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PROGRAM/PROJECT MANAGEMENT

A series of NASA/RECON bibliographies with indexes

A selection of annotated references to unclassified reports, journal articles, and conference proceeding papers introduced into the NASA scientific and technical information system and announced in:

Scientific and Technical Aerospace Reports (STAR)
International Aerospace Abstracts (IAA)

Prepared by the staff of the NASA Headquarters Scientific and Technical Library with support from the NASA Scientific and Technical Facility and Francis T. Hoban, Code FT, NASA Headquarters.

INTRODUCTION

This bibliography is the fifth in a series of publications listing 86 reports, articles and other documents announced in Scientific and Technical Aerospace Reports (STAR) and International Aerospace Abstracts (IAA).

In its subject coverage, the Program/Project Management bibliography includes many issues managers face today. Some of the subject areas are listed below:

Contract Management	Management Information Systems	Personnel Management
Cost Analysis	Management Methods	Project Management
Cost Effectiveness	Management Planning	Reliability Analysis
Cost Reduction	Management Systems	Reliability Engineering
Engineering Management	Manpower	Research Management
Government Procurement	Matrix Management	Scheduling
Life Cycle Costs	Mission Planning	System Effectiveness
Logistics Management	Operating Costs	Systems Engineering
Maintainability	Operations Research	Systems Management

While the emphasis is NASA management, documents from other federal agencies are represented. Each entry consists of a bibliographic citation and an abstract in most cases. The entries are listed by accession number in descending order. Subject, author, corporate source, report number, accession number and contract number indexes are provided at the end of the bibliography to assist the researcher in identifying pertinent citations.

AVAILABILITY OF CITED PUBLICATIONS

NASA employees may contact their center library to order "N" documents through RECON or copy short documents from microfiche. Center libraries also hold "A" microfiche for reproducing non-copyrighted IAA documents. Finally, it may be necessary to borrow documents from another libraries through interlibrary loan.

NASA contractors should contact their NASA Center Library to determine the lending policies of that Center Library. "N" documents are available from the National Technical Information Services (NTIS), 5285 Port Royal Road, Springfield, VA 22161. Phone 703-487-4650 Fax 703-321-8547. "A" documents are available from the American Institute of Aeronautics and Astronautics (AIAA), 555 West 57th Street, New York, N. Y. 10019. Phone 212-247-6500.

TYPICAL REPORT CITATION AND ABSTRACT

NASA SPONSORED

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CORPORATE SOURCE

ACCESSION NUMBER → **N90-10571*#** Virginia Univ., Charlottesville. Dept. of Environmental Sciences.

TITLE → **A SIMPLE, MASS BALANCE MODEL OF CARBON FLOW IN A CONTROLLED ECOLOGICAL LIFE SUPPORT SYSTEM**

AUTHOR AND PUBLICATION DATE → JAY L. GARLAND Mar. 1989 37 p Prepared in cooperation with Bionetics Corp., Cocoa Beach, FL

CONTRACT NUMBER → (Contract NAS10-10285)

REPORT NUMBERS → (NASA-TM-102151; NAS 1.15:102151) Avail: NTIS HC A03/MF A01

AVAILABILITY SOURCE

PRICE CODE

COSATI CODE → CSCL 05/8

Internal cycling of chemical elements is a fundamental aspect of a Controlled Ecological Life Support System (CELSS). Mathematical models are useful tools for evaluating fluxes and reservoirs of elements associated with potential CELSS configurations. A simple mass balance model of carbon flow in CELSS was developed based on data from the CELSS Breadboard project at Kennedy Space Center. All carbon reservoirs and fluxes were calculated based on steady state conditions and modelled using linear, donor-controlled transfer coefficients. The linear expression of photosynthetic flux was replaced with Michaelis-Menten kinetics based on dynamical analysis of the model which found that the latter produced more adequate model output. Sensitivity analysis of the model indicated that accurate determination of the maximum rate of gross primary production is critical to the development of an accurate model of carbon flow. Atmospheric carbon dioxide was particularly sensitive to changes in photosynthetic rate. The small reservoir of CO2 relative to large CO2 fluxes increases the potential for volatility in CO2 concentration. Feedback control mechanisms regulating CO2 concentration will probably be necessary in a CELSS to reduce this system instability.

Author

TYPICAL JOURNAL ARTICLE CITATION AND ABSTRACT

NASA SPONSORED

CORPORATE SOURCE

ACCESSION NUMBER → **A90-11091*** Krug International, San Antonio, TX.

TITLE → **DETERMINING A BENDS-PREVENTING PRESSURE FOR A SPACE SUIT**

AUTHORS → R. W. KRUTZ, JR., J. T. WEBB (Krug International, Technology Services Div., San Antonio, TX), and G. A. DIXON (USAF, School of Aerospace Medicine, Brooks AFB, TX) SAFE Journal, vol. 19, Fall 1989, p. 20-24. Research sponsored by USAF. refs (Contract NASA ORDER T-82170)

AUTHORS' AFFILIATION

JOURNAL TITLE

PUBLICATION DATE

Copyright

Research conducted to determine the proper pressure for preventing bends during EVA without preoxygenation is examined. Male and *female subjects* with *different* breathing gas mixtures and pressures are studied in order to define the pressure. Visual and auditory *Doppler ultrasonic signals* are utilized to monitor intravascular gas bubbles. The workload, which simulates EVA, consists of a handturned bicycle *ergometer*, a *torque* wrench operation, and a rope pull. The experimental data reveal that the minimum space suit pressure *needed to prevent decompression* sickness is 9.5 psi.

I.F.

OTHER RESOURCES

This bibliography is not intended to be the final or conclusive source of Program and Project Management documentation. Many excellent sources are commercially available. Some possibilities are listed below.

Indexes

- ABI/Inform
- Air University Library Index to Military Periodicals
- Business Periodical Index
- Economic Literature Index
- Harvard Business Review
- Magazine Index
- Management Contents
- National Newspaper Index
- Newsearch
- Personnel Literature

Associations

- American Institute of Management (AIM)
- American Management Association (AMA)
- Institute of Management Sciences (TIMS)
- International Project Management Association (INTERNET)
- Project Management Institute (PMI)
- Society for Advancement of Management (SAM)

91A44104# ISSUE 18 PAGE 3199 CATEGORY 83 RPT#: AIAA PAPER 91-2048 91/06/00 19 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Low cost space transportation - The hurdles of implementation
AUTH: A/KEITH, EDWARD L. PAA: A/(Rockwell International Corp., Downey, CA)
CIO: UNITED STATES
AIAA, SAE, ASME, and ASEE, Joint Propulsion Conference, 27th, Sacramento, CA, June 24-26, 1991. 19 p.
MAJS: /*COST REDUCTION/*EARTH ORBITAL ENVIRONMENTS/*SPACE TRANSPORTATION
MINS: / ECONOMIC FACTORS/ PAYLOAD DELIVERY (STS)/ ROCKET FLIGHT
ABA: C.D.
ABS: A system architecture which promises greatly to reduce the cost of transporting cargo from the earth surface to LEO is evaluated. The system involves a parallel burn cluster of seven identical rockets. The propellant from two rockets at a time would be used by the entire cluster, making this design operate as a four-stage vehicle. Market size, low-cost development system testing, manufacturing, launch service costs, launch size location, government involvement and support, and financing of the system are addressed along with system reliability and dependability.

91A44071# ISSUE 18 PAGE 3081 CATEGORY 20 RPT#: AIAA PAPER 91-1940 91/06/00 12 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: A concurrent engineering approach to reliable, low cost propulsion system design
AUTH: A/SANDERS, HEIDI J.; B/DOMMER, KATIE T.; C/WOLTING, DUANE E. PAA: C/(Aerojet, Propulsion Div., Sacramento, CA)
CIO: UNITED STATES
AIAA, SAE, ASME, and ASEE, Joint Propulsion Conference, 27th, Sacramento, CA, June 24-26, 1991.
MAJS: /*ADVANCED LAUNCH SYSTEM (STS)/*AEROSPACE ENGINEERING/*COST REDUCTION/*PROPULSION SYSTEM CONFIGURATIONS/*RELIABILITY ANALYSIS/*ROCKET ENGINE DESIGN
MINS: / COMBUSTION CHAMBERS/ FAILURE MODES/ LOW COST/ SPACE TRANSPORTATION
ABA: Author
ABS: A method for comparing competing rocket engine design concepts based on cost and reliability is presented. The method uses a systematic approach for evaluating and accounting for the factors which contribute to the cost and reliability of specific design alternatives. The method is designed for simplicity and is appropriate for implementation during the conceptual design phase. It uses a scoring approach to quantify relative cost and reliability. Analysis of the results readily provides an understanding of specific features and characteristics which make one concept superior to another. The method ultimately provides the system designer with the data to make informed design decisions.

91A43347# ISSUE 18 PAGE 3199 CATEGORY 83 91/05/00 3 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Dynamic development of space business - A study of German space industry
AUTH: A/KLEB, R.-H. PAA: A/(Kienbaum Unternehmensberatung GmbH, Federal Republic of Germany)
CIO: GERMANY,FEDERAL REPUBLIC OF
ESA Bulletin (ISSN 0376-4265), no. 66, May 1991, p. 101-103.
MAJS: /*AEROSPACE INDUSTRY/*DATA BASES/*EUROPEAN SPACE AGENCY/*GERMAN SPACE PROGRAM/*SPACE COMMERCIALIZATION
MINS: / COMPUTER TECHNIQUES/ COST ANALYSIS/ FEDERAL BUDGETS/ GOVERNMENT PROCUREMENT
ABA: R.E.P.
ABS: A review is presented of an empirical study of the German space industry that is based on data and databases collected from government and industry sources. It is seen that in addition to the generation of more private demand for space systems, the increase in the level of technological expertise within industry can itself contribute to additional market development. Attention is given to the total public-authority expenditure on space activities between 1976 and 1985 and the allocation of funds to space industry in 1985.

91A43339# ISSUE 18 PAGE 3074 CATEGORY 16 91/05/00 8 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Wings for European spaceflight - The future of space transportation
AUTH: A/FEUSTEL-BUEECHL, J.; B/ISAKEIT, D.; C/PFEFFER, H. PAA: C/(ESA, Directorate for Space Transportation Systems, Paris, France)
CIO: INTERNATIONAL ORGANIZATION
ESA Bulletin (ISSN 0376-4265), no. 66, May 1991, p. 21-28.
MAJS: /*ARIANE LAUNCH VEHICLE/*EUROPEAN SPACE AGENCY/*HERMES MANNED SPACEPLANE/*SPACE TRANSPORTATION SYSTEM
MINS: / AEROSPACE INDUSTRY/ INTERNATIONAL COOPERATION/ SPACE FLIGHT/ TECHNOLOGY ASSESSMENT
ABA: R.E.P.
ABS: A review is presented of the development and evolution of the European space program from its inception in the sixties to the projected space transportation programs beyond the year 2000. It is noted that Europe could not draw on any existing military rocket programs in building up its civil space transportation program, and it could not exploit political competition between opposing systems as a financial lever and driving force. Attention is given to the evolutionary development of the Ariane family of launchers, from the initial Ariane I of the 1980's to the projected Hermes spaceplane of 1998 and beyond. New long-term space transportation programs including increased payload for commercial launchers, an advanced reusable rocket, advanced enabling technologies, an

aerospace plane, advanced orbital transfer vehicles and moon/Mars transportation vehicles are described.

91A43273 ISSUE 18 PAGE 3047 CATEGORY 1 91/07/00 7 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Sub-contractors play new strategic roles
AUTH: A/BUTTERWORTH-HAYES, PHILIP; B/WILSON, J. R.
CIO: UNITED KINGDOM
Interavia Aerospace Review (ISSN 0020-6512), vol. 46, July 1991, p. 30-32, 34, 36-38.
MAJS: /*AIRCRAFT DESIGN/*AIRCRAFT PARTS/*CONTRACTS/* INTERNATIONAL TRADE/*PRODUCT DEVELOPMENT
MINS: / AIRCRAFT CONFIGURATIONS/ DESIGN ANALYSIS/ INTERNATIONAL RELATIONS/ MANUFACTURING/ PROCESS CONTROL (INDUSTRY)/ QUALITY CONTROL
ABA: R.E.P.
ABS: An overview is presented of the manner in which U.S. aircraft manufacturers have approached their outside suppliers, though sharply different from each other, reflecting the recognition they have given to the changing nature of international manufacturing and marketing. A breakdown of major civilian transport aircraft by component parts and subcontracting manufacturers is provided. The relationship between the major civil airline airframe manufacturers and their suppliers is evolving into growing complex structures, with suppliers themselves making intricate arrangements with their own subcontractors. Specific examples of contractual arrangements are described for European, Asian, and other international manufacturers as well as those in the U.S.A.

91A43036 ISSUE 18 PAGE 3217 CATEGORY 99 91/05/00 36 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: A series on the European Communication Satellite Program. I - Historical background and start of the TELECOM programme
AUTH: A/MUELLER, JOACHIM PAA: A/(UN, Financial Services, Vienna, Austria)
CIO: INTERNATIONAL ORGANIZATION
Space Communications (ISSN 0924-8625), vol. 8, May 1991, p. 105-140.
MAJS: /*EUROPEAN COMMUNICATIONS SATELLITE/*EUROPEAN SPACE PROGRAMS/*HISTORIES/*PROJECT PLANNING
MINS: / INTELSAT SATELLITES/ POLICIES/ PROJECT MANAGEMENT/ SATELLITE COMMUNICATION
ABA: O.G.
ABS: The evolution of the European Communication Satellite Program is examined for the period of 1964-1971 in the context of national activities focusing, on collaborative ventures as an alternative to national projects and government funding of communication satellite technology as compared with private initiatives. Topics discussed include policy-making at government level, project management by ESRO/ESA, and industrial implementation and system utilization.

91A41766# ISSUE 17 PAGE 2868 CATEGORY 12 RPT#: AIAA PAPER 91-2384 91/06/00 12 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: A case for the development of a new National Launch System now
AUTH: A/STROBL, WILLIAM C. PAA: A/(General Dynamics Corp., Space Systems Div., San Diego, CA)
CIO: UNITED STATES
AIAA, SAE, ASME, and ASEE, Joint Propulsion Conference, 27th, Sacramento, CA, June 24-26, 1991. 12 p.
MAJS: /*ATLAS LAUNCH VEHICLES/*DELTA LAUNCH VEHICLE/*SPACE TRANSPORTATION/*TITAN LAUNCH VEHICLES
MINS: / COST REDUCTION/ RELIABILITY ANALYSIS/ TECHNOLOGICAL FORECASTING
ABA: K.K.
ABS: The importance of a National Launch System (NLS) to U.S. preeminence in space is stressed. It is suggested that the development of an NLS should not be linked to a space initiative program, but rather, it should be funded separately. The author believes that, in this manner, a highly reliable robust low-cost transportation (launch vehicle) system will be created which will accomodate any and all future nationally supported payloads into space.

91A41692# ISSUE 17 PAGE 3014 CATEGORY 81 RPT#: AIAA PAPER 91-2065 91/06/00 5 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: The Process Team concept
AUTH: A/HAUSSMANN, AL; B/DEPHILIPPIS, BOB PAA: B/(Aerojet, Propulsion Div., Sacramento, CA)
CIO: UNITED STATES
AIAA, SAE, ASME, and ASEE, Joint Propulsion Conference, 27th, Sacramento, CA, June 24-26, 1991. 5 p.
MAJS: /*COST REDUCTION/*PERSONNEL MANAGEMENT/*QUALITY CONTROL/* TEAMS
MINS: / COST EFFECTIVENESS/ SAFETY FACTORS
ABA: R.E.P.
ABS: The organizational responsibilities and operational aspects of the Process Team concept are presented. The overall objective of the Process Team is to reduce the time to complete an operation or to reduce the span time of a product by utilizing cost-effective total quality management principles and practices while meeting customer requirements. Organizations that have properly implemented this process team concept have achieved improved quality, safety, cost, and schedule performance while experiencing improved morale.

91A41549 ISSUE 17 PAGE 3015 CATEGORY 84 91/05/00 5 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Swords into ploughshares - Missiles as commercial

launchers
AUTH: A/POTTER, MICHAEL PAA: A/(Icomnet, Washington, DC)
CIO: UNITED STATES
Space Policy (ISSN 0265-9646), vol. 7, May 1991, p. 146-150.
MAJS: /*COMMERCIAL SPACECRAFT/*ECONOMIC FACTORS/*LAUNCH VEHICLES /*MISSILES
MINS: / COST REDUCTION/ MARKET RESEARCH
ABA: P.D.
ABS: Two initiatives that have been advanced in the U.S. and the USSR to convert missiles into low-cost launchers are examined, and the political and economic issues they raise are discussed. A U.S. agreement with Glavkosmos, the Soviet space marketing agency, for the sale of space hardware and services is described, and the USSR's START project to turn SS-20 production facilities and workforce into commercial activities is outlined. Consideration is given to the Lodestar initiative to adapt a version of the U.S. Navy's C-3 Poseidon missile, and also to arms-control restraints on commercialization, technology-transfer controls, and unfair competition and trade.

91A41547 ISSUE 17 PAGE 3015 CATEGORY 84 91/05/00
8 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Changing structure of the Soviet space programme
AUTH: A/CREMINS, TOM; B/NEWTON, ELIZABETH PAA: A/(Institute for Security and Cooperation in Outer Space, Washington, DC); B/(Analytic Services, Inc., Arlington, VA)
CIO: UNITED STATES
Space Policy (ISSN 0265-9646), vol. 7, May 1991, p. 129-136.
MAJS: /*ECONOMIC FACTORS/*POLICIES/*U.S.S.R. SPACE PROGRAM
MINS: / NASA SPACE PROGRAMS/ SPACE COMMERCIALIZATION/ SPACE EXPLORATION
ABA: P.D.
ABS: The impact political and economic change in the USSR has been having on the Soviet space policy and program is described. Attention is given to such factors as a new generation of officialdom, less funding, public opinion and national disunity, and to the greater stress all these changes are putting on the increasingly fractured bureaucracy. The lack of a guiding force for the Soviet space effort is discussed, with emphasis on the disarray in the space-planning authority. The hard-currency drive in the space program is considered, with the focus on the burgeoning marketing of satellites, space-derived applications and launchers, and applied space missions for which there is a tangible economic return. The planning and structure of the Soviet space program is outlined, with emphasis on the Ministry of General Machine-Building, which provides the supervisory cohesion for the Soviet aerospace industry. Pressure from the republics for space-program decentralization is examined.

91A31750 ISSUE 12 PAGE 1924 CATEGORY 12 91/04/00
4 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: NASP as an American orphan - Bureaucratic politics and the development of hypersonic flight
AUTH: A/JOHNSON-FREESE, JOAN; B/HANDBERG, ROGER PAA: B/(Central Florida, University, Orlando, FL)
CIO: UNITED STATES
Spaceflight (ISSN 0038-6340), vol. 33, April 1991, p. 134-137.
MAJS: /*HYPERSONIC FLIGHT/*LAUNCH VEHICLES/*MISSION PLANNING/* NASA SPACE PROGRAMS/*NATIONAL AEROSPACE PLANE PROGRAM
MINS: / AIRCRAFT DESIGN/ AIRCRAFT SPECIFICATIONS/ HYPERSONIC AIRCRAFT/ MANNED SPACE FLIGHT
ABA: L.K.S.
ABS: The development of the NASP program is summarized and the current politics associated with the hypersonic program are reviewed. It is noted that the two agencies most likely to sponsor the NASP program, NASA and DOD, are reluctant to sponsor any expensive research and development program in a constrained fiscal environment. For this reason, it is argued that the continued existence of the NASP program is contingent upon winning the support of the military, particularly the Air Force. Significant applications of a hypersonic airplane with sustained cruise capability between Mach 5 and 14 are given. These include a hypersonic plane to carry out interdiction, reconnaissance, surveillance, and precision targeting and weapons guidance missions; a hypersonic bomber for strategic bombing operations; and a hypersonic transport for strategic airlift missions. It is noted that, according to NASP program officials, an aerospace plane deployed at just six bases around the world could deploy anywhere in 45 minutes or less.

91A29699# ISSUE 11 PAGE 1864 CATEGORY 83 90/00/00
5 PAGES UNCLASSIFIED DOCUMENT
UTTL: Satellite environmental testing cost benefits
AUTH: A/HAMBERG, O.; B/BRACKIN, C. A.; C/TOSNEY, W. F. PAA: C/(Aerospace Corp., El Segundo, CA)
CIO: UNITED STATES
IN: Aerospace Testing Seminar, 12th, Manhattan Beach, CA, Mar. 13-15, 1990, Proceedings (A91-29689 11-38). Mount Prospect, IL, Institute of Environmental Sciences, 1990, p. 39-43.
MAJS: /*COST ANALYSIS/*ENVIRONMENTAL TESTS/*GROUND TESTS/* SATELLITE DESIGN/*SPACE MISSIONS
MINS: / FAILURE ANALYSIS/ MTBF/ RELIABILITY ANALYSIS/ SATELLITE COMMUNICATION/ SATELLITE LIFETIME
ABA: Author
ABS: Cost benefits are presented of system-level environmental tests for two Space Systems Division operational programs. The programs were evaluated and used as case studies for developing methodologies to derive cost benefits. The results indicate that system-level environmental tests conducted for these two programs had positive benefits as

related to the cost of the tests.

91A29698# ISSUE 11 PAGE 1863 CATEGORY 81 90/00/00
8 PAGES UNCLASSIFIED DOCUMENT
UTTL: Risk assessment and program management
AUTH: A/HABER, JEROLD M.
CIO: UNITED STATES
IN: Aerospace Testing Seminar, 12th, Manhattan Beach, CA, Mar. 13-15, 1990, Proceedings (A91-29689 11-38). Mount Prospect, IL, Institute of Environmental Sciences, 1990, p. 31-38.
MAJS: /*ENVIRONMENT MANAGEMENT/*PROJECT PLANNING/*RISK
MINS: / ACCEPTABILITY/ CONTRACT MANAGEMENT/ COST ANALYSIS/ DECISION MAKING/ MTBF/ VULNERABILITY
ABA: T.K.
ABS: The application of risk-assessment (RA) methods to aerospace development programs is described and illustrated with extensive diagrams. The basic RA concepts are defined (hazard, exposure, vulnerability, and risk acceptability criteria); the analysis of a product development program in terms of the general environment and the contractor's work force, assets, and deliverables is explained; the construction of a risk estimation model is outlined; and different RA techniques are compared. A typical RA application involving a government procurement program with an artificially large number of risk sources is discussed in detail, with an emphasis on the value of RA for Total Quality Management.

91A29696# ISSUE 11 PAGE 1864 CATEGORY 83 90/00/00
4 PAGES UNCLASSIFIED DOCUMENT
UTTL: Test cost savings through risk analysis
AUTH: A/FEILER, ALFRED M.; B/GEMINDER, ROBERT PAA: B/(Log/An, Inc., Los Angeles, CA)
CIO: UNITED STATES
IN: Aerospace Testing Seminar, 12th, Manhattan Beach, CA, Mar. 13-15, 1990, Proceedings (A91-29689 11-38). Mount Prospect, IL, Institute of Environmental Sciences, 1990, p. 25-28.
MAJS: /*COST ANALYSIS/*PRODUCTION PLANNING/*RISK/*STATISTICAL TESTS
MINS: / MANAGEMENT PLANNING/ PROJECT PLANNING/ TECHNOLOGY ASSESSMENT
ABA: Author
ABS: This paper addresses test program cost savings through application of program risk management procedures. Over the past few years, program risk analysis has become a requirement for most DoD acquisition programs. Although the technique has significantly contributed to reduction of cost/schedule/technical risks, relatively little attention has been given to another attainable benefit: direct reduction of test program costs. This paper includes a discussion of test planning, scheduling and resourcing. It presents examples to illustrate how expenditures for thest resources (labor, equipment, facilities and test articles) can be minimized through use of probabilistic plan analysis.

91A27832 ISSUE 10 PAGE 1661 CATEGORY 84 90/00/00
51 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: The 1992 European unification - Effects in the air transport industry
AUTH: A/LUEBKER, MONICA L.
CIO: UNITED STATES
Journal of Air Law and Commerce (ISSN 0021-8642), vol. 56, Winter 1990, p. 589-639.
MAJS: /*AIR TRANSPORTATION/*ECONOMIC FACTORS/*INTERNATIONAL COOPERATION/*TRANSPORT AIRCRAFT
MINS: / COMMERCIAL AIRCRAFT/ EUROPE
ABA: C.D.
ABS: The effect of the plan for European unification in 1992 on the air tranport sector in both Member and nonmember states is addressed. The general concepts behind the unification are explained, and it is shown how airlines fit within the purview of the Treaty Establishing the European Economic Community. Resistance to a common policy exhibited by some Member States is examined. Arguments both for and against a deregulated airline system in Europe are illustrated, and concerns about deregulation held by the United States airline industry are analyzed.

91A27723 ISSUE 10 PAGE 1537 CATEGORY 12 90/00/00
10 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Normal accidents and logistics in space operations
AUTH: A/BOCAST, ALEXANDER K. PAA: A/(DOD, Office of the Assistant Secretary of Defense for Production and Logistics, Washington, DC)
CIO: UNITED STATES
IN: Engineering, construction, and operations in space II; Proceedings of Space 90, the Second International Conference, Albuquerque, NM, Apr. 22-26, 1990. Vol. 2 (A91-27576 10-12). New York, American Society of Civil Engineers, 1990, p. 1482-1491.
MAJS: /*ACCIDENT PREVENTION/*LOGISTICS MANAGEMENT/*SPACE LOGISTICS/*SPACE MAINTENANCE
MINS: / AEROSPACE ENGINEERING/ MISSION PLANNING/ OPERATIONAL PROBLEMS/ RESOURCES MANAGEMENT/ SERVICE LIFE
ABA: Author
ABS: Unpredictable systemic accidents, called normal accidents, will occur in highly complex large-scale space systems. To mitigate the catastrophic consequences of normal accidents, containment engineering will need to rely upon adequate logistics infrastructures provided by transform logistics channels to minimize consequential risk to target systems. The resource requirements of such an in situ logistics infrastructure to support the primary logistics channels of target systems may be orders of magnitude larger than current models estimate.

91A27566 ISSUE 10 PAGE 1534 CATEGORY 12 91/02/00
12 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Can space exploration survive the end of the Cold War?
AUTH: A/MURRAY, BRUCE PAA: A/(California Institute of Technology, Pasadena)
CIO: UNITED STATES
Space Policy (ISSN 0265-9646), vol. 7, Feb. 1991, p. 23-34.
MAJS: /*INTERNATIONAL COOPERATION/*MANNED MARS MISSIONS/*MISSION PLANNING/*SPACE EXPLORATION
MINS: / CASSINI MISSION/ GOVERNMENT PROCUREMENT/ NASA SPACE PROGRAMS/ U.S.S.R./ UNITED STATES
ABA: L.K.S.
ABS: The achievements in space exploration since 1986 are reviewed. It is argued that the first age of space exploration was driven by competition between the U.S. and the USSR. With the apparent close of the Cold War, it is possible that a necessary shift of attention to domestic issues in most nations will cause a hiatus in space exploration. It is thus suggested that a future space exploration program of proper proportion will only be achieved if international cooperation is achieved on a large scale and backed by the necessary political will. It is also suggested that a Mars mission can provide a focus for space exploration well into the next century.

91A26938 ISSUE 10 PAGE 1545 CATEGORY 16 91/02/00
12 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Launching the Space Shuttle Challenger - Disciplinary deficiencies in the analysis of engineering data
AUTH: A/LIGHTHALL, FREDERICK F. PAA: A/(Chicago, University, IL)
CIO: UNITED STATES
IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. 38, Feb. 1991, p. 63-74.
MAJS: /*DATA REDUCTION/*DECISION MAKING/*O RING SEALS/*SPACE SHUTTLES/*SPACECRAFT LAUNCHING
MINS: / AEROSPACE ENGINEERING/ DATA PROCESSING
ABA: I.E.
ABS: Published and archival testimony of participants in the decision to launch the Challenger Space Shuttle and new lessons from the decision process for engineering training and engineering managers are analyzed. Examination of interview testimony, published hearings, and tabular data examined by the decision participants at the time of the Challenger launch shows that analysis of data and reasoning were flawed and that the flaws are attributable in large measure not to personal or even organizational failings but rather to a professional weakness shared by all participants. The professional weakness is either curricular or instructional: a gap in the education of engineers. Staff engineers and engineering managers arguing for and against the launch, all of whom agreed they had insufficient quantitative data to support an argument against the launch, were unable to frame basic questions of covariation among field variables and thus unable to see the relevance of routinely gathered field data to the issues they debated before the Challenger launch. Simple analyses of field data available to both Morton-Thiokol and NASA at launch time and months before the Challenger launch are presented to show that the arguments against launching at cold temperatures could have been quantified, but were not quantified, to the point of predicting degrees of component failure beyond those held by decision participants to be safe. The weakness in engineering education, in turn, is taken to be of a pervasive genre: an overemphasis in contemporary universities and research centers on specialization and analysis and an underemphasis on synthesis of knowledge across fields. A larger lesson of the accident, then, is that professional narrowness, leading to false diagnosis of cause-effect relations, can be fatal.

91A24653# ISSUE 9 PAGE 1332 CATEGORY 12 89/00/00
8 PAGES UNCLASSIFIED DOCUMENT
UTTL: Construction of low cost spacecraft - The UOSAT programme
AUTH: A/RADBONE, JACKY PAA: A/(Surrey, University, Guildford, England)
CIO: UNITED KINGDOM
IN: Low-cost access to space; Proceedings of the Conference and Exhibition, Paris, France, June 6, 1989 (A91-24651 09-12). Burnham, England, Shephard Press, Ltd., 1989, 8 p.
MAJS: /*LOW COST/*SMALL SCIENTIFIC SATELLITES/*SPACECRAFT DESIGN /*SYSTEMS ENGINEERING
MINS: / ARCHITECTURE (COMPUTERS)/ COMMAND AND CONTROL/ SPACECRAFT COMMUNICATION/ SPACECRAFT POWER SUPPLIES/ TELEMETRY/ UNIVERSITIES
ABA: R.E.P.
ABS: This paper describes the various factors that have been found to be key issues for cost-effective spacecraft design and which have led to the design of the UoSAT space vehicles at the University of Surrey. Attention is given to such issues as systems architectures, component selection, manufacturing techniques and quality control, project management, and launch considerations. The UoSAT program has shown both the usefulness and feasibility of small, low-cost space vehicles that offer long lifetime, quick response, and sophisticated operations. Also, these spacecraft have provided a cost-effective means of supporting in-orbit technology demonstration, space education, and earth observation missions.

91A19974 ISSUE 6 PAGE 932 CATEGORY 76 90/12/31 3
PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Growth and properties of YBa2Cu3O7 thin films on vicinal and polycrystalline MgO substrates

AUTH: A/MOECKLY, B. H.; B/RUSSEK, S. E.; C/LATHROP, D. K.; D/BUHRMAN, R. A.; E/NORTON, M. G. PAA: E/(Cornell University, Ithaca, NY)
CIO: UNITED STATES
Applied Physics Letters (ISSN 0003-6951), vol. 57, Dec. 31, 1990, p. 2951-2953. Research supported by DARPA and U.S. Navy.
MAJS: /*COPPER OXIDES/*CRYSTAL GROWTH/*HIGH TEMPERATURE SUPERCONDUCTORS/*POLYCRYSTALS/*SUPERCONDUCTING FILMS/*THIN FILMS
MINS: / BARIUM OXIDES/ LASER APPLICATIONS/ MAGNESIUM OXIDES/ SINGLE CRYSTALS/ VOLT-AMPERE CHARACTERISTICS/ YTTRIUM OXIDES
ABA: Author
ABS: Results of a study on the growth by laser ablation of YBa2Cu3O7 thin films on polycrystalline and annealed vicinal (001) MgO substrates are discussed. In both instances the films were found to grow predominantly with the c axis normal to the plane of the substrate, regardless of the orientation of the MgO surface. In the case of the vicinal substrates the films were found to have superconducting properties comparable to those obtained with films grown on (001) oriented, annealed single-crystal substrates.

91A18187 ISSUE 5 PAGE 781 CATEGORY 90 90/11/00 10 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Scanning interferometer observations of the shell N186E in the Large Magellanic Cloud
AUTH: A/ROSADO, M.; B/LAVAL, A.; C/BOULESTEIX, J.; D/GEORGELIN, Y. P.; E/GREVE, A. PAA: A/(Universidad Nacional Autonoma de Mexico, Coyoacan, Mexico); D/(Marseille, Observatoire, France); E/(Institut de Radioastronomie Millimetrique, Saint-Martin-d'Heres, France)
CIO: MEXICO
Astronomy and Astrophysics (ISSN 0004-6361), vol. 238, no. 1-2, Nov. 1990, p. 315-324.
MAJS: /*INTERFEROMETERS/*INTERSTELLAR MATTER/*MAGELLANIC CLOUDS /*NEBULAE/*STELLAR ENVELOPES
MINS: / EMISSION SPECTRA/ H ALPHA LINE/ SCANNING/ SUPERNOVA REMNANTS/ VELOCITY DISTRIBUTION
ABA: Author
ABS: The velocity field ad the H-alpha flux of the large shell N186E of the LMC are measured over a 7 x 7 arcsec field, covering most of the filamentary structure. The radial velocity field appears to be contaminated by faint blue-shifted and red-shifted emission which confirms the presence of H-I slabs along the line of sight. The remaining gas in N186E does not show high velocity expansion motions (25 km/s), much less than found inside the similar but smaller bubble N185. The recently detected exciting stars are sufficient to explain the ionization of N186E, although none of them is located close to the center. The density inside the filaments is produced by weak shocks, whereas the circular shape and the size of the shell indicate homogeneity of the preshock material. An intense interaction is found at the dense border between N186E and the young neighboring SNR, N186D. N186E is probably an old SNR, now being ionized by internal stars.

91A10139# ISSUE 1 PAGE 74 CATEGORY 66 RPT#: AIAA PAPER 90-3773 90/09/00 12 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Risk management integration with system engineering and program management
AUTH: A/VLAY, GEORGE J.; B/BREKKA, LAWRENCE T. PAA: A/(Ford Aerospace Corp., Palo Alto, CA); B/(BDM International, Inc., McLean, VA)
CIO: UNITED STATES
AIAA, Space Programs and Technologies Conference, Huntsville, AL, Sept. 25-27, 1990. 12 p.
MAJS: /*MANAGEMENT PLANNING/*PROJECT MANAGEMENT/*RISK/*SYSTEMS ENGINEERING
MINS: / COMPUTER PROGRAMS/ COSTS/ PROGRAM TREND LINE ANALYSIS/ QUALITY CONTROL
ABA: C.D.
ABS: The integration of computerized risk management into a system engineering and program management processes is discussed. Program management using Total Quality Management (TQM) is reviewed, and the ways that such management can be improved by computerized risk management are shown using the BDM Risk Analysis and Management System (BRAMS). The application of BRAMS to assess the risk of achieving launch on schedule of a hypothetical satellite system is examined. The role of TQM in system engineering management is discussed.

91A10136# ISSUE 1 PAGE 89 CATEGORY 81 RPT#: AIAA PAPER 90-3767 90/09/00 15 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: An overview of risk management techniques, methods and application
AUTH: A/SHAW, THOMAS E. PAA: A/(Lockheed Sanders, Inc., Nashua, NH)
CIO: UNITED STATES
AIAA, Space Programs and Technologies Conference, Huntsville, AL, Sept. 25-27, 1990. 15 p.
MAJS: /*MANAGEMENT METHODS/*RISK/*SYSTEMS ENGINEERING
MINS: / PROBABILITY THEORY/ PROJECT MANAGEMENT/ SYSTEMS MANAGEMENT
ABA: B.P.
ABS: An overview of various approaches, methods, and management processes associated with the risks of both traditional and extreme nature is presented. The risk identification and risk analysis steps of risk management are emphasized. Risk assessment methods such as probabilistic risk assessment (PRA) and qualitative rating methods are seen

in perspective. The critical importance of the risk awareness of the program on the part of the team leadership and its individual members is emphasized.

91A10054# ISSUE 1 PAGE 7 CATEGORY 12 RPT#: AIAA PAPER 90-3617 90/09/00 7 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: A review of the Apollo Lunar Module program and its lessons for future space missions
AUTH: A/KELLY, THOMAS J. PAA: A/(Grumman Corp., Bethpage, NY)
CIO: UNITED STATES
AIAA, Space Programs and Technologies Conference, Huntsville, AL, Sept. 25-27, 1990. 7 p.
MAJS: /*APOLLO LUNAR EXPERIMENT MODULE/*APOLLO PROJECT/*MISSION PLANNING/*SPACECRAFT DESIGN
MINS: / APOLLO 13 FLIGHT/ FLIGHT TESTS/ INTERNATIONAL COOPERATION/ SPACE STATIONS/ SYSTEMS ENGINEERING/ SYSTEMS INTEGRATION
ABA: C.D.
ABS: The role of the Lunar Module (LM) in the Project Apollo lunar landing mission is reviewed. The lessons learned from the LM with regard to quality and reliability, flight test and operations, program management, and systems engineering and integration are discussed.

88A51978# ISSUE 22 PAGE 3732 CATEGORY 81 RPT#: AIAA PAPER 88-4516 88/09/00 10 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Wright Brothers lectureship in aeronautics: The Skunk Works' management style - It's no secret
AUTH: A/RICH, BEN R. PAA: A/(Lockheed Aeronautical Systems Co., Burbank, CA)
CIO: UNITED STATES
AIAA, AHS, and ASEE, Aircraft Design, Systems and Operations Meeting, Atlanta, GA, Sept. 7-9, 1988. 10 p.
MAJS: /*AERONAUTICAL ENGINEERING/*MANAGEMENT METHODS/*ORGANIZING
MINS: / AIRCRAFT DESIGN/ COST ESTIMATES/ ENGINEERING DRAWINGS/ PERSONNEL MANAGEMENT/ QUALITY CONTROL/ RESEARCH AND DEVELOPMENT
ABA: O.C.
ABS: An historical development and organizational-principles account is presented for the 'Skunk Works' management philosophy created at the Lockheed Aeronautical Systems Company by Clarence 'Kelly' Johnson, beginning in 1943, in order to tightly organize and expedite small, highly-classified advanced aircraft design and prototype construction projects. This management philosophy has produced such aircraft as the U-2 and SR-71 spy aircraft and the P-80 and F-104 fighters. The 14 management principles formulated by Johnson are presented and discussed.

88A35077 ISSUE 13 PAGE 2197 CATEGORY 84 RPT#: AAS PAPER 86-342 87/00/00 8 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Competition and cooperation in international joint projects
AUTH: A/FORMAN, BRENDA PAA: A/(Lockheed Corp., Calabasas, CA)
CIO: UNITED STATES
IN: Aerospace century XXI: Space missions and policy; Proceedings of the Thirty-third Annual AAS International Conference, Boulder, CO, Oct. 26-29, 1986 (A88-35051 13-12). San Diego, CA, Univelt, Inc., 1987, p. 455-462.
MAJS: /*INTERNATIONAL COOPERATION/*SPACE COMMERCIALIZATION/*SPACE LAW/*SPACE STATIONS
MINS: / NASA SPACE PROGRAMS/ RESEARCH AND DEVELOPMENT
ABA: Author
ABS: An analysis is undertaken of the tension between cooperation and competition in joint endeavors, beginning with the company-to-company teaming arrangement, through large-scale R&D consortia formed under the National Cooperative Research Act of 1984, to major international undertakings such as the U.S. Space Station. Examples are discussed of various techniques used to protect proprietary information while furthering the goals of the joint undertaking.

88A27634# ISSUE 10 PAGE 1572 CATEGORY 54 86/06/00 4 PAGES UNCLASSIFIED DOCUMENT
UTTL: Qualitative requirements of a modern fighter aircraft
AUTH: A/JAYAL, B. D.
CIO: INDIA
Aviation Medicine, vol. 30, June 1986, p. 9-12.
MAJS: /*AIRCRAFT RELIABILITY/*FIGHTER AIRCRAFT/*MAN MACHINE SYSTEMS/*QUALITY CONTROL
MINS: / HUMAN FACTORS ENGINEERING/ PILOT PERFORMANCE/ RESEARCH AND DEVELOPMENT/ TASK COMPLEXITY
ABA: I.S.
ABS: The requirements of a combat aircraft are examined together with the operational principles and the utility of devices that help to achieve an effective pilot-vehicle interface, such as electronic cockpits, head-up displays, multifunction displays, hands-on throttle and stick layout, voice command systems, helmet-mounted sights, and touch panels. It is pointed out that, to cope with the multirole aircraft requirements where a very high volume of information will be processed and displayed, a two-pilot concept may become necessary to maintain physical and mental alertness of the crew. The need for the protection of the crew in a nuclear biological and chemical environment by supplying a special airconditioning system, clothing, mask, and oxygen system is emphasized.

88A24807 ISSUE 8 PAGE 1253 CATEGORY 81 87/00/00 373 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Engineering management: Concepts, procedures and models

--- Book
AUTH: A/DHILLON, B. S. PAA: A/(Ottawa, University, Canada)
SAP: $49
CIO: CANADA
Lancaster, PA, Technomic Publishing Co., Inc., 1987, 373 p.
MAJS: /*ENGINEERING MANAGEMENT/*MANAGEMENT ANALYSIS/*MANAGEMENT METHODS/*PERSONNEL MANAGEMENT
MINS: / CONTRACT MANAGEMENT/ COST ANALYSIS/ DECISION MAKING/ LEADERSHIP/ MARKETING/ MATHEMATICAL MODELS/ OPERATIONS RESEARCH/ PRODUCT DEVELOPMENT/ PROJECT MANAGEMENT/ QUALITY CONTROL
ABA: T.K.
ABS: Engineering management (EM) techniques are examined in an introductory text intended for undergraduate and graduate engineering and EM students. Chapters are devoted to organizing, the human element in EM, creativity, manpower planning and control, selecting engineering projects, project management, EM of technical proposals and specifications, EM of contracts, and techniques for making better EM decisions. Consideration is given to mathematical models of EM decision making, product development and costing, EM of design and drawings, value engineering and configuration management, EM of product assurance sciences, EM of maintenance, marketing, product warranties and liabilities, and work study. Diagrams, tables, and exercises are provided.

87A53567 ISSUE 24 PAGE 3838 CATEGORY 12 87/06/00 3 PAGES In GERMAN UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Assurance of quality and reliability for European space flight projects
AUTH: A/BECK, JUERGEN; B/SCHUETZ, HELMUT A. PAA: A/(DFVLR, Oberpfaffenhofen and Cologne, West Germany); B/(DFVLR, Cologne, West Germany)
CIO: GERMANY,FEDERAL REPUBLIC OF
DFVLR-Nachrichten (ISSN 0011-4901), June 1987, p. 24-26. In German.
MAJS: /*EUROPEAN SPACE PROGRAMS/*QUALITY CONTROL/*SPACE FLIGHT/*SPACECRAFT RELIABILITY
MINS: / RADIATION DAMAGE/ RECOMMENDATIONS/ REVISIONS/ SPACECRAFT CONSTRUCTION MATERIALS
ABA: C.D.
ABS: Steps currently being taken to assure the quality and reliability of future European space flights are reviewed. The different steps that must be taken to assure the quality of a given project are stated, and the tests that need to be carried out are indicated. European committees that oversee the quality of the components of space systems are mentioned, and their work is discussed. Recommendations are made to improve the present situation.

87A49199 ISSUE 21 PAGE 3490 CATEGORY 81 86/00/00 5 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Management of United States Air Force (USAF) operational test and evaluation (OT&E) flight test programs
AUTH: A/HERRLINGER, STEPHEN P. PAA: A/(USAF, Edwards AFB, CA)
CIO: UNITED STATES
IN: Society of Flight Test Engineers, Annual Symposium, 17th, Washington, DC, Aug. 10-14, 1986, Proceedings (A87-49198 21-01). Lancaster, CA, Society of Flight Test Engineers, 1986, p. 1.1-1 to 1.1-5.
MAJS: /*ARMED FORCES (UNITED STATES)/*FLIGHT TESTS/*MILITARY AIRCRAFT/*PROJECT MANAGEMENT
MINS: / ORGANIZATIONS/ REGULATIONS
ABA: Author
ABS: USAF Operational Test and Evaluation (OT&E) objectives during flight test are similar, yet distinctively different from Developmental Test and Evaluation (DT&E) objectives. The interactions and relationships required between DT&E and OT&E teams in accomplishing their respective charters will be highlighted. Specifically, inputs from the 31st Test and Evaluation Squadron (TES), Strategic Air Command (SAC), to various OT&E projects at Edwards AFB, CA, will be reviewed to illustrate the interaction between the Systems Program Office (SPO), the Air Force Operational Test and Evaluation Center (AFOTEC), the Combined Test Force (CTF), the Air Force Flight Test Center (AFFTC), and contractors.

86A24116 ISSUE 9 PAGE 1299 CATEGORY 81 85/00/00 3 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Entrepreneurial spirit combines with hard-headed business sense
AUTH: A/OLONE, R. G.
CIO: UNITED STATES
Commercial Space (ISSN 8756-4831), vol. 1, Fall 1985, p. 37-39.
MAJS: /*FINANCIAL MANAGEMENT/*SPACE COMMERCIALIZATION
MINS: / LAUNCH VEHICLES/ SPACECRAFT LAUNCHING
ABA: I.F.
ABS: The difficulties encountered by small companies in their development and completion of space projects are examined. The lack of adequate capital to complete the intended projects is analyzed. The inexperience of the personnel, the selection of improper projects, and improper calculation of the time required to complete the projects are all factors which contributed to the failure of many companies. The assembly of experienced and competent management teams is discussed. The possible need for private entrepreneurs to join with large aerospace firms in order to complete space projects is investigated. Examples of companies which have tried and failed to complete space projects are presented.

86A19524* ISSUE 7 PAGE 955 CATEGORY 81 84/00/00 6 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT

UTTL: Science operations management --- with Infrared Astronomy Satellite project
AUTH: A/SQUIBB, G. F. PAA: A/(California Institute of Technology, Jet Propulsion Laboratory, Pasadena)
CORP: Jet Propulsion Lab., California Inst. of Tech., Pasadena.
CIO: UNITED STATES
IN: The National Symposium and Workshop on Optical Platforms, Huntsville, AL, June 12-14, 1984, Proceedings (A86-19523 07-12). Bellingham, WA, SPIE - The International Society for Optical Engineering, 1984, p. 4-9. NASA-supported research.
MAJS: /*INFRARED ASTRONOMY SATELLITE/*PROJECT MANAGEMENT
MINS: / COOPERATION/ ORGANIZATIONS/ PROJECT PLANNING
ABA: O.C.
ABS: The operation teams engaged in the IR Astronomical Satellite (IRAS) project included scientists from the IRAS International Science Team. The detailed involvement of these scientists in the design, testing, validation, and operations phases of the IRAS mission contributed to the success of this project. The Project Management Group spent a substantial amount of time discussing science-related issues, because science team coleaders were members from the outset. A single scientific point-of-contact for the Management Group enhanced the depth and continuity of agreement reached in decision-making.

86A17472 ISSUE 5 PAGE 616 CATEGORY 38 85/00/00
308 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Quality control, reliability, and engineering design --- Book
AUTH: A/DHILLON, B. S. PAA: A/(Ottawa, University, Canada)
SAP: $49.50
CIO: CANADA
New York, Marcel Dekker, Inc. (Industrial Engineering. Volume 10), 1985, 308 p.
MAJS: /*OPTIMIZATION/*QUALITY CONTROL/*RELIABILITY ENGINEERING/*SYSTEMS ENGINEERING
MINS: / COST ANALYSIS/ DESIGN ANALYSIS/ ECONOMIC ANALYSIS/ FAILURE ANALYSIS/ HUMAN FACTORS ENGINEERING/ MATHEMATICAL MODELS/ PROBABILITY THEORY/ STATISTICAL ANALYSIS
ABA: C.D.
ABS: An introductory test on quality control, reliability, and engineering design is presented. The topics discussed include: basic mathematical concepts, economic considerations, introduction to quality control, management for quality control, quality costs and procurement quality control, statistical quality control, applied quality control, introduction to reliability, design for reliability, time-dependent reliability models, and reliability estimation. Also addressed are: introduction to engineering design, the design process, engineering design reviews, reliability and maintainability in systems design, human factors in engineering design, and design optimization methods.

85A43203# ISSUE 20 PAGE 3019 CATEGORY 81 85/00/00
4 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Sony keeps high quality and productivity in the United States
AUTH: A/WADA, S. PAA: A/(Sony Corporation of America, New York, NY)
CIO: UNITED STATES
IN: White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality: Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984 (A85-43176 20-81). New York, AIAA, 1985, p. 183-186.
MAJS: /*EMPLOYEE RELATIONS/*INDUSTRIAL MANAGEMENT/*PRODUCTION MANAGEMENT/*PRODUCTIVITY/*QUALITY CONTROL
MINS: / JAPAN

85A43194# ISSUE 20 PAGE 3018 CATEGORY 81 85/00/00
5 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Counteracting the stifling effects of a large organization
AUTH: A/WEISS, H.; B/HILL, R. L. PAA: B/(Digital Equipment Corp., Maynard, MA)
CIO: UNITED STATES
IN: White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality: Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984 (A85-43176 20-81). New York, AIAA, 1985, p. 121-125.
MAJS: /*INDUSTRIAL MANAGEMENT/*MANAGEMENT METHODS/*ORGANIZATIONS
MINS: / ELECTRONIC MAIL/ MARKETING/ PRODUCTIVITY/ PRODUCTS
ABA: T.K.
ABS: Techniques for improving productivity in a large organization are discussed using examples from a computer-manufacturing corporation. The measures examined and their applications are: thinking differently (redesign of a factory from conventional assembly line to assembly of the total product by a single worker), investing in people (installation of a company-wide electronic-mail network to lower costs and facilitate communication), and focusing on the organizational mission (restructuring the organization, with establishment of regional management centers and emphasis on strategic rather than short-term goals).

85A21298# ISSUE 8 PAGE 1114 CATEGORY 81 RPT#: ASME PAPER 84-MGT-8 84/02/00 5 PAGES UNCLASSIFIED DOCUMENT
UTTL: Managing projects for high performance
AUTH: A/SHEPARD, H.; B/GONZALEZ, J. PAA: A/(Portsmouth Consulting Group, Stamford, CT); B/(Bell Northern Research, Ltd., Ottawa, Canada)
CIO: UNITED STATES
American Society of Mechanical Engineers, Annual Energy

Sources Technology Conference and Exhibit, 7th, New Orleans, LA, Feb. 11-17, 1984. 5 p.
MAJS: /*INDUSTRIAL MANAGEMENT/*PERSONNEL MANAGEMENT/*PROJECT MANAGEMENT
MINS: / COOPERATION/ MANAGEMENT ANALYSIS/ MANAGEMENT METHODS/ TEAMS
ABA: M.S.K.
ABS: The effectiveness of organizations developed to handle particular projects was assessed through interviews with managers of twenty different efforts. The projects covered energy, aerospace and chemical endeavors. Team management solving problems in an ongoing manner was found preferable to vertical management structures. Communication among the managers is therefore a critical need, as are clearly defined goals, role clarity, teamwork values, flexibility in response to need and a team commitment to success. Rewards and recognition assure teamwork when combined with open dealings with shortfalls. A clear, consistent management philosophy must be articulated at the outset and must account for interim goals and a gradual introduction of the operational organization as the project progresses. Blurring the distinctions between contract and project personnel is recommended, as are celebrations of milestones. Finally, emphasis is laid on factors such as open communications, dealing with whatever problems arise as they are perceived, and maintaining a matrix consciousness of the entire system.

84A35922# ISSUE 16 PAGE 2376 CATEGORY 81 RPT#: MBB-UR-673-84-OE 84/02/00 21 PAGES In GERMAN UNCLASSIFIED DOCUMENT DCAF A070087
UTTL: Methods and operational means for project management
AUTH: A/PILZ, W.-D. PAA: A/(Messerschmitt-Boelkow-Blohm GmbH, Munich, West Germany)
CIO: GERMANY,FEDERAL REPUBLIC OF
Verein Deutscher Ingenieure and Gesellschaft Energietechnik, Jahrestagung, Universitaet Essen - Gesamthochschule, Essen, West Germany, Feb. 27, 28, 1984, Paper. 21 p. In German.
MAJS: /*MANAGEMENT PLANNING/*PROJECT MANAGEMENT
MINS: / CONTRACT MANAGEMENT/ COSTS/ ENGINEERING MANAGEMENT/ PROJECT PLANNING/ RISK/ SYSTEMS ENGINEERING
ABA: G.R.
ABS: The economical-political situation of today leads to problems which can only be solved with the aid of technical systems of growing complexity. Risks related to the implementation and the utilization of such systems are increasing, and it becomes often very difficult to recognize aspects and relations concerning the technical system and its operation. For these reasons, the concepts and operational procedures of systems engineering become increasingly vital for the execution of the tasks of project management in connection with the implementation of such systems. The present investigation provides a description of the various methods and operational approaches which are now available to project management. Attention is given to the importance of the correct definition of the objectives of a project, the structuralization of the project, approaches for dealing with risks, aspects of configurational control, quality assurance, the employment of technical standards, legal relations, scheduling, and cost control.

84A23990 ISSUE 9 PAGE 1324 CATEGORY 81 84/02/00 4 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Managing creative individuals in high-technology research projects
AUTH: A/ZACHARY, W. B.; B/KRONE, R. M. PAA: A/(San Jose State University, San Jose, CA); B/(Southern California, University, Los Angeles, CA)
CIO: UNITED STATES
IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-31, Feb. 1984, p. 37-40.
MAJS: /*HUMAN RESOURCES/*MANAGEMENT METHODS/*PERSONNEL MANAGEMENT/*PROJECT MANAGEMENT/*RESEARCH MANAGEMENT/*RESEARCH PROJECTS
MINS: / GOAL THEORY/ MANAGEMENT ANALYSIS/ MOTIVATION/ PERSONNEL DEVELOPMENT/ PERSONNEL SELECTION/ VALUE ENGINEERING

84A15600 ISSUE 4 PAGE 505 CATEGORY 81 83/11/00 7 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Managing engineers effectively
AUTH: A/THAMHAIN, H. J. PAA: A/(Worcester Polytechnic Institute, Worcester, MA)
CIO: UNITED STATES
IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-30, Nov. 1983, p. 231-237.
MAJS: /*ENGINEERING MANAGEMENT/*HUMAN PERFORMANCE/*PERSONNEL MANAGEMENT/*PRODUCTIVITY/*PROJECT MANAGEMENT
MINS: / COST EFFECTIVENESS/ MANAGEMENT PLANNING/ ORGANIZATIONS/ VALUE ENGINEERING
ABA: Author
ABS: The professional needs of engineering personnel are investigated. Their degree of satisfaction is positively associated with overall engineering performance. All of the 16 specific needs analyzed involve 3 primary issues: (1) people skills, (2) organizational structure, and (3) management style, influenced by the task to be performed and the surrounding environment. To be effective, engineering managers must understand the dynamics of their organizations so they can diagnose potential problems and the need for change. Specific suggestions are made to increase the engineering manager's effectiveness and to improve overall engineering productivity.

84A15327 ISSUE 4 PAGE 505 CATEGORY 81 83/00/00 8 PAGES In FRENCH UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Course on project management - The SPOT case

AUTH: A/COUILLARD, P. PAA: A/(Centre National d'Etudes Spatiales, Toulouse, France)
CIO: FRANCE
IN: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings (A84-15301 04-81). Toulouse, Cepadues-Editions, 1983, p. 865-872. In French.
MAJS: /*AEROSPACE INDUSTRY/*PROJECT MANAGEMENT/*SPOT (FRENCH SATELLITE)
MINS: / CONFIGURATION MANAGEMENT/ COSTS/ PRODUCT DEVELOPMENT/ PROJECT PLANNING/ QUALITY CONTROL
ABA: T.K.
ABS: The development of the French-Belgian-Swedish remote-sensing satellite SPOT is surveyed, with an emphasis on management techniques. The design requirements and early developmental history of the satellite are reviewed, noting the many innovative features which require extensive development efforts. The project evolved in four main phases: preliminary design and feasibility studies, definition, development, and realization. It is pointed out that the decision to proceed is ideally made after the first phase, but that realistic cost estimates are available only after the second; an early decision, which necessarily involves risk, is recommended. The organizational structure is described, with detailed discussion of the management of delays, costs, and configuration. Strict adherence to established management rules is found to be absolutely essential for undertakings of this scale.

84A15301 ISSUE 4 PAGE 503 CATEGORY 81 83/00/00
872 PAGES UNCLASSIFIED DOCUMENT COPYRIGHT
UTTL: Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings
SAP: $47.75
CIO: FRANCE
Course sponsored by the Centre National d'Etudes Spatiales. Toulouse, Cepadues-Editions, 1983, 872 p. In French and English.
MAJS: /*AEROSPACE INDUSTRY/*CONFERENCES/*MANAGEMENT METHODS/*PROJECT MANAGEMENT/*PROJECT PLANNING/*SPACE PROGRAMS
MINS: / CONFIGURATION MANAGEMENT/ CONTRACT MANAGEMENT/ DECISION MAKING/ DOCUMENTATION/ EUROPEAN SPACE PROGRAMS/ GROUND SUPPORT EQUIPMENT/ ORGANIZATIONS/ PRODUCT DEVELOPMENT/ PRODUCTION MANAGEMENT/ QUALITY CONTROL/ RELIABILITY ANALYSIS/ SPACECRAFT RELIABILITY
ABA: M.S.K.
ABS: Topics discussed in an 11-day course on space technology sponsored by CNES to characterize the management techniques involved in the development of large space projects are presented, with attention focused on the production of the Ariane launch vehicle. Consideration is devoted to management of the day-to-day progress of a project that involved ESA, CNES, and European industries. Note is taken of contract features which distributed authority for various management and manufacturing tasks, established production and delivery schedules, specified performances, and characterized interface components. Scheduling techniques included setting margins for delivery dates in order to ameliorate the effects of the delay of delivery of any one subsystem on the project as a whole. Examples are cited from the Ariane, SPOT, and Spacelab projects. For individual items see A84-15302 to A84-15327

91N71557*# CATEGORY 81 RPT#: NASA-TM-105017 NAS 1.15:105017 91/07/00 11 PAGES UNCLASSIFIED DOCUMENT
UTTL: SPECSINTACT administration guide
CORP: National Aeronautics and Space Administration, Washington, DC.
SAP: Avail: NTIS
CIO: UNITED STATES
MAJS: /*COMPUTER PROGRAMS/*FILE MAINTENANCE (COMPUTERS)/*LIBRARIES/*SPECIFICATIONS/*TEXTS
MINS: / ARCHITECTURE (COMPUTERS)/ COMPUTER SYSTEMS PERFORMANCE/ SOFTWARE ENGINEERING

91N70971 CATEGORY 15 RPT#: AEROSPACE-ATR-84(4460-03)-1ND CNT#: F04701-83-C-0084 84/07/00 64 PAGES UNCLASSIFIED DOCUMENT
UTTL: Space launch vehicle costs
AUTH: A/BLOND, E.; B/KNITTLE, W. A.
CORP: Aerospace Corp., El Segundo, CA. CSS: (Space Launch Vehicle Operations.)
SAP: Avail: NTIS
CIO: UNITED STATES
MAJS: /*COSTS/*LAUNCH VEHICLES/*NASA SPACE PROGRAMS/*SPACE TRANSPORTATION SYSTEM FLIGHTS/*SPACECRAFT LAUNCHING
MINS: / COST ANALYSIS/ SPACE COMMERCIALIZATION

91N70957 CATEGORY 99 91/00/00 20 PAGES UNCLASSIFIED DOCUMENT
UTTL: At the 30-year mark: The directors look back at Lab history
AUTH: A/LIBERATORE, DANIEL
CORP: Lawrence Livermore National Lab., CA.
SAP: Avail: NTIS
CIO: UNITED STATES
MAJS: /*HISTORIES/*LABORATORIES/*NUCLEAR RESEARCH/*NUCLEAR WEAPONS/*RESEARCH FACILITIES
MINS: / NUCLEAR EXPLOSIONS/ PERSONNEL/ RESEARCH MANAGEMENT/ UNDERGROUND EXPLOSIONS

91N70794 CATEGORY 81 77/00/00 36 PAGES UNCLASSIFIED DOCUMENT
UTTL: The Apollo tradition: An object lesson for the management

of large-scale technological endeavors
AUTH: A/SEAMANS, ROBERT C., JR.; B/ORDWAY, FREDERICK I. PAA: B/(Energy Research and Development Administration, Washington, DC.)
CORP: Massachusetts Inst. of Tech., Cambridge.
SAP: Avail: NTIS
CIO: UNITED STATES Repr. from Interdisciplinary Science Reviews, v. 2, no. 4, 1977
MAJS: /*APOLLO PROJECT/*MANAGEMENT PLANNING/*MISSION PLANNING/* PROJECT MANAGEMENT
MINS: / COMPONENT RELIABILITY/ FEDERAL BUDGETS/ PERSONNEL DEVELOPMENT/ POLITICS

74N70436* CATEGORY 99 RPT#: ER-12014 NSA-CR-136303 CNT#: NAS5-303 61/06/00 23 PAGES UNCLASSIFIED DOCUMENT
UTTL: Apollo. Program management TLSP: Finail Report
CORP: Martin Co., Baltimore, MD. AVAIL.NTIS
CIO: UNITED STATES
MAJS: /*APOLLO PROJECT/*MANAGEMENT PLANNING
MINS: / OPERATIONS RESEARCH/ PROJECT MANAGEMENT/ RESEARCH AND DEVELOPMENT

72N74281* CATEGORY 99 RPT#: NASA-CR-127739 REPT-6223-WP-26 CNT#: NGL-33-022-090 70/02/00 16 PAGES UNCLASSIFIED DOCUMENT
UTTL: The power spectrum in project management
AUTH: A/GEMMILL, G. R.; B/WILEMON, D. L.
CORP: Syracuse Univ., NY.
CIO: UNITED STATES Submitted for publication
MAJS: /*MANAGEMENT SYSTEMS/*PROJECT MANAGEMENT
MINS: / DECISION MAKING/ MANAGEMENT ANALYSIS/ MANAGEMENT METHODS

91N31023*# ISSUE 22 PAGE 3770 CATEGORY 85 RPT#: NASA-TM-104528 E-6404 DOE/NASA/33408-5 NAS 1.15:104528 CNT#: DE-AI04-85AL-33408 91/00/00 11 PAGES UNCLASSIFIED DOCUMENT
UTTL: Status of the advanced Stirling conversion system project for 25 kW dish Stirling applications TLSP: Final Report
AUTH: A/SHALTENS, RICHARD K.; B/SCHREIBER, JEFFREY G.
CORP: National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
SAP: Avail: NTIS HC/MF A03
CIO: UNITED STATES Presented at the 26th Intersociety Energy Conversion Engineering Conference, Boston, MA, 4-9 Aug. 1991; cosponsored by ANS, SAE, ACS, AIAA, ASME, IEEE, and AIChE
MAJS: /*CONTRACT MANAGEMENT/*ENGINE DESIGN/*ENGINE PARTS/* PARABOLIC REFLECTORS/*PISTON ENGINES/*RESEARCH PROJECTS/* SOLAR COLLECTORS/*STIRLING CYCLE/*STIRLING ENGINES
MINS: / AEROSPACE SYSTEMS/ COMPONENT RELIABILITY/ COST EFFECTIVENESS/ ENERGY CONVERSION/ HEAT TRANSFER/ LIQUID METALS/ SPACECRAFT POWER SUPPLIES/ SYSTEM EFFECTIVENESS/ TECHNOLOGY UTILIZATION
ABA: Author
ABS: Heat engines were evaluated for terrestrial Solar Distributed Heat Receivers. The Stirling engine was identified as one of the most promising heat engines for terrestrial applications. Technology development is also conducted for Stirling convertors directed toward a dynamic power source for space applications. Space power requirements include high reliability with very long life, low vibration, and high system efficiency. The free-piston Stirling engine has the potential for future high power space conversion systems, either nuclear or solar powered. Although both applications appear to be quite different, their requirements complement each other.

91N31019# ISSUE 22 PAGE 3770 CATEGORY 83 RPT#: AD-A238352 AFIT/GOR/ENS/91M-5 91/03/00 151 PAGES UNCLASSIFIED DOCUMENT
UTTL: An interactive life cycle cost forecasting tool TLSP: M.S. Thesis
AUTH: A/GIBSON, JOHN A., IV
CORP: Air Force Inst. of Tech., Wright-Patterson AFB, OH.
SAP: Avail: NTIS HC/MF A08
CIO: UNITED STATES
MAJS: /*FORECASTING/*LIFE CYCLE COSTS/*MATHEMATICAL MODELS/* SOFTWARE TOOLS
MINS: / DATA MANAGEMENT/ FLOW CHARTS/ LEARNING
ABA: GRA
ABS: Enhancements were applied to an existing tool designed to estimate life cycle costs. These enhancements provide greater ease of data manipulation, additional options in developing models, and the ability to make modifications to suit the needs of the user. Life cycle costs can be generated quickly and easily. Analysis proved the amount of work done by the computer could be reduced with no loss of information. Additionally, the paths available to the user are shown graphically through flow charts, aiding in the learning process. The efforts of the user can now be directed towards developing models instead of spending those efforts on deciphering how to make the tool work.

91N30977# ISSUE 22 PAGE 3763 CATEGORY 81 RPT#: AD-A229534 AFIT/GCM/LSP/90S-9 90/09/00 125 PAGES UNCLASSIFIED DOCUMENT
UTTL: A lexicon of contracting terms: Contract types TLSP: M.S. Thesis
AUTH: A/MATRO, DEAN R.
CORP: Air Force Inst. of Tech., Wright-Patterson AFB, OH. CSS: (School of Systems and Logistics.)
SAP: Avail: NTIS HC/MF A06
CIO: UNITED STATES
MAJS: /*ACQUISITION/*CONTRACT MANAGEMENT/*CONTRACTS/* DICTIONARIES/*NOMENCLATURES/*TERMS/*THESAURI
MINS: / ARMED FORCES (UNITED STATES)/ DECISION THEORY

ABA: GRA
ABS: This thesis continued the National Contracting Management Association (NCMA) sponsored research effort of creating a dictionary of acquisition and contracting terms. Research is currently being conducted at the Air Force Institute of Technology, Wright-Patterson AFB, Ohio, and the Naval Postgraduate School, Monterey, California. This effort focused on defining government contract types. Limited to the compensation arrangement and contract form type contracts, a literature review identified 26 contract types. Attributes for each contract type were tabulated, which led to synthesized definition. A written survey was distributed to a sample group of contracting professionals, requesting their feedback. Predetermined decision rules were applied in conjunction with the literature review and the survey to minimize the personal subjectivity of the research. Moderate consensus on the definitions was achieved after evaluating 42 surveys.

91N30973# ISSUE 22 PAGE 3762 CATEGORY 81 RPT#: AD-A229419 AFIT/GCM/LSP/90S-4 90/09/00 79 PAGES UNCLASSIFIED DOCUMENT
UTTL: The identification of contracting terms in support of the body of knowledge TLSP: M.S. Thesis
AUTH: A/HAUF, WILLIAM J.
CORP: Air Force Inst. of Tech., Wright-Patterson AFB, OH. CSS: (School of Systems and Logistics.)
SAP: Avail: NTIS HC/MF A05
CIO: UNITED STATES
MAJS: /*CONTRACT MANAGEMENT/*DICTIONARIES
MINS: / ARMED FORCES (UNITED STATES)/ EDUCATION/ TERMINOLOGY
ABA: GRA
ABS: This theses studied the advancement of professionalism within the contracting work force and established a baseline of contracting terms that, when defined, will form a dictionary of contracting terminology. This theses is a part of an effort at both the Air Force Institute of Technology and Naval Postgraduate School to identify and define those terms to be included in the initial publication of a dictionary by the National Contract Management Association. This study had two main objectives: first, to examine how further developing the contracting body of knowledge will enhance the professionalism of the contracting discipline and work force; and second, to compile a master listing of candidate terms to be defined by associated research leading to the eventual publication of a dictionary. A master listing of terms, built using the comments and recommendations of selected experts in the contracting and education fields is the main product of this research effort.

91N28127*# ISSUE 19 PAGE 3277 CATEGORY 31 89/00/00 5 PAGES UNCLASSIFIED DOCUMENT
UTTL: Suggested criteria for evaluating systems engineering methodologies
AUTH: A/GATES, AUDREY; B/PAUL, ARTHUR S.; C/GILL, TEPPER L.
CORP: Howard Univ., Washington, DC. CSS: (Dept. of Systems and Computer Science.)
SAP: Avail: NTIS HC/MF A23
In Alabama A & M Univ., NASA-HBCU Space Science and Engineering Research Forum Proceedings p 489-493(SEE N91-28063 19-99)
CIO: UNITED STATES
MAJS: /*COMPLEX SYSTEMS/*IDENTIFYING/*INDUSTRIES/*ORGANIZATIONS /*SYSTEMS ENGINEERING
MINS: / PROBLEM SOLVING/ PROCEDURES/ QUALITY CONTROL
ABA: Author
ABS: Systems engineering is the application of mathematical and scientific principles to practical ends in the life-cycle of a system. A methodology for systems engineering is a carefully developed, relatively complex procedure or process for applying these mathematical and scientific principles. There are many systems engineering methodologies (or possibly many versions of a few methodologies) currently in use in government and industry. These methodologies are usually designed to meet the needs of a particular organization. It has been observed, however, that many technical and non-technical problems arise when inadequate systems engineering methodologies are applied by organizations to their systems development projects. Various criteria for evaluating systems engineering methodologies are discussed. Such criteria are developed to assist methodology-users in identifying and selecting methodologies that best fit the needs of the organization.

91N28122*# ISSUE 19 PAGE 3276 CATEGORY 81 89/00/00 7 PAGES UNCLASSIFIED DOCUMENT
UTTL: Engineering management of large scale systems
AUTH: A/SANDERS, SERITA; B/GILL, TEPPER L.; C/PAUL, ARTHUR S.
CORP: Howard Univ., Washington, DC. CSS: (Dept. of Electrical Engineering.)
SAP: Avail: NTIS HC/MF A23
In Alabama A & M Univ., NASA-HBCU Space Science and Engineering Research Forum Proceedings p 443-449(SEE N91-28063 19-99)
CIO: UNITED STATES
MAJS: /*DECISION THEORY/*ENGINEERING MANAGEMENT/*PROBLEM SOLVING /*SYSTEMS ANALYSIS/*SYSTEMS ENGINEERING
MINS: / COST EFFECTIVENESS/ DECISION MAKING/ HUMAN BEHAVIOR/ PRODUCTIVITY
ABA: Author
ABS: The organization of high technology and engineering problem solving, has given rise to an emerging concept. Reasoning principles for integrating traditional engineering problem solving with system theory, management sciences, behavioral decision theory, and planning and design approaches can be incorporated into a

methodological approach to solving problems with a long range perspective. Long range planning has a great potential to improve productivity by using a systematic and organized approach. Thus, efficiency and cost effectiveness are the driving forces in promoting the organization of engineering problems. Aspects of systems engineering that provide an understanding of management of large scale systems are broadly covered here. Due to the focus and application of research, other significant factors (e.g., human behavior, decision making, etc.) are not emphasized but are considered.

91N27216*# ISSUE 19 PAGE 3116 CATEGORY 20 RPT#: NASA-CR-187154 NAS 1.26:187154 AIAA-91-3451 CNT#: NAS3-25266 91/07/00 14 PAGES UNCLASSIFIED DOCUMENT

UTTL: An historical perspective of the NERVA nuclear rocket engine technology program TLSP: Final Report
AUTH: A/ROBBINS, W. H.; B/FINGER, H. B. PAA: B/(Sverdrup Technology, Inc., Brook Park, OH.)
CORP: Analytical Engineering Corp., North Olmsted, OH.
SAP: Avail: NTIS HC/MF A03
CIO: UNITED STATES Prepared for presentation at the Conference on Advanced Space Exploration Initiative Technologies, Cleveland, OH, 4-6 Sep. 1991; sponsored in part by NASA, AIAA, and OAI
MAJS: /*ENGINE DESIGN/*HISTORIES/*NUCLEAR ENGINE FOR ROCKET VEHICLES/*NUCLEAR ROCKET ENGINES/*PROPULSION SYSTEM CONFIGURATIONS
MINS: / SPACE EXPLORATION/ SPACECRAFT POWER SUPPLIES/ SPACECRAFT PROPULSION
ABA: Author
ABS: Nuclear rocket research and development was initiated in the United States in 1955 and is still being pursued to a limited extent. The major technology emphasis occurred in the decade of the 1960s and was primarily associated with the Rover/NERVA Program where the technology for a nuclear rocket engine system for space application was developed and demonstrated. The NERVA (Nuclear Engine for Rocket Vehicle Application) technology developed twenty years ago provides a comprehensive and viable propulsion technology base that can be applied and will prove to be valuable for application to the NASA Space Exploration Initiative (SEI). This paper, which is historical in scope, provides an overview of the conduct of the NERVA Engine Program, its organization and management, development philosophy, the engine configuration, and significant accomplishments.

91N26866# ISSUE 18 PAGE 3054 CATEGORY 66 RPT#: AD-A234971 90/05/00 61 PAGES UNCLASSIFIED DOCUMENT

UTTL: Space doctrine
AUTH: A/CHILCOTT, GARY A.
CORP: Air War Coll., Maxwell AFB, AL.
SAP: Avail: NTIS HC/MF A04
CIO: UNITED STATES
MAJS: /*AIR DEFENSE/*ARMED FORCES (UNITED STATES)/*MILITARY OPERATIONS/*POLICIES/*SPACE WEAPONS/*STRATEGY/*WARFARE
MINS: / AEROSPACE ENVIRONMENTS/ COMMUNICATION SATELLITES/ MILITARY SPACECRAFT/ SPACE LAW/ U.S.S.R.
ABA: GRA
ABS: United States military space activities have been guided by policy and technological decisions since the 1950s because little work has been done to develop and articulate coherent space doctrine. In December 1988, the Chief of Staff of the Air Force and the Secretary of the Air Force signed a new Air Force space policy which stated that space power would assume as decisive a role in future combat operations as airpower does today. Since doctrine represents our fundamental beliefs based on our experience, it is essential that the military formulate space doctrine so it may evolve as experience is gained in space operations. This paper looks at several space doctrinal tenets and discusses their applicability. It also points to some of the obstacles that have precluded space doctrinal development. It concludes with ideas for the future in developing a space doctrine.

91N24215# ISSUE 16 PAGE 2564 CATEGORY 15 RPT#: PB91-135970 90/00/00 29 PAGES UNCLASSIFIED DOCUMENT

UTTL: Commercial aspects of the Long March launch system
AUTH: A/MARDON, AUSTIN ALBERT
CORP: Mardon (Austin Albert), Lethbridge (Alberta).
SAP: Avail: NTIS HC/MF A03
CIO: CANADA
MAJS: /*CHINA/*CHINESE SPACE PROGRAM/*CHINESE SPACECRAFT/* COMMERCE/*LAUNCH VEHICLES/*SPACE COMMERCIALIZATION
MINS: / AEROSPACE INDUSTRY/ INTERNATIONAL COOPERATION/ JAPAN
ABA: GRA
ABS: The Chinese have moved into the international commercial space business based on the launch capability of the Long March series of rockets. The report briefly describes the following: characteristics of the Long March system and examines the ways in which Long March launch services are marketed; implications surrounding proposed payloads containing U.S.-developed technology; reasons why the Chinese are maintaining a strong presence in the world commercial space market; areas in which the Chinese are interested in expanding their space commercialization business; and the prospects of Chinese-Japanese cooperation.

91N22939# ISSUE 14 PAGE 2340 CATEGORY 82 88/12/00 11 PAGES UNCLASSIFIED DOCUMENT

UTTL: NASA-Space Station Program
AUTH: A/RITZMAN, STEPHEN J.
CORP: Booz-Allen and Hamilton, Inc., Reston, VA.

SAP: Avail: NTIS HC/MF A09
In NIST, Proceedings of the Federal Information Processing Standards (FIPS) Workshop on Information Resource Dictionary System (IRDS) Applications p 142-152 (SEE N91-22936 14-82)
CIO: UNITED STATES
MAJS: /*DATA INTEGRATION/*DATA MANAGEMENT/*DICTIONARIES/* INFORMATION MANAGEMENT/*INFORMATION SYSTEMS/*MANAGEMENT INFORMATION SYSTEMS/*NASA SPACE PROGRAMS/*SPACE STATIONS
MINS: / DATA BASE MANAGEMENT SYSTEMS/ INFORMATION TRANSFER/ PROJECT MANAGEMENT/ SOFTWARE ENGINEERING
ABA: K.S.
ABS: This talk concerns the Technical and Management Information System (TMIS) project and issues related to other systems within the Space Station Program (SSP) as well as the impact of the Information Resource Dictionary System (IRDS) on them. Some of the topics discussed include: (1) information management; (2) program management; (3) software development; (4) the Space Station Information System; (5) the TMIS; (6) information transfer systems; (7) the three characteristics of the information resources that are going to exist in the different system domains; and (8) interoperability, data transportability, and commonality.

91N22238# ISSUE 14 PAGE 2215 CATEGORY 12 90/10/00
7 PAGES UNCLASSIFIED DOCUMENT DCAF E003091
COPYRIGHT
UTTL: MARS: A generic mission planning tool
AUTH: A/KELLNER, A.; B/SCHIELOW, N.; C/ZAPP, F.
CORP: Messerschmitt-Boelkow-Blohm G.m.b.H., Bremen (Germany, F.R.).; Erno Raumfahrttechnik G.m.b.H. Bremen (Germany, F.R.).
SAP: Avail: NTIS HC/MF A99
In ESA, Ground Data Systems for Spacecraft Control p 297-303 (SEE N91-22189 14-17)
CIO: GERMANY,FEDERAL REPUBLIC OF Prepared in cooperation with Erno Raumfahrttechnik G.m.b.H.
MAJS: /*COLUMBUS SPACE STATION/*DATA SYSTEMS/*GROUND BASED CONTROL/*HERMES MANNED SPACEPLANE/*MISSION PLANNING/* SCHEDULING
MINS: / ARTIFICIAL INTELLIGENCE/ COMMUNICATION NETWORKS/ OPERATIONS RESEARCH/ OPTIMIZATION/ PROJECT MANAGEMENT/ SOFTWARE TOOLS
ABA: ESA
ABS: A Mission Activities and Resources Scheduler (MARS) is described. It is a mission planning tool for both automatic and interactive generation of spacecraft timelines of realistic complexity, which has been extensively tested during Columbus, Hermes, and Eureca mission planning. It is in operational use for Eureca maneuver planning. It is being extended to full distributed mission planning capability for the Columbus mission planning scenario under the ESA contract New Expert Planning Tool for Users in a Networked Environment (NEPTUNE). The main features of the planning tools used for Columbus, Hermes, and Eureca mission planning are discussed.

91N22226# ISSUE 14 PAGE 2213 CATEGORY 12 90/10/00
7 PAGES UNCLASSIFIED DOCUMENT DCAF E003091
COPYRIGHT
UTTL: Mission planning systems for scientific and remote sensing satellites: A comparative analysis
AUTH: A/HADDOW, C. R.; B/ROESKA, K. O.; C/SOERENSEN, ERIK MOSE
PAA: C/(European Space Agency. European Space Operations Center, Darmstadt, Germany, F.R.)
CORP: Logica Ltd., London (England).
SAP: Avail: NTIS HC/MF A99
In ESA, Ground Data Systems for Spacecraft Control p 221-227 (SEE N91-22189 14-17)
CIO: UNITED KINGDOM
MAJS: /*COMPUTER PROGRAMS/*ERS-1 (ESA SATELLITE)/*EURECA (ESA)/* HIPPARCOS SATELLITE/*MISSION PLANNING/*PROJECT MANAGEMENT /*SPACECRAFT CONTROL
MINS: / AIRBORNE/SPACEBORNE COMPUTERS/ EUROPEAN SPACE PROGRAMS/ REMOTE SENSING/ SPACEBORNE ASTRONOMY
ABA: ESA
ABS: A general definition of the term mission planning is given followed by an overall description of the main parts of a typical mission planning system. A description is given of mission planning systems for the Hipparcos, ERS-1, and Eureca missions. Both commonalities and differences between the mission planning systems of these three missions are identified and discussed. Noting that traditionally mission planning systems were developed as mission specific items for ESA's scientific and remote sensing missions, an attempt is made to separate functions which could form part of a common kernel mission system for multimission support.

91N22223*# ISSUE 14 PAGE 2213 CATEGORY 17 90/10/00
6 PAGES UNCLASSIFIED DOCUMENT DCAF E003091
COPYRIGHT
UTTL: Ground data system resource allocation planning to support mission management
AUTH: A/DURHAM, RALPH; B/REILLY, NORMAN B.; C/SPRINGER, JOE B. ; D/TAYLOR, THOMAS M.
CORP: Jet Propulsion Lab., California Inst. of Tech., Pasadena.
SAP: Avail: NTIS HC/MF A99
In ESA, Ground Data Systems for Spacecraft Control p 201-206 (SEE N91-22189 14-17)
CIO: UNITED STATES Sponsored by NASA, Washington
MAJS: /*MANAGEMENT PLANNING/*MISSION PLANNING/*OPERATIONS RESEARCH/*PROJECT MANAGEMENT/*PROJECT PLANNING/*RESOURCE ALLOCATION/*SATELLITE TRACKING
MINS: / FORECASTING/ NASA SPACE PROGRAMS/ OPTIMIZATION
ABA: ESA
ABS: Mission planning and manangement optimization using unique

planning methodologies is described. The ground data system resource allocation process provides mission planners and managers with both short and long range visibility of resource loading. Launch dates, mission designs, and spacecraft sequencing can be planned to optimize science return despite limited resources. Periods of resource contention are identified for managers of flying missions in time for them to plan and implement alternatives rather than be forced to react hastily to unforeseen conflicts. Conflict resolution is by consensus, and a simple route of appeal is provided.

91N22222*# ISSUE 14 PAGE 2212 CATEGORY 17 CNT#: NAS5-31000 NAS5-27772 90/10/00 6 PAGES UNCLASSIFIED DOCUMENT DCAF E003091 COPYRIGHT
UTTL: The Explorer platform planning system: An application of a resource reasoning planning shell
AUTH: A/MCLEAN, DAVID R.; B/PAGE, BRENDA J.; C/POTTER, WILLIAM J. PAA: B/(Bendix Field Engineering Corp., Seabrook, MD.)
CORP: National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
SAP: Avail: NTIS HC/MF A99
In ESA, Ground Data Systems for Spacecraft Control p 195-200 (SEE N91-22189 14-17)
CIO: UNITED STATES
MAJS: /*APPLICATIONS PROGRAMS (COMPUTERS)/*EXPLORER SATELLITES/*LOGISTICS MANAGEMENT/*MANAGEMENT PLANNING/*MISSION PLANNING/*PROJECT MANAGEMENT/*PROJECT PLANNING/*SPACE PLATFORMS
MINS: / C (PROGRAMMING LANGUAGE)/ SCHEDULING/ SOFTWARE TOOLS
ABA: ESA
ABS: The Explorer Platform Planning System (EPPS) designed to provide tools which allow mission planners to schedule the platform activities and resource utilization of each mission is described. In order to support scheduling for different missions, EPPS tools are designed so that the mission specific reconfiguration process can be done with minimum effort and disruption. The planning and scheduling tools which support EPPS are described.

91N22168*# ISSUE 14 PAGE 2203 CATEGORY 18 90/04/00 20 PAGES UNCLASSIFIED DOCUMENT
UTTL: Advanced spacecraft: What will they look like and why
AUTH: A/PRICE, HUMPHREY W.
CORP: Jet Propulsion Lab., California Inst. of Tech., Pasadena.
SAP: Avail: NTIS HC/MF A25
In NASA. Lewis Research Center, Vision-21: Space Travel for the Next Millennium p 371-390 (SEE N91-22139 14-12)
CIO: UNITED STATES
MAJS: /*ELECTRIC PROPULSION/*MISSION PLANNING/*PLASMA PROPULSION /*SOLAR SAILS/*SPACE FLIGHT/*SPACECRAFT DESIGN
MINS: / DESIGN ANALYSIS/ ENERGY DISSIPATION/ HIGH TEMPERATURE PLASMAS/ MINIATURIZATION/ PROPULSION SYSTEM CONFIGURATIONS / RADIATION SOURCES
ABA: Author
ABS: The next century of spaceflight will witness an expansion in the physical scale of spacecraft, from the extreme of the microspacecraft to the very large megaspacecraft. This will respectively spawn advances in highly integrated and miniaturized components, and also advances in lightweight structures, space fabrication, and exotic control systems. Challenges are also presented by the advent of advanced propulsion systems, many of which require controlling and directing hot plasma, dissipating large amounts of waste heat, and handling very high radiation sources. Vehicle configuration studies for a number of theses types of advanced spacecraft were performed, and some of them are presented along with the rationale for their physical layouts.

91N22159*# ISSUE 14 PAGE 2202 CATEGORY 12 90/04/00 13 PAGES UNCLASSIFIED DOCUMENT
UTTL: The Centauri project: Manned interstellar travel
AUTH: A/CIESLA, THOMAS M.
CORP: Outer Space Environments, Houston, TX.
SAP: Avail: NTIS HC/MF A25
In NASA. Lewis Research Center, Vision-21: Space Travel for the Next Millennium p 286-298 (SEE N91-22139 14-12)
CIO: UNITED STATES
MAJS: /*CENTAURUS CONSTELLATION/*HUMAN FACTORS ENGINEERING/*INTERSTELLAR TRAVEL/*LIFE SUPPORT SYSTEMS/*MATTER-ANTIMATTER PROPULSION/*SPACECRAFT PROPULSION
MINS: / ASTEROIDS/ GOVERNMENTS/ GRAVITATIONAL EFFECTS/ LAW (JURISPRUDENCE)/ LIFE SCIENCES/ SPACE COLONIES
ABA: Author
ABS: The development of antimatter engines for spacecraft propulsion will allow man to expand to the nearest stellar neighbors such as the Alpha Centuri system. Compared to chemically powered rockets like the Apollo mission class which would take 50,000 years to reach the Centauri system, antimatter propulsion would reduce one way trip time to 30 years or less. The challenges encountered by manned interstellar travel are formidable. The spacecraft must be a combination of sublight speed transportation system and a traveling microplanet serving an expanding population. As the population expands from the initial 100 people to approximately 300, the terraformed asteroid, enclosed by a man-made shell will allow for expansion over its surface in the fashion of a small terrestrial town. All aspects of human life - birth; death; physical, emotional, and educational needs; and government and law must be met by the structure, systems, and institutions on-board.

91N21964# ISSUE 13 PAGE 2168 CATEGORY 82 RPT#: DE91-008072 SAND-90-2993 CNT#: DE-AC04-76DP-00789 91/01/00 76 PAGES UNCLASSIFIED DOCUMENT

UTTL: Administrative information systems plan, FY 1991 - FY 1995
AUTH: A/DETRY, R. J.; B/PITTS, L. H.
CORP: Sandia National Labs., Albuquerque, NM.
SAP: Avail: NTIS HC/MF A05
CIO: UNITED STATES
MAJS: /*COMPUTER NETWORKS/*COMPUTER PROGRAMMING/*INFORMATION SYSTEMS/*MANAGEMENT METHODS/*PROJECT MANAGEMENT
MINS: / ARCHITECTURE (COMPUTERS)/ COMPUTER PROGRAMS/ DATA BASE MANAGEMENT SYSTEMS/ PLANNING
ABA: DOE
ABS: In FY90 important milestones from past Administrative Information Systems (AIS) plans were realized. The first phase of the Payroll migration was implemented early in the year. This event signified the completion of a major migration milestone and the transition of the Laboratory Information Systems (LIS) machine to a production environment. The Access and Clearance System (A and CS) system and several early deliverables from other migration projects were also implemented during the year. FY91 promises to be another challenging year for those involved with administrative information systems. Aggressive schedules are in effect for the migration projects; the Financial Migration, Human Resources (HR) Migration, and Integrated Procurement System Replacement (IPS/R) efforts will deliver major system components this year. The administrative computing consolidation is underway and will be completed early in FY91. Consolidating computing hardware resources will provide adequate resources and better systems support for the entire AIS community.

91N21762# ISSUE 13 PAGE 2136 CATEGORY 61 RPT#: AD-A231282 WES/MP/ITL-90-6 90/12/00 21 PAGES UNCLASSIFIED DOCUMENT
UTTL: Software development standards for project cost management information system TLSP: Final Report
AUTH: A/WRIGHT, MARGARET B.
CORP: Army Engineer Waterways Experiment Station, Vicksburg, MS. CSS: (Information Technology Lab.)
SAP: Avail: NTIS HC/MF A03
CIO: UNITED STATES
MAJS: /*COMPUTER PROGRAMMING/*COMPUTER PROGRAMS/*CONFIGURATION MANAGEMENT/*COST ANALYSIS/*MANAGEMENT INFORMATION SYSTEMS /*PROJECT MANAGEMENT/*QUALITY CONTROL
MINS: / DATA BASES/ DEFENSE PROGRAM/ LIFE (DURABILITY)/ MILITARY OPERATIONS/ STANDARDS
ABA: GRA
ABS: The U.S. Army Engineer Waterways Experiment Station (WES) Corporate Data Base Project (CDB) is using software engineering methods and a structured approach for development of management information systems. These software engineering methods are implemented on the Project Cost Management Information System (PCMIS) as part of the WES CDB. The standards used are based not only on the structured approach but also on Department of Defense and Military standards. Modifications were made to typical life cycle standards so they apply to a fourth generation language (4GL) based information system being developed in a prototyping environment. Project standards encompass quality assurance, design analysis, development, documentation, testing, screen/report standards, and security. Configuration management (CM) standards are developed, but implementation has proven very difficult in a prototyping environment. CM implementation is planned after successful system testing. The use of standards provides consistency in reporting and is a valuable tool for the assurance of a quality product.

91N20981# ISSUE 12 PAGE 1995 CATEGORY 81 RPT#: AD-A230557 AFIT/GSM/ENC/90S-23 90/09/00 167 PAGES UNCLASSIFIED DOCUMENT
UTTL: An analysis of the advanced cruise missile system program office engineering change proposal process TLSP: M.S. Thesis
AUTH: A/ROBERTSON, JEFFERY S.
CORP: Air Force Inst. of Tech., Wright-Patterson AFB, OH. CSS: (School of Systems and Logistics.)
SAP: Avail: NTIS HC/MF A08
CIO: UNITED STATES
MAJS: /*CRUISE MISSILES/*MISSILE SYSTEMS/*PERSONNEL/*SYSTEMS ENGINEERING
MINS: / EDUCATION/ ERROR ANALYSIS/ MANAGEMENT
ABA: GRA
ABS: This study investigated the engineering change proposal (ECP) process in the Advanced Cruise Missile System Program Office (SPO). Specifically, efforts were geared toward verifying a problem with the timeliness of the process and identifying the specific problems leading to untimeliness. Also, a survey questionnaire was analyzed to assist in the development of conclusions about the problems with the ECP process. The major conclusion was that the personnel in the Advanced Cruise Missile SPO were not taking advantage of the opportunity to review a preliminary copy of the ECP, called a Technical Change Package (TCP). By doing so, the SPO could have produced better quality ECPs which the approval authorities perhaps could have approved as written. However, because of content and documentation errors, the ECPs had to be deferred or approved with comments. These ECPs that were approved with comments required additional process steps which added significantly to the amount of time required for eventual approval. The recommendation was made for the SPO to educate the personnel about the importance of an adequate TCP review, encourage improvement through the adoption of an awards program, and take steps to educate those personnel in the SPO who need training.

91N20684*# ISSUE 12 PAGE 1942 CATEGORY 38 CNT#: NAS9-18057 91/01/00 8 PAGES UNCLASSIFIED DOCUMENT

UTTL: A failure management prototype: DR/Rx
AUTH: A/HAMMEN, DAVID G.; B/BAKER, CAROLYN G.; C/KELLY, CHRISTINE M.; D/MARSH, CHRISTOPHER A.
CORP: Mitre Corp., Houston, TX.
SAP: Avail: NTIS HC/MF A21
In NASA, Lyndon B. Johnson Space Center, Fourth Annual Workshop on Space Operations Applications and Research (SOAR 90) p 347-354 (SEE N91-20641 12-59)
CIO: UNITED STATES
MAJS: /*ARCHITECTURE (COMPUTERS)/*DISTRIBUTED PARAMETER SYSTEMS /*EXPERT SYSTEMS/*FAILURE ANALYSIS/*FAULT TOLERANCE/* MANAGEMENT SYSTEMS/*SPACE STATIONS/*SYSTEM FAILURES
MINS: / KNOWLEDGE REPRESENTATION/ PROTOTYPES
ABA: Author
ABS: This failure management prototype performs failure diagnosis and recovery management of hierarchical, distributed systems. The prototype, which evolved from a series of previous prototypes following a spiral model for development, focuses on two functions: (1) the diagnostic reasoner (DR) performs integrated failure diagnosis in distributed systems; and (2) the recovery expert (Rx) develops plans to recover from the failure. Issues related to expert system prototype design and the previous history of this prototype are discussed. The architecture of the current prototype is described in terms of the knowledge representation and functionality of its components.

91N20074*# ISSUE 12 PAGE 1833 CATEGORY 5 91/01/00
40 PAGES UNCLASSIFIED DOCUMENT
UTTL: X-15: The perspective of history
AUTH: A/HALLION, RICHARD P.
CORP: National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Facility, Edwards, CA.
SAP: Avail: NTIS HC/MF A08
In its Proceedings of the X-15 First Flight 30th Anniversary Celebration p 54-93 (SEE N91-20071 12-05)
CIO: UNITED STATES
MAJS: /*APOLLO PROJECT/*APOLLO SPACECRAFT/*APOLLO 11 FLIGHT/* HISTORIES/*PROJECT MANAGEMENT/*RESEARCH AND DEVELOPMENT/* X-15 AIRCRAFT
MINS: / AIRCRAFT DESIGN/ FLIGHT TESTS/ HYPERSONIC FLIGHT/ NASA PROGRAMS/ SPACE FLIGHT/ SPACECRAFT DESIGN
ABA: K.S.
ABS: The linkages between the Apollo 11 voyage to Tranquility Base and the 199 flights of the X-15 aircraft are discussed. Accomplishments of the X-15 program and a history of aircraft developments that led up to the X-15 are presented.

91N19119# ISSUE 11 PAGE 1655 CATEGORY 16 RPT#: GAO/IMTEC-91-20 91/02/00 29 PAGES UNCLASSIFIED DOCUMENT
UTTL: Space Shuttle: NASA should implement independent oversight of software development
CORP: General Accounting Office, Washington, DC.
SAP: Avail: NTIS HC/MF A03
CIO: UNITED STATES
MAJS: /*AIRBORNE/SPACEBORNE COMPUTERS/*COMPUTER PROGRAMS/* COMPUTER SYSTEMS PROGRAMS/*CONGRESSIONAL REPORTS/*FLIGHT MANAGEMENT SYSTEMS/*PROGRAM VERIFICATION (COMPUTERS)/* QUALITY CONTROL/*SAFETY MANAGEMENT
MINS: / MANAGEMENT INFORMATION SYSTEMS/ PROVING/ RESEARCH AND DEVELOPMENT/ SPACE SHUTTLES/ SYSTEMS MANAGEMENT
ABA: J.P.S.
ABS: In response to a request from the House Committee on Science, Space, and Technology, the General Accounting Office (GAO) presents information on NASA's efforts to improve shuttle software oversight activities and to establish independent oversight of critical shuttle software processes. GAO identifies NASA's procedures for developing, validating, verifying, and reconfiguring shuttle software. GAO also notes recommendations made by the independent contractor hired by NASA to verify and validate shuttle software; problems hindering NASA's progress in implementing the recommendations; actions taken by NASA to specifically resolve concerns raised by the National Research Council (NRC) and the shuttle program's software steering group formed to recommend changes in the verification and validation processes; and GAO's recommendations. Included as an appendix are NASA's comments on GAO's findings.

91N17058*# ISSUE 9 PAGE 1284 CATEGORY 16 90/08/00
9 PAGES UNCLASSIFIED DOCUMENT
UTTL: Systems Engineering and Integration (SE and I)
CORP: National Aeronautics and Space Administration, Washington, DC.
SAP: Avail: NTIS HC/MF A99
In its Space Transportation Avionics Technology Symposium. Volume 2: Conference Proceedings p 791-800 (SEE N91-17020 09-06)
CIO: UNITED STATES
MAJS: /*AEROSPACE INDUSTRY/*COSTS/*NASA PROGRAMS/*POLICIES/* PROJECT MANAGEMENT/*RISK/*STANDARDS/*SYSTEMS ENGINEERING/* SYSTEMS INTEGRATION
MINS: / FAULT TOLERANCE/ GOALS/ LABORATORIES/ PERFORMANCE TESTS/ PROCEDURES/ REDUNDANCY
ABA: Author
ABS: Systems engineering and integration topics are presented in viewgraph form. Requirements, risk, redundancy, standards, costs, tests beds, and operations are covered.

91N17051*# ISSUE 9 PAGE 1282 CATEGORY 81 90/08/00
7 PAGES UNCLASSIFIED DOCUMENT
UTTL: Risk analysis and management
AUTH: A/SMITH, H. E.
CORP: Lockheed Missiles and Space Co., Sunnyvale, CA.
SAP: Avail: NTIS HC/MF A99

In NASA, Washington, Space Transportation Avionics Technology Symposium. Volume 2: Conference Proceedigs p 687-694 (SEE N91-17020 09-06)
CIO: UNITED STATES
MAJS: /*ACCIDENTS/*AEROSPACE SYSTEMS/*ARTIFICIAL INTELLIGENCE/* COMPUTER PROGRAMS/*DESIGN ANALYSIS/*FAILURE ANALYSIS/* KNOWLEDGE BASES (ARTIFICIAL INTELLIGENCE)/*MANAGEMENT METHODS/*RISK/*SOFTWARE TOOLS/*SPACE SHUTTLES/*SYSTEMS ANALYSIS/*SYSTEMS ENGINEERING
MINS: / COMPUTER GRAPHICS/ PROTOTYPES/ SPACECRAFT CONFIGURATIONS
ABA: Author
ABS: Present software development accomplishments are indicative of the emerging interest in and increasing efforts to provide risk assessment backbone tools in the manned spacecraft engineering community. There are indications that similar efforts are underway in the chemical processes industry and are probably being planned for other high risk ground base environments. It appears that complex flight systems intended for extended manned planetary exploration will drive this technology.

91N17036*# ISSUE 9 PAGE 1280 CATEGORY 66 90/08/00
11 PAGES UNCLASSIFIED DOCUMENT
UTTL: Operations management system
AUTH: A/BRANDLI, A. E.; B/ECKELKAMP, R. E.; C/KELLY, C. M.; D/MCCANDLESS, W.; E/RUE, D. L. PAA: E/(TRW Electronics and Defense Sector, Redondo Beach, CA.)
CORP: National Aeronautics and Space Administration, Washington, DC.
SAP: Avail: NTIS HC/MF A99
In its Space Transportation Avionics Technology Symposium. Volume 2: Conference Proceedings p 451-462 (SEE N91-17020 09-06)
CIO: UNITED STATES
MAJS: /*AVIONICS/*COMMAND AND CONTROL/*COMPUTER PROGRAMMING/* COMPUTER SYSTEMS PERFORMANCE/*EXPERT SYSTEMS/*FLIGHT MANAGEMENT SYSTEMS/*FLIGHT OPERATIONS
MINS: / AEROSPACE VEHICLES/ CHECKOUT/ DECISION MAKING/ MAN MACHINE SYSTEMS/ SYSTEMS ENGINEERING/ SYSTEMS INTEGRATION/ WORKLOADS (PSYCHOPHYSIOLOGY)
ABA: Author
ABS: The objective of an operations management system is to provide an orderly and efficient method to operate and maintain aerospace vehicles. Concepts are described for an operations management system and the key technologies are highlighted which will be required if this capability is brought to fruition. Without this automation and decision aiding capability, the growing complexity of avionics will result in an unmanageable workload for the operator, ultimately threatening mission success or survivability of the aircraft or space system. The key technologies include expert system application to operational tasks such as replanning, equipment diagnostics and checkout, global system management, and advanced man machine interfaces. The economical development of operations management systems, which are largely software, will require advancements in other technological areas such as software engineering and computer hardware.

90N15855# ISSUE 7 PAGE 1011 CATEGORY 84 RPT#:
AD-A214408 89/07/00 98 PAGES UNCLASSIFIED DOCUMENT
UTTL: Congressional involvement and relations: A guide for Department of Defense acquisition managers
AUTH: A/JONES, WILBUR D., JR.
CORP: Defense Systems Management School, Fort Belvoir, VA.
SAP: Avail: NTIS HC A05/MF A01
CIO: UNITED STATES
MAJS: /*CONTRACT MANAGEMENT/*DEFENSE PROGRAM/*GOVERNMENT PROCUREMENT/*GOVERNMENTS/*LAW (JURISPRUDENCE)
MINS: / ARMED FORCES (UNITED STATES)/ WEAPON SYSTEMS
ABA: GRA
ABS: This guide is written to assist program managers achieving the necessary understanding of congressional involvement and relations with DOD. It describes how the congress is organized and structured to carry out its two major responsibilities in dealing with DOD: the legislative process and the oversight function. This guide covers congressional involvement in the DOD weapon system acquisitions process.

90N13277*# ISSUE 4 PAGE 562 CATEGORY 81 RPT#:
NASA-SP-6101(02) NAS 1.21:6101(02) 89/00/00 57 PAGES
UNCLASSIFIED DOCUMENT
UTTL: Issues in NASA program and project management
AUTH: A/HOBAN, FRANCIS T. PAT: A/ed.
CORP: National Aeronautics and Space Administration, Washington, DC.
SAP: Avail: NTIS HC A04/MF A01; SOD HC $15.00 as 033-000-010-64-8
CIO: UNITED STATES
MAJS: /*AEROSPACE INDUSTRY/*MANAGEMENT METHODS/*NASA PROGRAMS/* PROJECT MANAGEMENT
MINS: / BUDGETING/ HISTORIES/ SPACE SHUTTLES/ SYSTEMS MANAGEMENT
ABA: Author
ABS: This new collection of papers on aerospace management issues contains a history of NASA program and project management, some lessons learned in the areas of management and budget from the Space Shuttle Program, an analysis of tools needed to keep large multilayer programs organized and on track, and an update of resources for NASA managers. A wide variety of opinions and techniques are presented.

89N15775# ISSUE 7 PAGE 1003 CATEGORY 82 RPT#:
PB88-223268 DOD-4245.1-H 87/09/00 45 PAGES
UNCLASSIFIED DOCUMENT
UTTL: Acquisition alerts for program managers

CORP: Department of Defense, Washington, DC. CSS: (Office of the Inspector General.)
SAP: Avail: NTIS HC A03/MF A01
CIO: UNITED STATES
MAJS: /*DEFENSE PROGRAM/*ETHICS/*GOVERNMENT PROCUREMENT
MINS: / LAW (JURISPRUDENCE)/ MANAGEMENT/ REGULATIONS/ STANDARDS
ABA: Author
ABS: The primary objective of the publication is to assist in preventing problems during the acquisition process by alerting the acquisition manager to problem areas (past and present) where the acquisition manager must take certain actions and/or ensure the acquisition manager seeks expert advice. The booklet serves as a quick and easy reference guide, although it does not answer all questions. The publication contains five sections: contracting procedures, personal conduct and actions, historical problems in acquisition, a glossary, and topical references.

88N28819 ISSUE 22 PAGE 3161 CATEGORY 81 88/03/00
20 PAGES In FRENCH UNCLASSIFIED DOCUMENT DCAF
E002583 COPYRIGHT
UTTL: Value analysis
AUTH: A/CHALLIER, M. LOUIS
CORP: Methodologos, Bischheim (France).
SAP: Avail: CEPADUES-Editions, 111 Rue Nicolas-Vauquelin, 31100 Toulouse, France
In CNES, Management of Large Space Projects p 397-416 (SEE N88-28803 22-81)
CIO: FRANCE
MAJS: /*FINANCIAL MANAGEMENT/*PROJECT MANAGEMENT/*VALUE ENGINEERING
MINS: / COST ANALYSIS/ COST EFFECTIVENESS/ COST REDUCTION
ABA: ESA
ABS: The causes of high costs and bad functioning of organizations are reviewed. Value analysis methods and bases are outlined. The introduction of value analysis into a company is considered.

88N20202*# ISSUE 12 PAGE 1705 CATEGORY 81 RPT#:
NASA-CR-182461 NAS 1.26:182461 PB88-190624 CNT#:
NASW-4003 88/01/00 150 PAGES UNCLASSIFIED DOCUMENT
UTTL: Post-Challenger evaluation of space shuttle risk assessment and management
CORP: National Academy of Engineering, Washington, DC. CSS: (Committee on Shuttle Criticality Review and Hazard Analysis Audit.)
SAP: Avail: NTIS HC A07/MF A01
CIO: UNITED STATES
MAJS: /*ACCIDENTS/*HAZARDS/*PROJECT MANAGEMENT/*RISK/*SAFETY FACTORS/*SPACE TRANSPORTATION SYSTEM
MINS: / CHALLENGER (ORBITER)/ FAILURE MODES/ POLICIES/ QUALITY CONTROL
ABA: B.G.
ABS: As the shock of the Space Shuttle Challenger accident began to subside, NASA initiated a wide range of actions designed to ensure greater safety in various aspects of the Shuttle system and an improved focus on safety throughout the National Space Transportation System (NSTS) Program. Certain specific features of the NASA safety process are examined: the Critical Items List (CIL) and the NASA review of the Shuttle primary and backup units whose failure might result in the loss of life, the Shuttle vehicle, or the mission; the failure modes and effects analyses (FMEA); and the hazard analysis and their review. The conception of modern risk management, including the essential element of objective risk assessment is described and it is contrasted with NASA's safety process in general terms. The discussion, findings, and recommendations regarding particular aspects of the NASA STS safety assurance process are reported. The 11 subsections each deal with a different aspect of the process. The main lessons learned by SCRHAAC in the course of the audit are summarized.

87N20833* ISSUE 13 PAGE 1821 CATEGORY 81 RPT#:
NASA-SP-7500(21) NAS 1.21:7500(21) 87/04/00 70 PAGES
UNCLASSIFIED DOCUMENT
UTTL: Management: A bibliography for NASA managers (supplement 21)
CORP: National Aeronautics and Space Administration, Washington, DC.
SAP: Avail: NTIS HC A04
CIO: UNITED STATES
MAJS: /*BIBLIOGRAPHIES/*MANAGEMENT/*MANAGEMENT METHODS/*MANAGEMENT PLANNING/*NASA PROGRAMS
MINS: / COST ANALYSIS/ EXPERT SYSTEMS/ HUMAN FACTORS ENGINEERING / INFORMATION MANAGEMENT/ MANUFACTURING/ PERSONNEL MANAGEMENT/ QUALITY CONTROL/ RELIABILITY/ ROBOTICS
ABA: Author
ABS: This bibliography lists 664 reports, articles and other documents introduced into the NASA scientific and technical information system in 1986. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnel issues; management theory and techniques; industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy.

86N15170*# ISSUE 5 PAGE 867 CATEGORY 81 85/00/00
7 PAGES UNCLASSIFIED DOCUMENT
UTTL: A case study in R and D productivity: Helping the program manager cope with job stress and improve communication

effectiveness
AUTH: A/BODENSTEINER, W. D.; B/GERLOFF, E. A.
CORP: Texas Univ., Arlington. AVAIL.NTIS
SAP: HC A25/MF A04
In NASA. Johnson (Lyndon B.) Space Center R and D Productivity: New Challenges for the US Space Program p 142-148 (SEE N86-15157 05-81)
CIO: UNITED STATES
MAJS: /*HUMAN RESOURCES/*PERSONNEL MANAGEMENT/*PRODUCTIVITY/* PROJECT MANAGEMENT/*RESEARCH AND DEVELOPMENT/*STRESS (PSYCHOLOGY)
MINS: / CASE HISTORIES/ EFFECTIVENESS
ABA: Author
ABS: Certain structural changes in the Naval Material Command which resulted from a comparison of its operations to those of selected large-scale private sector companies are described. Central to the change was a reduction in the number of formal reports from systems commands to headquarters, and the provision of Program Management Assistance Teams (at the request of the program manager) to help resolve project problems. It is believed that these changes improved communication and information-processing, reduced program manager stress, and resulted in improved productivity.

86N15164*# ISSUE 5 PAGE 866 CATEGORY 81 85/00/00
10 PAGES UNCLASSIFIED DOCUMENT
UTTL: Mentoring as a communication channel: Implications for innovation and productivity
AUTH: A/AVANT, L.; B/BOOZER, R. W. PAA: B/(Memphis State Univ.)
CORP: Federal Express Corp., Memphis, TN. AVAIL.NTIS
SAP: HC A25/MF A04
In NASA. Johnson (Lyndon B.) Space Center R and D Productivity: New Challenges for the US Space Program p 63-72 (SEE N86-15157 05-81)
CIO: UNITED STATES
MAJS: /*AEROSPACE SYSTEMS/*HUMAN RESOURCES/*MANAGEMENT/* PERSONNEL DEVELOPMENT/*PERSONNEL MANAGEMENT/*PRODUCTIVITY
MINS: / CREATIVITY/ LEADERSHIP/ MORALE
ABA: Author
ABS: The impact of a formalized mentoring program as a communication channel for enhancing information distribution, innovation, and productivity is investigated. Formal and informal approaches to mentoring are discussed. Interviews with 11 members of formal mentor-protege teams indicate communications in the mentoring relationship can affect individual and organizational innovation and productivity.

86N15163*# ISSUE 5 PAGE 866 CATEGORY 81 85/00/00
12 PAGES UNCLASSIFIED DOCUMENT
UTTL: Management behavior, group climate and performance appraisal at NASA
AUTH: A/MANDERLINK, G.; B/CLARK, L. P.; C/BERNSTEIN, W. M.; D/BURKE, W. W.
CORP: Columbia Univ., New York, NY. CSS: (Teachers Coll.) AVAIL.NTIS
SAP: HC A25/MF A04
In NASA. Johnson (Lyndon B.) Space Center R and D Productivity: New Challenges for the US Space Program p 51-62 (SEE N86-15157 05-81)
CIO: UNITED STATES
MAJS: /*EFFECTIVENESS/*GROUP DYNAMICS/*HUMAN BEHAVIOR/*HUMAN RESOURCES/*PRODUCTION MANAGEMENT
MINS: / PERSONNEL DEVELOPMENT/ TRAINING ANALYSIS
ABA: Author
ABS: The relationships among manager behavior, group climate and managerial effectiveness are examined. Survey data were collected from 435 GM14-15 managers and their subordinates at NASA concerning management practices and perceptions of the group environment. Performance ratings of managers were obtained from their superiors. The results strongly supported a causal model in which subordinates' climate perceptions mediate the effects of manager behavior on performance. That is, the development of group climate provides the process through which the effects of manager practices may be understood. Analyses also revealed that the function performed by a manager and his group (e.g., research) influenced the specific nature of the causal dynamics. Some implications of the results for management training and development are discussed.

85N26439* ISSUE 15 PAGE 2664 CATEGORY 81 RPT#: NASA-SP-7500(19) NAS 1.21:7500(19) 85/03/00 183 PAGES UNCLASSIFIED DOCUMENT
UTTL: Management: A bibliography for NASA managers
CORP: National Aeronautics and Space Administration, Washington, DC. AVAIL.NTIS
SAP: HC A09
CIO: UNITED STATES
MAJS: /*BIBLIOGRAPHIES/*DECISION MAKING/*MANAGEMENT/*MANAGEMENT METHODS/*NASA PROGRAMS
MINS: / ARTIFICIAL INTELLIGENCE/ COMPUTERS/ ECONOMIC FACTORS/ EMPLOYEE RELATIONS/ INFORMATION SYSTEMS/ LEADERSHIP/ MANAGEMENT ANALYSIS/ MANAGEMENT PLANNING/ POLICIES/ QUALITY CONTROL/ REGULATIONS
ABA: A.R.H.
ABS: This bibliography lists 706 reports, articles, and other documents introduced into the NASA scientific and technical information system in 1984. Entries, which include abstracts, are arranged in the following categories: human factors and personnel issues; management theory and techniques; industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy. Subject, personal author,

corporate source, contract number, report number, and accession number indexes are included.

85N16665*# ISSUE 7 PAGE 1050 CATEGORY 81 RPT#: NASA-SP-481 NAS 1.21:481 84/00/00 311 PAGES UNCLASSIFIED DOCUMENT
UTTL: The management of research institutions: A look at government laboratories
AUTH: A/MARK, H.; B/LEVINE, A.
CORP: National Aeronautics and Space Administration, Washington, DC. AVAIL.NTIS
SAP: MF A02; SOD HC $9.00 as SN-033-000-00937-2
CIO: UNITED STATES
MAJS: /*MANAGEMENT PLANNING/*PROJECT MANAGEMENT/*RESEARCH AND DEVELOPMENT/*RESEARCH FACILITIES
MINS: / LEGAL LIABILITY/ ORGANIZATIONS/ PERSONNEL MANAGEMENT/ PRODUCTIVITY/ SCIENTISTS
ABA: B.G.
ABS: Technology development; project management; employment patterns; research productivity; legal status of support services; functions of senior executives; the role of the sponsoring agency; research diversification; obstacles to technical innovation; organizational structures; and personnel management are addressed.

84N19068# ISSUE 9 PAGE 1388 CATEGORY 74 RPT#: AD-A136600 ARCSL-CR-83027 CNT#: DAAK11-80-Q-0106 83/06/00 44 PAGES UNCLASSIFIED DOCUMENT
UTTL: Information content and sensitivity of matrix elements to structural changes in complex scattering system TLSP: Progress Report, Sep. 1980 - Sep. 1982
AUTH: A/BICKEL, W. S.
CORP: Arizona Univ., Tucson. CSS: (Dept. of Physics.) AVAIL.NTIS
SAP: HC A03/MF A01
CIO: UNITED STATESAberdeen Proving Ground, Md. Army Armament Research and Development Command
MAJS: /*LIGHT SCATTERING/*MATHEMATICAL MODELS/*MATRICES (MATHEMATICS)
MINS: / BACKSCATTERING/ CONSTANTS/ FIBERS/ FOURIER TRANSFORMATION/ NEPHELOMETERS/ PARTICLE SIZE DISTRIBUTION/ POLARIZED LIGHT/ REFRACTIVITY/ SPHERES
ABA: Author (GRA)
ABS: Physics Department researchers at the University of Arizona investigated a number of basic problems that are central to understanding light scattered from complex systems. They started with simple geometrical systems--spherical and cylindrical geometries with known optical constants that are directly amenable to theory. Theorists can calculate exactly every scattering property (the matrix elements) of these systems and experimentalists can measure them with arbitrarily high accuracy and precision. Yet some of the most basic questions about: (1) the information content in the various matrix elements, (2) their response to large and small changes in particle property, (3) their specificity to a particular parameter change, (4) the information density per scattering angle interval, and (5) ways to quantify changes, still needed careful study. The research was an optical study of fundamentals systems theoretically solvable and experimentally obtainable. The things learned from this study and described in this report will give insight to the matrix element data obtained from complex scattering systems.

77N11084*# ISSUE 2 PAGE 154 CATEGORY 15 RPT#: NASA-CR-151102 MDC-G6508-PT-1-VOL-1 CNT#: NAS9-14958 76/09/01 41 PAGES UNCLASSIFIED DOCUMENT
UTTL: Space station systems analysis study. Part 1, volume 1: Executive study
CORP: McDonnell-Douglas Astronautics Co., Huntington Beach, CA. AVAIL.NTIS
SAP: HC A03/MF A01
CIO: UNITED STATES
MAJS: /*COSMOLOGY/*DATA ACQUISITION/*SATELLITE POWER TRANSMISSION/*SPACE STATIONS
MINS: / AEROSPACE ENGINEERING/ NUCLEAR ELECTRIC POWER GENERATION / ORBITAL WORKSHOPS/ SPACE COMMERCIALIZATION/ SPACECRAFT COMMUNICATION
ABA: S.M.
ABS: Potential space station system options were examined for a permanent, manned, orbital space facility and to provide data to NASA program planners and decision makers for their use in future program planning. There were ten space station system objectives identified. These were categorized into five major objectives and five supporting objectives. The major objectives were to support the development of: (1) satellite power systems, (2) nuclear energy plants in space, (3) space processing, (4) earth services, and (5) space cosmological research and development. The five supporting objectives, to define space facilities which would be basic building blocks for future systems, were: (1) a multidiscipline science laboratory, (2) an orbital depot to maintain, fuel, and service orbital transfer vehicles, (3) cluster support systems to provide power and data processing for multiple orbital elements, (4) a sensor development facility, and (5) the facilities necessary to enhance man's living and working in space.

76N11195*# ISSUE 2 PAGE 157 CATEGORY 13 RPT#: NASA-CR-144062 MDC-G5919-BK-1 CNT#: NAS8-31014 75/09/30 41 PAGES UNCLASSIFIED DOCUMENT
UTTL: Manned orbital systems concepts study. Book 1: Executive summary
CORP: McDonnell-Douglas Astronautics Co., Huntington Beach, CA. AVAIL.NTIS
SAP: HC $4.00

NASA/RECON

CIO: UNITED STATES
MAJS: /*COST EFFECTIVENESS/*MANNED SPACE FLIGHT/*MISSION PLANNING/*ORBITAL WORKSHOPS
MINS: / EARTH ORBITS/ SYSTEMS ANALYSIS
ABA: Author
ABS: Requirements for and definitions of a cost effective orbital facility concept, capable of supporting extended manned operations in earth orbit beyond those visualized for the 7 to 30 day shuttle/spacelab system, were studied. Data are given on requirements derivation, concepts identification, systems analysis and definition, and programmatics.

A

ACCIDENT PREVENTION
Normal accidents and logistics in space operations A91-27723
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Post-Challenger evaluation of space shuttle risk assessment and management
NASA-CR-182461 N88-20202
Risk analysis and management N91-17051
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AD-A229534 N91-30977
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A concurrent engineering approach to reliable, low cost propulsion system design
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Management of large space projects; Course on Space Technology, Toulouse, France, May 3-14, 1982, Proceedings A84-15301
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Qualitative requirements of a modern fighter aircraft A88-27634
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A review of the Apollo Lunar Module program and its lessons for future space missions
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A review of the Apollo Lunar Module program and its lessons for future space missions
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X-15: The perspective of history N91-20074
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X-15: The perspective of history N91-20074
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Wings for European spaceflight - The future of space transportation A91-43339
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ATLAS LAUNCH VEHICLES
A case for the development of a new National Launch System now
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NASA-SP-7500(21) N87-20833

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Commercial aspects of the Long March launch system
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Commercial aspects of the Long March launch system
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Suggested criteria for evaluating systems engineering methodologies
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Software development standards for project cost management information system
AD-A231282 N91-21762
Administrative information systems plan, FY 1991 - FY 1995
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Software development standards for project cost management information system
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Mission planning systems for scientific and remote sensing satellites: A comparative analysis
N91-22226
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NASA-TM-105017 N91-71557
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DOE/NASA/33408-5 ..... N91-31023*#

E-6404 ..... N91-31023*#

ER-12014 ..... N74-70436*

GAO/IMTEC-91-20 ..... N91-19119 #

MBB-UR-673-84-OE ..... A84-35922 #

MDC-G5919-BK-1 ..... N76-11195*#
MDC-G6508-PT-1-VOL-1 ..... N77-11084*#

NAS 1.15:104528 ..... N91-31023*#
NAS 1.15:105017 ..... N91-71557*#
NAS 1.21:481 ..... N85-16665*#
NAS 1.21:6101(02) ..... N90-13277*#
NAS 1.21:7500(19) N85-26439*
NAS 1.21:7500(21) N87-20833*
NAS 1.26:182461 ..... N88-20202*#
NAS 1.26:187154 ..... N91-27216*#

NASA-CR-127739 ..... N72-74281*
NASA-CR-144062 ..... N76-11195*#
NASA-CR-151102 ..... N77-11084*#
NASA-CR-182461 ..... N88-20202*#
NASA-CR-187154 ..... N91-27216*#

NASA-SP-481 ..... N85-16665*#
NASA-SP-6101(02) ..... N90-13277*#
NASA-SP-7500(19) N85-26439*
NASA-SP-7500(21) N87-20833*

NASA-TM-104528 ..... N91-31023*#
NASA-TM-105017 ..... N91-71557*#

NSA-CR-136303 ..... N74-70436*

PB88-190624 ..... N88-20202*#
PB88-223268 ..... N89-15775 #
PB91-135970 ..... N91-24215 #

REPT-6223-WP-26 ..... N72-74281*

SAND-90-2993 ..... N91-21964 #

WES/MP/ITL-90-6 ..... N91-21762 #

A84-15301 ..... NO REPORT NUMBER
A84-15327 ..... NO REPORT NUMBER
A84-15600 ..... NO REPORT NUMBER
A84-23990 ..... NO REPORT NUMBER
A84-35922 # MBB-UR-673-84-OE
A85-21298 # ..... ASME PAPER 84-MGT-8
A85-43194 # ..... NO REPORT NUMBER
A85-43203 # ..... NO REPORT NUMBER
A86-17472 ..... NO REPORT NUMBER
A86-19524* ..... NO REPORT NUMBER
A86-24116 ..... NO REPORT NUMBER
A87-49199 ..... NO REPORT NUMBER
A87-53567 ..... NO REPORT NUMBER
A88-24807 ..... NO REPORT NUMBER
A88-27634 # ..... NO REPORT NUMBER
A88-35077 ..... AAS PAPER 86-342
A88-51978 # ..... AIAA PAPER 88-4516
A91-10054 # ..... AIAA PAPER 90-3617
A91-10136 # ..... AIAA PAPER 90-3767
A91-10139 # ..... AIAA PAPER 90-3773
A91-18187 ..... NO REPORT NUMBER
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A91-44071 # ..... AIAA PAPER 91-1940
A91-44104 # ..... AIAA PAPER 91-2048

N76-11195*# MDC-G5919-BK-1
N76-11195*# NASA-CR-144062
N77-11084*# MDC-G6508-PT-1-VOL-1
NASA-CR-151102
N84-19068 # AD-A136600
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N85-26439* ..... NAS 1.21:7500(19)
NASA-SP-7500(19)
N86-15163*# ..... NO REPORT NUMBER
N86-15164*# ..... NO REPORT NUMBER
N86-15170*# ..... NO REPORT NUMBER
N87-20833* ..... NAS 1.21:7500(21)
NASA-SP-7500(21)
N88-20202*# ..... NAS 1.26:182461
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PB88-190624
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N91-17058*# ..... NO REPORT NUMBER
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N91-20074*# ..... NO REPORT NUMBER
N91-20684*# ..... NO REPORT NUMBER
N91-20981 # AD-A230557
AFIT/GSM/ENC/90S-23
N91-21762 # AD-A231282
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N91-22222*# ..... NO REPORT NUMBER
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N91-30977 # AD-A229534
AFIT/GCM/LSP/90S-9
N91-31019 # AD-A238352
AFIT/GOR/ENS/91M-5
N91-31023*# DOE/NASA/33408-5
E-6404
NAS 1.15:104528
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