite Power System (SPS) Laser Environmental Impact Study			
DATE: February 1979	VOLUMES:	PAGES: 138	REFERENCES: 139
ACQUISITION NO: NAS8-32475			SOURCE: 4
KEY WORDS: Atmospheric Heating Ionospheric Perturbations Laser Effects		Wildlife Effects	

SUBJECT: ENVIRONMENTAL EFFECTS			SPSPO INDEX NO: EE-19
AUTHOR(S): Beverly, R. E.			
AUTHOR AFFILIATION: Rockwell International			
TITLE: Satellite Power Systems (SPS) Laser Studies; Volume I: Laser Environmental Impact Study			
DATE: November 1980	VOLUMES:	PAGES: 85	REFERENCES: 139
ACQUISITION NO: NASA CR 3346 NAS 8-32475			SOURCE: 4
KEY WORDS: Atmospheric Effects Laser Effects Ecosystem Impacts Operations Effects Ionospheric Effects Safety Issues			

SUBJECT: ENVIRONMENTAL EFFECTS			SPSPO INDEX NO: EE-10
AUTHOR(S): Boeing Aerospace Company			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: Satellite Power System (SPS) Brightness Due to Reflected Sunlight			
DATE: October 1980	VOLUMES:	PAGES: 73	REFERENCES: 8
ACQUISITION NO: DOE/ER-0081			SOURCE: 5
KEY WORDS: Operations Effects Reflected Light Space Effects			

SUBJECT: ENVIRONMENTAL EFFECTS		SPSPO INDEX NO: EE-7	
AUTHOR(S): Dickinson, R. M.			
AUTHOR AFFILIATION: Jet Propulsion Laboratory			
TITLE: Satellite Power System (SPS) Microwave Subsystem Impacts and Benefits			
DATE: September 1977	VOLUMES:	PAGES: 104	REFERENCES: 37
ACQUISITION NO: 900-800			SOURCE: 4
KEY WORDS: Electromagnetic Compatibility Ionospheric Effects Microwave Effects		Occupational Effects Space Health Terrestrial Effects	

SUBJECT: ENVIRONMENTAL EFFECTS		SPSPO INDEX NO: EE-6	
AUTHOR(S): Energy, U.S. Department of			
AUTHOR AFFILIATION: U.S. Department of Energy			
TITLE: Preliminary Environmental Assessment for the Satellite Power System (SPS)			
DATE: October 1978	VOLUMES: 2	PAGES: 218	REFERENCES: 122
ACQUISITION NO: DOE/ER-0021/1; V. 1, Summary (46 pp) DOE/ER-0021/2; V. 2, Details (172 pp)			SOURCE: 5
KEY WORDS: Atmospheric Effects Electromagnetic Compatibility Ionospheric Effects		Microwave Effects Space Effects Terrestrial Effects	

SUBJECT: ENVIRONMENTAL EFFECTS			SPSPO INDEX NO: EE-5
AUTHOR(S): Energy, U.S. Department of			
AUTHOR AFFILIATION: U.S. Department of Energy			
TITLE: Preliminary Environmental Assessment for the Satellite Power System (SPS), Revision 1			
DATE: January 1980	VOLUMES: 2	PAGES: 252	REFERENCES: 199
ACQUISITION NO: DOE/ER-UU36/1; V. 1, Summary (52 pp) DOE/ER-0036/1; V. 2, Details(200 pp)			SOURCE: 5
KEY WORDS: Atmospheric Effects Electromagnetic Compatibility Ionospheric Effects		Microwave Effects Space Effects Terrestrial Effects	

SUBJECT: ENVIRONMENTAL EFFECTS			SPSPO INDEX NO: EE-11
AUTHOR(S): Energy Research and Development Administration			
AUTHOR AFFILIATION: Energy Research and Development Administration			
TITLE: Solar Program Assessment: Environmental Factors for Solar Thermal Electric			
DATE: March 1977	VOLUMES:	PAGES: 73	REFERENCES: 24
ACQUISITION NO: ERDA 77-47/4			SOURCE: 20
KEY WORDS: Air Quality Ecosystem Impacts Land Use		Safety Issues Societal Effects Water Resources	

SUBJECT: ENVIRONMENTAL EFFECTS		SPSPO INDEX NO: EE-12	
AUTHOR(S): Energy Research and Development Administration			
AUTHOR AFFILIATION: Energy Research and Development Administration			
TITLE: Solar Program Assessment: Environmental Factors for Photovoltaics			
DATE: March 1977	VOLUMES:	PAGES: 62	REFERENCES: 47
ACQUISITION NO: ERDA 77-47/3			SOURCE: 20
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Air Quality Health Maintenance Land Use </div> <div> Occupational Effects Photovoltaics Solid Waste </div> </div>			

SUBJECT: ENVIRONMENTAL EFFECTS		SPSPO INDEX NO: EE-18	
AUTHOR(S): Energy Research and Development Administration			
AUTHOR AFFILIATION: Energy Research and Development Administration			
TITLE: Solar Program Assessment: Environmental Factors for Solar Total Energy Systems			
DATE: March 1977	VOLUMES:	PAGES: 68	REFERENCES: 17
ACQUISITION NO: ERDA 77-47/5			SOURCE: 20
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Air Quality Ecosystem Impacts Land Use </div> <div> Safety Issues Solid Waste Water Resources </div> </div>			

SUBJECT: ENVIRONMENTAL EFFECTS		SPSPO INDEX NO: EE-9	
AUTHOR(S): Environmental Resources Group			
AUTHOR AFFILIATION: Environmental Resources Group			
TITLE: Prototype Environmental Assessment of the Impacts of Siting and Constructing a Satellite Power System (SPS) Ground Receiving Station (GRS)			
DATE: August 1980	VOLUMES:	PAGES: 269	REFERENCES: Bibliography
ACQUISITION NO: DOE/ER-0072			SOURCE: 5
KEY WORDS: Air Quality Terrestrial Effects Land Use Water Resources Noise Wildlife Effects			

SUBJECT: ENVIRONMENTAL EFFECTS		SPSPO INDEX NO: EE-8	
AUTHOR(S): Halverson, S. I. (1) Davis, K. (3) Rote, D. M. (1) White, M. (4) Rush, C. M. (2) Cahill, D. F. (5)			
AUTHOR AFFILIATION: (1) Argonne National Laboratory; (2) Institute for Telecommunications Sciences; (3) Pacific Northwest Laboratory; (4) Lawrence Berkeley Laboratory; (5) U. S. Environmental Protection Agency			
TITLE: Preliminary Assessment of the Environmental Impacts of the Satellite Power System (SPS)			
DATE: December 1978	VOLUMES:	PAGES: 17	REFERENCES: 3
ACQUISITION NO: By Title (Anglo-American Workshop on Energy and Aerospace, Royal Aeronautical Society, London)			SOURCE: 2
KEY WORDS: Atmospheric Effects Microwave Effects Electromagnetic Compatibility Operations Effects Ionospheric Effects Terrestrial Effects			

SUBJECT: ENVIRONMENTAL EFFECTS		SPSPO INDEX NO: EE-1	
AUTHOR(S): Kornberg, J. P. Chapman, P. K. Glaser, P. E.			
AUTHOR AFFILIATION: A. D. Little, Incorporated			
TITLE: Health Maintenance and Health Surveillance Considerations for an SPS Space Construction Community			
DATE: November 1978	VOLUMES:	PAGES: 12	REFERENCES: 5
ACQUISITION NO: AAS 78-176			SOURCE: 30
KEY WORDS: Health Maintenance Occupational Effects Operations Effects Space Effects Space Habitat Space Health			

SUBJECT: ENVIRONMENTAL EFFECTS		SPSPO INDEX NO: EE-4	
AUTHOR(S): Livingston, F. R.			
AUTHOR AFFILIATION: Jet Propulsion Laboratory			
TITLE: Satellite Power System (SPS) Environmental Impacts Preliminary Assessment			
DATE: May 1978	VOLUMES:	PAGES: 23	REFERENCES: 10
ACQUISITION NO: JPL-900-822, Rev. A			SOURCE: 4
KEY WORDS: Air Quality Land Use Noise Solid Waste Water Resources			

SUBJECT: ENVIRONMENTAL EFFECTS		SPSPO INDEX NO: EE-2	
AUTHOR(S): Livingston, L. E.			
AUTHOR AFFILIATION: NASA Johnson Space Center			
TITLE: Visibility of Solar Power Satellites from the Earth			
DATE: February 1979	VOLUMES:	PAGES: 15	REFERENCES: None
ACQUISITION NO: JSC-14715			SOURCE: 4
KEY WORDS: Operations Effects Reflected Light			

SUBJECT: ENVIRONMENTAL EFFECTS		SPSPO INDEX NO: EE-20	
AUTHOR(S): Pearsons, K. S. White, P. H. Wilby, J. F.			
AUTHOR AFFILIATION: Bolt, Berenek and Newman, Inc.			
TITLE: An Evaluation of the Noise Impact of Satellite Power System.			
DATE: December 1980	VOLUMES:	PAGES: 126	REFERENCES: 35
ACQUISITION NO: LBL-11978			SOURCE: 5
KEY WORDS: Atmospheric Effects Hearing Effects Noise		Occupational Effects Public Welfare Wildlife Effects	

SUBJECT: ENVIRONMENTAL EFFECTS			SPSPO INDEX NO: EE-17
AUTHOR(S): Poch, L. A. Wolsko, T. D.			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: A Review of the Nuclear Waste Disposal Problem			
DATE: October 1979	VOLUMES:	PAGES: 17	REFERENCES: 12
ACQUISITION NO: ANL/EES-TM-68			SOURCE: 5
KEY WORDS: Nuclear Effects Operations Effects Safety Issues Solid Waste			

SUBJECT: ENVIRONMENTAL EFFECTS			SPSPO INDEX NO: EE-14
AUTHOR(S): Scott-Walton, B. Clark, K. M. Holt, B. R. Jones, D. C. Kaplan S. D. Krebs, J. S. Polson, P. Shepherd, R. A. Young, J. R.			
AUTHOR AFFILIATION: SRI International			
TITLE: Potential Environmental Effects of 765-kV Transmission Lines: Views Before the New York State Public Service Commission, Cases 26529 and 26559, 1976-1978			
DATE: November 1979	VOLUMES:	PAGES: 125	REFERENCES: Bibliography
ACQUISITION NO: DOE/EV-0056			SOURCE: 5
KEY WORDS: Ecosystem Impacts Electromagnetic Compatibility Health Maintenance Noise Ozone Safety Issues			

SUBJECT: ENVIRONMENTAL EFFECTS		SPSPO INDEX NO: EE-15	
AUTHOR(S): Smith, P.L. Gatzke, A.E. McCreary, S.T.			
AUTHOR AFFILIATION: Lawrence Berkeley Laboratory			
TITLE: Land Use and Environmental Impacts of Decentralized Solar Energy Use			
DATE: January 1980	VOLUMES:	PAGES: 307	REFERENCES: 125
ACQUISITION NO: DOE/EV-0067			SOURCE: 5
KEY WORDS: Air Quality Photovoltaics Health Maintenance Safety Issues Land Use Societal Effects			

SUBJECT: ENVIRONMENTAL EFFECTS		SPSPO INDEX NO: EE-13	
AUTHOR(S): SRI International			
AUTHOR AFFILIATION: SRI International			
TITLE: Final Environmental Impact Statement - Operation of the PAVE PAWS Radar System at Otis Air Force Base, MA.			
DATE: May 1979	VOLUMES: 2	PAGES: 853	REFERENCES: Bibliography
ACQUISITION NO: AD-A069200 (Vol. 1) AD-A069201 (Vol. 2)			SOURCE: 5
KEY WORDS: Ecosystem Impacts Microwave Effects Electromagnetic Compatibility Occupational Effects Health Maintenance Operations Effects			

SUBJECT: ENVIRONMENTAL EFFECTS		SPSPO INDEX NO: EE-16	
AUTHOR(S): Valentino, A. R.			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: Environmental Assessment for the Satellite Power System (SPS) Concept Development and Evaluation Program (CDEP)			
DATE: August 1980	VOLUMES:	PAGES: 127	REFERENCES: 81
ACQUISITION NO: DOE/ER-0069			SOURCE: 5
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Atmospheric Effects Electromagnetic Compatibility Ionospheric Effects </div> <div> Microwave Effects Operations Effects Space Health </div> </div>			

SUBJECT: ENVIRONMENTAL EFFECTS		SPSPO INDEX NO: EE-21	
AUTHOR(S): (1) Valentino, A. R. (2) Abromavage, M. M.			
AUTHOR AFFILIATION: (1) Argonne National Laboratory (2) IIT Research Institute			
TITLE: Environmental Assessment of the Satellite Power System Microwave Power Transmission System			
DATE: December 1980	VOLUMES:	PAGES: 4	REFERENCES: 4
ACQUISITION NO: By Title; National Telecommunications Conference (Houston)			SOURCE: 6
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Atmospheric Heating Electromagnetic Compatibility Ionospheric Effects </div> <div> Microwave Effects Occupational Effects Public Welfare </div> </div>			

SUBJECT: ENVIRONMENTAL EFFECTS		SPSPO INDEX NO: EE-23	
AUTHOR(S): White, M. R.			
AUTHOR AFFILIATION: Lawrence Berkeley Laboratory			
TITLE: Environmental Assessment for the Satellite Power System Concept Development and Evaluation Program - Nonmicrowave Health and Ecological Effects			
DATE: November 1980	VOLUMES:	PAGES: 86	REFERENCES: 51
ACQUISITION NO: DOE/ER-0089			SOURCE: 5
KEY WORDS: Air Quality Ecosystem Impacts Heath Maintenance Noise Occupational Effects Space Effects			

ECONOMICS AND FINANCES (CATEGORY EF)

This category of documents includes reports and papers which deal with the costs and economics involved in the development of SPS, and possible ways in which the development program might be financed in the future. Market potential, production costs and economic risks are included.

KEY WORDS:	PAGE NUMBER:
Consumption Patterns	103
Cost Model	104, 105
Cost Uncertainty	104, 105, 106, 107, 108
Demand Rates	103, 105
Disposal Costs	103
Emerging Technologies	103, 105, 106
Energy Costs	105, 106, 108
Energy Policy	103
Financial Requirements	106, 107, 108
Maintenance Cost	104, 105, 108
Market Potential	103
Operations Costs	104, 105, 106, 107
Production Cost	104, 105, 106, 107, 108
Returns	106, 107
Risks	104, 105, 106, 107
Rewards	106
Satellite Salvage	103
Uncertainties	105, 108

RELATED CATEGORIES:

Comparative Analyses (CA)

Energy Alternatives and Policy (EA)

Resources and Materials (RM)

Systems Analyses (SA)

Social Issues (SI)

THIS PAGE
WAS INTENTIONALLY
LEFT BLANK

SUBJECT: ECONOMICS AND FINANCES			SPSPO INDEX NO: EF-1
AUTHOR(S): ECON, Inc.			
AUTHOR AFFILIATION: ECON, Inc.			
TITLE: A Study of Some Economic Factors Relating to the Development and Implementation of a Satellite Power System			
DATE: January 1978	VOLUMES:	PAGES: 74	REFERENCES: None
ACQUISITION NO: NAS8-32698 77-146-1			SOURCE: 4
KEY WORDS: Consumption Patterns Energy Policy Demand Rates Market Potential Emerging Technologies			

SUBJECT: ECONOMICS AND FINANCES			SPSPO INDEX NO: EF-10
AUTHOR(S): ECON, Inc.			
AUTHOR AFFILIATION: ECON, Inc.			
TITLE: Satellite Power System Salvage and Disposal Alternatives			
DATE: November 1980	VOLUMES:	PAGES: 90	REFERENCES: 8
ACQUISITION NO: NASA CR 3349 NAS 8 - 33783			SOURCE: 4
KEY WORDS: Disposal Costs Satellite Salvage			

SUBJECT: ECONOMICS AND FINANCES			SPSPO INDEX NO: EF-2
AUTHOR(S): Hazelrigg, G. A.			
AUTHOR AFFILIATION: ECON, Incorporated			
TITLE: Space-Based Solar Power Conversion and Delivery Systems Study			
DATE: June 1976	VOLUMES: 2	PAGES: 160	REFERENCES: 15
ACQUISITION NO: NAS8 31308 76-145-2 Vol. 1 - Summary (32 pp.) Vol. 2 - Economic Analysis (128 pp.)			SOURCE: 4
KEY WORDS: Cost Model Cost Uncertainty Maintenance Cost Operations Cost Production Cost			

SUBJECT: ECONOMICS AND FINANCES			SPSPO INDEX NO: EF-7
AUTHOR(S): Hazelrigg, G. A.			
AUTHOR AFFILIATION: ECON, Incorporated			
TITLE: The Economic Viability of Pursuing a Space Power System Concept			
DATE: March-April 1977	VOLUMES:	PAGES: 9	REFERENCES: 3
ACQUISITION NO: By Title, AIAA Journal of Energy			SOURCE: 2
KEY WORDS: Cost Model Cost Uncertainty Maintenance Costs Operations Costs Production Cost Risks			

SUBJECT: ECONOMICS AND FINANCES			SPSPO INDEX NO: EF-5
AUTHOR(S): Hazelrigg, G. A.			
AUTHOR AFFILIATION: ECON, Inc.			
TITLE: Costing the Satellite Power System			
DATE: November 1978	VOLUMES:	PAGES: 21	REFERENCES: 6
ACQUISITION NO: AAS 78-166			SOURCE: 30
KEY WORDS: Cost Uncertainty Emerging Technologies Operations Costs		Production Cost Risks Uncertainties	

SUBJECT: ECONOMICS AND FINANCES			SPSPO INDEX NO: EF-8
AUTHOR(S): (1) Hub, K. (2) Rowland, B. (1) Conley, L. (1) Stephenson, M. (2) Buehring, W.			
AUTHOR AFFILIATION: (1) Argonne National Laboratory (2) University of Wisconsin			
TITLE: Social Cost Studies Program - Electrical Utility Generating System Reliability Analysis Code, SYSREL			
DATE: September 1975	VOLUMES:	PAGES: 151	REFERENCES: 5
ACQUISITION NO: ANL/AA-4			SOURCE: 5
KEY WORDS: Cost Model Cost Uncertainty Demand Rates		Energy Costs Maintenance Cost Operations Cost	

SUBJECT: ECONOMICS AND FINANCES			SPSPO INDEX NO: EF-3	
AUTHOR(S): Kierolff, H. E.				
AUTHOR AFFILIATION: PRC Energy Analysis Company				
TITLE: Satellite Power System (SPS) Financial/Management Scenarios				
DATE: October 1978		VOLUMES:		PAGES: 62
				REFERENCES: 27
ACQUISITION NO: HCP/R-4024-13				SOURCE: 5
KEY WORDS: Risks Returns Rewards Uncertainties				

SUBJECT: ECONOMICS AND FINANCES			SPSPO INDEX NO: EF-9	
AUTHOR(S): Nansen, R. H. Johnson, O. E.				
AUTHOR AFFILIATION: Boeing Aerospace Corporation				
TITLE: Economic Aspects of Energy From Space				
DATE: October 1979		VOLUMES:		PAGES: 26
				REFERENCES: None
ACQUISITION NO: 79-236				SOURCE: 2
KEY WORDS: Cost Uncertainty Emerging Technologies Energy Costs Financial Requirements Operations Cost Production Cost				

SUBJECT: ECONOMICS AND FINANCES			SPSPO INDEX NO: EF-6
AUTHOR(S): Rossin, A. D. Rieck, T. A.			
AUTHOR AFFILIATION: Commonwealth Edison Company			
TITLE: Economics of Nuclear Power			
DATE: August 1978	VOLUMES:	PAGES: 8	REFERENCES: 24
ACQUISITION NO: 0036-8075/78/0818-0582501			SOURCE: 7
KEY WORDS: Cost Uncertainty Production Cost Financial Requirements Returns Operations Costs Risks			

SUBJECT: ECONOMICS AND FINANCES			SPSPO INDEX NO: EF-4
AUTHOR(S): Vajk, J. P.			
AUTHOR AFFILIATION: Science Applications, Inc.			
TITLE: Satellite Power System (SPS) Financial/Management Scenarios			
DATE: October 1978	VOLUMES:	PAGES: 73	REFERENCES: 16
ACQUISITION NO: HCP/R-4024-03			SOURCE: 5
KEY WORDS: Financial Requirements			

SUBJECT: ECONOMICS AND FINANCES			SPSPO INDEX NO: EF-11
AUTHOR(S): Woodcock, G. R.			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: SPS Cost Considerations			
DATE: July-August 1978	VOLUMES:	PAGES: 7	REFERENCES: None
ACQUISITION NO: By Title; Journal of Energy, Vol. 2, No. 4, pp. 196-202			SOURCE: 2
KEY WORDS: Cost Uncertainty Energy Costs Financial Requirements		Maintenance Cost Production Cost Uncertainties	

PROGRAM PLANS (CATEGORY PP)

Program plans developed for the overall SPS Concept Development and Evaluation Program and its various elements are included in this category. Not all plans were implemented, and some future planning is included. Plans for some other energy technologies are listed, as they are pertinent to assessing the SPS energy concept.

KEY WORDS:	PAGE NUMBER:
Assessment Concept	111
Atmospheric Effects	114, 116
Biomass	113
Comparative Assessment	112, 113, 114, 115
Concept Definition	112
Concept Selection	111
Cost Analysis	111
Decision Process	115
Ecology	116
Environmental Assessment	112, 114, 115, 116
Environmental Integration	111
Environmental Objectives	111, 112, 113, 117
Health Effects	116, 117
Key Issues	111, 112, 113
Lessons Learned	115
Microwave Effects	116
Ocean Thermal	113
Photovoltaics	112, 113
Program Objectives	115
Reference System	111, 114
Resources	117
Safety Effects	112, 113, 117
Societal Assessment	114, 116
Socio-Economics	112, 115, 117
Solar Thermal	112, 113
Space Technology	115
Space Transportation	111, 115

(Program Plans -
Category PP continued)

KEY WORDS:	PAGE NUMBER:
System Operations	116, 117
Systems Definition	112, 114, 115
Technology Requirements	116
Wind Energy	113

RELATED CATEGORIES:

Atmospheric Effects (AE)
Biologic Effects (BE)
Comparative Analyses (CA)
Electromagnetic Compatibility (EC)
Environmental Effects (EE)
Systems Analyses (SA)
Systems Engineering (SE)
Social Issues (SI)
Space Transportation (ST)

SUBJECT: PROGRAM PLANS		SPSPO INDEX NO: PP-1	
AUTHOR(S): Aerospace Corporation			
AUTHOR AFFILIATION: Aerospace Corporation			
TITLE: Systems Definition Plan for the ERDA Satellite Power Station Program			
DATE: February 1977	VOLUMES:	PAGES: 50	REFERENCES: 8
ACQUISITION NO: ERDA-EY-76-C-03-1101			SOURCE: 13
KEY WORDS: Concept Selection Space Transportation Cost Analysis Reference System			

SUBJECT: PROGRAM PLANS		SPSPO INDEX NO: PP-2	
AUTHOR(S): Bloomquist, C. E. Philipson, L. L.			
AUTHOR AFFILIATION: PRC Systems Sciences Company			
TITLE: SPS Environmental Assessment Plan (SEAP)			
DATE: November 1976	VOLUMES:	PAGES: 53	REFERENCES: 2
ACQUISITION NO: ERDA-EG-77-X-10-0794 PRC R-1847			SOURCE: 13
KEY WORDS: Assessment Concept Environmental Objectives Cost Analysis Key Issues Environmental Integration			

SUBJECT: PROGRAM PLANS		SPSPO INDEX NO: PP-5	
AUTHOR(S): Energy, U.S. Department of National Aeronautics and Space Administration			
AUTHOR AFFILIATION: U.S. Department of Energy National Aeronautics and Space Administration			
TITLE: Satellite Power System (SPS) Concept Development and Evaluation Program Plan (July 1977 - August 1980)			
DATE: February 1978	VOLUMES:	PAGES: 55	REFERENCES: 16
ACQUISITION NO: DOE/ET-0034			SOURCE: 5
KEY WORDS: Comparative Assessment Socio-Economics Concept Definition Systems Definition Environmental Assessment			

SUBJECT: PROGRAM PLANS		SPSPO INDEX NO: PP-13	
AUTHOR(S): Energy, U.S. Department of Energy			
AUTHOR AFFILIATION: U.S. Department of Energy			
TITLE: Environmental Development Plan (EDP) for Solar Thermal Power Systems			
DATE: March 1978	VOLUMES:	PAGES: 60	REFERENCES: Bibliography
ACQUISITION NO: DOE/EDP-0004			SOURCE: 5
KEY WORDS: Environmental Assessment Photovoltaics Environmental Objectives Safety Effects Key Issues Solar Thermal			

SUBJECT: PROGRAM PLANS			SPSPO INDEX NO: pp-12
AUTHOR(S): Energy, U.S. Department of			
AUTHOR AFFILIATION: U.S. Department of Energy			
TITLE: Environmental Development Plan (EDP) for Photovoltaics			
DATE: March 1978	VOLUMES:	PAGES: 51	REFERENCES: Bibliography
ACQUISITION NO: DOE/EDP-0003			SOURCE: 5
KEY WORDS: Environmental Assessment Photovoltaics Environmental Objectives Safety Effects Key Issues Solar Thermal			

SUBJECT: PROGRAM PLANS			SPSPO INDEX NO: PP-3
AUTHOR(S): Energy, U.S. Department of			
AUTHOR AFFILIATION: U.S. Department of Energy			
TITLE: Guide to Solar Energy Programs			
DATE: March 1978	VOLUMES:	PAGES: 66	REFERENCES: None
ACQUISITION NO: DOE/ET-0036			SOURCE: 13
KEY WORDS: Biomass Solar Thermal Ocean Thermal Wind Energy Photovoltaics			

SUBJECT: PROGRAM PLANS			SPSPO INDEX NO: PP-6	
AUTHOR(S): Energy, U.S. Department of				
AUTHOR AFFILIATION: U.S. Department of Energy				
TITLE: Satellite Power System (SPS) Program Summary				
DATE: December 1978		VOLUMES:		PAGES: 110
				REFERENCES: 10
ACQUISITION NO: DOE/ER-0022				SOURCE: 5
KEY WORDS: Comparative Assessment Environmental Assessment Societal Assessment Systems Definition				

SUBJECT: PROGRAM PLANS			SPSPO INDEX NO: PP-9	
AUTHOR(S): Energy, U.S. Department of				
AUTHOR AFFILIATION: U.S. Department of Energy				
TITLE: Satellite Power System (SPS) FY 79 Program Summary				
DATE: January 1980		VOLUMES:		PAGES: 208
				REFERENCES: None
ACQUISITION NO: DOE/ER-0037				SOURCE: 5
KEY WORDS: Atmospheric Effects Comparative Assessment Environmental Assessment Reference System Societal Assessment Systems Definition				

SUBJECT: PROGRAM PLANS		SPSPO INDEX NO: PP-10	
AUTHOR(S): Energy Research and Development Administration National Aeronautics and Space Administration			
AUTHOR AFFILIATION: Energy Research and Development Administration National Aeronautics and Space Administration			
TITLE: SPS Concept Development and Evaluation Program Plan			
DATE: May 1977	VOLUMES: 2	PAGES: 209	REFERENCES: 28
ACQUISITION NO: NMI 1052.200		SOURCE: 4	
KEY WORDS: Comparative Assessment Environmental Assessment Program Objectives Socio-Economic Space Technology Systems Definition			

SUBJECT: PROGRAM PLANS		SPSPO INDEX NO: PP-8	
AUTHOR(S): Logsdon, J. M.			
AUTHOR AFFILIATION: George Washington University			
TITLE: The Apollo Decision and Its Lessons for Policy-Makers			
DATE: January 1970	VOLUMES:	PAGES: 36	REFERENCES: 43
ACQUISITION NO: Grant 09-010-030		SOURCE: 4	
KEY WORDS: Decision Process Lessons Learned Space Transportation			

SUBJECT: PROGRAM PLANS		SPSPO INDEX NO: PP-11	
AUTHOR(S): Newsom, B. D.			
AUTHOR AFFILIATION: Bernard D. Newsom and Associates			
TITLE: Research Plan for Study of Biological and Ecological Effects of the Solar Power Satellite Transmission System			
DATE: August 1978	VOLUMES:	PAGES: 254	REFERENCES: 74
ACQUISITION NO: NASA-CR-3044 NAS2-9655			SOURCE: 4
KEY WORDS: Ecology Environmental Assessment Microwave Effects			

SUBJECT: PROGRAM PLANS		SPSPO INDEX NO: PP-7	
AUTHOR(S): Universities Space Research Association			
AUTHOR AFFILIATION: Universities Space Research Association			
TITLE: Report of the Solar-Power Satellite Task Group			
DATE: March 1978	VOLUMES:	PAGES: 25	REFERENCES: None
ACQUISITION NO: By Title			SOURCE: 19
KEY WORDS: Atmospheric Effects Environmental Assessment Health Effects Societal Assessment System Operations Technology Requirements			

SUBJECT: PROGRAM PLANS		SPSPO INDEX NO: PP-4	
AUTHOR(S): Wei, M. S.			
AUTHOR AFFILIATION: PRC Energy Analysis Company			
TITLE: Interim Environmental Guidelines Update for Satellite Power System (SPS) Concept Development and Evaluation			
DATE: December 1978	VOLUMES:	PAGES: 59	REFERENCES: 89
ACQUISITION NO: PRC EG-77-C-01-4024		SOURCE: 5	
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Environmental Objectives Health Effects Resources </div> <div> Safety Effects Socio-Economics System Operations </div> </div>			

THIS PAGE
WAS INTENTIONALLY
LEFT BLANK

POWER GENERATION AND TRANSMISSION (CATEGORY PT)

Research, development, experimentation and evaluation of engineering concepts and preliminary design of SPS power generation and transmission equipment is included in this category. All aspects of the transmitting system are included, such as the electrical characteristics of the space transmitting antenna, but the receiving system (rectenna) is excluded as a principal topic. Environmental effects are described in some documents.

KEY WORDS:	PAGE NUMBER:
Antenna	123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136
Atmospheric Effects	123, 133, 134, 136, 138
Broadcast	131
Cathode Life	127
Computer Prediction	132
Design	123, 124, 125, 126, 127, 128, 129, 130, 131, 133, 135, 136
Economics	121, 122, 125, 127, 137
Efficiency	121, 123, 124, 125, 126, 127, 128, 131, 133, 136, 138
Experiments	124, 125, 128, 129, 130, 131, 132
Frequency Selection	125, 131, 138
Gain Degradation	132
Hardware	126, 134, 136
Harmonics	128, 129
High Voltage	130, 132
Interference	137
Laser Alternatives	123, 133, 135, 136, 138
Laser Costs	133, 138
Laser Power	121, 122, 123, 130, 133, 135, 136, 138
Laser Safety	133
Magnetron Performance	127, 128
Mechanical System	123, 126, 134
Microwave	123, 124, 126, 127, 131, 132, 135, 137
Noise Characteristics	127, 128

(Power Generation and Transmission
Category PT continued)

KEY WORDS:	PAGE NUMBER:
Phase Control	124, 125, 127, 128, 129, 134, 137
Phase Error	128, 137
Photoklystron	122, 130, 131
Photovoltaics	122
Pointing Error	128, 137
Power Amplifier	123, 125, 127, 129, 130, 132, 134, 136
Power Conversion	124, 133, 135, 138
Power Density	129, 132, 137
Propagation	121, 126, 131, 132, 135, 136
Radiation Statistics	129, 130, 132, 137
Receiver System	123, 125
Reliability	125
Retrodirective Array	127, 128
Solar Conversion	121, 122, 130, 134, 135, 137, 138
Solid State	123, 132, 134, 136
Space Reflector	122
Technology	121, 122, 124, 125, 126, 130, 131, 132, 134, 136, 137
Thermal Systems	122, 138
Waste Heat	121, 136

RELATED CATEGORIES:

Atmospheric Effects (AE)

Electromagnetic Compatibility (EC)

Environmental Effects (EE)

Photovoltaics (PV)

Systems Analyses (SA)

Systems Engineering (SE)

Space Utilization (SU)

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-18	
AUTHOR(S): Bain, C. N.				
AUTHOR AFFILIATION: PRC Energy Analysis Company				
TITLE: Potential of Laser for SPS Power Transmission				
DATE: October 1978		VOLUMES:		PAGES: 97
				REFERENCES: 80
ACQUISITION NO: HCP/R-4024-07				SOURCE: 5
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Economics Efficiency/ Laser Power </div> <div> Propagation Solar Conversion Technology </div> </div>				

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-6	
AUTHOR(S): Bain, C. N.				
AUTHOR AFFILIATION: PRC Energy Analysis Company				
TITLE: Power from Space by Laser				
DATE: March 1979		VOLUMES:		PAGES: 13
				REFERENCES: 47 Bibliography
ACQUISITION NO: Astronautics and Aeronautics Vol. 17, No. 3 pp. 28-40				SOURCE: 2
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Economics Efficiency Laser Power </div> <div> Technology Waste Heat </div> </div>				

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-5	
AUTHOR(S): Billman, K. W.				
AUTHOR AFFILIATION: NASA Ames Research Center				
TITLE: Radiation Energy Conversion in Space				
DATE: March 1979		VOLUMES:		PAGES: 9
				REFERENCES: 4
ACQUISITION NO:		Astronautics and Aeronautics Vol. 17, No. 3 pp. 18-26		SOURCE: 2
KEY WORDS: Laser Power Solar Conversion Space Reflectors Thermal Systems				

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-7	
AUTHOR(S): Boeing Aerospace Company				
AUTHOR AFFILIATION: Boeing Aerospace Company				
TITLE: Systems Definition Space Based Power Conversion Systems				
DATE: March 1977		VOLUMES: 2		PAGES: 117
				REFERENCES: None
ACQUISITION NO:		NAS8-31628 DPD Item MA-04 D 180-20309-1(Summary), 27 pp. D 180-20309-2(Technical Report), 90 pp.		SOURCE: 4
KEY WORDS: Economics Photovoltaics Solar Conversion Technology Thermal Systems				

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-29
AUTHOR(S): Boeing Aerospace Company			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: Solar Power Satellite System Definition Study, Laser SPS Analysis			
DATE: June 1980	VOLUMES:	PAGES: 96	REFERENCES: 9
ACQUISITION NO: D180-25969-3 NAS 9-15636			SOURCE: 4
KEY WORDS: Atmospheric Effects Laser Power Efficiency Propagation Laser Alternatives Receiver System			

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-30
AUTHOR(S): Boeing Aerospace Company			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: Solar Power Satellite System Definition Study, Solid State SPS Analysis			
DATE: June 1980	VOLUMES:	PAGES: 76	REFERENCES: None
ACQUISITION NO: D180-25969-4 NAS 9-15636			SOURCE: 4
KEY WORDS: Antenna Microwave Design Power Amplifier Mechanical System Solid State			

SUBJECT: POWER GENERATION AND TRANSMISSION		SPSPO INDEX NO: PT-14	
AUTHOR(S): Brown, W. C.			
AUTHOR AFFILIATION: Raytheon Company			
TITLE: The Technology and Application of Free-Space Power Transmission by Microwave Beam			
DATE: January 1974	VOLUMES:	PAGES: 15	REFERENCES: 30
ACQUISITION NO: Proc. IEEE; Vol. 62, No. 1, pp. 11-25		SOURCE: 6	
KEY WORDS: Antenna Design Efficiency Microwave Power Conversion Technology			

SUBJECT: POWER GENERATION AND TRANSMISSION		SPSPO INDEX NO: PT-15	
AUTHOR(S): Brown, W. C. Maynard, O. E.			
AUTHOR AFFILIATION: Raytheon Company			
TITLE: The Adaptation of Free Space Power Transmission Technology to the SSPS Concept			
DATE: April 1975	VOLUMES:	PAGES: 11	REFERENCES: 10
ACQUISITION NO: AIAA-75-642		SOURCE: 2	
KEY WORDS: Efficiency Experiments Microwave Phase Control Power Conversion Technology			

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-13
AUTHOR(S): Brown, W. C.			
AUTHOR AFFILIATION: Raytheon Company			
TITLE: Technology Forecast for Free-Space Power Transmission by Microwave Beam			
DATE: June 1976	VOLUMES:	PAGES: 41	REFERENCES: None
ACQUISITION NO: PT-4808(21-4)			SOURCE: 6
KEY WORDS: Economics Efficiency Frequency Selection Phase Control Reliability Technology			

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-35
AUTHOR(S): Brown, W. C.			
AUTHOR AFFILIATION: Raytheon Company			
TITLE: Transmission of Power from Space to Earth			
DATE: August 1977	VOLUMES:	PAGES: 11	REFERENCES: 24
ACQUISITION NO: By Title; New Options in Energy Technology (San Francisco)			SOURCE: 6
KEY WORDS: Antenna Design Efficiency Experiments Power Amplifier Receiver System			

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-17
AUTHOR(S): Brown, W. C.			
AUTHOR AFFILIATION: Raytheon Company			
TITLE: Electronic and Mechanical Improvment of the Receiving Terminal of a Free-Space Microwave Power Transmission System			
DATE: August 1977	VOLUMES: 1	PAGES: 148	REFERENCES: 31
ACQUISITION NO: NASA CR-135194 PT-4964			SOURCE: 4
KEY WORDS: Antenna Design Efficiency Hardware Mechanical System Technology			

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-3
AUTHOR(S): Brown, W. C.			
AUTHOR AFFILIATION: Raytheon Company			
TITLE: A Profile of Power Transmission by Microwaves			
DATE: May 1979	VOLUMES:	PAGES: 6	REFERENCES: 9
ACQUISITION NO: Astronautics and Aeronautics Vol. 17, No. 5			SOURCE: 2
KEY WORDS: Antenna Efficiency Hardware Microwave Propagation			

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-12	
AUTHOR(S): Brown, W. C.				
AUTHOR AFFILIATION: Raytheon Company				
TITLE: Solar Power Satellites: Microwaves Deliver the Power				
DATE: June 1979		VOLUMES:		PAGES: 5
				REFERENCES: None
ACQUISITION NO: 0018-9235/79/0600-0036				SOURCE: 6
KEY WORDS: Antenna Economics Efficiency Phase Control Power Amplifier Retrodirective Array				

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-25	
AUTHOR(S): Brown, W. C.				
AUTHOR AFFILIATION: Raytheon Company				
TITLE: Microwave Beamed Power Technology Improvement				
DATE: May 1980		VOLUMES:		PAGES: 135
				REFERENCES: None
ACQUISITION NO: PT-5613 JPL Contract 955104 NAS 7-100				SOURCE: 4
KEY WORDS: Cathode Life Design Efficiency Magnetron Performance Microwave Noise Characteristics				

SUBJECT: POWER GENERATION AND TRANSMISSION		SPSPO INDEX NO: PT-20	
AUTHOR(S): Dickinson, R. M.			
AUTHOR AFFILIATION: Jet Propulsion Laboratory			
TITLE: Microwave Power Transmitting Phased Array Antenna Research Project Summary Report			
DATE: December 1978	VOLUMES:	PAGES: 74	REFERENCES: 9
ACQUISITION NO: JPL-78-28			SOURCE: 4
KEY WORDS: Antenna Design Experiments Phase Control Power Amplifier Power Density			

SUBJECT: POWER GENERATION AND TRANSMISSION		SPSPO INDEX NO: PT-28	
AUTHOR(S): Dickinson, R. M.			
AUTHOR AFFILIATION: Jet Propulsion Laboratory			
TITLE: Beamed Microwave Power Transmitting and Receiving Subsystems Radiation Characteristics			
DATE: June 1980	VOLUMES:	PAGES: 83	REFERENCES: 30
ACQUISITION NO: JPL 80-11			SOURCE: 4
KEY WORDS: Antenna Design Harmonics Power Amplifier Power Density Radiation Statistics			

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-26
AUTHOR(S): Fitzsimmons, G. W. Nalos, E. J.			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: SPS Solid-State Antenna Power Combiner			
DATE: February 1980	VOLUMES:	PAGES: 99	REFERENCES: 1
ACQUISITION NO: D 180-25895-1 NAS 9-15636A			SOURCE: 4
KEY WORDS: Antenna Design Efficiency Power Amplifier Radiation Statistics Technology			

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-2
AUTHOR(S): Freeman, J. W. Colson, W. B. Simons, S.			
AUTHOR AFFILIATION: Rice University			
TITLE: New Methods for the Conversion of Solar Energy to Radio Frequency and Laser Power			
DATE: May 1979	VOLUMES:	PAGES: 6	REFERENCES: 8
ACQUISITION NO: 79-1416			SOURCE: 2
KEY WORDS: Experiments High Voltage Laser Power Photoklystron Power Amplifier Solar Conversion			

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-36
AUTHOR(S): Freeman, J. W. Brotzen, F. R. Simons, S. Hester, J. Colson, W. B.			
AUTHOR AFFILIATION: Rice University			
TITLE: The Photoklystron			
DATE: 1980	VOLUMES:	PAGES: 10	REFERENCES: 10
ACQUISITION NO: 0191-9067/80/010145-10 Space Solar Power Review, Vol. 1, pp. 145-154			SOURCE: 33
KEY WORDS: Design Microwave Experiments Photoklystron Frequency Selection Technology			

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-4
AUTHOR(S): Fordyce, S. W. (1) Brown, W. C. (2)			
AUTHOR AFFILIATION: (1) National Aeronautics and Space Administration (2) Raytheon Company			
TITLE: Applications of Free-Space Microwave Power Transmission			
DATE: September 1979	VOLUMES:	PAGES: 6	REFERENCES: 8
ACQUISITION NO: Astronautics and Aeronautics Vol. 17, No. 9 pp. 54-61			SOURCE: 2
KEY WORDS: Antenna Propagation Broadcast Technology Microwave			

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-1
AUTHOR(S): Gibson, M. H. Pollacsek, M. Strijk, S.			
AUTHOR AFFILIATION: European Space Agency			
TITLE: Further Investigation of RF Gain Degradation in High Power Microwave Transistors under Multicarrier Operation			
DATE: 1978	VOLUMES:	PAGES: 7	REFERENCES: 1
ACQUISITION NO: ESA Journal 78/3, Vol. 2 pp. 207-213			SOURCE: 1
KEY WORDS: Computer Prediction Experiments Gain Degradation High Voltage Power Amplifier Solid State			

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-34
AUTHOR(S): Kozakoff, D. J. Schuchardt, J. M.			
AUTHOR AFFILIATION: Georgia Institute of Technology			
TITLE: High Accuracy Radiation Efficiency Measurement Techniques			
DATE: January 1981	VOLUMES:	PAGES: 82	REFERENCES: 17
ACQUISITION NO: NASA CR 3372 NAS 8-33605			SOURCE: 4
KEY WORDS: Antenna Microwave Power Density Propagation Radiation Statistics Technology			

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-19
AUTHOR(S): Lockheed Missiles and Space Company			
AUTHOR AFFILIATION: Lockheed Missiles and Space Company			
TITLE: Laser Power Conversion System Analysis			
DATE: September 1978	VOLUMES: 2	PAGES: 205	REFERENCES: 56
ACQUISITION NO: NASA-CR-159523			SOURCE: 4
KEY WORDS: Antenna Atmospheric Effects Laser Cost Laser Power Laser Safety Power Conversion			

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-27
AUTHOR(S): Mathematical Sciences Northwest, Inc.			
AUTHOR AFFILIATION: Mathematical Sciences Northwest, Inc.			
TITLE: Study, Optimization, and Design of a Laser Heat Engine			
DATE: January 1978	VOLUMES:	PAGES: 158	REFERENCES: 74
ACQUISITION NO: MSNW 78 - 1082 - 1			SOURCE: 4
KEY WORDS: Design Efficiency Laser Alternatives Laser Power			

SUBJECT: POWER GENERATION AND TRANSMISSION		SPSPO INDEX NO: PT-22	
AUTHOR(S): Nalos, E. J.			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: New Developments in Electromagnetic Energy Beaming			
DATE: March 1978	VOLUMES:	PAGES: 14	REFERENCES: 20
ACQUISITION NO: 0018-9219/78/0300-0276			SOURCE: 6
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Antenna Design Laser Power </div> <div> Microwave Phase Control Power Amplifier </div> </div>			

SUBJECT: POWER GENERATION AND TRANSMISSION		SPSPO INDEX NO: PT-23	
AUTHOR(S): Rather, J.D. G. Gerry, E. T. Zeiders, G. W.			
AUTHOR AFFILIATION: W. J. Schafer Associates, Inc.			
TITLE: Investigation of Possibilities for Solar Powered High Energy Lasers in Space			
DATE: May 1977	VOLUMES:	PAGES: 47	REFERENCES: 15
ACQUISITION NO: 77SR-VA-U3 NASW-3048			SOURCE: 4
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Laser Alternatives Laser Power Power Conversion </div> <div> Propagation Solar Conversion </div> </div>			

SUBJECT: POWER GENERATION AND TRANSMISSION		SPSPO INDEX NO: PT-8	
AUTHOR(S): Stevens, G. H. (1) Leininger, G. (2)			
AUTHOR AFFILIATION: (1) NASA Lewis Research Center (2) University of Toledo			
TITLE: Statistics of the Radiated Field of a Space-to-Earth Microwave Power Transfer System			
DATE: None	VOLUMES:	PAGES: 36	REFERENCES: 23
ACQUISITION NO: NASA TM X-73684 E-9217		SOURCE: 4	
KEY WORDS: Microwave Phase Error Pointing Error Power Density Radiation Statistics			

SUBJECT: POWER GENERATION AND TRANSMISSION		SPSPO INDEX NO: PT-9	
AUTHOR(S) Stevens, G. H. Schuh, R.			
AUTHOR AFFILIATION: NASA Lewis Research Center			
TITLE: Space-to-Earth Power Transmission System			
DATE: None	VOLUMES:	PAGES: 139	REFERENCES: 30
ACQUISITION NO: NASA TM X-73489 E-8885		SOURCE: 4	
KEY WORDS: Economics Interference Phase Control Solar Conversion Technology			

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-21
AUTHOR(S): Taussig, R. Christiansen, W. Bruzzone, C. Neice, S. Quimbly, D. Cassady, P. Nelson, L. Pindroh, A.			
AUTHOR AFFILIATION: Mathematical Sciences Northwest, Inc.			
TITLE: Design Investigation of Solar Powered Lasers for Space Applications			
DATE: May 1979	VOLUMES:	PAGES: 175	REFERENCES: 82
ACQUISITION NO: MSNW-79-1087/1090-1			SOURCE: 4
KEY WORDS: Laser Alternatives Power Conversion Laser Costs Solar Conversion Laser Power Thermal Systems			

SUBJECT: POWER GENERATION AND TRANSMISSION			SPSPO INDEX NO: PT-24
AUTHOR(S): Walbridge, E. W.			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: Laser Satellite Power Systems			
DATE: January 1980	VOLUMES:	PAGES: 77	REFERENCES: 39
ACQUISITION NO: ANL/ES-92			SOURCE: 5
KEY WORDS: Atmospheric Effects Laser Alternatives Efficiency Laser Power Frequency Selection			

RESOURCES AND MATERIALS (CATEGORY RM)

Resources and materials which would be required to fully develop SPS, their source throughout the world and knowledge about current production and likely needs by other ventures are described in documents in this category. Processes for evaluating resource and material needs also are included.

KEY WORDS:

PAGE NUMBER:

Assessment	141, 143, 144, 145, 146
Cell Design	142
Commercial Market	142
Design Characterizations	143
Economics	142, 144, 146
Efficiency	142
Energy Payback	144
Energy Use	142
Federal Programs	142
Fuels	144
Inventory	141, 143, 145, 146
Land	144
Land Survey	141, 142, 143, 145
Manpower	144
Mapping	141, 145
Materials Constraints	143, 146
Materials Extraction	144, 145
Materials Processing	144, 145
Materials Requirements	143
Photovoltaics	142
Problem Identification	143
Process Conversions	143
Production	141, 145, 146
Rectenna Sites	141, 142, 144, 145
Sea Survey	142
Selection Methods	141, 142, 143, 145, 146
Water	144

(Resources and Materials
Category RM Continued)

RELATED CATEGORIES:

Energy Alternatives and Policy (EA)

Environmental Effects (EE)

Economics and Finances (EF)

Systems Analyses (SA)

Systems Engineering (SE)

Social Issues (SI)

SUBJECT: RESOURCES AND MATERIALS		SPSPO INDEX NO: RM-8	
AUTHOR(S): Blackburn, J. B. Bavinger, B. A.			
AUTHOR AFFILIATION: PRC Energy Analysis Company			
TITLE: Satellite Power System (SPS) Mapping of Exclusion Areas for Rectenna Sites			
DATE: October 1978	VOLUMES:	PAGES: 112	REFERENCES: 24
ACQUISITION NO: HCP/R-4024-10		SOURCE: 5	
KEY WORDS: Inventory Land Survey Mapping Rectenna Sites Selection Methods			

SUBJECT: RESOURCES AND MATERIALS		SPSPO INDEX NO: RM-1	
AUTHOR(S): Culver, D. H. Teeter, R. R. Jamieson, W. M.			
AUTHOR AFFILIATION: Battelle Columbus Laboratories			
TITLE: A Methodology for Assessing Systems Materials Requirements			
DATE: January 1980	VOLUMES:	PAGES: 40	REFERENCES: 27
ACQUISITION NO: DOE/ER-0040		SOURCE: 5	
KEY WORDS: Assessment Methods Inventory Production			

SUBJECT: RESOURCES AND MATERIALS		SPSPO INDEX NO: RM-2	
AUTHOR(S): Eberhardt, A. W.			
AUTHOR AFFILIATION: NASA Marshall Space Flight Center			
TITLE: Candidate Locations for SPS Rectifying Antennas			
DATE: November 1977	VOLUMES:	PAGES: 83	REFERENCES: 15
ACQUISITION NO: NASA TM-78146		SOURCE: 4	
KEY WORDS: Land Survey Rectenna Sites Sea Survey Selection Methods			

SUBJECT: RESOURCES AND MATERIALS		SPSPO INDEX NO: RM-12	
AUTHOR(S): Ehrenreich, H. Martin, J. H.			
AUTHOR AFFILIATION: Harvard University			
TITLE: Solar Photovoltaic Energy			
DATE: September 1979	VOLUMES:	PAGES: 8	REFERENCES: 2
ACQUISITION NO: By Title, Physics Today, pp. 25-32		SOURCE: 36	
KEY WORDS: Cell Design Commercial Market Economics Efficiency Federal Programs Photovoltaics			

SUBJECT: RESOURCES AND MATERIALS		SPSPO INDEX NO: RM-9	
AUTHOR(S): Kotin, A. D.			
AUTHOR AFFILIATION: Allan D. Kotin Economic Consultants			
TITLE: Satellite Power System (SPS) Resource Requirements (Critical Materials, Energy and Land)			
DATE: October 1978	VOLUMES:	PAGES: 128	REFERENCES: 87
ACQUISITION NO: HCP/R-4024-02			SOURCE: 5
KEY WORDS: Assessment Methods Energy Use Land Survey		Materials Constraints Material Requirements	

SUBJECT: RESOURCES AND MATERIALS		SPSPO INDEX NO: RM-3	
AUTHOR(S): Litchfield, J. W. Hartley, J. N. Watts, R. L. Bloomster, C. H. Gurwell, W. E.			
AUTHOR AFFILIATION: Pacific Northwest Laboratory			
TITLE: A Methodology for Identifying Materials Constraints to Implementation of Solar Energy Technologies			
DATE: July 1978	VOLUMES:	PAGES: 84	REFERENCES: 36
ACQUISITION NO: PNL-2711			SOURCE: 13
KEY WORDS: Design Characterizations Inventory Problem Identification		Process Conversion Production Selection Methods	

SUBJECT: RESOURCES AND MATERIALS		SPSPO INDEX NO: RM-4	
AUTHOR(S): Livingston, F. R. Baker, L.R. Poon, P. T. Y. Kuo, T. J.			
AUTHOR AFFILIATION: Jet Propulsion Laboratory			
TITLE: Satellite Power System (SPS) Preliminary Resource Assessment			
DATE: August 1978	VOLUMES:	PAGES: 81	REFERENCES: 22
ACQUISITION NO: 900-805 (Rev. A)			SOURCE: 4
KEY WORDS: Energy Payback Fuels Land Manpower Rectenna Sites Water			

SUBJECT: RESOURCES AND MATERIALS		SPSPO INDEX NO: RM-5	
AUTHOR(S): Reeber, R. R.			
AUTHOR AFFILIATION: U.S. Department of Energy			
TITLE: An Overview: The Materials/Energy Tradeoff			
DATE: June 1978	VOLUMES:	PAGES: 9	REFERENCES: 35
ACQUISITION NO: By Title: National Symposium on Critical and Strategic Materials			SOURCE: 25
KEY WORDS: Assessment Methods Economics Energy Payback Materials Extraction Materials Processing			

SUBJECT: RESOURCES AND MATERIALS		SPSPO INDEX NO: RM-11	
AUTHOR(S): Rice University			
AUTHOR AFFILIATION: Rice University			
TITLE: Satellite Power System (SPS) Rectenna Siting: Availability and Distribution of Nominally Eligible Sites			
DATE: November 1980	VOLUMES:	PAGES: 280	REFERENCES: 36
ACQUISITION NO: DOE/ER/10041-T10			SOURCE: 5
KEY WORDS: Assessment Methods Mapping Inventory Rectenna Sites Land Survey Selection Methods			

SUBJECT: RESOURCES AND MATERIALS		SPSPO INDEX NO: RM-10	
AUTHOR(S): Rosi, F. D.			
AUTHOR AFFILIATION: University of Virginia			
TITLE: A Survey of the Market, Supply and Availability of Gallium			
DATE: July 1980	VOLUMES:	PAGES: 20	REFERENCES: 17
ACQUISITION NO: DOE/ER-0063			SOURCE: 5
KEY WORDS: Inventory Production Materials Processing Materials Requirements			

SUBJECT: RESOURCES AND MATERIALS			SPSPO INDEX NO: RM-7							
AUTHOR(S): Teeter, R. R. Jamieson, W. M.										
AUTHOR AFFILIATION: Battelle Columbus Laboratories										
TITLE: Preliminary Materials Assessment for the Satellite Power System (SPS)										
DATE: January 1980		VOLUMES:		PAGES: 120						
				REFERENCES: 26						
ACQUISITION NO: DOE/ER-0038				SOURCE: 5						
KEY WORDS: <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Assessment Methods</td> <td style="width: 50%;">Materials Constraints</td> </tr> <tr> <td>Economics</td> <td>Production</td> </tr> <tr> <td>Inventory</td> <td>Selection Methods</td> </tr> </table>					Assessment Methods	Materials Constraints	Economics	Production	Inventory	Selection Methods
Assessment Methods	Materials Constraints									
Economics	Production									
Inventory	Selection Methods									

SUBJECT: RESOURCES AND MATERIALS			SPSPO INDEX NO: RM-6							
AUTHOR(S): <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Watts, R. L.</td> <td style="width: 50%;">Smith, S. A.</td> </tr> <tr> <td>Gurwell, W. E.</td> <td>Nelson, T. A.</td> </tr> <tr> <td>Bloomster, C. H.</td> <td>Paulewicz, W. W.</td> </tr> </table>					Watts, R. L.	Smith, S. A.	Gurwell, W. E.	Nelson, T. A.	Bloomster, C. H.	Paulewicz, W. W.
Watts, R. L.	Smith, S. A.									
Gurwell, W. E.	Nelson, T. A.									
Bloomster, C. H.	Paulewicz, W. W.									
AUTHOR AFFILIATION: Pacific Northwest Laboratory										
TITLE: Some Potential Material Supply Constraints in the Deployment of Photovoltaic Solar Electric Systems										
DATE: September 1978		VOLUMES:		PAGES: 231						
				REFERENCES: 52						
ACQUISITION NO: PNL-2971				SOURCE: 5						
KEY WORDS: <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Assessment Methods</td> <td style="width: 50%;">Materials Requirements</td> </tr> <tr> <td>Design Characterizations</td> <td>Photovoltaics</td> </tr> <tr> <td>Materials Constraints</td> <td></td> </tr> </table>					Assessment Methods	Materials Requirements	Design Characterizations	Photovoltaics	Materials Constraints	
Assessment Methods	Materials Requirements									
Design Characterizations	Photovoltaics									
Materials Constraints										

SYSTEMS ANALYSES (CATEGORY SA)

This category of documents includes reports and papers dealing with SPS and other energy technologies in a broad sense. Most documents address more than one key issue or concern relating to one or more technologies rather than concentrating on individual issues. As a result, the shorter reports provide summaries rather than in-depth analyses of energy technologies, and the longer reports cover a wide range of topics.

KEY WORDS:	PAGE NUMBER:
Comparative Assessment	149, 153, 161, 162, 168
Concept Definition	151, 155, 160, 161, 164, 165, 167, 171
Concept Review	149, 151, 152, 153, 154, 156, 157, 158, 161, 162, 163, 165, 168, 169, 170, 171
Costs	150, 163, 167
Economics	149, 151, 152, 154, 155, 156, 157, 158, 159, 160, 162, 164, 166, 169
Energy Balance	151
Energy Conversion	149, 150, 151, 152, 155, 156, 157, 158, 159, 160, 163, 164, 165, 169, 170, 171
Environment	149, 150, 151, 152, 153, 154, 155, 156, 157, 159, 160, 161, 162, 165, 166, 168
Ground Receiver	154, 164, 165, 171
Key Issues	151, 153, 154, 155, 161, 162, 165, 167, 168
Laser Power	150, 151, 157, 160
Microwave Transmission	150, 151, 156, 157, 163, 167, 169
Orbital Operations	151, 158, 159, 167, 170
Power Distribution	152, 155, 158, 164, 169, 170
Resource Analyses	156, 161, 164
Satellite Stability	152, 159, 169
Satellite Structure	149, 150, 151, 152, 154, 155, 156, 158, 159, 161, 163, 165, 167, 169, 170, 171
Social Impacts	149, 153, 156, 157, 161, 162, 165, 166, 168
Solid State	152
Space Assembly	152, 156, 157, 158, 159, 160, 163, 164, 167, 169, 170, 171
Space Environment	166
Space Reflector	150, 160
Space Transportation	149, 150, 153, 154, 155, 156, 158, 159, 160, 162, 163, 164, 165, 167, 168, 170, 171

(Systems Analyses -
Category SA Continued)

KEY WORDS:

Technology Requirements

Transmission System

PAGE NUMBER:

149, 151, 153, 154, 155, 156, 158, 162, 167,
169, 171

149, 150, 152, 154, 155, 157, 158, 159, 160,
163, 164, 165, 166, 169, 170

RELATED CATEGORIES:

All Other Categories

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-20
AUTHOR(S): Alabama, University of			
AUTHOR AFFILIATION: University of Alabama (Huntsville)			
TITLE: The Final Proceedings of the Solar Power Satellite Program Review			
DATE: July 1980	VOLUMES:	PAGES: 700	REFERENCES: None
ACQUISITION NO: CONF-800491			SOURCE: 5
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Comparative Assessment Concept Review Environment </div> <div> Satellite Structures Social Impacts Transmission System </div> </div>			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-44
AUTHOR(S): Argonne National Laboratory			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: Survey and Documentation of Emerging Technologies for the Satellite Power System (SPS)			
DATE: January 1981	VOLUMES:	PAGES: 130	REFERENCES: 115
ACQUISITION NO: DOE/ER-0097			SOURCE: 5
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Concept Review Economics Energy Conversion </div> <div> Space Transportation Technology Requirements Transmission System </div> </div>			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-29	
AUTHOR(S): Billman, K. W. (Ed.)				
AUTHOR AFFILIATION: Ames Research Center				
TITLE: Radiation Energy Conversion in Space				
DATE: 1978	VOLUMES:	PAGES: 688	REFERENCES: 791	
ACQUISITION NO: ISBN 0-915928-26-4 Progress in Astronautics and Aeronautics, Volume 61			SOURCE: 2	
KEY WORDS: Energy Conversion Space Transportation Laser Power Transmission System Microwave Transmission				

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-36	
AUTHOR(S): Billman, K. W. Gilbreath, W. P. Bowen, S. W.				
AUTHOR AFFILIATION: NASA Ames Research Center				
TITLE: Space Reflector Technology and Its System Implications				
DATE: February 1979	VOLUMES:	PAGES: 17	REFERENCES: 18	
ACQUISITION NO: 79-0545			SOURCE: 2	
KEY WORDS: Costs Satellite Structures Energy Conversion Space Reflector Environment Space Transportation				

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-14
AUTHOR(S): Bloomquist, C. E.			
AUTHOR AFFILIATION: PRC Systems Sciences Company			
TITLE: A Survey of Satellite Power Stations			
DATE: September 1976	VOLUMES:	PAGES: 334	REFERENCES: 78
ACQUISITION NO: DSE 2071-1			SOURCE: 5
KEY WORDS: Concept Review Economics Energy Balance Environment Key Issues Technology Requirements			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-30
AUTHOR(S): Boeing Aerospace Company			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: Solar Power Satellite System Definition Study, Phase III Executive Summary			
DATE: June 1980	VOLUMES:	PAGES: 67	REFERENCES: None
ACQUISITION NO: D180-25969-1 NAS 9-15636			SOURCE: 4
KEY WORDS: Concept Definition Energy Conversion Laser Power Orbital Operations Microwave Transmission Satellite Structures			

SUBJECT: SYSTEMS ANALYSES		SPSPO INDEX NO: SA-11	
AUTHOR(S): Brown, W. C.			
AUTHOR AFFILIATION: Raytheon Company			
TITLE: Satellite Power Stations: A New Source of Energy?			
DATE: March 1973	VOLUMES:	PAGES: 10	REFERENCES: 30
ACQUISITION NO: Spectrum; Vol. 10, No. 3, pp. 38-47			SOURCE: 6
KEY WORDS: Concept Review Economics Energy Conversion Environment Transmission System			

SUBJECT: SYSTEMS ANALYSES		SPSPO INDEX NO: SA-3	
AUTHOR(S): Cantafio, L. J. Chobotov, V. A. Wolfe, M. G.			
AUTHOR AFFILIATION: Aerospace Corporation			
TITLE: Photovoltaic, Gravitationally-Stabilized Solid-State Satellite Solar Power Station (GSS ⁴ PS)			
DATE: March 1977	VOLUMES:	PAGES: 15	REFERENCES: 32
ACQUISITION NO: AIAA-77-511			SOURCE: 2
KEY WORDS: Power Distribution Satellite Stability Satellite Structures Solid State Space Assembly			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-17	
AUTHOR(S): Energy, U.S. Department of				
AUTHOR AFFILIATION: U.S. Department of Energy				
TITLE: Satellite Power Systems (SPS) Concept Development and Evaluation Program Preliminary Assessment				
DATE: September 1979		VOLUMES:	PAGES: 14	REFERENCES: 22
ACQUISITION NO: DOE/ER-0041			SOURCE: 5	
KEY WORDS: Comparative Assessment Concept Review Environment <div style="float: right;"> Key Issues Social Impacts Technology Requirements </div>				

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-24	
AUTHOR(S): Energy, U. S. Department of				
AUTHOR AFFILIATION: U. S. Department of Energy				
TITLE: Program Assessment Report Statement of Findings				
DATE: November 1980		VOLUMES:	PAGES: 76	REFERENCES: 50
ACQUISITION NO: DOE/ER-0085			SOURCE: 5	
KEY WORDS: Comparative Assessment Concept Review Environment <div style="float: right;"> Key Issues Social Impacts Space Transportation </div>				

SUBJECT: SYSTEMS ANALYSES		SPSPO INDEX NO: SA-2	
AUTHOR(S): Energy Research and Development Administration			
AUTHOR AFFILIATION: Energy Research and Development Administration			
TITLE: Final Report of the ERDA Task Group on Satellite Power Stations			
DATE: November 1976	VOLUMES:	PAGES: 29	REFERENCES: None
ACQUISITION NO: ERDA-76/148		SOURCE: 13	
KEY WORDS: Concept Review Economics Environment Key Issues			

SUBJECT: SYSTEMS ANALYSES		SPSPO INDEX NO: SA-33	
AUTHOR(S): Glaser, P. E.			
AUTHOR AFFILIATION: Arthur D. Little, Inc.			
TITLE: Power From The Sun: Its Future			
DATE: November 1968	VOLUMES:	PAGES: 5	REFERENCES: 15
ACQUISITION NO: By Title, Vol. 162, No. 3856		SOURCE: 7	
KEY WORDS: Concept Review Ground Receiver Satellite Structures Space Transportation Technology Requirements Transmission System			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-15	
AUTHOR(S): Glaser, P. E. (1) Ralph, E. L. (4) Maynard, O. E. (2) Mackovciak, J. (3)				
AUTHOR AFFILIATION: (1) A. D. Little, Inc. (3) Grumman Aerospace Corp. (2) Raytheon Co. (4) Textron Inc.				
TITLE: Feasibility Study of Satellite Solar Power Station				
DATE: February 1974		VOLUMES:		PAGES: 199 REFERENCES: 72
ACQUISITION NO: NASA CR-2357				SOURCE: 4
KEY WORDS: Concept Definition Key Issues Economics Satellite Structures Environment Technology Requirements				

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-28	
AUTHOR(S): Glaser, P. E.				
AUTHOR AFFILIATION: A. D. Little, Inc.				
TITLE: Perspectives on Satellite Solar Power				
DATE: January 1977		VOLUMES:		PAGES: 12 REFERENCES: 31
ACQUISITION NO: By Title; AIAA 13th Annual Meeting (Washington, D. C.)				SOURCE: 2
KEY WORDS: Concept Definition Space Transportation Energy Conversion Technology Requirements Power Distribution Transmission System				

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-34
AUTHOR(S): Glaser, P. E.			
AUTHOR AFFILIATION: Arthur D. Little, Inc.			
TITLE: Solar Power From Satellites			
DATE: February 1977	VOLUMES:	PAGES: 7	REFERENCES: 15
ACQUISITION NO: By Title; Physics Today			SOURCE: 36
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Concept Review Energy Conversion Microwave Transmission </div> <div> Satellite Structures Space Assembly Space Transportation </div> </div>			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-41
AUTHOR(S): Glaser, P. E.			
AUTHOR AFFILIATION: Arthur D. Little, Inc.			
TITLE: The Development of Solar Power Satellites			
DATE: 1979	VOLUMES:	PAGES: 48	REFERENCES: 49
ACQUISITION NO: ISBN-0-12-014902-8			SOURCE: 40
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Concept Review Economics Environment </div> <div> Resource Analysis Social Impacts Technology Requirements </div> </div>			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-5	
AUTHOR(S): Glaser, P. E. (1) Hanley, G. M. (2) Nansen, R. H. (3) Kline, R. L. (4)				
AUTHOR AFFILIATION: (1) Arthur D. Little, Inc. (3) Boeing Aerospace Company (2) Rockwell, International (4) Grumman Aerospace Company				
TITLE: First Steps to the Solar Power Satellite				
DATE: May 1979		VOLUMES:	PAGES: 7	REFERENCES: None
ACQUISITION NO: 0018-9235/0500-0052			SOURCE: 6	
KEY WORDS: Concept Review Space Assembly Energy Conversion Transmission System Laser Power				

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-38	
AUTHOR(S): Glaser, P. E.				
AUTHOR AFFILIATION: Arthur D. Little, Inc.				
TITLE: The Earth Benefits of Solar Power Satellites				
DATE: 1980		VOLUMES:	PAGES: 30	REFERENCES: 36
ACQUISITION NO: 0191-9067/80/010009-30 Space Solar Power Review, Vol. 1, pp. 9-38			SOURCE: 33	
KEY WORDS: Concept Review Laser Power Economics Microwave Transmission Environment Social Impacts				

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-40
AUTHOR(S): Hanley, G. M.			
AUTHOR AFFILIATION: Rockwell International			
TITLE: Rockwell Satellite Power System (SPS) Concept Definition Studies			
DATE: 1980	VOLUMES:	PAGES: 17	REFERENCES: 2
ACQUISITION NO: 0191-9067/80/010079-17 Space Solar Power Review, Vol. 1, pp. 79-95			SOURCE: 33
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Concept Review Energy Conversion Power Distribution </div> <div> Satellite Structures Space Assembly Space Transportation </div> </div>			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-10
AUTHOR(S): Hazelrigg, G. A. (1) Adornato, R. J. (2) Wendell, C. A. (3) Glaser, P. E. (4)			
AUTHOR AFFILIATION: (1) ECON, Inc. (3) Raytheon Company (2) Grumman Aerospace Corp. (4) A. D. Little, Inc.			
TITLE: Space-Based Solar Power Conversion and Delivery Systems Study			
DATE: March 1977	VOLUMES: 5	PAGES: 812	REFERENCES: 72
ACQUISITION NO: V.1-Summary(40 pp.) V.5-Economics V.2-Orbit Analysis(257-pp.) (262 pp.) NAS8-31308 V.3-Power System(185 pp.) 77-145-1 V.4-Energy Conversion(68 pp.)			SOURCE: 4
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Economics Energy Conversion Orbital Operations </div> <div> Space Assembly Technology Requirements Transmission System </div> </div>			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-8	
AUTHOR(S): Johnson Space Center				
AUTHOR AFFILIATION: National Aeronautics and Space Administration				
TITLE: Initial Technical, Environmental and Economic Evaluation of Space Solar Power Concepts				
DATE: August 1976		VOLUMES: 2		PAGES: 986
				REFERENCES: 72
ACQUISITION NO: JSC-11568 V. 1 - Summary (119 pp.) V. 2 - Analysis(867 pp.)				SOURCE: 4
KEY WORDS: Economics Energy Conversion Environment Orbital Operations Space Transportation Transmission System				

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-4	
AUTHOR(S): Johnson Space Center				
AUTHOR AFFILIATION: National Aeronautics and Space Administration				
TITLE: Preliminary Assessment of Technology Advancement Requirement for Space Solar Power				
DATE: March 1977		VOLUMES:		PAGES: 200
				REFERENCES: None
ACQUISITION NO: JSC-12702				SOURCE: 4
KEY WORDS: Energy Conversion Satellite Stability Satellite Structures Space Assembly Transmission System				

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-9	
AUTHOR(S): Johnson Space Center				
AUTHOR AFFILIATION: National Aeronautics and Space Administration				
TITLE: Solar Power Satellite Concept Evaluation Activities Report				
DATE: July 1977		VOLUMES: 2		PAGES: 1274
				REFERENCES: 125
ACQUISITION NO: JSC-12973				SOURCE: 4
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Economics Energy Conversion Environment </div> <div> Space Assembly Space Transportation Transmission System </div> </div>				

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-1	
AUTHOR(S): Jones, W. S. Hunter, M. W.				
AUTHOR AFFILIATION: Lockheed Missiles and Space Company				
TITLE: Solar Power Satellites: The Laser Option				
DATE: March 1979		VOLUMES:		PAGES: 2
				REFERENCES: None
ACQUISITION NO: Astronautics and Aeronautics Vol 17, No. 3 pp. 59, 67				SOURCE: 2
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Concept Definition Laser Power Space Reflector </div> </div>				

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-21
AUTHOR(S): Koomanoff, F. A.			
AUTHOR AFFILIATION: U. S. Department of Energy			
TITLE: Status of the Satellite Power System (SPS) Concept Development and Evaluation Program			
DATE: December 1978	VOLUMES:	PAGES: 17	REFERENCES: None
ACQUISITION NO: By Title; Anglo-American Workshop on Energy and Aerospace (London)			SOURCE: 2
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Concept Review Environment Key Issues </div> <div> Resource Analysis Satellite Structures Social Impacts </div> </div>			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-22
AUTHOR(S): Koomanoff, F. A. (1) Sandahl, C. A. (2)			
AUTHOR AFFILIATION: (1) U. S. Department of Energy (2) Argonne National Laboratory			
TITLE: Status of Satellite Power System Concept Development and Evaluation Program			
DATE: September 1979	VOLUMES:	PAGES: 17	REFERENCES: 22
ACQUISITION NO: By Title (30th Congress of the International Astronautical Federation Munich, FRG)			SOURCE: 42
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Comparative Assessment Concept Definition Environment </div> <div> Key Issues Satellite Structures Social Impacts </div> </div>			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-27
AUTHOR(S): Koomanoff, F. A. (1) Sandahl, C. A. (2)			
AUTHOR AFFILIATION: (1) U. S. Department of Energy (2) Argonne National Laboratory			
TITLE: Status of the Satellite Power System Concept Development and Evaluation Program			
DATE: 1980	VOLUMES:	PAGES: 11	REFERENCES: 22
ACQUISITION NO: 0191-9067/80/010067, Space Solar Power Review			SOURCE: 33
KEY WORDS: Comparative Assessment Key Issues Concept Review Social Impacts Environment Technology Requirements			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-23
AUTHOR(S): Koomanoff, F. A.			
AUTHOR AFFILIATION: U. S. Department of Energy			
TITLE: Satellite Power System Concept Development and Evaluation Program Findings			
DATE: September 1980	VOLUMES:	PAGES: 33	REFERENCES: 11
ACQUISITION NO: By Title; 31st Congress of the International Astronautical Federation (Tokyo)			SOURCE: 42
KEY WORDS: Concept Review Key Issues Economics Social Impacts Environment Space Transportation			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-16
AUTHOR(S): Kraft, C. C.			
AUTHOR AFFILIATION: National Aeronautics and Space Administration			
TITLE: The Solar Power Satellite Concept - The Past Decade and the Next Decade			
DATE: February 1979	VOLUMES:	PAGES: 17	REFERENCES: 24
ACQUISITION NO: 79-0534			SOURCE: 2
KEY WORDS: Concept Review Space Transportation Energy Conversion Transmission System Space Assembly			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-39
AUTHOR(S): Kraft, C. C. Piland, R. O.			
AUTHOR AFFILIATION: National Aeronautics and Space Administration			
TITLE: The Solar Power Satellite Concept - The Past Decade and the Next Decade			
DATE: 1980	VOLUMES:	PAGES: 27	REFERENCES: 20
ACQUISITION NO: 0191-9067/80/010039-27 Space Solar Power Review, Vol. 1, pp. 39-65			SOURCE: 33
KEY WORDS: Concept Review Satellite Structures Costs Space Assembly Microwave Transmission Space Transportation			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-46	
AUTHOR(S): National Research Council				
AUTHOR AFFILIATION: National Academy of Sciences				
TITLE: <i>NOT AVAILABLE - Committee Report on SPS expected to be published in Mid-1981</i>				
DATE:		VOLUMES:		PAGES:
ACQUISITION NO:		REFERENCES:		
		SOURCE: 27		
KEY WORDS:				

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-13	
AUTHOR(S): Rice University				
AUTHOR AFFILIATION: Rice University				
TITLE: Space Solar Power Research Program				
DATE: December 1977		VOLUMES:		PAGES: 63
ACQUISITION NO: By Title		REFERENCES: None		
		SOURCE: 19		
KEY WORDS: Economics Environment Social Impacts Space Environment Transmission System				

SUBJECT: SYSTEMS ANALYSES		SPSPO INDEX NO: SA-31	
AUTHOR(S): Rockwell International			
AUTHOR AFFILIATION: Rockwell International			
TITLE: Satellite Power Systems (SPS) Concept Definition Study Final Report			
DATE: August 1980	VOLUMES: 4	PAGES: 724	REFERENCES: 135
ACQUISITION NO: SSD 80-0108-1,2,4,7 NAS 8-32475 V.1, Summary, 51 pp. V.3, Operations, 67 pp. V.2, Analyses, 340 pp. V.7, Requirements, 266 pp.			SOURCE: 4
KEY WORDS: Concept Definition Satellite Structures Orbital Operations Space Assembly Microwave Transmission Technology Requirements			

SUBJECT: SYSTEMS ANALYSES		SPSPO INDEX NO: SA-32	
AUTHOR(S): Rockwell International			
AUTHOR AFFILIATION: Rockwell International			
TITLE: Satellite Power Systems (SPS) Concept Definition Study Final Report			
DATE: October 1980	VOLUMES: 4	PAGES: 792	REFERENCES: 2
ACQUISITION NO: SSD80-0108-3, 5, 6-1, 6-2 NAS 8-32475 V.3, Transportation, 87 pp. V.6-1; Costs, 88 pp. V.5, Integration, 220 pp. V.6-2, Appendix, 397 pp.			SOURCE: 4
KEY WORDS: Concept Definition Space Transportation Costs Technology Requirements Key Issues			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-37
AUTHOR(S): Schwenk, F. C.			
AUTHOR AFFILIATION: National Aeronautics and Space Administration			
TITLE: The SPS Concept-An Overview of Status and Outlook			
DATE: August 1980	VOLUMES:	PAGES: 7	REFERENCES: 10
ACQUISITION NO: 809267			SOURCE: 2
KEY WORDS: Comparative Assessment Concept Review Environment		Key Issues Social Impacts Space Transportation	

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-45
AUTHOR(S): Technology Assessment, Office of			
AUTHOR AFFILIATION: U. S. Congress			
TITLE: <i>NOT AVAILABLE - Report on SPS expected to be published in Spring, 1981</i>			
DATE:	VOLUMES:	PAGES:	REFERENCES:
ACQUISITION NO:			SOURCE: 20
KEY WORDS:			

SUBJECT: SYSTEMS ANALYSES		SPSPO INDEX NO: SA-42	
AUTHOR(S): Vanke, V. A. Lopukhin, V. M. Savvin, V. L.			
AUTHOR AFFILIATION: M. W. Lomonosov State University (Moscow)			
TITLE: Satellite Solar Power Stations			
DATE: December 1977	VOLUMES:	PAGES: 13	REFERENCES: 91
ACQUISITION NO: ISSN:0038-5670			SOURCE: 41
KEY WORDS: Concept Review Economics Energy Conversion Microwave Transmission			

SUBJECT: SYSTEMS ANALYSES		SPSPO INDEX NO: SA-6	
AUTHOR(S): Wolfe, M. G.			
AUTHOR AFFILIATION: Aerospace Corporation			
TITLE: Application of Stationkept Array Concepts to Satellite Solar Power Station Design			
DATE: November 1976	VOLUMES: 2	PAGES: 199	REFERENCES: 8
ACQUISITION NO: NA8-31842 ATR-76(7575)-1 Vol. 1 - Summary (32 pp.) Vol. 2 - Analysis (167 pp.)			SOURCE: 4
KEY WORDS: Power Distribution Satellite Stability Satellite Structures Space Assembly Technology Requirements Transmission System			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-7
AUTHOR(S): Woodcock, G. R.			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: Satellite Power Systems for Large-Scale Power Generation			
DATE: October 1976	VOLUMES:	PAGES: 11	REFERENCES: 8
ACQUISITION NO: By Title; 27th Congress of the International Astronautical Federation (Anaheim)			SOURCE: 42
KEY WORDS: Concept Review Satellite Structures Energy Conversion Space Transportation Power Distribution Transmission System			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-25
AUTHOR(S): Woodcock, G. R.			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: Solar Satellites-Space Key to Our Power Future			
DATE: July-August 1977	VOLUMES:	PAGES: 15	REFERENCES: None
ACQUISITION NO: By Title; Astronautics and Aeronautics			SOURCE: 2
KEY WORDS: Concept Review Satellite Structures Energy Conversion Space Assembly Orbital Operations Space Transportation			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-19
AUTHOR(S): Woodcock, G. R.			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: Large-Scale Space Operations for Solar Power Satellites			
DATE: August 1977	VOLUMES:	PAGES: 15	REFERENCES: 9
ACQUISITION NO: By Title (New Options in Energy Technology, San Francisco, 1977)			SOURCE: 2
KEY WORDS: Concept Review Satellite Structures Space Assembly Space Transportation			

SUBJECT: SYSTEMS ANALYSES			SPSPO INDEX NO: SA-26
AUTHOR(S): Woodcock, G.			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: Solar Power Satellite Systems Definition			
DATE: December 1978	VOLUMES:	PAGES: 47	REFERENCES: None
ACQUISITION NO: By Title (AIAA-RAS Conference on Energy and Aerospace, London)			SOURCE: 2
KEY WORDS: Concept Definition Energy Conversion Ground Receiver Satellite Structures Space Assembly Technology Requirements			

THIS PAGE
WAS INTENTIONALLY
LEFT BLANK

SYSTEMS ENGINEERING (CATEGORY SE)

Documents in this category deal with the engineering aspects of the satellite structure which would be assembled in space and the receiving antenna complex which would be built on earth as a part of SPS. Other issues, such as the space-to-earth transmission path, are discussed only to the extent that they may be important factors in engineering principles and design. Note also that reports and papers concentrating on power generation and transmission are listed in a separate category.

KEY WORDS:	PAGE NUMBER:
Antenna	179, 182, 183, 184, 185, 191, 193
Antenna Errors	180, 188, 193
Array Control	180, 188, 190, 193
Array Design	176, 183
Cell Design	176, 183
Charged Particles	192
Command Signals	180, 188, 190
Concentrators	176, 188
Converter Station	175
Debonding	182
Dipole Assembly	175
Economics	183
Efficiency	176
Electric Charge	192
Electrostatic Protection	191
Energy Collection	175, 178, 179, 183, 185, 188, 191
Energy Conversion	175, 178, 185, 186, 188
Failure Analysis	176, 182
Fatigue	182
Federal Programs	183
Fiber Optics	190
Frequency Offset	180, 190
Geophysics	192
Ground Station	178, 179, 180, 181, 183, 185, 186, 187, 191
Industrial Capacity	183
Interference Effects	190
Laser Annealing	177
Load Estimates	181
Machine Intelligence	189
Manufacturing Process	183
Mitigation	192
Models	192

(Systems Engineering -
Category SE continued)

KEY WORDS:	PAGE NUMBER:
Offshore Rectenna	179, 181, 191
Orbit Maintenance	176
Orbit Position	189
Performance	176
Photovoltaics	175, 188
Pilot Beam	180, 185, 188, 190
Pointing Control	180, 188, 190, 193
Power Blocks	175, 181
Power Conversion	175
Power Distribution	175, 178, 182, 185, 186, 187
Rectenna	175, 181
Rectenna Alternatives	179, 181, 185
Rectenna Constructability	179, 181, 192
Rectenna Costs	179, 185, 191, 192
Rectenna Design	179, 181, 185, 191, 192
Rectenna Heat	192
Rectenna Maintainability	179, 181, 192
Rectenna Materials	179, 192
Reliability	181
Satellite Control	176, 177, 182, 184, 187, 189, 190, 193
Satellite Maintainability	184, 186
Satellite Materials	187, 189, 191
Satellite Structure	177, 178, 182, 183, 184, 186, 187, 188, 189, 191, 193
Shielding	192
Solar Collector	175
Space Automation	184, 189
Space Construction	177, 178, 184, 186, 187, 189
Space Transportation	176, 177, 178, 182, 186, 187, 189
Stability	181
System Capacity	181
System Uncertainties	177
Systems Definition	177, 182, 187
Transmission Path	180, 183, 190
Transmission System	177, 178, 182, 183, 184, 185, 186, 187
Vibration Test	182

RELATED CATEGORIES:

All Other Categories

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-26
AUTHOR(S): Alabama, University of			
AUTHOR AFFILIATION: University of Alabama			
TITLE: The Final Report of the SPS Energy Conversion and Power Management Workshop			
DATE: June 1980	VOLUMES:	PAGES: 102	REFERENCES: None
ACQUISITION NO: By Title, NAS 8-33132			SOURCE: 4
KEY WORDS: Energy Collection Power Distribution Energy Conversion Solar Collector Photovoltaic			

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-33
AUTHOR(S): Andryczyk, R. Foldes, P. Chestek, J. Kaupang, B. M.			
AUTHOR AFFILIATION: General Electric Company			
TITLE: Solar Power Satellite Ground Stations			
DATE: July 1979	VOLUMES:	PAGES: 5	REFERENCES: None
ACQUISITION NO: 0018-9235/79/0700-0051			SOURCE: 6
KEY WORDS: Converter Station Power Conversion Dipole Assembly Rectenna Power Blocks			

SUBJECT: SYSTEMS ENGINEERING		SPSPO INDEX NO: SE-31	
AUTHOR(S): Argonne National Laboratory			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: Design Requirements for Orbit Maintenance of SPS Elements			
DATE: November 1980	VOLUMES:	PAGES: 68	REFERENCES: 6
ACQUISITION NO: DOE/ER-0087			SOURCE: 5
KEY WORDS: Failure Analysis Space Transportation Orbit Maintenance Satellite Control			

SUBJECT: SYSTEMS ENGINEERING		SPSPO INDEX NO: SE-36	
AUTHOR(S): Bekey, I. Blocker, W.			
AUTHOR AFFILIATION: Aerospace Corporation			
TITLE: High Efficiency Low Cost Solar Cell Power			
DATE: November 1978	VOLUMES:	PAGES: 7	REFERENCES: 12
ACQUISITION NO: By Title; Astronautics and Aeronautics, pp. 32-38			SOURCE: 2
KEY WORDS: Array Design Efficiency Cell Design Performance Concentrators			

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-15
AUTHOR(S): Boeing Aerospace Company			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: Satellite Power System System Definition Study, Parts I and II			
DATE: December 1977	VOLUMES: 7	PAGES: 1317	REFERENCES: None
ACQUISITION NO: D180228-1,2,3,4,5,6,8 NAS9-15196 DRL T-1346 DRD MA-664T			SOURCE: 4
KEY WORDS: Satellite Structure Space Construction Space Transportation		System Uncertainties Systems Definition Transmission System	

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-3
AUTHOR(S): Boeing Aerospace Company			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: Solar Power Satellite System Definition Study Phase I Final Report			
DATE: February-April 1979	VOLUMES: 4	PAGES: 1001	REFERENCES: 4
ACQUISITION NO: D180-25037-1 (Summary), 27 pp. D180-25037-2 (Analyses/Tradeoffs), 537 pp. D180-25037-3 (System Description), 348 pp. D180-25037-4 (Solar Cell Annealing), 89 pp.			SOURCE: 4
KEY WORDS: Laser Annealing Satellite Control Satellite Structure		Space Construction Space Transportation System Definition	

SUBJECT: SYSTEMS ENGINEERING		SPSPO INDEX NO: SE-4	
AUTHOR(S): Boeing Aerospace Company			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: Solar Power Satellite System Definition Study, Part III, Preferred Concept			
DATE: March 1978	VOLUMES:	PAGES: 357	REFERENCES: None
ACQUISITION NO: NAS9-15196 DRL T-1346 DRD MA-664T D 180-24071-1		SOURCE: 4	
KEY WORDS: Energy Collection Energy Conversion Ground Station		Power Distribution Satellite Structure Transmission System	

SUBJECT: SYSTEMS ENGINEERING		SPSPO INDEX NO: SE-24	
AUTHOR(S): Boeing Aerospace Company			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: Solar Power Satellite System Definition Study, Phase II			
DATE: November 1979	VOLUMES: 4	PAGES: 1272	REFERENCES: 32
ACQUISITION NO: D180-25461-1,2,3,4, Vol. I, Summary, 37 pp. Vol.II, Description, 340 pp.		SOURCE: 4 Vol.III, Synthesis, 599 pp. Vol.IV, Analysis, 296 pp.	
KEY WORDS: Energy Collection Energy Conversion Ground Station		Satellite Structure Space Construction Space Transportation	

SUBJECT: SYSTEMS ENGINEERING		SPSPO INDEX NO: SE-30	
AUTHOR(S): Bresters, A. R.			
AUTHOR AFFILIATION: Hydronamic B. V.			
TITLE: Study on Infrastructure Considerations for Microwave Energy Ground Receiving Stations (SPS - Offshore Rectenna Siting Study in West-Europe)			
DATE: November 1980	VOLUMES: 2	PAGES: 136	REFERENCES: 3
ACQUISITION NO: ESTEC 4382/80/NL/PP (SC) V. 1, Summary, 25 pp.		SOURCE: 1 V.2, Final Report, 111 pp.	
KEY WORDS: Antenna Energy Collection Ground Station Offshore Rectenna Rectenna Alternatives Rectenna Design			

SUBJECT: SYSTEMS ENGINEERING		SPSPO INDEX NO: SE-23	
AUTHOR(S): Brown and Root Development, Inc.			
AUTHOR AFFILIATION: Brown and Root Development, Inc.			
TITLE: Offshore Space Center			
DATE: October 1979	VOLUMES:	PAGES: 43	REFERENCES: None
ACQUISITION NO: EF-0082		SOURCE: 4	
KEY WORDS: Rectenna Alternatives Rectenna Constructability Rectenna Costs Rectenna Design Rectenna Maintainability Rectenna Materials			

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-27
AUTHOR(S): Chan, C. H.			
AUTHOR AFFILIATION: Marshall Space Flight Center			
TITLE: Pilot Signals for Large Active Retro-Directive Arrays			
DATE: August 1980	VOLUMES:	PAGES: 18	REFERENCES: 7
ACQUISITION NO: NASA-TM-78310			SOURCE: 5
KEY WORDS: Array Control Pilot Beam Command Signals Pointing Control Frequency Offset Transmission Path			

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-25
AUTHOR(S): Chie, C. M. Kantak, A. V. Lindsey, W. C. Scholtz, R. A.			
AUTHOR AFFILIATION: LinCom Corporation			
TITLE: SPS Reference Phase Control System - Final Report for Phase III			
DATE: January 1980	VOLUMES: 4	PAGES: 308	REFERENCES: 28
ACQUISITION NO: TR 0180-0779, NAS 9-15782 Vol. I, Summary, 49 pp. Vol. III, Simulation, 89 pp. Vol. II, Analysis, 106 pp. Vol. IV, Ground Base, 64 pp.			SOURCE: 4
KEY WORDS: Antenna Errors Ground Station Array Control Pilot Beam Command Signals Pointing Control			

SUBJECT: SYSTEMS ENGINEERING		SPSPO INDEX NO: SE-32	
AUTHOR(S): Collins, P. Q.			
AUTHOR AFFILIATION: Imperial College of Science and Technology (London)			
TITLE: Feasibility of Siting SPS Rectennas Over the Sea			
DATE: 1980	VOLUMES:	PAGES: 12	REFERENCES: 26
ACQUISITION NO: 0191-9067/80/010133-12 Space Solar Power Review, Vol. 1, pp. 133-144			SOURCE: 33
KEY WORDS: Ground Station Offshore Rectenna Rectenna Alternatives		Rectenna Constructability Rectenna Design Rectenna Maintainability	

SUBJECT: SYSTEMS ENGINEERING		SPSPO INDEX NO: SE-34	
AUTHOR(S): Donalek, P. J. Whysong, J. L.			
AUTHOR AFFILIATION: Harza Engineering Company			
TITLE: Utility Interface Requirements for a Solar Power System			
DATE: September 1978	VOLUMES:	PAGES: 57	REFERENCES: 8
ACQUISITION NO: DOE/ER-0032			SOURCE: 5
KEY WORDS: Load Estimates Power Blocks Rectenna		Reliability Stability System Capacity	

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-7	
AUTHOR(S): Glaser, P. E.				
AUTHOR AFFILIATION: Arthur D. Little, Inc.				
TITLE: Method and Apparatus for Converting Solar Radiation to Electrical Power				
DATE: December 1973		VOLUMES: .		PAGES: 11
				REFERENCES: 7
ACQUISITION NO: U.S. Patent 3,781,647				SOURCE: 22
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Antenna Energy Collection Ground Station </div> <div> Satellite Structure Transmission Path Transmission System </div> </div>				

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-35	
AUTHOR(S): Glaser, P. E. Almgren, D. W. Csigi, K. Gaudet, A. D.				
AUTHOR AFFILIATION: Arthur D. Little, Inc.				
TITLE: Evaluation of Solar Cells and Arrays for Potential Solar Power Satellite Applications				
DATE: March 1970		VOLUMES:		PAGES: 75
				REFERENCES: 42
ACQUISITION NO: NASA 9-15294				SOURCE: 4
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Array Design Cell Design Economics </div> <div> Federal Programs Industrial Capacity Manufacturing Process </div> </div>				

SUBJECT: SYSTEMS ENGINEERING		SPSPO INDEX NO: SE-13	
AUTHOR(S): Gorman, D. Lord, C. Skidmore, R. Grant, C. Rombach, J. Thomas, R. Kyrias, G. Salis, M.			
AUTHOR AFFILIATION: Martin Marietta Corporation			
TITLE: Orbital Assembly and Maintenance Study			
DATE: August 1975	VOLUMES:	PAGES: 25	REFERENCES: None
ACQUISITION NO: MCR-75-319 NAS9-14319			SOURCE: 4
KEY WORDS: Antenna Satellite Maintainability Space Construction Transmission System			

SUBJECT: SYSTEMS ENGINEERING		SPSPO INDEX NO: SE-10	
AUTHOR(S): Grumman Aerospace Corporation			
AUTHOR AFFILIATION: Grumman Aerospace Corporation			
TITLE: Orbital Construction Demonstration Study			
DATE: June 1977	VOLUMES: 3	PAGES: 551	REFERENCES: 104
ACQUISITION NO: NSS-OC-RPO-12 V.1 - Summary (61 pp.) V.2 - Technical (339 pp.) V.3 - Requirements (91 pp.)			SOURCE: 4
KEY WORDS: Antenna Satellite Control Satellite Structure Space Automation Space Construction			

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-17	
AUTHOR(S): Guttman, R. J. (Editor)				
AUTHOR AFFILIATION: Rensselaer Polytechnic Institute				
TITLE: Solar Power Satellites Design Considerations for Solar Collection and Conversion, Power Beam Phase Control and Rectenna Subsystems				
DATE: June 1978		VOLUMES: 1		PAGES: 145
				REFERENCES: 50
ACQUISITION NO: NAS9-15453				SOURCE: 4
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Antenna Energy Collection Energy Conversion </div> <div> Pilot Beam Rectenna Design Transmission System </div> </div>				

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-19	
AUTHOR(S): Guttman, R. J. Borrego, J. M.				
AUTHOR AFFILIATION: Rensselaer Polytechnic Institute				
TITLE: Solar Power Satellite Rectenna Design Study: Directional Receiving Elements and Parallel-Series Combining Analysis				
DATE: December 1978		VOLUMES:		PAGES: 116
				REFERENCES: 21
ACQUISITION NO: NAS9-15453				SOURCE: 4
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Ground Station Power Distribution Rectenna Alternatives </div> <div> Rectenna Costs Rectenna Design </div> </div>				

SUBJECT: SYSTEMS ENGINEERING		SPSPO INDEX NO: SE-14	
AUTHOR(S): Hanley, G. M.			
AUTHOR AFFILIATION: Rockwell International			
TITLE: Satellite Power System (SPS) Concept Definition Study Key Issue Identification and Assessment			
DATE: August 1977	VOLUMES:	PAGES: 34	REFERENCES: None
ACQUISITION NO: SD 77-AP-0103-2		SOURCE: 4	
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Energy Conversion Ground Station Satellite Maintainability </div> <div> Space Construction Space Transportation Transmission System </div> </div>			

SUBJECT: SYSTEMS ENGINEERING		SPSPO INDEX NO: SE-8	
AUTHOR(S): Hanley, G. M.			
AUTHOR AFFILIATION: Rockwell International			
TITLE: Satellite Power Systems (SPS) Concept Definition Study Final Report			
DATE: April 1978	VOLUMES: 7	PAGES: 1323	REFERENCES: None
SD 78-AP-0023 V.2-Requirements(86 pp) ACQUISITION NO: V.3-Evolution(289 pp.) V.1-Summary(77 pp.) V.4-Design(188 pp.) V.5-Transportation and Operations(168 pp.)		V.6-Technology (129 pp.) V.7-Economics (299 pp.)	SOURCE: 4
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Energy Conversion Ground Station Power Distribution </div> <div> Satellite Structure Space Transportation Transmission System </div> </div>			

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-9	
AUTHOR(S): Hanley, G. M.				
AUTHOR AFFILIATION: Rockwell International				
TITLE: Satellite Power Systems (SPS) Concept Definition Study - Point Design Definition Update				
DATE: July 1978		VOLUMES:		PAGES: 107
				REFERENCES: None
ACQUISITION NO: SD78-AP-0113 NAS8-32475 DPD 558				SOURCE: 4
KEY WORDS: Ground Station Power Distribution Satellite Control Satellite Materials Satellite Structure Transmission System				

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-16	
AUTHOR(S): Hanley, G. M.				
AUTHOR AFFILIATION: Rockwell International				
TITLE: Satellite Power Systems (SPS) Concept Definition Study Final Report				
DATE: March 1979		VOLUMES: 9		PAGES: 1336
				REFERENCES: 3
ACQUISITION NO: SSD 79-0010-1 through -7 NAS8-32475 DPD558 MA-04				SOURCE: 4
KEY WORDS: Ground Station Satellite Structure Space Construction Space Transportation Systems Definition Transmission System				

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-21
AUTHOR(S): Lindsay, T. A. Nalos, E. J.			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: SPS Fiber Optic Link Assessment			
DATE: January 1980	VOLUMES:	PAGES: 94	REFERENCES: 16
ACQUISITION NO: D 180-25888-1 NAS9-15636A			SOURCE: 4
KEY WORDS: Array Control Command Signals Fiber Optics Pointing Control			

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-2
AUTHOR(S): Raytheon Company			
AUTHOR AFFILIATION: Raytheon Company			
TITLE: Solar Power Satellite (SPS) Pilot Beam and Communication Link Subsystem Investigation Report--Phase I			
DATE: January 1979	VOLUMES:	PAGES: 76	REFERENCES: 10
ACQUISITION NO: ER 79-4032 Contract NAS8-33157 DCN 1-8-PP-00800			SOURCE: 4
KEY WORDS: Frequency Offset Interference Effects Pilot Beam Satellite Control Transmission Path			

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-20
AUTHOR(S): Reiff, P. H. Freeman, J. W. Cooke, D. L.			
AUTHOR AFFILIATION: Rice University			
TITLE: Environmental Protection of the Solar Power Satellite			
DATE: 1979	VOLUMES:	PAGES: 23	REFERENCES: 25
ACQUISITION NO: By Title, Progress in Astronautics and Aeronautics, Vol. 71			SOURCE: 2
KEY WORDS: Electrostatic Protecion Satellite Materials Satellite Structure			

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-28
AUTHOR(S): Rice University			
AUTHOR AFFILIATION: Rice University			
TITLE: Solar Power Satellite Offshore Rectenna Study			
DATE: November 1980	VOLUMES:	PAGES: 257	REFERENCES: 6
ACQUISITION NO: NASA CR 3348 NAS 8-33023			SOURCE: 4
KEY WORDS: Antenna Energy Collection Ground Station Offshore Rectenna Rectenna Costs Rectenna Design			

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-37
AUTHOR(S): Rice University			
AUTHOR AFFILIATION: Rice University			
TITLE: Electrostatic Protection of the Solar Power Satellite and Rectenna; Part I: Protection of the Solar Power Satellite			
DATE: November 1980	VOLUMES:	PAGES: 34	REFERENCES: 26
ACQUISITION NO: NASA CR 3344 NAS 8 - 33023			SOURCE: 4
KEY WORDS: Charged Particles Mitigation Electric Charge Models Geophysics Shielding			

SUBJECT: SYSTEMS ENGINEERING			SPSPO INDEX NO: SE-12
AUTHOR(S): Taylor, R. B.			
AUTHOR AFFILIATION: Bovay Engineers, Inc.			
TITLE: Feasibility Study for Various Approaches to the Structural Design and Arrangement of the Ground Rectenna for the Proposed Satellite			
DATE: May 1977	VOLUMES:	PAGES: 72	REFERENCES: None
ACQUISITION NO: Contract NAS9-15280			SOURCE: 4
KEY WORDS: Rectenna Constructability Rectenna Heat Rectenna Costs Rectenna Maintainability Rectenna Design Rectenna Materials			

SUBJECT: SYSTEMS ENGINEERING		SPSPO INDEX NO: SE-29	
AUTHOR(S): Tennessee, University of			
AUTHOR AFFILIATION: University of Tennessee			
TITLE: Satellite Power System (SPS) Antenna Pointing Control			
DATE: November 1980	VOLUMES:	PAGES: 84	REFERENCES: 11
ACQUISITION NO: NASA CR 3350 NAS 8- 33604			SOURCE: 4
KEY WORDS: Antenna Pointing Control Antenna Errors Satellite Control Array Control Satellite Structure			

THIS PAGE
WAS INTENTIONALLY
LEFT BLANK

SOCIAL ISSUES (CATEGORY SI)

Reports and other documents in this category cover a wide range of social issues and questions about the SPS concept, and describe the elements of the SPS Social Assessment CDEP and its results. The social implications of all key issues are described.

KEY WORDS:	PAGE NUMBER:
Building Uses	211
Commercial Market	211
Damage Liability	201, 205, 210
Decentralization	200, 202, 204, 205, 206, 207, 208, 214
Demographics	199, 200, 206
Economics	197, 199, 200, 202, 203, 204, 205, 206 207, 208, 209, 210, 211, 213, 214
Energy Analysis	211
Energy Options	203, 206, 207, 211, 213
Environmental Concerns	198, 199, 201, 202, 205, 207, 212, 213
Financial Regulation	200, 202, 203, 204, 209
Industry	199, 204
Institutional Concerns	199, 200, 202, 204, 205, 210, 212, 213, 214
International Concerns	198, 199, 201, 203, 205, 207, 208, 209, 210 212, 213
International Interest	203, 204, 214
Key Issues	198, 201, 207
Land Use	199, 201, 205, 209, 214
Liability	197
Microwave Standards	201
Military Issues	198, 201, 205, 208, 212
Ownership	197
Performance	211
Population	199, 203, 206
Power Conversion	197
Power Regulation	200, 202, 203, 204, 208, 209, 211
Pricing	197
Public Acceptance	198, 199, 206, 207, 208, 210, 211, 213, 214
Public Outreach	198, 201, 209, 210, 213

(Social Issues
Category SI Continued)

KEY WORDS:	PAGE NUMBER:
Radio Spectrum	201, 107
Regulation	211
Reliability	197
Resource Use	199, 202, 203, 206, 207
Satellite Vulnerability	198, 208, 212
Space Law	201, 207, 208
Stability	197
Student Interest	205, 209, 210
System Capacity	197
System Storage	197
Terrestrial Solar	200, 204, 206, 214
Western Europe	214

RELATED CATEGORIES:

Biologic Effects (BE)
Energy Alternatives and Policy (EA)
Environmental Effects (EE)
Economics and Finances (EF)
Power Generation and Transmission (PT)
Resources and Materials (RM)
Systems Engineering (SE)

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-34
AUTHOR(S): Arthur D. Little, Inc.			
AUTHOR AFFILIATION: Arthur D. Little, Inc.			
TITLE: Impacts and Benefits of a Satellite Power System on the Electric Utility Industry			
DATE: July 1977	VOLUMES:	PAGES: 128	REFERENCES: None
ACQUISITION NO: C-80020 JPL 954639			SOURCE: 4
KEY WORDS: Liability Ownership Pricing Reliability Stability			

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-35
AUTHOR(S): Asbury, J. G. Mueller, R. O.			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: Solar Energy and Electric Utilities: Should They Be Interfaced?			
DATE: February 1977	VOLUMES:	PAGES: 6	REFERENCES: 16
ACQUISITION NO: By Title; Science, Vol. 195, pp.445-450			SOURCE: 7
KEY WORDS: Economics Ownership Power Conversion Pricing System Capacity System Storage			

SUBJECT: SOCIAL ISSUES		SPSPO INDEX NO: SI-2	
AUTHOR(S): Bachrach, A.			
AUTHOR AFFILIATION: Environmental/Resources Group			
TITLE: Satellite Power System (SPS) Public Acceptance			
DATE: October 1978	VOLUMES:	PAGES: 78	REFERENCES: 186
ACQUISITION NO: HCP/R-4024-04		SOURCE: 5	
KEY WORDS: Environmental Concerns International Concerns Key Issues Public Acceptance Public Outreach			

SUBJECT: SOCIAL ISSUES		SPSPO INDEX NO: SI-11	
AUTHOR(S): Bain, C. N.			
AUTHOR AFFILIATION: PRC Energy Analysis Company			
TITLE: Satellite Power System (SPS) Military Implications			
DATE: October 1978	VOLUMES:	PAGES: 44	REFERENCES: 19
ACQUISITION NO: HCP/R-4024-11		SOURCE: 5	
KEY WORDS: International Concerns Military Issues Satellite Vulnerability			

SUBJECT: SOCIAL ISSUES		SPSPO INDEX NO: SI-4	
AUTHOR(S): Baldwin, T. E. Hill, L. G. Santini, D. J. Stenehjem, E. J.			
AUTHOR AFFILIATION: PRC Energy Analysis Company			
TITLE: Economic and Demographic Issues Related to Deployment of the Satellite Power System (SPS)			
DATE: October 1978	VOLUMES:	PAGES: 69	REFERENCES: Bibliography
ACQUISITION NO: ANL/EES-TM-23			SOURCE: 5
KEY WORDS: Demographics Economics Industry Land Use Population Public Acceptance			

SUBJECT: SOCIAL ISSUES		SPSPO INDEX NO: SI-14	
AUTHOR(S): Bloomquist, C. E. Daurio, A. P. Shotland, S.			
AUTHOR AFFILIATION: PRC Energy Analysis Company			
TITLE: Satellite Power System (SPS) Preliminary Societal Assessment			
DATE: May 1979	VOLUMES:	PAGES: 60	REFERENCES: 12
ACQUISITION NO: HCP/R-4024-01/14			SOURCE: 5
KEY WORDS: Economics Environmental Concerns Institutional Concerns International Concerns Population Resource Use			

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-23
AUTHOR(S): Bohn, J. G. Patmore, J. W. Zaininger, H. W.			
AUTHOR AFFILIATION: Systems Control, Inc.			
TITLE: Satellite Power System: Utility Impact Study			
DATE: September 1980	VOLUMES:	PAGES: 72	REFERENCES: 37
ACQUISITION NO: EPRI AP-1548 TPS 79-752			SOURCE: 26
KEY WORDS: Economics Financial Regulation Institutional Concerns Power Regulation			

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-27
AUTHOR(S): (1) Bronfman, B. H. (1) Carnes, S. A. (1) Schweitzer, M. (1) Peelle, E. (2) Enk, G.			
AUTHOR AFFILIATION: (1) Oak Ridge National Laboratory (2) Institute on Man and Science			
TITLE: The Decentralized Solar Energy Technology Assessment Program: Review of Activities			
DATE: May 1980	VOLUMES:	PAGES: 104	REFERENCES: 44
ACQUISITION NO: ORNL/TM-7189			SOURCE: 13
KEY WORDS: Decentralization Demographics Institutional Concerns Terrestrial Solar			

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-6
AUTHOR(S): Christol, C. Q.			
AUTHOR AFFILIATION: PRC Energy Analysis Company			
TITLE: Satellite Power System (SPS) International Agreements			
DATE: October 1978	VOLUMES:	PAGES: 287	REFERENCES: Bibliography
ACQUISITION NO: HCP/R-4024-08			SOURCE: 5
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Damage Liability Environmental Concerns International Concerns </div> <div> Microwave Standards Radio Spectrum Space Law </div> </div>			

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-5
AUTHOR(S): Citizens' Energy Project			
AUTHOR AFFILIATION: Citizens' Energy Project			
TITLE: Satellite Power System Program Summary Series			
DATE: 1978	VOLUMES:	PAGES: 69	REFERENCES: None
ACQUISITION NO: By Title, 22 White Papers			SOURCE: 31
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Environmental Concerns International Concerns Key Issues </div> <div> Land Use Military Issues Public Outreach </div> </div>			

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-17
AUTHOR(S): Citizens' Energy Project			
AUTHOR AFFILIATION: Citizens' Energy Project			
TITLE: Solar Space Satellites			
DATE: June 1978	VOLUMES:	PAGES: 8	REFERENCES: 10
ACQUISITION NO: By Title			SOURCE: 31
KEY WORDS: Decentralization Institutional Concerns Economics Power Regulation Environmental Concerns Public Acceptance			

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-29
AUTHOR(S): (1) Crist, M. (2) Rabe, J. A. (2) Hill, J. (3) Kotin, A. D.			
AUTHOR AFFILIATION: (1) None (2) Environmental Resources Group (3) Kotin, Regan and Mouchly, Inc.			
TITLE: Satellite Power System (SPS) Utility Integration: Institutional Planning and Operational Issues			
DATE: October 1980	VOLUMES:	PAGES: 200	REFERENCES: Bibliography
ACQUISITION NO: PRC - EAC R-4015			SOURCE: 5
KEY WORDS: Economics International Concerns Financial Regulation Power Regulation Institutional Concerns Resource Use			

SUBJECT: SOCIAL ISSUES		SPSPO INDEX NO: SI-30	
AUTHOR(S): (1) Criswell, D. R. (4) O'Leary, B. T. (2) Glaser, P. E. (4) O'Neill, G. K. (3) Mayur, R. (5) Vajk, J. P.			
AUTHOR AFFILIATION: (1) Lunar and Planetary Institute (2) Arthur D. Little, Inc. (3) Urban Development Institute (India) (4) Princeton University (5) Science Applications, Inc.			
TITLE: The Role of Space Technology in the Developing Countries			
DATE: 1980	VOLUMES:	PAGES: 11	REFERENCES: None
ACQUISITION NO: 0191-9067/80/010097-11 Space Solar Power Review, Vol. 1, pp. 97-107			SOURCE: 33
KEY WORDS: Economics Population Energy Options Resource Use International Concerns			

SUBJECT: SOCIAL ISSUES		SPSPO INDEX NO: SI-33	
AUTHOR(S): Daurio, A. P.			
AUTHOR AFFILIATION: PRC Energy Analysis Company			
TITLE: Determinants of a Strategy for International Participation in an SPS Program			
DATE: December 1980	VOLUMES:	PAGES: 54	REFERENCES:
ACQUISITION NO: DOE/ER/10041-T13			SOURCE: 5
KEY WORDS: Economics International Concerns Energy Options International Interest Financial Regulation Power Regulation			

SUBJECT: SOCIAL ISSUES		SPSPO INDEX NO: SI-22	
AUTHOR(S): Duffy-Armstrong, M.			
AUTHOR AFFILIATION: SRI International			
TITLE: A Technology Assessment of Solar Energy Systems: Community Impediments to Implementation of Solar Energy			
DATE: November 1979	VOLUMES:	PAGES: 119	REFERENCES: 35
ACQUISITION NO: DOE/EV-0059			SOURCE: 5
KEY WORDS: Decentralization Economics Financial Regulation		Industry Institutional Concerns Terrestrial Solar	

SUBJECT: SOCIAL ISSUES		SPSPO INDEX NO: SI-13	
AUTHOR(S): Edler, H. G.			
AUTHOR AFFILIATION: PRC Energy Analysis Company			
TITLE: Satellite Power System (SPS): An Overview of Prospective Organizational Structures in the Solar Power Satellite Field			
DATE: October 1978	VOLUMES:	PAGES: 16	REFERENCES: 15
ACQUISITION NO: TID-29094			SOURCE: 5
KEY WORDS: Economics Financial Regulation International Interest		Power Regulation	

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-26						
AUTHOR(S): Energy, U. S. Department of									
AUTHOR AFFILIATION: U. S. Department of Energy									
TITLE: Some Questions and Answers About the Satellite Power System (SPS)									
DATE: January 1980	VOLUMES:	PAGES: 44	REFERENCES: 67						
ACQUISITION NO: DOE/ER-0049/1			SOURCE: 5						
KEY WORDS: <table border="0"> <tr> <td>Damage Liability</td> <td>Institutional Concerns</td> </tr> <tr> <td>Economics</td> <td>International Concerns</td> </tr> <tr> <td>Environmental Concerns</td> <td>Land Use</td> </tr> </table>				Damage Liability	Institutional Concerns	Economics	International Concerns	Environmental Concerns	Land Use
Damage Liability	Institutional Concerns								
Economics	International Concerns								
Environmental Concerns	Land Use								

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-19						
AUTHOR(S): Forum for the Advancement of Students in Science and Technology, Inc.									
AUTHOR AFFILIATION: Forum for the Advancement of Students in Science and Technology, Inc.									
TITLE: Satellite Power System (SPS) FASST Briefing									
DATE: July 1979	VOLUMES:	PAGES: 76	REFERENCES: None						
ACQUISITION NO: By Title			SOURCE: 38						
KEY WORDS: <table border="0"> <tr> <td>Decentralization</td> <td>International Concerns</td> </tr> <tr> <td>Environmental Concerns</td> <td>Military Issues</td> </tr> <tr> <td>Institutional Concerns</td> <td>Student Interest</td> </tr> </table>				Decentralization	International Concerns	Environmental Concerns	Military Issues	Institutional Concerns	Student Interest
Decentralization	International Concerns								
Environmental Concerns	Military Issues								
Institutional Concerns	Student Interest								

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-15
AUTHOR(S): George Washington University			
AUTHOR AFFILIATION: George Washington University			
TITLE: Social Assessment of On-Site Solar Energy			
DATE: April 1979	VOLUMES:	PAGES: 235	REFERENCES: 197
ACQUISITION NO: HCP/R4040-02			SOURCE: 5
KEY WORDS: Decentralization Public Acceptance Economics Resource Use Energy Options Terrestrial Solar			

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-24
AUTHOR(S): George Washington University			
AUTHOR AFFILIATION: George Washington University			
TITLE: Energy Implications of an Aging Population			
DATE: August 1980	VOLUMES:	PAGES: 64	REFERENCES: 17
ACQUISITION NO: DOE/ER/10041-01			SOURCE: 5
KEY WORDS: Demographics Economics Population			

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-16
AUTHOR(S): Gerlach, L. P.			
AUTHOR AFFILIATION: University of Minnesota			
TITLE: Technological Innovation and Social Exploration in Economic Growth and Energy Development			
DATE: May 1977	VOLUMES:	PAGES: 12	REFERENCES: 42
ACQUISITION NO: 77-558			SOURCE: 2
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Decentralization Economics Energy Options </div> <div> Environmental Concerns Public Acceptance Resource Use </div> </div>			

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-7
AUTHOR(S): Gorove, S.			
AUTHOR AFFILIATION: PRC Energy Analysis Company			
TITLE: Satellite Power System (SPS) International Agreements			
DATE: October 1978	VOLUMES: 1	PAGES: 80	REFERENCES: Bibliography
ACQUISITION NO: HCP/R-4024-12			SOURCE: 5
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> International Concerns Key Issues Radio Spectrum Space Law </div> </div>			

SUBJECT: SOCIAL ISSUES		SPSPO INDEX NO: SI-12	
AUTHOR(S): Hazelrigg, G. A.			
AUTHOR AFFILIATION: ECON Incorporated			
TITLE: Political and Legal Implications of Developing and Operating a Satellite Power System			
DATE: August 1977	VOLUMES:	PAGES: 244	REFERENCES: Bibliography
ACQUISITION NO: 77-195-1 JPL 954652			SOURCE: 4
KEY WORDS: Economics International Concerns Military Issues Power Regulation Satellite Vulnerability Space Law			

SUBJECT: SOCIAL ISSUES		SPSPO INDEX NO: SI-25	
AUTHOR(S): Klineberg, S. I.			
AUTHOR AFFILIATION: Rice University			
TITLE: Social Acceptability of Satellite Power Systems (SPS): The Near Term Outlook			
DATE: May 1980	VOLUMES:	PAGES: 58	REFERENCES: Bibliography
ACQUISITION NO: By Title			SOURCE: 13
KEY WORDS: Decentralization Power Regulation Public Acceptance			

SUBJECT: SOCIAL ISSUES		SPSPO INDEX NO: SI-8	
AUTHOR(S): Kotin, A. D.			
AUTHOR AFFILIATION: Allan D. Kotin Economic Consultants			
TITLE: Satellite Power System (SPS) State and Local Regulations as Applied to Satellite Power System Microwave Receiving Antenna Facilities			
DATE: October 1978	VOLUMES:	PAGES: 90	REFERENCES: 164
ACQUISITION NO: HCP/R-4024-05		SOURCE: 5	
KEY WORDS: Economics Financial Regulation International Concerns Land Use Power Regulation			

SUBJECT: SOCIAL ISSUES		SPSPQ INDEX NO: SI-9	
AUTHOR(S): Ladwig, A. David, L.			
AUTHOR AFFILIATION: Forum for the Advancement of Students in Science and Technology (FASST)			
TITLE: Satellite Power System (SPS) Student Participation			
DATE: October 1978	VOLUMES:	PAGES: 91	REFERENCES: 148
ACQUISITION NO: HCP/R-4024-06		SOURCE: 5	
KEY WORDS: Public Outreach Student Interest			

SUBJECT: SOCIAL ISSUES		SPSPO INDEX NO: SI-32	
AUTHOR(S): Mc Neal, S. R.			
AUTHOR AFFILIATION: PRC Energy Analysis Company			
TITLE: Satellite Power System (SPS) Public Outreach Experiment			
DATE: December 1980	VOLUMES:	PAGES: 66	REFERENCES: 67
ACQUISITION NO: DOE/ER/10041-T11			SOURCE: 5
KEY WORDS: Institutional Concerns International Concerns Public Acceptance Public Outreach Student Interest			

SUBJECT: SOCIAL ISSUES		SPSPO INDEX NO: SI-28	
AUTHOR(S): Marsh and McLellen, Inc.			
AUTHOR AFFILIATION: Marsh and McLellen, Inc.			
TITLE: Satellite Power System (SPS) Initial Insurance Evaluation			
DATE: September 1980	VOLUMES:	PAGES: 31	REFERENCES: 11
ACQUISITION NO: DOE/ER/21059-01			SOURCE: 5
KEY WORDS: Damage Liability Economics Institutional Concerns			

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-36	
AUTHOR(S): <div style="display: flex; justify-content: space-between;"> <div> Mixon, W. R. (1) Christian, J. E. (1) Jackson, W. L. (1) Pine, G. D. (1) </div> <div> Hagler, H. (2) Shanker, R. (2) Koppelman, L. (2) Greenstein, D. (2) </div> </div>				
AUTHOR AFFILIATION: <div style="display: flex; justify-content: space-between;"> <div>(1)</div> <div>Oak Ridge National Laboratory</div> </div> <div style="display: flex; justify-content: space-between;"> <div>(2)</div> <div>Resource Planning Associates, Inc.</div> </div>				
TITLE: Market Assessment of Fuel Cell Total Energy Systems				
DATE: April 1978		VOLUMES:		PAGES: 99 REFERENCES: 19
ACQUISITION NO: W-7405-ENG-26				SOURCE: 13
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Building Uses Commercial Market Economics </div> <div> Energy Analysis Performance Regulation </div> </div>				

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-10	
AUTHOR(S): Naisbitt, J.				
AUTHOR AFFILIATION: PRC Energy Analysis Company				
TITLE: Satellite Power System (SPS) Centralization/Decentralization				
DATE: October 1978		VOLUMES:		PAGES: 63 REFERENCES: Bibliography
ACQUISITION NO: HCP/R-4024-09				SOURCE: 5
KEY WORDS: <div style="display: flex; justify-content: space-between;"> <div> Economics Energy Options Power Regulation </div> <div>Public Acceptance</div> </div>				

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-18
AUTHOR(S): National Space Institute			
AUTHOR AFFILIATION: National Space Institute			
TITLE: Solar Power Satellite Issue Guides			
DATE: October 1978	VOLUMES:	PAGES: 40	REFERENCES: Bibliography
ACQUISITION NO: By Title			SOURCE: 38
KEY WORDS: Environmental Concerns Military Issues Institutional Concerns Satellite Vulnerability International Concerns			

SUBJECT: SOCIAL ISSUES			SPSPO INDEX NO: SI-3
AUTHOR(S): Ozeroff, M. J.			
AUTHOR AFFILIATION: PRC Energy Analysis Corporation			
TITLE: Satellite Power System (SPS) Military Implications			
DATE: October 1978	VOLUMES:	PAGES: 43	REFERENCES: Bibliography
ACQUISITION NO: HCP/R-4024-01			SOURCE: 5
KEY WORDS: International Concerns Military Issues Satellite Vulnerability			

SUBJECT: SOCIAL ISSUES		SPSPO INDEX NO: SI-20	
AUTHOR(S): Poch, L. A. Wolsko, T. D.			
AUTHOR AFFILIATION: Argonne National Laboratory			
TITLE: A Review of the Nuclear Safeguards Problem			
DATE: October 1979	VOLUMES:	PAGES: 19	REFERENCES: 13
ACQUISITION NO: ANL/EES-TM-67			SOURCE: 5
KEY WORDS: Institutional Concerns International Concerns Public Acceptance			

SUBJECT: SOCIAL ISSUES		SPSPO INDEX NO: SI-31	
AUTHOR(S): PRC Energy Analysis Company			
AUTHOR AFFILIATION: PRC Energy Analysis Company			
TITLE: Satellite Power System (SPS) Societal Assessment			
DATE: December 1980	VOLUMES:	PAGES: 55	REFERENCES: 31
ACQUISITION NO: DOE/ER/10041-T12			SOURCE: 5
KEY WORDS: Economics Energy Options Environmental Concerns Institutional Concerns International Concerns Public Outreach			

SUBJECT: SOCIAL ISSUES		SPSPO INDEX NO: SI-21	
AUTHOR(S): Ritschard, R. L.			
AUTHOR AFFILIATION: Lawrence Berkeley Laboratory			
TITLE: Assessment of Solar Energy Within a Community: Summary of Three Community-Level Studies			
DATE: October 1979	VOLUMES:	PAGES: 38	REFERENCES: 3
ACQUISITION NO: DOE/EV-0054			SOURCE: 5
KEY WORDS: Decentralization Land Use Economics Public Acceptance Institutional Concerns Terrestrial Solar			

SUBJECT: SOCIAL ISSUES		SPSPO INDEX NO: SI-1	
AUTHOR(S): Ruth, J. Westphal, W.			
AUTHOR AFFILIATION: European Space Agency			
TITLE: Study on European Aspects of Solar Power Satellites			
DATE: June 1979	VOLUMES:	PAGES: 131	REFERENCES: Bibliography
ACQUISITION NO: 3705/78/F/DK(SC)			SOURCE: 1
KEY WORDS: International Interest Western Europe			

SPACE TRANSPORTATION (CATEGORY ST)

Reports in this category deal only with space transportation technology, advancements and concepts and are applicable to space ventures in general.

KEY WORDS:	PAGE NUMBER:
Cargo Vehicle	217, 219, 222
Chemical Rocket	218, 221
Cost	217, 218, 219, 220, 222
Economics	218, 222
Electric Vehicle	217, 222
Energy Requirements	220
Engineering Constraints	217, 221
Heavy Lift Launch Vehicle	217, 222
Laser Rocket	219, 220, 221
Nuclear Electric	218
Nuclear Rocket	218
Orbit Transport	217, 219, 222
Payload	218, 219, 220, 221
Personnel Launch Vehicle	217, 222
Propellant	220, 221
Space Shuttle	218, 221
Solar Electric	218, 221
Thermal Systems	220, 221
Thruster Concept	218, 219, 220, 221

RELATED CATEGORIES:

Atmospheric Effects (AE)
Economics and Finances (EF)
Resources and Materials (RM)
Systems Analyses (SA)
Space Utilization (SU)

THIS PAGE
WAS INTENTIONALLY
LEFT BLANK

SUBJECT: SPACE TRANSPORTATION		SPSPO INDEX NO: ST-6	
AUTHOR(S): Alabama, University of			
AUTHOR AFFILIATION: University of Alabama			
TITLE: The Final Report of the SPS Space Transportation Workshop			
DATE: October 1980	VOLUMES:	PAGES: 140	REFERENCES: 9
ACQUISITION NO: By Title, NAS 8 - 33132			SOURCE: 4
KEY WORDS: Cargo Vehicle Heavy Lift Launch Vehicle Electric Vehicle Orbit Transfer Engineering Constraints Personnel Launch Vehicle			

SUBJECT: SPACE TRANSPORTATION		SPSPO INDEX NO: ST-7	
AUTHOR(S): Battelle Columbus Laboratories			
AUTHOR AFFILIATION: Battelle Columbus Laboratories			
TITLE: Satellite Power Systems (SPS) Space Transportation Cost Analysis and Evaluation			
DATE: November 1980	VOLUMES:	PAGES: 138	REFERENCES: 10
ACQUISITION NO: DOE/ER-0086			SOURCE: 5
KEY WORDS: Cargo Vehicle Heavy Lift Launch Vehicle Cost Orbit Transport Electric Vehicle Personnel Launch Vehicle			

SUBJECT: SPACE TRANSPORTATION		SPSPO INDEX NO: ST-3	
AUTHOR(S): Boeing Aerospace Company			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: SYSTEMS CONCEPTS FOR STS - Derived Heavy Lift Launch Vehicle Study			
DATE: June 1976	VOLUMES:	PAGES: 14	REFERENCES: None
ACQUISITION NO: NAS 9-14710 DRL-T-1183 DRD-MA48T			SOURCE: 4
KEY WORDS: Cost Thruster Concept Payload Space Shuttle			

SUBJECT: SPACE TRANSPORTATION		SPSPO INDEX NO: ST-2	
AUTHOR(S): Helms, I. L. (Editor)			
AUTHOR AFFILIATION: National Aeronautics and Space Administration			
TITLE: Advanced Propulsion Comparison Study			
DATE: April 1973	VOLUMES:	PAGES: 205	REFERENCES: 53
ACQUISITION NO: By Title			SOURCE: 4
KEY WORDS: Chemical Rocket Nuclear Rocket Economics Solar Electric Nuclear Electric Space Shuttle			

SUBJECT: SPACE TRANSPORTATION			SPSPO INDEX NO: ST-10
AUTHOR(S): (1) Hertzberg, A. (1) Sun, K. (2) Jones, W. S.			
AUTHOR AFFILIATION: (1) University of Washington (2) Lockheed Missiles and Space Company			
TITLE: A Laser Powered Flight Transportation System			
DATE: August 1978	VOLUMES:	PAGES: 30	REFERENCES: 28
ACQUISITION NO: 78-1484			SOURCE: 2
KEY WORDS: Cost Payload Laser Rocket Thruster Concept Orbit Transport			

SUBJECT: SPACE TRANSPORTATION			SPSPO INDEX NO: ST-11
AUTHOR(S): Kramer, P. R. Buhler, R. D.			
AUTHOR AFFILIATION: Universitat Stuttgart (Germany)			
TITLE: Hybrid Rocket/Air-Breathing Propulsion for Ballistic Space Transportation - Project ITUSTRA			
DATE: April 1979	VOLUMES:	PAGES: 10	REFERENCES: 21
ACQUISITION NO: 79-7038			SOURCE: 2
KEY WORDS: Cargo Vehicle Payload Thruster Concept			

SUBJECT: SPACE TRANSPORTATION		SPSPO INDEX NO: ST-4	
AUTHOR(S): Lockheed Missiles and Space Company, Inc.			
AUTHOR AFFILIATION: Lockheed Missiles and Space Company, Inc.			
TITLE: Laser Rocket System Analysis Study			
DATE: August 1978	VOLUMES:	PAGES: 190	REFERENCES: 20
ACQUISITION NO: LMSC-D564671A			SOURCE: 4
KEY WORDS: Cost Thruster Concept Laser Rocket Propellant			

SUBJECT: SPACE TRANSPORTATION		SPSPO INDEX NO: ST-9	
AUTHOR(S): Rice, E. E.			
AUTHOR AFFILIATION: Battelle Columbus Laboratories			
TITLE: Energy Impact Assessment of NASA's Past, Present and Future Space Launch Vehicles			
DATE: May-June 1978	VOLUMES:	PAGES: 7	REFERENCES: 20
ACQUISITION NO: By Title; Journal of Energy, Vol. 2, No. 3, pp 182-188			SOURCE: 2
KEY WORDS: Energy Requirements Payload Technology			

SUBJECT: SPACE TRANSPORTATION		SPSPO INDEX NO: ST-1	
THOR(S): Weiss, R. F. Pirri, A.N. Kemp, N. H.			
AUTHOR AFFILIATION: Physical Sciences, Inc.			
TITLE: Laser Propulsion			
DATE: March 1979	VOLUMES:	PAGES: 9	REFERENCES: 30
ACQUISITION NO: Astronautics and Aeronautics Vol. 17, No. 3 pp. 50-58		SOURCE:	
KEY WORDS: Engineering Constraints Laser Rocket Propellant		Thermal Systems Thruster Concept	

SUBJECT: SPACE TRANSPORTATION		SPSPO INDEX NO: ST-5	
AUTHOR(S): Woodcock, G. R.			
AUTHOR AFFILIATION: Boeing Aerospace Company			
TITLE: Solar Power Satellite System Definition Study, Space Transportation Analysis			
DATE: June 1980	VOLUMES:	PAGES: 150	REFERENCES: 9
ACQUISITION NO: D180-25969-5 NAS 9-15636		SOURCE: 4	
KEY WORDS: Chemical Rocket Economics Payload		Propellant Space Shuttle Solar Electric	

SUBJECT: SPACE TRANSPORTATION		SPSPO INDEX NO: ST-8	
AUTHOR(S): Wolfe, M. G.			
AUTHOR AFFILIATION: Aerospace Corporation			
TITLE: Satellite Power System (SPS) Transportation Cost Assessment Study			
DATE: January 1981	VOLUMES:	PAGES: 87	REFERENCES: 45
ACQUISITION NO: ATR-81 (7898)-1 NAS Contract PRM-7919687			SOURCE: 27
KEY WORDS: Cargo Vehicle Cost Electric Vehicle		Heavy Lift Launch Vehicle Orbit Transport Personnel Launch Vehicle	

SPACE UTILIZATION (CATEGORY SU)

The space utilization category includes reports and papers concerning a wide range of issues and interests about exploring and using space (including other planets) to fulfill and expand upon man's social needs and goals.

KEY WORDS:	PAGE NUMBER:
Bogota Declaration	228, 235
Communications	225, 228, 230,
Computer Model	236, 237
Economics	229, 232, 233, 234, 235, 237
Energy Demands	237
Energy Source	229, 230, 231, 234, 235, 236
Future Projections	225
Habitat Requirements	225, 229, 231, 232, 237
Industrialization	225, 226, 227, 229, 231, 233, 234, 235
Interference Effects	232
International Cooperation	227, 228, 230, 232, 235
Lunar Mining	226, 229
Manned Flight	225, 229, 230, 231, 234
Manufacturing	226, 227, 231, 233, 234, 235
Material Processes	226, 233
Material Resources	225, 226, 227, 235
National Programs	230, 232, 233
Neutrino	230
Outer Space Treaty	227, 228, 235
Particles	230
Process Designs	226
Resource Depletion	237
Satellite Uses	225, 227, 228, 230, 233, 234, 236
Slot Availability	225, 227, 228, 232,
Space Colonization	225, 229, 231, 232, 233, 234, 235, 236,
	237
Space Experiments	230
Space Law	227, 228, 235
Space Properties	225, 227, 232, 233

(Space Utilization
Category SU continued)

KEY WORDS:	PAGE NUMBER:
Space Shuttle	233
Space Transmission	229, 232
Spectrum Usage	227, 228, 232
Technology	220
Theory	230, 233, 234, 235, 236
Unmanned Exploration	230, 233, 234

RELATED CATEGORIES:

Biologic Effects (BE)
Environmental Effects (EE)
Economics and Finances (EF)
Resources and Materials (RM)
Systems Analyses (SA)
Systems Engineering (SE)
Space Transportation (ST)

SUBJECT: SPACE UTILIZATION			SPSPO INDEX NO: SU-7							
AUTHOR(S): Abdulezer, L.										
AUTHOR AFFILIATION: Polytechnic Institute of New York										
TITLE: Consideration in the Design of Large-Scale Space Habitats										
DATE: November 1977		VOLUMES:		PAGES: 16						
				REFERENCES: 16						
ACQUISITION NO: The Polytechnic Engineer Vol. XVIII, No. 1 pp. 28-41, 53, 56				SOURCE: 11						
KEY WORDS: <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Habitat Requirements</td> <td style="width: 50%;">Space Colonization</td> </tr> <tr> <td>Material Resources</td> <td>Space Properties</td> </tr> <tr> <td>Slot Availability</td> <td></td> </tr> </table>					Habitat Requirements	Space Colonization	Material Resources	Space Properties	Slot Availability	
Habitat Requirements	Space Colonization									
Material Resources	Space Properties									
Slot Availability										

SUBJECT: SPACE UTILIZATION			SPSPO INDEX NO: SU-26							
AUTHOR(S): American Institute of Aeronautics and Astronautics										
AUTHOR AFFILIATION: American Institute of Aeronautics and Astronautics										
TITLE: Projected Space Technologies, Missions and Capabilities in the 2000-2020 Time Period										
DATE: January 1981		VOLUMES:		PAGES: 208						
				REFERENCES: 85						
ACQUISITION NO: By Title				SOURCE: 2						
KEY WORDS: <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Communications</td> <td style="width: 50%;">Manned Flight</td> </tr> <tr> <td>Future Projections</td> <td>Material Resources</td> </tr> <tr> <td>Industrialization</td> <td>Satellite Uses</td> </tr> </table>					Communications	Manned Flight	Future Projections	Material Resources	Industrialization	Satellite Uses
Communications	Manned Flight									
Future Projections	Material Resources									
Industrialization	Satellite Uses									

SUBJECT: SPACE UTILIZATION			SPSPO INDEX NO: SU-19
AUTHOR(S): (1) Arnold, J. R. (Ed.) (2) Duke, M. B. (Ed.)			
AUTHOR AFFILIATION: (1) University of California (San Diego) (2) NASA Johnson Space Center			
TITLE: Summer Workshop on Near-Earth Resources			
DATE: 1978	VOLUMES:	PAGES: 107	REFERENCES: 61
ACQUISITION NO: NASA Conference Publication 2031			SOURCE: 4
KEY WORDS: Lunar Mining Material Resources			

SUBJECT: SPACE UTILIZATION			SPSPO INDEX NO: SU-11
AUTHOR(S): Criswell, D. R.			
AUTHOR AFFILIATION: Lunar and Planetary Institute			
TITLE: Extraterrestrial Materials Processing and Construction			
DATE: September 1978	VOLUMES:	PAGES: 474	REFERENCES: 102
ACQUISITION NO: By Title			SOURCE: 18
KEY WORDS: Industrialization Lunar Mining Manufacturing Material Processes Material Resources Process Designs			

SUBJECT: SPACE UTILIZATION		SPSPO INDEX NO: SU-8	
AUTHOR(S): Freedman, R. S.			
AUTHOR AFFILIATION: Polytechnic Institute of New York			
TITLE: Techniques of Optimization Applied to Space Industrialization: An Introduction			
DATE: November 1977	VOLUMES:	PAGES: 5	REFERENCES: 7
ACQUISITION NO: The Polytechnic Engineer Vol. XVIII, No. 1 pp. 44-47, 56			SOURCE: 11
KEY WORDS: Industrialization Manufacturing Material Resources Space Properties			

SUBJECT: SPACE UTILIZATION		SPSPO INDEX NO: SU-24	
AUTHOR(S): Galloway, E.			
AUTHOR AFFILIATION: International Institute of Space Law			
TITLE: The Future of Space Law			
DATE: October 1976	VOLUMES:	PAGES: 11	REFERENCES: 35
ACQUISITION NO: IAF-ISL-76-06; 27th International Astronautical Congress (Anaheim)			SOURCE: 42
KEY WORDS: International Cooperation Outer Space Treaty Satellite Uses Slot Availability Space Law Spectrum Usage			

SUBJECT: SPACE UTILIZATION			SPSPO INDEX NO: SU-23
AUTHOR(S): Gehrig, J. J.			
AUTHOR AFFILIATION: U. S. Senate Staff			
TITLE: Geostationary Orbit - Technology and Law			
DATE: October 1976	VOLUMES:	PAGES: 30	REFERENCES: 28
ACQUISITION NO: IAF-ISL-76-30; 27th International Astronautical Congress (Anaheim)			SOURCE: 42
KEY WORDS: Communications International Cooperation Satellite Uses		Slot Availability Spectrum Usage	

SUBJECT: SPACE UTILIZATION			SPSPO INDEX NO: SU-10
AUTHOR(S): Gorove, S.			
AUTHOR AFFILIATION: University of Mississippi			
TITLE: The Geostationary Orbit: Issues of Law and Policy			
DATE: July 1979	VOLUMES:	PAGES: 18	REFERENCES: 120
ACQUISITION NO: American Journal of International Law Vol. 73, No. 3 pp. 444-461			SOURCE: 12
KEY WORDS: Bogota Declaration International Cooperation Outer Space Treaty		Slot Availability Space Law Spectrum Usage	

SUBJECT: SPACE UTILIZATION			SPSPO INDEX NO: SU-18
AUTHOR(S): Grey, J. (Ed.)			
AUTHOR AFFILIATION: American Institute of Aeronautics and Astronautics			
TITLE: Space Manufacturing Facilities 2 - Space Colonies			
DATE: September 1977	VOLUMES:	PAGES: 367	REFERENCES: 586
ACQUISITION NO: By Title (Proceedings of the Third Princeton/AIAA Conference)			SOURCE: 2
KEY WORDS: Energy Source Manned Flight Industrialization Space Colonization Lunar Mining Space Transmission			

SUBJECT: SPACE UTILIZATION			SPSPO INDEX NO: SU-20
AUTHOR(S): Grey, J. (Ed.) Krop, C. (Ed.)			
AUTHOR AFFILIATION: American Institute of Aeronautics and Astronautics			
TITLE: Space Manufacturing III			
DATE: October 1979	VOLUMES:	PAGES: 585	REFERENCES: 959
ACQUISITION NO: By Title; Proceedings of the Fourth Princeton/AIAA Conference (May 1979)			SOURCE: 2
KEY WORDS: Economics Industrialization Energy Source Manned Flight Habitat Requirements Space Colonization			

SUBJECT: SPACE UTILIZATION			SPSPO INDEX NO: SU-1
AUTHOR(S): Harford, J. J.			
AUTHOR AFFILIATION: American Institute of Aeronautics and Astronautics			
TITLE: A Rush of Space Programs			
DATE: January 1979	VOLUMES:	PAGES: 10	REFERENCES: None
ACQUISITION NO: Astronautics and Aeronautics January 1979 pp. 56-65			SOURCE: 2
KEY WORDS: International Cooperation Manned Flight National Programs Satellite Uses Space Experiments Unmanned Exploration			

SUBJECT: SPACE UTILIZATION			SPSPO INDEX NO: SU-3
AUTHOR(S): Hellman, H.			
AUTHOR AFFILIATION: Omni Magazine			
TITLE: Artful Dodger of the Physical World			
DATE: June 1979	VOLUMES:	PAGES: 9	REFERENCES: None
ACQUISITION NO: OMNI, Vol. 1, No. 9 pp. 44-49, 108-110			SOURCE: 10
KEY WORDS: Communications Energy Source Neutrino Particles Theory			

SUBJECT: SPACE UTILIZATION		SPSPO INDEX NO: SU-9	
AUTHOR(S): Homatas, G.			
AUTHOR AFFILIATION: Polytechnic Institute of New York			
TITLE: Man Powered Flight in a Space Habitat			
DATE: November 1977	VOLUMES:	PAGES: 4	REFERENCES: 5
ACQUISITION NO: The Polytechnic Engineer Vol. XVIII, No. 1 pp. 42-43, 47, 56			SOURCE: 11
KEY WORDS: Habitat Requirements Manned Flight			

SUBJECT: SPACE UTILIZATION		SPSPO INDEX NO: SU-5	
AUTHOR(S): Mc Hugh, D.			
AUTHOR AFFILIATION: Polytechnic Institute of New York			
TITLE: Space Industrialization: Redefining the World			
DATE: November 1977	VOLUMES:	PAGES: 14	REFERENCES: 33
ACQUISITION NO: The Polytechnic Engineer Vol. XVIII, No. 1 pp. 6-17, 55-56			SOURCE: 11
KEY WORDS: Energy Source Industrialization Manufacturing Space Colonization			

SUBJECT: SPACE UTILIZATION		SPSPO INDEX NO: SU-15	
AUTHOR(S): Marshall Space Flight Center			
AUTHOR AFFILIATION: National Aeronautics and Space Administration			
TITLE: Space Colonization by the Year 2000 -- An Assessment			
DATE: January 1975	VOLUMES:	PAGES: 60	REFERENCES: None
ACQUISITION NO: By Title			SOURCE: 4
KEY WORDS: Economics Habitat Requirements Space Colonization Space Properties			

SUBJECT: SPACE UTILIZATION		SPSPO INDEX NO: SU-2	
AUTHOR(S): Mokhoff, N.			
AUTHOR AFFILIATION: Institute of Electrical and Electronic Engineers			
TITLE: Communications and Microwave--Orbit and Spectrum Congestion			
DATE: January 1980	VOLUMES:	PAGES: 6	REFERENCES: None
ACQUISITION NO: 0018-9235/80/0100-0038			SOURCE: 6
KEY WORDS: Interference Effects International Cooperation National Programs Slot Availability Space Transmission Spectrum Usage			

SUBJECT: SPACE UTILIZATION			SPSPO INDEX NO: SU-17
AUTHOR(S): National Aeronautics and Space Administration			
AUTHOR AFFILIATION: National Aeronautics and Space Administration			
TITLE: A Forecast of Space Technology: 1980-2000			
DATE: January 1976	VOLUMES:	PAGES: 312	REFERENCES: 243
ACQUISITION NO: NASA SP-387			SOURCE: 4
KEY WORDS: Economics National Programs Satellite Uses		Space Colonization Technology Unmanned Exploration	

SUBJECT: SPACE UTILIZATION			SPSPO INDEX NO: SU-16
AUTHOR(S): National Research Council			
AUTHOR AFFILIATION: National Academy of Sciences			
TITLE: Materials Processing in Space			
DATE: 1978	VOLUMES:	PAGES: 75	REFERENCES: None
ACQUISITION NO: By Title			SOURCE: 27
KEY WORDS: Industrialization Manufacturing Material Processes		Space Properties Space Shuttle	

SUBJECT: SPACE UTILIZATION			SPSPO INDEX NO: SU-21
AUTHOR(S): O'Neill, G. K.			
AUTHOR AFFILIATION: Princeton University			
TITLE: Space Colonies and Energy Supply to Earth			
DATE: December 1975	VOLUMES:	PAGES: 5	REFERENCES: 23
ACQUISITION NO: By Title; Vol. 190, pp. 943-947			SOURCE: 7
KEY WORDS: Economics Manufacturing Energy Source Satellite Uses Industrialization Space Colonization			

SUBJECT: SPACE UTILIZATION			SPSPO INDEX NO: SU-12
AUTHOR(S): Rather, J. D. G.			
AUTHOR AFFILIATION: W. J. Schafer Associates, Inc.			
TITLE: Space Transportation, Solar Power from Space and Space Industrialization: A Better Way			
DATE: None	VOLUMES:	PAGES: 21	REFERENCES: 7
ACQUISITION NO: By Title			SOURCE: 21
KEY WORDS: Energy Source Space Colonization Industrialization Technology Manned Flight Unmanned Exploration			

SUBJECT: SPACE UTILIZATION			SPSPO INDEX NO: SU-22
AUTHOR(S): Turner, G. F.			
AUTHOR AFFILIATION: Lockheed Missiles and Space Company			
TITLE: Electric Power Systems for Space			
DATE: December 1976	VOLUMES:	PAGES: 12	REFERENCES: None
ACQUISITION NO: By Title, pp. 18-29			SOURCE: 2
KEY WORDS: Energy Source Satellite Uses Technology			

SUBJECT: SPACE UTILIZATION			SPSPO INDEX NO: SU-13
AUTHOR(S): Vajk, J. P.			
AUTHOR AFFILIATION: Lawrence Livermore Laboratory			
TITLE: Newworld: A World Dynamics Code for Assessing the Impact of Space Colonization			
DATE: January 1976	VOLUMES:	PAGES: 42	REFERENCES: 2
ACQUISITION NO: UCID-17003			SOURCE: 13
KEY WORDS: Computer Model Space Colonization			

SUBJECT: SPACE UTILIZATION		SPSPO INDEX NO: SU-14	
AUTHOR(S): Vajk, J. P.			
AUTHOR AFFILIATION: Science Applications, Inc.			
TITLE: The Impact of Space Colonization on World Dynamics			
DATE: March 1976	VOLUMES:	PAGES: 38	REFERENCES: 28
ACQUISITION NO: Technological Forecasting and Social Change; 9, 361-399 (1976)			SOURCE: 24
KEY WORDS: Computer Model Economics Energy Demands		Resources Depletion Space Colonization	

SUBJECT: SPACE UTILIZATION		SPSPO INDEX NO: SU-6	
AUTHOR(S): Ziegler, W.			
AUTHOR AFFILIATION: Polytechnic Institute of New York			
TITLE: Weather Report from L-5			
DATE: November 1977	VOLUMES:	PAGES: 6	REFERENCES: None
ACQUISITION NO: The Polytechnic Engineer Vol. XVIII, No. 1 pp. 22-27			SOURCE: 11
KEY WORDS: Habitat Requirements Space Colonization			

THIS PAGE
WAS INTENTIONALLY
LEFT BLANK

AUTHOR INDEX

A

Abdulezer, L. 225
 Abromavage, M. M. 89, 99
 Adornato, R. J. 158
 Aerospace Corporation 111
 Alabama, University of 149, 175, 217
 Allen, K. C. 17
 Allen, N. C. 3
 Almgren, D. W. 183
 American Institute of Aeronautics
 and Astronautics 71, 225
 Ames Research Center 3
 Anderson, B. 81
 Andryczyk, R. 175
 Argonne National Laboratory 53,
 149, 176
 Arnold, J. R. 54, 226
 Arthur D. Little, Incorporated 197
 Asbury, J. G. 197
 Ayres, R. U. 54

B

Babcock, W. H. 71
 Bachrach, A. 198
 Bain, C. N. 121, 198
 Baker, L. R. 44, 144
 Baldwin, T. E. 199
 Baranski, S. 23
 Barany, R. 61
 Basu, S. 4
 Battelle Columbus Laboratories 217
 Bauer, E. 4
 Baumgardner, B. 13
 Bavinger, B. A. 141
 Behnke, R. A. 10, 19

B (continued)

Bekey, , I. 176
 Bell, C. R. 54
 Benedick, M. H. 24
 Bernhardt, P. A. 5
 Beverly, R. E. 5, 89, 90
 Billman, K. W. 122, 150
 Blackburn, J. B. 141
 Blocker, W. 176
 Bloomquist, C. E. 111, 151, 199
 Bloomster, C. H. 143, 146
 Boeing Aerospace Company 90, 122,
 123, 151, 177, 178, 218
 Bohn, J. G. 200
 Borrego, J. M. 185
 Bowen, S. W. 150
 Bracken, T. D. 46
 Bresters, A. R. 179
 Bridges, J. E. 24
 Brodeur, P. 25
 Bronfman, B. H. 200
 Brotzen, F. R. 131
 Brown and Root Development,
 Incorporated 179
 Brown, C. D. 62, 68
 Brown, W. C. 124, 125, 126, 127, 128,
 131, 134, 152
 Brubaker, K. L. 6, 16
 Bruzzone, C. 138
 Buehring, W. 67, 105
 Buhler, R. D. 219

C

Cahill, D. F. 94
 Cantafio, L. J. 152

AUTHOR INDEX

C (continued)

Caputo, R. S. 55
 Carasso, M. 61
 Carnes, S. A. 200
 Carroll, J. C. 17
 Carter, N. E. 60
 Cassady, P. 138
 Chaco, C. C. 6
 Chan, C. H. 180
 Chapman, P. K. 95
 Chernoff, R. C. 128
 Chestek, J. 175
 Chie, C. M. 180
 Chiu, Y. T. 7
 Cho, B. S. 56
 Chobotov, V. A. 152
 Christian, J. E. 211
 Christiansen, W. 138
 Christol, C. Q. 201
 Cirillo, R. R. 56, 63, 67, 68
 Citizens' Energy Project 201, 202
 Clark, K. M. 97
 Claverie, M. J. 56, 57
 Clearly, S. F. 25
 Coates, V. T. 57
 Collins, D. S. 182
 Collins, P. Q. 181
 Colson, W. B. 130, 131
 Committee on Commerce, Science
 and Transportation 26
 Committee on Governmental Affairs 27
 Community and Economic
 Development Division 27
 Comptroller General of the U.S. 28
 Conley, L. 105

C (continued)

Cook, H. J. 48
 Cooke, D. L. 191
 Crist, M. 202
 Criswell, D. R. 7, 8, 203, 226
 Crowley, J. H. 58
 Csigi, K. 183
 Culver, D. H. 141
 Curtis, S. B. 28
 Czerski, P. 23

D

da Rosa, A. V. 5
 Daurio, A. P. 199, 203
 David, L. 29, 209
 Davis, K. A. 81, 94
 Dawley, R. 76
 De, B. R. 7, 8
 Deffeyes, K. S. 35
 DeForest, S. 8
 Dickinson, R. M. 91, 129
 Doane, J. W. 58
 Donalek, P. J. 181
 Douglas, M. 8
 Drucker, H. 59
 Duffy-Armstrong, M. 204
 Duke, M. B. 226
 Dula, A. 29
 Duncan, L. M. 9, 10, 11, 19
 Dunn, B. D. 182
 Dupas, A. P. 56, 57

AUTHOR INDEX

E

Eberhardt, A. W. 142
 Econ, Incorporated 103
 Edler, H. G. 204
 Edwards, A. 134
 Ehrenreich, H. 142
 Ekstron, P. A. 82
 Electromagnetic Radiation Management Advisory Council 30, 31, 32
 Eltgrowth, M. W. 14
 Emerle, E. 34
 Energy, U.S. Department of 91, 92, 112, 113, 114, 153, 182, 205
 Energy Analysis, Institute for 62
 Energy Research and Development Administration 59, 72, 92, 93, 115, 154
 Enk, G. 200
 Environmental Health Directorate 32, 33
 Environmental Protection Agency 33
 Environmental Resource Group 94
 Espeland, R. H. 17

F

Fitzsimmons, G. W. 130
 Foldes, P. 175
 Fordyce, S. W. 131
 Formanek, V. C. 34
 Forum for the Advancement of Students in Science and Technology, Inc. 205
 Fraley, D. W. 60
 Freedman, R. S. 227
 Freeman, J. W. 130, 131, 191
 Fujita, T. 60, 61

G

Gallagher, J. M. 61
 Galloway, E. 227
 Gandhi, O. P. 34
 Gary, N. N. 23
 Gasper, J. R. 62, 67, 68
 Gatzke, A. E. 98
 Gaudet, A. D. 183
 Gauger, J. R. 34
 Gehrig, J. J. 228
 General Accounting Office 72
 George Washington University 206
 Gerlach, L. P. 207
 Gerry, E. T. 135
 Gibson, M. H. 132
 Gilbert, R. O. 46
 Gilbreath, W. P. 150
 Glaser, P. E. 73, 95, 154, 155, 156, 157, 158, 183, 203
 Goldford, A. I. 10
 Gordon, W. E. 9, 11
 Gordon, Z. V. 35
 Gorman, D. 184
 Gorman, R. 76
 Gorove, S. 207, 228
 Gould, J. L. 35, 36
 Grant, C. 184
 Grant, W. B. 81, 83
 Greenstein, D. 211
 Grey, J. 73, 229
 Grumman Aerospace Corporation 184
 Gurwell, W. E. 143, 146
 Guttman, R. J. 185
 Guy, A. W. 36, 40

AUTHOR INDEX

H

Habegger, L. J. 62, 67, 68.
Hagler, H. 211
Haley, J. T. 134
Halverson, S. L. 94
Ham, W. T. 37
Hanley, G. M. 158, 186, 187
Harford, J. J. 230
Hartley, J. N. 143
Hazelrigg, G. A. 104, 105, 158, 212
Hazzard, D. G. 37
Hegg, D. A. 14
Hellman, H. 230
Helms, I. L. 218
Herendeen, R. A. 74
Hermiter, B. 13
Hertzberg, A. 219
Hester, J. 131
Hill, J. 202
Hill, L. G. 199
Hinds, W. T. 40
Hjeresen, D. L. 40
Hobbs, P. V. 14
Holdren, J. P. 66
Holt, B. R. 97
Homatas, G. 231
Howell, J. M. 134
Hub, K. 67, 68, 105
Huie, H. H. 188
Hung, J. C. 188
Hunter, M. W. 160

I

International Radiation Protection
Association 38

I (continued)

Ishimaru, A. 38

J
Jackson, W. L. 211
Jamieson, W. M. 146
Jet Propulsion Laboratory 189
Johnson, A. L. 4
Johnson, C. C. 39
Johnson, U. E. 106
Johnson, R. W. 189
Johnson Space Center 11, 39, 159,
160
Jones, D. C. 97
Jones, W. C. 160, 219
Juroshek, J. R. 81
Justesen, D. R. 40

K

Kane, G. L. 48
Kantak, A. V. 180
Kaplan, S. D. 97
Kary T. 74
Kassing, D. 75
Kaupang, B. M. 175
Kellermeyer, D. A. 63
Kemp, N. H. 221
Kierolff, H. E. 106
Kirschvink, J. L. 35
Kline, R. L. 157
Klineberg, S. I. 208
Klobuchar, J. A. 4
Koomanoff, F. A. 161, 162
Koppelman, L. 211
Kornberg, J. P. 95
Kotin, A. D. 143, 202, 209

AUTHOR INDEX

K (continued)

Kozakoff, D. J. 132

Kraft, C. C. 163

Kramer, P. R. 219

Krebs, J. R. 97

Krop, C. 229

Kuo, T. J. 44, 144

Kyrias, G. 184

L

Ladwig, A. 209

LaQuey, R. 8

Lawrence Berkeley Laboratory 41

Lee, J. L. 12, 16

Lee, J. M. 46

Leininger, G. 137

Leon, H. I. 76

Levine, E. P. 56, 63, 68

Levinson, R. J. 75

Liebe, H. J. 82

Lindsay, T. A. 190

Lindsey, C. 8

Lindsey, W. C. 180

Litchfield, J. W. 143

Livingston, F. R. 95, 144

Livingston, L. E. 96

Lockheed Missiles and Space
Company 133, 220

Logsdon, J. M. 115

Lopukhin, V. M. 169

Lord, C. 184

Lovell, B. 81

Luhmann, J. G. 7

Mac - Mc

MacDonald, G. J. 47

McCreary, S. T. 98

McDonald, C. L. 60

McDougall, J. A. 36

McHugh, D. 231

McNeal, S. R. 210

McRae, M. V. 164

M

Machol, R. E. 76

Mackovciak, J. 155

Mallalieu, R. C. 41

Markson, R. 12

Marsh and McLennen, Incorporated 210

Marshall Space Flight Center 164, 232

Martin, J. H. 142

Massey, K. A. 42

Mathematical Sciences Northwest,
Incorporated 133

Maynard, O. E. 124, 134, 155

Mayur, R. 203

Meltz, G. 134

Mendillo, M. 6, 13

Michaelson, S. M. 42

Mixon, W. R. 211

Mokhoff, N. 232

Monarch, M. R. 56

Morgan, M. G. 46

Morrison, E. L. 81, 83

Moses, H. 165

Mueller, R. O. 197

Muir, M. 12

Myers, D. H. 77

AUTHOR INDEX

N

Naisbitt, J. 211
 Nalos, E. J. 130, 135, 190
 Nansen, R. H. 106, 157
 Nathan, A. 134
 National Aeronautics and Space Administration 112, 115, 165, 182, 233
 National Research Council 43, 83, 166, 233
 National Space Institute 212
 National Telecommunications Information Administration 14, 43
 Neice, S. 138
 Nelson, L. 138
 Nelson, T. A. 146
 Newsom, B. D. 116
 Newsom, D. E. 64, 67, 68

O

O'Leary, B. T. 203
 O'Neill, G. K. 203, 234
 Ostrowski, K. 44
 O'Toole, R. P. 58
 Ott, R. H. 83
 Ozeroff, M. J. 212
 Ozerski, P. 44

P

Pacific Northwest Laboratory 84
 Patmore, J. W. 200
 Pawlewicz, W. W. 146
 Pearsons, K. S. 96
 Peebles, P. Z. 188
 Peelle, E. 200
 Phillips, R. D. 40

P (continued)

Phillipson, L. L. 111
 Piland, R. O. 163
 Pindroh, A. 138
 Pine, G. D. 211
 Pirri, A. N. 221
 Poch, L. A. 97, 213
 Pollacsek, M. 132
 Polson, P. 97
 Poon, P. T. Y. 44, 144
 PRC Energy Analysis Company 213
 Price, K. M. 5

Q

Quimby, D. 138

R

Rabe, J. A. 202
 Radiation Protection Bureau 45
 Radke, L. F. 14
 Ragan, H. A. 40
 Ralph, E. L. 155
 Rather, J. D. G. 135, 234
 Raytheon Company 190
 Rebitzer, J. 74
 Reeber, R. R. 144
 Reiff, P. H. 191
 Reilly, J. P. 136
 Reinhartz, K. K. 75
 Repacholi, M. H. 45
 Rice, E. E. 220
 Rice University 15, 145, 166, 191, 192
 Ridker, R. G. 54
 Rieck, T. A. 107

AUTHOR INDEX

R (continued)

Rish, W. R. 46
 Ritschard, R. L. 214
 Robinson, G. S. 235
 Rockwell International 136, 166, 167
 Rogers, L. E. 40, 46
 Romback, J. 184
 Rosi, F. D. 145
 Rossin, A. D. 107
 Rote, D. M. 13, 15, 16, 94
 Rowland, B. 105
 Ruderman, M. A. 47
 Rush, C. M. 4, 17, 94
 Ruth, J. 214

S

Salis, M. 184
 Samsa, M. E. 64, 67, 68
 Sandahl, C. A. 161, 162
 Santini, D. J. 199
 Savvin, V. L. 169
 Schiefelbein, S. 47
 Schimmerling, W. 28
 Scholtz, R. A. 180
 Schuchardt, J. M. 132
 Schuh, R. 137
 Schulz, M. 7
 Schweitzer, M. 200
 Schwenk, F. C. 168
 Scott-Walton, B. 97
 Selenk, M. K. 65, 66
 Senew, M. J. 63
 Shanker, R. 211
 Shepherd, R. A. 97

S (continued)

Shore, M. L. 39, 44
 Shotland, S. 199
 Showen, R. L. 17
 Siegel, S. B. 71
 Silverman, C. 44
 Simons, S. 130, 131
 Skidmore, R. 184
 Sliney, D. H. 37
 Smith, K. R. 66
 Smith, M. S. 77
 Smith, P. L. 98
 Smith, S. A. 146
 Spaulding, A. D. 84
 SRI International 98
 Steneck, N. H. 48
 Stenehjem, E. J. 67, 199
 Stephenson, M. 105
 Stevens, G. H. 137
 Stine, H. 235
 Stokes, G. M. 82
 Stone, S. N. 19
 Strijk, S. 132
 Suess, M. J. 44
 Sun, K. 219
 Sutherland, C. D. 18, 19
 Sviedrys, R. 78
 Swanson, C. A. 71

T

Tanzman, E. 68
 Taussig, R. 138
 Tayi, G. 54
 Taylor, R. B. 192

AUTHOR INDEX

T (continued)

Technology Assessment, Office of 168

Teeter, R. R. 141, 146

Telecommunications Sciences,
Institute of 85

Tennessee, University of 193

Thomas, R. 184

TRW Energy Systems Planning
Division 67

Turner, G. F. 236

U

Universities Space Research
Association 116

V

Vajk, J. P. 107, 203, 236, 237

Valentino, A. R. 16, 48, 89, 99

Vander, A. J. 48

Vanke, V. A. 169

Van Kuiken, J. 68

Violette, E. J. 17

W

Walbridge, E. W. 138

Waldeskog, B. 44

Warshaw, H. 8

Watson, W. D. 54

Watts, J. W. 49

Watts, R. L. 143, 146

Webb, M. D. 36

Wei, M. S. 117

Weiss, R. F. 221

W (continued)

Wendell, C. A. 158

Westerdahl, B. B. 23

Westphal, W. 214

Weyant, J. 66

White, M. 49, 94, 100

White, P. H. 96

Whitfield, R. 67, 68

Whysong, J. L. 181

Wilby, J. F. 96

Wolfe, M. G. 152, 169, 222

Wolsko, T. D. 64, 68, 97, 213

Woodcock, G. R. 108, 170, 171, 221

Wright, J. J. 49

X

Y

Yamaura, I. 50

Young, J. R. 97

Z

Zaininger, H. W. 200

Zeiders, G. W. 135

Ziegler, E. J. 58

Ziegler, W. 237

Zimmerman, R. G. 61

Zinn, J. 9, 18, 19

ACQUISITION SOURCES

1. ESA SPACE DOCUMENTATION SERVICE
8-10, RUE MARIO NIKIS
75738 PARIS CEDEX 15
FRANCE
2. AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS
1290 AVENUE OF THE AMERICAS
NEW YORK, NY 10019
3. CONGRESSIONAL RESEARCH SERVICE
LIBRARY OF CONGRESS
WASHINGTON, D. C. 20540
4. SCIENTIFIC AND TECHNICAL INFORMATION OFFICE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546
5. NATIONAL TECHNICAL INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA 22161
6. INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS
445 HOES LANE
PISCATAWAY, NJ 08854
7. AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
1515 MASSACHUSETTS AVENUE, N.W.
WASHINGTON, D.C. 20005
8. AMERICAN BAR ASSOCIATION
SCIENCE & TECHNOLOGY DIVISION
1155 EAST 60TH STREET
CHICAGO, ILL 60637
9. U.S. GENERAL ACCOUNTING OFFICE
REPORTS AND DOCUMENTS
BOX 6015
GAITHERSBURG, MD 20760

10. OMNI PUBLICATIONS INTERNATIONAL, LTD.
909 THIRD AVENUE
NEW YORK, NY 10022
11. POLYTECHNIC INSTITUTE OF NEW YORK
333 JAY STREET
BROOKLYN, NY 11201
12. AMERICAN SOCIETY OF INTERNATIONAL LAW
2223 MASSACHUSETTS AVENUE, N.W.
WASHINGTON, D.C. 20008
13. TECHNICAL INFORMATION CENTER
P. O. BOX 62
OAK RIDGE, TN 37830
14. DUKE UNIVERSITY
SCHOOL OF LAW
DURHAM, NC 27706
15. SATURDAY REVIEW
1290 AVENUE OF THE AMERICAS
NEW YORK, NY 10019
16. RADIATION PROTECTION BUREAU
DEPARTMENT OF HEALTH AND WELFARE
BROOKFIELD ROAD
FEDERATION HEIGHTS
OTTAWA, ONTARIO CANADA K1A1C1
17. DEPARTMENT OF BIOPHYSICS
VIRGINIA COMMONWEALTH UNIVERSITY
RICHMOND, VA 23298
18. LUNAR AND PLANETARY INSTITUTE
3303 NASA ROAD 1
HOUSTON, TX 77058
19. UNIVERSITIES SPACE RESEARCH ASSOCIATION
P. O. BOX 1892
HOUSTON, TX 77001
20. SUPERINTENDENT OF DOCUMENTS
U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON, D.C. 20402

21. W. J. SCHAFER ASSOCIATES, INC.
1901 NORTH FT. MYER DRIVE, SUITE 803
ARLINGTON, VA 22209
22. COMMISSIONER OF PATENTS
U. S. PATENT OFFICE
WASHINGTON, D. C. 20231
23. DOWDEN, HUTCHINSON AND ROSS, INC.
STROUDSBURG, PA 18360
24. AMERICAN ELSEVIER PUBLISHING COMPANY, INC.
52 VANDERBILT AVENUE
NEW YORK, NY 10017
25. AMERICAN CHEMICAL SOCIETY
1530 P STREET, N.W.
WASHINGTON, D.C. 20005
26. ELECTRIC POWER RESEARCH INSTITUTE
P. O. BOX 10412
PALO ALTO, CA 94303
27. NATIONAL ACADEMY OF SCIENCES
2101 CONSTITUTION AVENUE, N.W.
WASHINGTON, D. C. 20418
28. ENERGY RESEARCH GROUP
OFFICE OF THE VICE-CHANCELLOR FOR RESEARCH
UNIVERSITY OF ILLINOIS
URBANA, IL 61801
29. TECHNOLOGY REVIEW
ROOM 10-140
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MA 02139

30. AAS PUBLICATIONS OFFICE
P. O. BOX 28130
SAN DIEGO, CA 92128
31. CITIZENS' ENERGY PROJECT
1110 SIXTH STREET, N.W.
WASHINGTON, D. C. 20001
32. W. W. NORTON AND CO., INC.
500 FIFTH AVENUE
NEW YORK, N. Y. 10036
33. PERGAMON PRESS
MAXWELL HOUSE
FAIRVIEW PARK
ELMSFORD, N. Y. 10523
34. POLISH MEDICAL PUBLISHERS
WARSAW, POLAND
35. SIGMA XI
THE AMERICAN SCIENTIST
345 WHITNEY AVE.
NEW HAVEN, CT. 06511
36. AMERICAN GEOPHYSICAL UNION
2000 FLORIDA AVENUE, N. W.
WASHINGTON, D.C. 20009
37. HEMISPHERE PUBLISHING CORP.
GLOBAL BUILDING
1025 VERMONT AVENUE, N. W.
WASHINGTON, D.C. 20005
38. FASST, INC.
2030 M. STREET, N. W.
SUITE 402
WASHINGTON, D.C. 20036

39. INTERNATIONAL MICROWAVE POWER INSTITUTE
BOX 1556
EDMONTON, ALBERTA
T5J 2N7 CANADA

40. ACADEMIC PRESS
111 FIFTH AVENUE
NEW YORK, N. Y. 10003

41. AMERICAN INSTITUTE OF PHYSICS
335 EAST 45TH STREET
NEW YORK, N. Y. 10017

42. INTERNATIONAL ACADEMY OF ASTRONAUTICS
250 RUE SAINT-JACQUES
75005 PARIS, FRANCE

THIS PAGE
WAS INTENTIONALLY
LEFT BLANK

ORDERING INFORMATION

The copyright laws of the United States prohibits the reproduction of material published by commercial printers and distributors without the written consent of the originator, including professional organizations such as the American Institute of Aeronautics and Astronautics and the Institute of Electrical and Electronics Engineers. The copyright laws do not apply to reports prepared by or for the U.S. government, and they may be copied without consent. Articles and professional papers should be requested from publishers listed on citation cards. Order forms follow for requesting government documents from the U.S. Government Printing Office (Source 20), the Department of Energy Technical Information Center (Source 13), and the National Technical Information Service (Source 5). The latter form also should be used for obtaining documents from the NASA Scientific and Technical Information Office (Source 4). The following price schedule can be used to estimate costs of purchases from these services.

Page Range	Domestic Price	NTIS Price Code	Page Range	Domestic Price	NTIS Price Code
001-025	\$4.00	A02	326-350	\$12.00	A15
026-050	4.50	A03	351-375	12.50	A16
051-075	5.25	A04	376-400	13.00	A17
076-100	6.00	A05	401-425	13.25	A18
101-125	6.50	A06	426-450	14.00	A19
126-150	7.25	A07	451-475	14.50	A20
151-175	8.00	A08	476-500	15.00	A21
176-200	9.00	A09	501-525	15.25	A22
201-225	9.25	A10	526-550	15.50	A23
226-250	9.50	A11	551-575	16.25	A24
251-275	10.75	A12	576-600	16.50	A25
276-300	11.00	A13	601-up	†	
301-325	11.75	A14			

*All microfiche are priced A01.

†Add \$2.50 for each additional 100 page increment from 601 to 1,000 pages.

THIS PAGE
WAS INTENTIONALLY
LEFT BLANK

INFORMATION CONCERNING YOUR ORDER OR INQUIRY

Thank you for your interest in U.S. Government publications. If you have made a written inquiry, it is returned herewith for your reference. We have indicated the prices of publications currently available, or have provided the information requested to the best of our ability. Unless otherwise noted, prices are for single copies.

Regulations require payment in advance of shipment of publications. Please make checks or money orders payable to the Superintendent of Documents. You may charge your order using your Deposit Account, Master Charge, or Visa. Do not send currency (bills or coins) or postage stamps.

Shipping is by non-priority mail or United Parcel Service. First class mailing is available at a higher rate. Contact us for rates if you desire this service. (202-783-3238)

With the exception of specially priced publications and subscriptions, a discount of 25 percent is allowed on quantity purchases (100 or more copies of a single publication). The same discount applies to orders from a bookdealer (any quantity) when the publications are mailed to the dealer's normal place of business. No discount will be allowed when publications and subscriptions are mailed to a third party (unless in quantities of 100 or more per title).

NON U.S. CUSTOMERS: International mailing regulations require special handling for which we charge an additional 25 percent of the total cost of your order. Remittance is required in advance of shipping by draft on a United States or Canadian bank, by UNESCO coupons, or by International Postal Money Order made payable to the Superintendent of Documents. These orders are mailed via surface mail unless funds are sent to cover airmail postage. Foreign currency or checks will not be accepted. All orders must be in English.

TO ORDER, USE FORM ON REVERSE SIDE

Follow Instructions Below

1. Please use separate forms for ordering publications and subscriptions.
2. Type or print your complete name and address, your order number (if any), your Deposit Account number (if applicable), Visa or Master Charge number (if applicable), and date in proper places at the top of the form. If order is to be shipped to a third party, fill in address at bottom of form. We request you order a minimum of \$1.00 worth of materials. Please include office/home telephone no.
3. When ordering **publications**, type or print the stock number, unit of issue (see front), quantity, title, price, and total payment enclosed.
4. When ordering **subscriptions**, or single issues of subscriptions, type or print the stock number, quantity, title, price, List ID (when available), and total payment enclosed. Allow 2-6 weeks plus mailing time for processing. All subscriptions are for one year, unless otherwise noted. Subscribers will be notified in ample time to renew.
5. Mail Original of Form to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Retain the copy for your records.
6. If shipment is incorrect, return the shipping documents for adjustment. DO NOT RETURN BOOKS UNTIL NOTIFIED TO DO SO. All claims must be submitted within six months.
7. Call 202-783-3238 for publication information or for placing your Deposit Account, Visa or Master Charge order.

THE FOLLOWING INFORMATION EXPLAINS HOW YOUR REQUEST WAS PROCESSED

- C** . . . Indicates the quantity of publications enclosed or scheduled for mailing.
- B** . . . The publication is not available at this time but we have scheduled mailing for a later date. Charges have been included on your order.
- C** . . . We are unable to identify the publication from the information furnished.
- I** . . . This publication is not currently in stock. Please Inquire as to the availability and price in 60 days. You may inquire and order by telephone (202-783-3238) using your VISA, MASTER CHARGE, or Superintendent of Documents Deposit Account. This will expedite shipment of your publications.
- L** . . . The publication is not currently sold by this Office. We suggest you contact your local library which can refer you to a Federal Depository Library in your area for further assistance.
- S** . . . Publication has been replaced by another with similar but more recent information and it will be included in your shipment.
- T** . . . Publication has been replaced by another with similar but more recent information. Because of a difference in price, we are noting new ordering information on your request.
- Z** . . . Requested or pertinent information has been supplied. See attached.

INFORMATION CONCERNING YOUR ORDER OR INQUIRY

Thank you for your interest in U.S. Government publications. If you have made a written inquiry, it is returned herewith for your reference. We have indicated the prices of publications currently available, or have provided the information requested to the best of our ability. Unless otherwise noted, prices are for single copies.

Regulations require payment in advance of shipment of publications. Please make checks or money orders payable to the Superintendent of Documents. You may charge your order using your Deposit Account, Master Charge, or Visa. Do not send currency (bills or coins) or postage stamps.

Shipping is by non-priority mail or United Parcel Service. First class mailing is available at a higher rate. Contact us for rates if you desire this service. (202-783-3238)

With the exception of specially priced publications and subscriptions, a discount of 25 percent is allowed on quantity purchases (100 or more copies of a single publication). The same discount applies to orders from a bookdealer (any quantity) when the publications are mailed to the dealer's normal place of business. No discount will be allowed when publications and subscriptions are mailed to a third party (unless in quantities of 100 or more per title).

NON U.S. CUSTOMERS: International mailing regulations require special handling for which we charge an additional 25 percent of the total cost of your order. Remittance is required in advance of shipping by draft on a United States or Canadian bank, by UNESCO coupons, or by International Postal Money Order made payable to the Superintendent of Documents. These orders are mailed via surface mail unless funds are sent to cover airmail postage. Foreign currency or checks will not be accepted. All orders must be in English.

TO ORDER, USE FORM ON REVERSE SIDE

Follow Instructions Below

1. Please use separate forms for ordering publications and subscriptions.
2. Type or print your complete name and address, your order number (if any), your Deposit Account number (if applicable), Visa or Master Charge number (if applicable), and date in proper places at the top of the form. If order is to be shipped to a third party, fill in address at bottom of form. We request you order a minimum of \$1.00 worth of materials. Please include office/home telephone no.
3. When ordering *publications*, type or print the stock number, unit of issue (see front), quantity, title, price, and total payment enclosed.
4. When ordering *subscriptions*, or single issues of subscriptions, type or print the stock number, quantity, title, price, List ID (when available), and total payment enclosed. Allow 2-6 weeks plus mailing time for processing. All *subscriptions* are for one year, unless otherwise noted. Subscribers will be notified in ample time to renew.
5. Mail Original of Form to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Retain the copy for your records.
6. If shipment is incorrect, return the shipping documents for adjustment. **DO NOT RETURN BOOKS UNTIL NOTIFIED TO DO SO.** All claims must be submitted within six months.
7. Call 202-783-3238 for publication information or for placing your Deposit Account, Visa or Master Charge order.

THE FOLLOWING INFORMATION EXPLAINS HOW YOUR REQUEST WAS PROCESSED

- C** . . . Indicates the quantity of publications enclosed or scheduled for mailing.
- B** . . . The publication is not available at this time but we have scheduled mailing for a later date. Charges have been included on your order.
- C** . . . We are unable to identify the publication from the information furnished.
- I** . . . This publication is not currently in stock. Please inquire as to the availability and price in 60 days. You may inquire and order by telephone (202-783-3238) using your VISA, MASTER CHARGE, or Superintendent of Documents Deposit Account. This will expedite shipment of your publications.
- L** . . . The publication is not currently sold by this Office. We suggest you contact your local library which can refer you to a Federal Depository Library in your area for further assistance.
- S** . . . Publication has been replaced by another with similar but more recent information, and it will be included in your shipment.
- T** . . . Publication has been replaced by another with similar but more recent information. Because of a difference in price, we are noting new ordering information on your request.
- Z** . . . Requested or pertinent information has been supplied. See attached.

ORDER FORM

FOR OFFICE USE ONLY

Date Your Order Number

[illegible]**Customer's Name and Address**

Expiration Date
Month/Year

**Master Charge
Interbank No.**

--	--	--	--

Quantity	Charges
_____	Enclosed
_____	To be mailed
_____	Subscriptions
Postage _____	
Foreign handling _____	
MMOB _____	
OPNR _____	
_____	UPNS
_____	Discount
_____	Refund

Deposit Account Number

							-	
--	--	--	--	--	--	--	---	--

**BEFORE USING THIS FORM, READ IMPORTANT INFORMATION ON REVERSE SIDE
PLEASE PRINT OR TYPE ALL INFORMATION ON THIS FORM.**

[illegible]

WE REQUEST THAT YOU ORDER A MINIMUM OF \$1.00 WORTH OF MATERIALS.

TOTAL ENCLOSED \$

SHIP TO: (if different from above)

ZIP

Unit of Issue

Explanation

PK	Package containing multiple copies
EA	Each—single copy
PD	Pad containing multiple sheets
SE	Set of multiple items
KT	Kit of multiple items in a special container

INFORMATION CONCERNING YOUR ORDER OR INQUIRY

Thank you for your interest in U.S. Government publications. If you have made a written inquiry, it is returned herewith for your reference. We have indicated the prices of publications currently available, or have provided the information requested to the best of our ability. Unless otherwise noted, prices are for single copies.

Regulations require payment in advance of shipment of publications. Please make checks or money orders payable to the Superintendent of Documents. You may charge your order using your Deposit Account, Master Charge, or Visa. Do not send currency (bills or coins) or postage stamps.

Shipping is by non-priority mail or United Parcel Service. First class mailing is available at a higher rate. Contact us for rates if you desire this service. (202-783-3238)

With the exception of specially priced publications and subscriptions, a discount of 25 percent is allowed on quantity purchases (100 or more copies of a single publication). The same discount applies to orders from a bookdealer (any quantity) when the publications are mailed to the dealer's normal place of business. No discount will be allowed when publications and subscriptions are mailed to a third party (unless in quantities of 100 or more per title).

NON U.S. CUSTOMERS: International mailing regulations require special handling for which we charge an additional 25 percent of the total cost of your order. Remittance is required in advance of shipping by draft on a United States or Canadian bank, by UNESCO coupons, or by International Postal Money Order made payable to the Superintendent of Documents. These orders are mailed via surface mail unless funds are sent to cover airmail postage. Foreign currency or checks will not be accepted. All orders must be in English.

TO ORDER, USE FORM ON REVERSE SIDE

Follow Instructions Below

1. Please use separate forms for ordering publications and subscriptions.
2. Type or print your complete name and address, your order number (if any), your Deposit Account number (if applicable), Visa or Master Charge number (if applicable), and date in proper places at the top of the form. If order is to be shipped to a third party, fill in address at bottom of form. We request you order a minimum of \$1.00 worth of materials. Please include office/home telephone no.
3. When ordering publications, type or print the stock number, unit of issue (see front), quantity, title, price, and total payment enclosed.
4. When ordering subscriptions, or single issues of subscriptions, type or print the stock number, quantity, title, price, List ID (when available), and total payment enclosed. Allow 2-6 weeks plus mailing time for processing. All subscriptions are for one year, unless otherwise noted. Subscribers will be notified in ample time to renew.
5. Mail Original of Form to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Retain the copy for your records.
6. If shipment is incorrect, return the shipping documents for adjustment. DO NOT RETURN BOOKS UNTIL NOTIFIED TO DO SO. All claims must be submitted within six months.
7. Call 202-783-3238 for publication information or for placing your Deposit Account, Visa or Master Charge order.

THE FOLLOWING INFORMATION EXPLAINS HOW YOUR REQUEST WAS PROCESSED

- C** . . . Indicates the quantity of publications enclosed or scheduled for mailing.
- B** . . . The publication is not available at this time but we have scheduled mailing for a later date. Charges have been included on your order.
- C** . . . We are unable to identify the publication from the information furnished.
- I** . . . This publication is not currently in stock. Please inquire as to the availability and price in 60 days. You may inquire and order by telephone (202-783-3238) using your VISA, MASTER CHARGE, or Superintendent of Documents Deposit Account. This will expedite shipment of your publications.
- L** . . . The publication is not currently sold by this Office. We suggest you contact your local library which can refer you to a Federal Depository Library in your area for further assistance.
- S** . . . Publication has been replaced by another with similar but more recent information and it will be included in your shipment.
- T** . . . Publication has been replaced by another with similar but more recent information. Because of a difference in price, we are noting new ordering information on your request.
- Z** . . . Requested or pertinent information has been supplied. See attached.

DOE Technical Information Center, P.O. Box 62, Oak Ridge, Tennessee 37830

*U.S. GPO: 1979-298-528

DOE Form 1R540
(4-78) (Previous Editions
are obsolete)

OFFICIAL REPORT REQUEST

REPORT NO.	REPORT DATE	CLASSIF.	NO. OF COPIES WANTED
TITLE			
AUTHORS			
ORIGINATING ORGANIZATION			
REQUESTED FOR	SOURCE OF REFERENCE	CONTRACT NO. OF REPORT	
CERTIFICATION: REPORT IS TO BE USED FOR U.S. GOVERNMENT CONTRACT			
CONTRACT NO.	SIGNATURE		
DATE OF REQUEST			

(Enter your complete mailing address below.)

From: Department of Energy
Technical Information Center
P. O. Box 62
Oak Ridge, Tennessee 37830POSTAGE AND FEES PAID
DEPARTMENT OF ENERGYOFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

IMPORTANT The Technical Information Center will supply full-size copies of reports free of charge to official requesters if TIC has stock. The requesters should in all cases indicate below the action TIC should take.
ACTION REQUESTED (Check either No. 1 or No. 2 - <u>not both</u> .) 1. ☐ Supply <u>only</u> if free, full-size stock is available. 2. ☐ Supply if there is free, full-size stock <u>but</u> , if no stock is available, (Check (a) or (b) or (c).) (a) ☐ Send a quotation for a ☐ blow-back and/or ☐ microfiche copy from the reproduction contractor. (b) ☐ Have the reproduction contractor supply a blow-back copy of the report and (i) ☐ Bill requester Or (ii) ☐ Charge to requester's deposit account. (c) ☐ Have the reproduction contractor supply a microfiche and (i) ☐ Bill requester Or (ii) ☐ Charge to requester's deposit account.
FOR TIC USE (Do not write in this space.) 1. Drawer No. _____ 2. TIC has master copy Yes ☐ No ☐ 3. Report has been microfiched. . . Yes ☐ No ☐ 4. Classification O U C S CATEGORY C- _____ AUTHORIZED BY _____

☐ SEE REVERSE SIDE FOR REPLY

TIC REPLY TO REPORT REQUEST

- ☐ 1. We are attempting to obtain copies. We will inform you of our results.
- ☐ 2. Report is not yet available. You will receive a copy when distribution is made.
- ☐ 3. The information in the report you requested has been published in source noted below.
- ☐ 4. Report cannot be identified from the information furnished. Please return this form with additional information such as author, title, issuing organization, contract number, and source of reference.
- ☐ 5. Report is to be reprinted. Your request will be filled when copies are available.
- ☐ 6. Report is not yet available according to _____ and we do not know when it will be issued.
- ☐ 7. We have been informed by the issuing organization that this report received internal distribution only.
- ☐ 8. Report is obsolete. ☐ Superseded by report number _____
- ☐ 9. Report is illegible to degree that precludes reproduction.
- ☐ 10. Report is not available in microfiche form.
- ☐ 11. Not an DOE publication. ☐ Request from originating organization. ☐ Request from source noted below.
Request from ☐ DDC ☐ NASA ☐ NTIS
- ☐ 12. May be purchased from source noted below.
- ☐ 13. Other. See below.

DOE Technical Information Center, P.O. Box 62, Oak Ridge, Tennessee 37830

•U.S. GPO: 1979-298-528

DOE Form "IR-540" (Previous Editions
are obsolete)

OFFICIAL REPORT REQUEST

REPORT NO.	REPORT DATE	CLASSIF.	NO. OF COPIES WANTED	
TITLE				
AUTHORS				
ORIGINATING ORGANIZATION				
REQUESTED FOR	SOURCE OF REFERENCE	CONTRACT NO. OF REPORT		
CERTIFICATION: REPORT IS TO BE USED FOR U.S. GOVERNMENT CONTRACT				
CONTRACT NO.	SIGNATURE			
DATE OF REQUEST				

(Enter your complete mailing address below.)

From: Department of Energy
Technical Information Center
P. O. Box 62
Oak Ridge, Tennessee 37830OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300POSTAGE AND FEES PAID
DEPARTMENT OF ENERGY

IMPORTANT

The Technical Information Center will supply full-size copies of reports free of charge to official requesters if TIC has stock. The requesters should in all cases indicate below the action TIC should take.

ACTION REQUESTED

(Check either No. 1 or No. 2 — not both.)

1. ☐ Supply only if free, full-size stock is available.
2. ☐ Supply if there is free, full-size stock but, if no stock is available, (Check (a) or (b) or (c).)
 - (a) ☐ Send a quotation for a ☐ blow-back and/or ☐ microfiche copy from the reproduction contractor.
 - (b) ☐ Have the reproduction contractor supply a blow-back copy of the report and
 - (i) ☐ Bill requester Or
 - (ii) ☐ Charge to requester's deposit account.
 - (c) ☐ Have the reproduction contractor supply a microfiche and
 - (i) ☐ Bill requester Or
 - (ii) ☐ Charge to requester's deposit account.

FOR TIC USE (Do not write in this space.)

1. Drawer No. _____
2. TIC has master copy Yes ☐ No ☐
3. Report has been microfiched. Yes ☐ No ☐
4. Classification O U C S CATEGORY C- _____

AUTHORIZED BY _____

☐ SEE REVERSE SIDE FOR REPLY

TIC REPLY TO REPORT REQUEST

- ☐ 1. We are attempting to obtain copies. We will inform you of our results.
- ☐ 2. Report is not yet available. You will receive a copy when distribution is made.
- ☐ 3. The information in the report you requested has been published in source noted below.
- ☐ 4. Report cannot be identified from the information furnished. Please return this form with additional information such as author, title, issuing organization, contract number, and source of reference.
- ☐ 5. Report is to be reprinted. Your request will be filled when copies are available.
- ☐ 6. Report is not yet available according to _____ and we do not know when it will be issued.
- ☐ 7. We have been informed by the issuing organization that this report received internal distribution only.
- ☐ 8. Report is obsolete. ☐ Superseded by report number _____.
- ☐ 9. Report is illegible to degree that precludes reproduction.
- ☐ 10. Report is not available in microfiche form.
- ☐ 11. Not an DOE publication. ☐ Request from originating organization. ☐ Request from source noted below.
Request from ☐ DDC ☐ NASA ☐ NTIS
- ☐ 12. May be purchased from source noted below.
- ☐ 13. Other. See below.

DOE Technical Information Center, P.O. Box 62, Oak Ridge, Tennessee 37830

*U.S. GPO: 1979-298-528

DOE Form 1R-540
(4-78) (Previous Editions
are obsolete)

OFFICIAL REPORT REQUEST

REPORT NO.	REPORT DATE	CLASSIF.	NO. OF COPIES WANTED
TITLE			
AUTHORS			
ORIGINATING ORGANIZATION			
REQUESTED FOR	SOURCE OF REFERENCE	CONTRACT NO. OF REPORT	
CERTIFICATION: REPORT IS TO BE USED FOR U.S. GOVERNMENT CONTRACT			
CONTRACT NO.	SIGNATURE		
DATE OF REQUEST			

(Enter your complete mailing address below.)

From: Department of Energy
Technical Information Center
P. O. Box 62
Oak Ridge, Tennessee 37830OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300POSTAGE AND FEES PAID
DEPARTMENT OF ENERGY

IMPORTANT
The Technical Information Center will supply full-size copies of reports free of charge to official requesters if TIC has stock. The requesters should in all cases indicate below the action TIC should take.
ACTION REQUESTED
(Check either No. 1 or No. 2 — <u>not both</u> .)
1. ☐ Supply <u>only</u> if free, full-size stock is available.
2. ☐ Supply if there is free, full-size stock <u>but</u> , if no stock is available, (Check (a) or (b) or (c).)
(a) ☐ Send a quotation for a ☐ blow-back and/or ☐ microfiche copy from the reproduction contractor.
(b) ☐ Have the reproduction contractor supply a blow-back copy of the report and
(i) ☐ Bill requester Or
(ii) ☐ Charge to requester's deposit account.
(c) ☐ Have the reproduction contractor supply a microfiche and
(i) ☐ Bill requester Or
(ii) ☐ Charge to requester's deposit account.
FOR TIC USE (Do not write in this space.)
1. Drawer No. _____
2. TIC has master copy Yes ☐ No ☐
3. Report has been microfiched. . . Yes ☐ No ☐
4. Classification ☐ U.S. CATEGORY C- _____
AUTHORIZED BY _____

☐ SEE REVERSE SIDE FOR REPLY

TIC REPLY TO REPORT REQUEST

- ☐ 1. We are attempting to obtain copies. We will inform you of our results.
- ☐ 2. Report is not yet available. You will receive a copy when distribution is made.
- ☐ 3. The information in the report you requested has been published in source noted below.
- ☐ 4. Report cannot be identified from the information furnished. Please return this form with additional information such as author, title, issuing organization, contract number, and source of reference.
- ☐ 5. Report is to be reprinted. Your request will be filled when copies are available.
- ☐ 6. Report is not yet available according to _____ and we do not know when it will be issued.
- ☐ 7. We have been informed by the issuing organization that this report received internal distribution only.
- ☐ 8. Report is obsolete. ☐ Superseded by report number _____.
- ☐ 9. Report is illegible to degree that precludes reproduction.
- ☐ 10. Report is not available in microfiche form.
- ☐ 11. Not an DOE publication. ☐ Request from originating organization. ☐ Request from source noted below.
Request from ☐ DDC ☐ NASA ☐ NTIS
- ☐ 12. May be purchased from source noted below.
- ☐ 13. Other. See below.

NTIS

Routing Code
For Government Users
Who report on SF-224)
Treasury Agency Location Code
(8 digit)

For DDC User Only

DDC User Code _____

Contract Number _____
(max 6 characters only)

PURCHASER'S Name _____

Address _____

City, State, ZIP _____ Phone _____

☐ Charge my NTIS Deposit Account no. _____

☐ Check enclosed for \$ _____

☐ Purchase order attached*

☐ Bill me* (not available outside the North American continent.)

☐ Charge to my American Express Card account number.[illegible]

**Expiration
Date**

(Enter if different from address above)

Name _____

Organization _____

Address _____

City, State, ZIP _____

☐ Open a DEPOSIT ACCOUNT in above name. Enclosed is a check to NTIS for \$25 (in addition to any other payment you send) for opening my Deposit Account.

[illegible]

HOW TO ORDER

Please complete the *Order* section (on reverse side) in full to place your order. Fill out *Ship to* section only if you wish your order shipped to another address.

For additional information on NTIS products and services, fill out the *Information Requested* section (below) in full including mailing address.

You can opt for *priority mail* for \$3 North American continent; \$4 outside North America charge per item. Just check the *Priority Mail* box. If you're really pressed for time, call the NTIS Rush Handling Service (703) 557-4700.

For a \$10 charge per item, your order will be sent priority mail

within 24 hours. Or, for a \$6 per item charge, you can pick up your order in the Washington Information Center & Bookstore or at our Springfield Operations Center within 24 hours.

You may also place your order by telephone or TELEX if you have an NTIS Deposit Account or an American Express card. The order desk number is (703) 557-4650 and the TELEX number is 89-9405.

NTIS can label each document for routing within your organization. If you want this service put your routing code up to 8 characters in the box marked *Routing Code*.

Thank you for your interest in NTIS. We appreciate your order.

INFORMATION REQUESTED

SEND ME:

- ☐ An application for an NTIS Deposit Account, NTIS-PR-33-403
- ☐ Information Services General Catalog, NTIS-PR-154-403

Name _____

Address _____

City, State, ZIP _____

Telephone _____

- ☐ Environmental Subscriptions Brochure, NTIS-PR-373-403
- ☐ Energy Catalog, NTIS PR-378-403
- ☐ Abstract Newsletters Brochure, NTIS-PR-205-403
- ☐ Published Search Catalog, NTIS-PR-186-403
- ☐ An application for Special Credit Accounts for state/local governments and state universities, NTIS-PR-220-403
- ☐ Domestic Price Code list, NTIS-PR-360-3-403
- ☐ Foreign Price Code List, NTIS-PR-360-4-403
- ☐ Other _____

NTIS
NTIS
NTIS
NTIS
NTIS
NTIS
NTIS

Please Place
Stamp
Here

National Technical Information Service
U.S. DEPARTMENT OF COMMERCE
Springfield, VA 22161

NTIS

Routing Code
For Government Users
(Who report on SF-224)
Treasury Agency Location Code
(8 digit)

Epä DDC Viet, Dnhy

BDC User Code

Contract Number

class 6 characters only

PURCHASER'S Name**Address**

City, State, ZIP

Phone

SHIP TO:

(Enter if different from address above)

Name _____

Organization

Address

City, State, ZIP

- *Add \$5.00 per order for deferred payment and sign below.

- ☐ Charge to my American Express Card account number.

[illegible]

Signature

Expiration Date

- ☐ Open a DEPOSIT ACCOUNT in above name. Enclosed is a check to NTIS for \$25 (in addition to any other payment you send) for opening my Deposit Account.

[illegible]

Write NTIS for Foreign Prices

Sub Total**Additional Charge**

Enter Grand Total

HOW TO ORDER

Please complete the *Order* section (on reverse side) in full to place your order. Fill out *Ship to* section only if you wish your order shipped to another address.

For additional information on NTIS products and services, fill out the *Information Requested* section (below) in full including mailing address.

You can opt for *priority mail* for \$3 North American continent; \$4 outside North America charge per item. Just check the *Priority Mail* box. If you're really pressed for time, call the NTIS Rush Handling Service (703) 557-4700.

For a \$10 charge per item, your order will be sent priority mail

within 24 hours. Or, for a \$6 per item charge, you can pick up your order in the Washington Information Center & Bookstore or at our Springfield Operations Center within 24 hours.

You may also place your order by telephone or TELEX if you have an NTIS Deposit Account or an American Express card. The order desk number is (703) 557-4650 and the TELEX number is 89-9405.

NTIS can label each document for routing within your organization. If you want this service put your routing code up to 8 characters in the box marked *Routing Code*.

Thank you for your interest in NTIS. We appreciate your order.

INFORMATION REQUESTED

SEND ME:

- ☐ An application for an NTIS Deposit Account. NTIS-PR-33-403
- ☐ Information Services General Catalog. NTIS-PR-154-403

Name _____

Address _____

City, State, ZIP _____

Telephone _____

- ☐ Environmental Subscriptions Brochure. NTIS-PR-373-403
- ☐ Energy Catalog. NTIS-PR-378-403
- ☐ Abstract Newsletters Brochure. NTIS-PR-205-403
- ☐ Published Search Catalog. NTIS-PR-186-403
- ☐ An application for Special Credit Accounts for state/local governments and state universities. NTIS-PR-220-403
- ☐ Domestic Price Code list. NTIS-PR-360-3-403
- ☐ Foreign Price Code List. NTIS-PR-360-4-403
- ☐ Other _____

Please Place
Stamp
Here

National Technical Information Service
U.S. DEPARTMENT OF COMMERCE
Springfield, VA 22161

NTIS

Routing Code
For Government Users
(Who report on SF-224)
Treasury Agency Location Code
(18 digit)

DDC User Code

Contract Number _____

max 6 characters only

PURCHASER'S Name _____

Address _____

City, State, ZIP _____ Phone _____

SHIP TO:

(Enter if different from address above)

Name _____

Organization _____

Address _____

City, State, ZIP _____

- *Add \$5.00 per order for deferred payment and sign below.

- ☐ Charge to my American Express Card account number.

[illegible]

Signature

**Expiration
Date**

- ☐ Open a DEPOSIT ACCOUNT in above name. Enclosed is a check to NTIS for \$25 (in addition to any other payment you send) for opening my Deposit Account.

[illegible]

Sub Total

Additional Charges

Enter Grand Total

HOW TO ORDER

Please complete the *Order* section (on reverse side) in full to place your order. Fill out *Ship to* section *only if you wish your order shipped to another address*.

For additional information on NTIS products and services, fill out the Information Requested section (below) in full including mailing address.

You can opt for *priority mail* for \$3 North American continent.; \$4 outside North America charge per item. Just check the *Priority Mail* box. If you're really pressed for time, call the NTIS Rush Handling Service (703) 557-4700.

For a \$10 charge per item, your order will be sent priority mail

within 24 hours. Or, for a \$6 per item charge, you can pick up your order in the Washington Information Center & Bookstore or at our Springfield Operations Center within 24 hours.

You may also place your order by telephone or TELEX if you have an NTIS Deposit Account or an American Express card. The order desk number is (703) 557-4650 and the TELEX number is 89-9405.

NTIS can label each document for routing within your organization. If you want this service put your routing code up to 8 characters in the box marked *Routing Code*.

Thank you for your interest in NTIS. We appreciate your order.

INFORMATION REQUESTED

SEND ME:

- ☐ An application for an NTIS Deposit Account. NTIS PR 33-403
- ☐ Information Services General Catalog. NTIS-PR-154-403

Name _____

Address _____

City, State, ZIP _____

Telephone _____

- ☐ Environmental Subscriptions Brochure. NTIS-PR-373-403
- ☐ Energy Catalog. NTIS PR-378-403
- ☐ Abstract Newsletters Brochure. NTIS-PR-205-403
- ☐ Published Search Catalog. NTIS-PR-186-403
- ☐ An application for Special Credit Accounts for state/local governments and state universities. NTIS-PR-220-403
- ☐ Domestic Price Code list. NTIS-PR-360-3-403
- ☐ Foreign Price Code List. NTIS-PR-360-4-403
- ☐ Other _____

NTIS
NTIS
NTIS
NTIS
NTIS
NTIS
NTIS

Please Place
Stamp
Here

National Technical Information Service
U.S. DEPARTMENT OF COMMERCE
Springfield, VA 22161

United States
Department of Energy
Washington, D.C. 20585

THIRD-CLASS MAIL
POSTAGE & FEES PAID
U.S. DEPT. OF ENERGY
PERMIT NO. G 20

THIRD CLASS MAIL

Official Business
Penalty for Private Use, \$300