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AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES

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Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.

54 Man/System Technology and Life Support **10**

Includes human engineering; biotechnology; and space suits and protective clothing.

55 Space Biology **N.A.**

Includes exobiology; planetary biology; and extraterrestrial life.

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Typical Report Citation and Abstract

❶ **19970001126** NASA Langley Research Center, Hampton, VA USA
❷ **Water Tunnel Flow Visualization Study Through Poststall of 12 Novel Planform Shapes**
❸ Gatlin, Gregory M., NASA Langley Research Center, USA Neuhart, Dan H., Lockheed Engineering and Sciences Co., USA;
❹ Mar. 1996; 130p; In English
❺ Contract(s)/Grant(s): RTOP 505-68-70-04
❻ Report No(s): NASA-TM-4663; NAS 1.15:4663; L-17418; No Copyright; Avail: CASI; A07, Hardcopy; A02, Microfiche
❼ To determine the flow field characteristics of 12 planform geometries, a flow visualization investigation was conducted in the Langley 16- by 24-Inch Water Tunnel. Concepts studied included flat plate representations of diamond wings, twin bodies, double wings, cutout wing configurations, and serrated forebodies. The off-surface flow patterns were identified by injecting colored dyes from the model surface into the free-stream flow. These dyes generally were injected so that the localized vortical flow patterns were visualized. Photographs were obtained for angles of attack ranging from 10’ to 50’, and all investigations were conducted at a test section speed of 0.25 ft per sec. Results from the investigation indicate that the formation of strong vortices on highly swept forebodies can improve poststall lift characteristics; however, the asymmetric bursting of these vortices could produce substantial control problems. A wing cutout was found to significantly alter the position of the forebody vortex on the wing by shifting the vortex inboard. Serrated forebodies were found to effectively generate multiple vortices over the configuration. Vortices from 65’ swept forebody serrations tended to roll together, while vortices from 40’ swept serrations were more effective in generating additional lift caused by their more independent nature.
❽ Author
❾ *Water Tunnel Tests; Flow Visualization; Flow Distribution; Free Flow; Planforms; Wing Profiles; Aerodynamic Configurations*

Key

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AEROSPACE MEDICINE AND BIOLOGY

A Continuing Bibliography (Suppl. 440)

JUNE 2, 1997

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LIFE SCIENCES (GENERAL)

19970014441 Pacific Northwest Lab., Richland, WA USA

Low-temperature catalytic gasification of food processing wastes ***Topical Report, 1995***

Elliott, D. C., Pacific Northwest Lab., USA; Hart, T. R., Pacific Northwest Lab., USA; Aug. 1996; 31p; In English

Contract(s)/Grant(s): DE-AC06-76RL-01830

Report No.(s): PNNL-11246; DE96-050372; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

The catalytic gasification system described in this report has undergone continuing development and refining work at Pacific Northwest National Laboratory (PNNL) for over 16 years. The original experiments, performed for the Gas Research Institute, were aimed at developing kinetics information for steam gasification of biomass in the presence of catalysts. From the fundamental research evolved the concept of a pressurized, catalytic gasification system for converting wet biomass feedstocks to fuel gas. Extensive batch reactor testing and limited continuous stirred-tank reactor tests provided useful design information for evaluating the preliminary economics of the process. This report is a follow-on to previous interim reports which reviewed the results of the studies conducted with batch and continuous-feed reactor systems from 1989 to 1994, including much work with food processing wastes. The discussion here provides details of experiments on food processing waste feedstock materials, exclusively, that were conducted in batch and continuous- flow reactors.

DOE

Biomass; Gasification

19970015126 Texas Univ., Southwestern Medical Center, Dallas, TX USA

Life Sciences Data Archive Scientific Development ***Final Report***

Buckey, Jay C., Jr., Texas Univ., USA; Apr. 05, 1995; 5p; In English

Contract(s)/Grant(s): NAS9-19190

Report No.(s): NASA-CR-203948; NAS 1.26:203948; No Copyright; Avail: CASI; A01, Hardcopy; A01, Microfiche

The Life Sciences Data Archive will provide scientists, managers and the general public with access to biomedical data collected before, during and after spaceflight. These data are often irreplaceable and represent a major resource from the space program. For these data to be useful, however, they must be presented with enough supporting information, description and detail so that an interested scientist can understand how, when and why the data were collected. The goal of this contract was to provide a scientific consultant to the archival effort at the NASA-Johnson Space Center. This consultant (Jay C. Buckey, Jr., M.D.) is a scientist, who was a co-investigator on both the Spacelab Life Sciences-1 and Spacelab Life Sciences-2 flights. In addition he was an alternate payload specialist for the Spacelab Life Sciences-2 flight. In this role he trained on all the experiments on the flight and so was familiar with the protocols, hardware and goals of all the experiments on the flight. Many of these experiments were flown on both SLS-1 and SLS-2. This background was useful for the archive, since the first mission to be archived was Spacelab Life Sciences-1. Dr. Buckey worked directly with the archive effort to ensure that the parameters, scientific descriptions, protocols and data sets were accurate and useful.

Author

Life Sciences; Space Programs; Spacelab

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AEROSPACE MEDICINE

Includes physiological factors; biological effects of radiation; and effects of weightlessness on man and animals.

19970013794 Hahnemann Medical Coll. and Hospital, Philadelphia, PA USA
Efficacy of the Heat-Labile Enterotoxin from Escherichia Coli as an Adjuvant for a HSV-2 Inactivated Oral Vaccine ***Final Report, 1 Jun. 1993 - 31 Mar. 1996***
Pinto, Angelo J., Medical Coll. of Pennsylvania, USA; Mar. 31, 1996; 3p; In English
Contract(s)/Grant(s): N00014-93-1-0747
Report No.(s): AD-A312064; No Copyright; Avail: CASI; A01, Hardcopy; A01, Microfiche

This project examined the efficacy of the heat-labile enterotoxin from Escherichia coli (LT) as an adjuvant for an inactivated HSV-2 vaccine. Using 5-week-old BAB/c mice, three oral doses of inactivated HSV-2/LT (25 micro-g/25 micro-g) vaccine given at weekly intervals were ineffective in protecting mice from infection. Administering the second booster of vaccine intravaginally (IVAG) or reducing the dose of LT (10 micro-g) did not increase the efficacy of the vaccine. This lack of response to the vaccine was not age-related as 8-week-old mice gave similar results, even when the primary vaccination was given IVAG. Finally, we tested different doses of inactivated HSV-2 in a protocol which included an oral vaccination on day 0 and 7 with 10 micro-g LT and either 1 micro-g, 5 micro-g, or 10 micro-g inactivated HSV-2. This was followed by an IVAG booster on day 14. Our results showed significant protection (P less than 0.05) in the 10 micro-g HSV-2/LT treated group as evidenced by increased survival and decreased vaginal HSV-2 titers.
DTIC
Escherichia; Infectious Diseases; Mice; Vaccines

19970014245 Armstrong Lab., Brooks AFB, TX USA
Radio Frequency Radiation Dosimetry Workshop ***Final Report, Mar. 1992 - Jul. 1993***
Hurt, William D., Armstrong Lab., USA; Jun. 1996; 237p; In English; Present Status and Recommendations for Future Research, 7-9 Dec. 1996, Brooks AFB, TX, USA
Contract(s)/Grant(s): F33615-90-D-0606; AF Proj. 7757
Report No.(s): AD-A309928; AL/OE-SR-1996-0003; No Copyright; Avail: CASI; A11, Hardcopy; A03, Microfiche

The goal of this project is to advance the state of the art of RFR dosimetry to a level of sophistication where computer graphically generated, high-resolution SAR distributions can be obtained and displayed with anatomical features for any section of the human body. Procedures are to be developed to allow modeling of the realistic exposure conditions for whole-body or partial-body irradiation due to spatially uniform or nonuniform (far-field or near-field) EM fields that are CW, pulsed, or transient in nature. Effects will also be directed at improving thermal models of the human body so that expected temperature distributions due to RFR exposure can be predicted and displayed graphically. Participants have generated recommendations for research in subspecialty areas relevant to the above, such as standard models of humans and animals, graphical display methods, numerical algorithms; validation of computer-generated data, extrapolation of SAR data to thermal physiology, and others.
DTIC
Irradiation; Electromagnetic Radiation; Dosimeters; Continuous Radiation; Radiation Dosage; Human Body; Mathematical Models; Computer Graphics

19970014311 Institute for Human Factors TNO, Soesterberg, Netherlands
Ship Motions and 'Motion Sickness Incidence' (MSI): Estimations of the Percentage of Sick People Based on Vertical Motion ***Interim Report Scheepsbewegingen en 'Motion Sickness Incidence' (MSI): Voorspellingen van het Percentage Bewegingszieken op Basis van Vericale Bewegingen***
Bos, J. E., Institute for Human Factors TNO, Netherlands; Nov. 28, 1995; 22p; In Dutch
Contract(s)/Grant(s): A95/KM/358
Report No.(s): AD-A309612; TNO-TM-1995-A-71; TDCK-95-1489; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Ship motions can induce seasickness. Especially the vertical movements with frequencies below 1 Hz are very provocative. This report gives a summary and a description of a computer-implementation of a model formulated by McCauley et al. C1976). and a model by Griffin (1990), to predict the percentage of sick people given a motion time history.
DTIC
Motion Sickness; Vertical Motion; Ships; Vestibular Nystagmus

19970014331 Washington Univ., School of Nursing, Seattle, WA USA

Relationships Between Knowledge, Attitude and Frequency of Hospitalization in Heart Failure Patients

Erickson, Leslie D., Washington Univ., USA; May 22, 1996; 75p; In English

Report No.(s): AD-A311497; AFIT-96-046; No Copyright; Avail: CASI; A04, Hardcopy; A01, Microfiche

The purpose of this study was to determine if relationships existed between levels of knowledge about heart failure, attitude towards adhering to prescribed medical care and frequency of hospitalization among heart failure patients. The study also tested the reliability and validity of the Shih Heart Failure Knowledge Test. The test was used to measure subjects knowledge about their illness. Selected assessment areas were signs and symptoms of heart failure, medications, exercise and dietary restrictions. The Miller Health Attitude Scale was used to measure subjects predicted adherence to prescribed medical care. Selected assessment areas were cardiac diet, medications, physical activity, stress reduction, and smoking. A convenience sample of 21 subjects was used. All subjects were pre-cardiac transplant heart failure patients being treated at a large Northwest medical center. Subjects received a packet containing the knowledge test, the attitude scale and a demographic data survey. Nine subjects were selected to was used. All subjects were pre-cardiac transplant heart failure patients being treated at a large Northwest medical center. Subjects received a packet containing the knowledge test, the attitude scale and a demographic data survey. Nine subjects were selected to repeat the knowledge test two weeks later. The data was used to test the reliability of the knowledge test. At the end of four months subjects returned a hospitalization self-report survey documenting the number of times they were hospitalized, length of stay for each hospitalization, and reason for admission. Data was confirmed using subjects medical records.

DTIC

Heart Diseases; Signs and Symptoms; Sicknesses; Patients; Failure; Demography

19970014332 Washington Univ., School of Nursing, Seattle, WA USA

Experiences of Program Directors in the Enrollment of Patients who had Percutaneous Transluminal Coronary Angioplasty without Myocardial Infarction into Phase 2 Cardiac Rehabilitation Programs

Koch, Maureen A., Washington Univ., USA; Jan. 1996; 85p; In English

Report No.(s): AD-A311488; AFIT-96-049; No Copyright; Avail: CASI; A05, Hardcopy; A01, Microfiche

The benefits of cardiac rehabilitation (CR) have been demonstrated repeatedly. Little is known about the benefits percutaneous transluminal coronary angioplasty (PTCA) patients without myocardial infarction (MT) achieve due to their limited enrollment in CR programs. The purpose of this study was to describe the experiences program directors encountered during the enrollment of patients who have had PTCA without MT into their outpatient CR programs. I % .1 A A 19 item survey was developed. Program directors from the Northwest Association of Cardiovascular and Pulmonary Rehabilitation responded (39%). The study revealed 52% (N=16) provided Phase T CR programs, while 84% (N=27) provided Phase TT/TTT CR to PTCA patients. Programs had existed for an average of 8 years, and had accepted PTCA patients for an average of 7 years. Marketing of programs to physicians providing PTCA occurred in 74% (N=20) of programs, but only an average of 15 PTCA patients per year, out of an average yearly total of 298 PTCA procedures, were enrolled in Phase Il/Ill CR.

DTIC

Cardiovascular System; Myocardial Infarction; Heart

19970014333 Massachusetts General Hospital, Boston, MA USA

Development and Comparison of Different Peptide IgG Conjugates for the Treatment of Gram-Negative Sepsis *Progress Report, 7 Mar. - 22 Jun. 1995*

Warren, H. Shaw, Massachusetts General Hospital, USA; Jun. 22, 1995; 23p; In English

Contract(s)/Grant(s): N00014-94-C-0021

Report No.(s): AD-A311477; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Work over the trimester focused on defining the best LPS binding protein (LBP) peptide sequence, generating peptide-IgO conjugates with this sequence, and assessing the functional ability of these conjugates in buffer and serum. Preliminary work suggested that these, and similar peptides composed of CAPl8 and BPI peptides, lost activity in serum compared to buffer. We compared the bactericidal activity of the LBP peptides in serum and buffer, and assessed the ability of conjugates made with these peptides to bind LPS in serum and buffer. We also evaluated the effect of a terminal cysteine on the peptide on peptide activity. We found that that killing was reduced in serum compared to buffer, and that the ability of the LBP peptide-IgG conjugates to bind radio labeled LPS was reduced in serum compared to buffer. However, the activity of the peptides was dramatically increased with a terminal cysteine. Experiments using 14C-peptide confirmed previous estimates that constructs contained 3.9 and 9.5 peptides/IgG.

DTIC

Serums; Proteins; Cysteine; Bactericides

19970014352 Army Aeromedical Research Lab., Fort Rucker, AL USA

U.S. Army Aviation Epidemiology Data Register Data Entry and Flight Surgeon Office Administration Guide ***Final Report***

Mason, Kevin T., Army Aeromedical Research Lab., USA; Apr. 1996; 91p; In English

Contract(s)/Grant(s): DA Proj. 3O1-62787-A8-78

Report No.(s): AD-A309580; USAARL-96-23; No Copyright; Avail: CASI; A05, Hardcopy; A01, Microfiche

This guide provides U.S. Army Flight Surgeons (FS) with guideline s for completing Flying Duty Medical Examinations (FDME) that are compatible with Aviation Epidemiology Data Register (AEDR) data entry. It details the review and disposition of aeromedically disqualified aviation training program applicants, aircrew members, and air traffic controllers, both civilian and military. The traditional core of Army aviation medicine is the delivery of clinical and operational preventive medicine services. This administration guide establishes a public health protocol as it pertains to the conduct of U.S. Army FDMEs. The FDME protocol adopts the current standard of preventive health care promoted by the U.S. Public Health Service, but is modified to meet the needs and challenges of the operational Army aviation environment. The protocol is the result of 6 years of literature review, AEDR research, and staffing of proposed aviation medicine public health policy through the U.S. Army Aeromedical Center, U.S. Army Aeromedical Research Laboratory, Army Surgeon General Aviation Medicine Consultant, and the Aeromedical Consultant Advisory Panel.

DTIC

Aerospace Medicine; Medical Services; Flight Surgeons; Medical Personnel; Physical Examinations

19970014992 Air Force Inst. of Tech., Wright-Patterson AFB, OH USA

Selected Articles

Laser Journal; Oct. 15, 1996, pp. 586-588, 612-614, 61; Transl. into ENGLISH of Laser Jnl. (China) p586-588, p612-614, 618-622; In English; Translated by Leo Kanner Associates

Report No.(s): AD-A320985; NAIC-ID(RS)T-0497-96; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

There have already been reports and evaluations in foreign countries concerning damage to human skin from ruby laser irradiation. However, all of these reports were on the skin of people from the Caucasus and of blacks. Their skin lesion threshold values are fairly high, and are not completely appropriate for Asians. On the basis of experiments with pig skin, this article uses the same ruby laser to irradiate human skin, observing the erythema occurrence rate, and through statistical processing, calculates the dosage for 50 percent erythema reaction.

DTIC

Ruby Lasers; Skin (Anatomy); Damage; Irradiation

19970015025 Naval Health Research Center, San Diego, CA USA

The Effect of Hypoxia and Cold at Rest on Human Thermoregulation

Reading, J., Naval Health Research Center, USA; Roberts, D., Naval Health Research Center, USA; Hodgdon, J., Naval Health Research Center, USA; Pozos, R., Naval Health Research Center, USA; Jul. 30, 1996; 18p; In English

Report No.(s): AD-A314896; NHRC-96-14; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Cold is associated with altitude, and the higher the altitude, the lower the temperature. As the ambient temperature decreases, oxygen consumption (VO2) in humans at rest increases (Feith, Hesslink, Reading, Kincaid, & Pozos, 1993; LeBlanc, 1986; Reading, Kincaid, Roberts, Hesslink, & Pozos, 1994; Robinson & Haymes, 1990; Tikuisis, Bell, & Jacobs, 1991). As cold stress increases, VO2 and heat production rise. This rise is primarily due to shivering (Kleinebeckel & KIussmann, 1990). When hypoxia is added to cold at rest, less shivering and a lower VO2 can occur. Controversy exists as to the threshold altitude or oxygen (O2) percentage at which shivering is reduced. A threshold level of 12% oxygen (simulating an altitude of 4160 m) has been proposed for reduction in shivering and VO2 (Kottke, Phalen, Taylor, Visscher, & Evans, 1948; Blatteis, 1971). Resting thermogenesis, or the ability of the body to create heat in order to maintain homeostasis, occurs in part by shivering. If shivering is limited, decreased, or stopped, core temperature will decline, and the person will become hypothermic and eventually die if core temperature is not restored to normal. In a military environment, hypothermia will impede combat performance by rendering the hypothermic person ineffective to carry out his/her mission, and it will increase manpower demands by requiring attention from at least one other person. Therefore, maintenance of a stable core temperature during cold exposure is of paramount importance if troops are to be battle ready.

DTIC

Thermoregulation; Oxygen Consumption; Hypothermia; Hypoxia; Exposure

19970015414 Armstrong Lab., Crew Systems Directorate, Wright-Patterson AFB, OH USA
Female Performance Under High-G During Fatigue and After G-Layoff ***Final Report, 5 Dec. 1994 - 30 Sep. 1995***
Chelete, Tamara L., Armstrong Lab., USA; Jul. 1996; 28p; In English
Contract(s)/Grant(s): MIPR-95MM5549
Report No.(s): AD-A314478; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

The effects of fatigue and G-layoff on performance during high-G are mostly unknown for the female population. This research was conducted in the centrifuge Dynamic Environment Simulator (DES). Eight male and eight female active-duty personnel were trained to fly the F-16 simulation while thirty performance measures were recorded. Performance was re-evaluated after 24 hrs. of sleeplessness and after either 2 or 4 weeks of layoff. Neither male nor female overall performance was significantly affected by sleep status, although individual tasks showed sensitivity; call-sign reaction time was longer by 33% and missile survival was less likely. Also, perceived effort and physical demand were higher while perceived performance was lower when sleepless. No differences in performance were found in either gender due to layoff, although some physiologic deconditioning was apparent. Women commanded and endured the same amount of G load as men, however on average they could not perform the tracking task quite as well. Women also reported more adverse effects of exposure. Nothing was found that suggests that women should not fly high performance aircraft.
DTIC
Females; Performance Tests; Loads (Forces); Fatigue (Biology); Human Performance

19970015466 Department of the Navy, Washington, DC USA
Antisense Oligonucleotides Directed against Human ICAM-I RNA
Hoke, Glenn D., Inventor, Department of the Navy, USA; Bradley, Matthews O., Inventor, Department of the Navy, USA; Williams, Taffy J., Inventor, Department of the Navy, USA; Lee, Che-Hung, Inventor, Department of the Navy, USA; Dec. 03, 1996; 16p; In English
Patent Info.: Filed 12 Oct. 1993; US-Patent-Appl-SN-0136118; US-Patent-5,580,969
Report No.(s): AD-D018363; No Copyright; Avail: US Patent and Trademark Office, Microfiche

The present invention provides a method for the treatment of septic shock and inflammatory complications of shock. A process for selectively inhibiting the expression of the human ICAM-I mRNA transcript using at least one oligonucleotide which is complementary to at least a portion of the human ICAM-I mRNA is disclosed, as are oligonucleotides which are complementary to portions of the ICAM-I mRNA and compositions comprising the oligonucleotides.
DTIC
Oligomers; Shock (Physiology); Nucleotides

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BEHAVIORAL SCIENCES

Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.

19970013804 Naval Health Research Center, San Diego, CA USA
Physical Task Performance: Complexity of the Ability-Performance Interface ***Interim Report, Oct. 1994 - Sep. 1995***
Vickers, Ross R., Jr., Naval Health Research Center, USA; Sep. 05, 1995; 23p; In English
Contract(s)/Grant(s): M0096.002-6417
Report No.(s): AD-A308696; NHRC-95-30; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Simple, general models may provide useful representations of physical abilities and task performance. Physical abilities can be represented by 3 to 6 general dimensions summarizing individual differences on a range of specific physical ability tests (e.g., Hogan, 1991; Itrers, Gebhardt, Crump, & Fleishman, 1993). Similar simplicity may suffice to represent the physical task domain. When people perform two or more physically demanding tasks, individual differences in task performance are moderately to strongly positively correlated (Arnold, Rauschenberger, Soubel, & Guion, 1982; Beckett & Hodgdon, 1987; Robertson & Trent, 1985). This correlation pattern suggests the existence of one or more general dimensions underlying differences in performance on the specific tasks. With these observations as a starting point, this paper examines the utility of general dimensions as summary measures to characterize task performance and to describe physical ability-task performance relationships. The potential value of modeling ability-performance relationships in terms of general dimensions can be illustrated by comparison to more common approaches to modeling physical task performance. Standard practice for predicting physical task performance involves measuring performance on one or more tasks and administering a battery of physical ability measures. Procedures such as stepwise regression then are applied to select a set of ability measures to predict each task. The result is one predictive equation per criterion with

different predictors and/or predictor weights for each criterion. The set of regression equations defines the performance prediction model for the task set.
DTIC
Human Performance; Tasks; Psychological Tests; Performance Prediction

19970014299 Army Research Inst. of Environmental Medicine, Natick, MA USA
A Simplified Modeling Approach for Estimating Heat Loss During Cold Exposure
Santee, William R., Army Research Inst. of Environmental Medicine, USA; Jun. 1996; 34p; In English
Report No.(s): AD-A311468; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Equations to predict heat debt (D) and survival time (ST were derived from a simple ration model (Burton and Edholm, 1955) that predicted the clothing in insulation.. The methodology is analogous to a more complex approach derived by Holmer 1984) to calculate required insulation (IREQ) and survival times. The derived equations parallel s imple models developed by other investigators (Tikulsis and Frim, 1995 , but are explained in sufficient detail to allot other users to fully understand the methods and to develop variations of the basic model. The derived equations are used to calculate values for comparison to both theoretical and experimental results. The equation development process demonstrates both basic heat transfer principles and the derivation of a simple model. Other equation modifications are suggested provide insight into how basic models may be used in conjunction with experimental data I develop more sophisticated models. The equations may be used to generate predictions that may be used as simple alternative hypotheses for cold exposure modeling validation studies.
DTIC
Body Temperature; Insulation; Heat Transfer; Exposure

19970014317 Georgia Inst. of Tech., College of Computing, Atlanta, GA USA
Problem Solving and Learning in a Natural Task Domain ***Final Report, Sep. 1986 - Aug. 1989***
Kolodner, Janet, Georgia Inst. of Tech., USA; Barsaloud, Lawrence, Georgia Inst. of Tech., USA; Mar. 1996; 184p; In English
Contract(s)/Grant(s): MDA-903-86-C-0173; ARI Proj. B74F
Report No.(s): AD-A312239; ARI-RN-96-55; No Copyright; Avail: CASI; A09, Hardcopy; A02, Microfiche

This report explains the details of some of the problem solving and learning processes employed by novice problem solvers as they become more expert. In particular, the researchers investigate the effects of individual problem solving and learning experiences on later problem solving in the context of troubleshooting.
DTIC
Problem Solving; Learning; Tasks

19970014366 Executive Consulting Group, Inc., Slingerlands, NY USA
A Comparison and Integration of three Training Evaluation Approaches: Effectiveness, Utility, and Anticipatory Evaluation of Training ***Interim Report, Sep. 1993 - Aug. 1995***
Alliger, George M., Executive Consulting Group, Inc., USA; Bennett, Winston, Jr., Armstrong Lab., USA; Tannenbaum, Scott I., Executive Consulting Group, Inc., USA; Jul. 1996; 55p; In English
Contract(s)/Grant(s): F41624-93-C-5011; AF Proj. 1123
Report No.(s): AD-A311995; AL/HR-TR-1996-0016; No Copyright; Avail: CASI; A04, Hardcopy; A01, Microfiche

This report provides a brief overview of three methods, or general approaches, to judging the usefulness of training. The first method or approach is the traditional evaluation approach of training effectiveness evaluation. This method or approach centers on estimations of training effect size and the determination of the statistical significance of those training effects. Thus, in this first category standard pre(post analyses and control group comparisons are included. Next traditional training utility analysis, or training utility evaluation is reviewed here, costs and benefits of training are always contrasted in some way in determining traditional utility analysis. This branch of evaluation traces its roots back to Brogden & Taylor (1950), who discussed the need to examine the dollar criterion. Finally, anticipatory training evaluation is discussed Anticipatory training evaluation examines what kinds of training will have the greatest effectiveness and utility, given a variety of parameters and choices. The primary tool in anticipatory evaluation is Multi-Attribute Utility analysis (MAU). As opposed to training effectiveness and training utility evaluation, MAU is designed explicitly as a decision tool. It can be used most effectively as an anticipatory evaluation, the results of which facilitates planning for training. A detailed example of the development and application of MAU is described in this report, since it is the least well know n of the three approaches to researchers and practitioners in the training are. In explicating this expanded view of training evaluation, this report attempts to represent state-of-the-art understanding and research; thus current is-

sues like risk and uncertainty in input and output evaluation and utility indices, and problems in transfer of learned skills to the job, are addressed in appropriate contexts.
DTIC
Training Evaluation; Education; Training Analysis; Tasks

19970014373 South Carolina Univ., Dept. of Psychology, Columbia, SC USA
Retrieval and Storage Consequences of Working Memory Limitations ***Final Report, 15 May 1993 - 14 May 1996***
Engle, Randall W., South Carolina Univ., USA; Jul. 14, 1996; 41p; In English
Contract(s)/Grant(s): F49620-93-I-0336; AF Proj. 2313
Report No.(s): AD-A312121; AFOSR-TR-96-0421; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

The research funded by this grant addressed questions about the nature of individual differences in working memory (WM) capacity. Experiments showed that high and low WM subjects did not differ in retrieval from the inactive portion of memory and differed in retrieval from active or primary memory only under conditions of conflict or interference. In neither case was there a set size effect in retrieval from secondary memory. Another set of experiments showed that suppression of distracting or interfering information was a function of WM capacity and that suppression was diminished if the subjects was operating under a mental work load. The final project completed on the grant was a large scale factor analysis to determine w hether the wide range of putative WM tasks reflect a common mechanism, whether that mechanism is manifest in simple short-term memory tasks and the relationship of these constructs to general fluid intelligence. In a series of confirmatory factor analyses, the WM tasks loaded closely together and a separate STM factor was necessary. The WM factor was closely associated with a factor for general fluid intelligence.
DTIC
Memory; Mental Performance; Tasks; Work Capacity; Workloads (Psychophysiology)

19970014401 Army Aeromedical Research Lab., Fort Rucker, AL USA
Perception of an Illusory Form Under Conditions of Limited Visibility ***Final Report***
Rabin, Jeff C., Army Aeromedical Research Lab., USA; Apr. 1996; 11p; In English
Contract(s)/Grant(s): DA Proj. 3M1-62787-A8-79
Report No.(s): AD-A309581; USAARL-96-25; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Ambiguous figures and visual illusions are difficult to perceive when presented in terms of color contrast rather than luminance contrast. This finding has prompted the notion that the perception of these forms depends primarily on processing along an achromatic, luminance pathway. Others contend that the perception of such figures depends on the visibility of the stimulus rather than on the particular pathway traversed from eye to brain. If visibility is a limiting factor on perception, then it would be useful to determine how certain perceptual ambiguities are resolved under various conditions of limited visibility. In the present study, visual perception of a complex, ambig uous form was evaluated under several conditions of limited visibility including equiluminant color contrast (S and LM) and a range of luminance contrasts, also were evaluated. The results confirm and extend previous findings in showing that the perception of a complex, illusory form depends more on the visibility of the stimulus than on the particular pathway accessed. The expectations and prior experience of the observer also were found to be crucial determinants of complex object recognition.
DTIC
Visual Perception; Color Vision

19970014425 Armstrong Lab., Brooks AFB, TX USA
Gender Composition of High Stress Tactical Decision Making Teams: Impact on Team Process and Outcome ***Annual Report, 9 Jan. - 1 Aug. 1995***
Elliott, Linda R., Armstrong Lab., USA; Guerrero, Cynthia O., Armstrong Lab., USA; Sep. 01, 1995; 34p; In English
Contract(s)/Grant(s): MIPR-95MM5574
Report No.(s): AD-A312252; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

The purpose of this research is to ascertain the effects of team communication and decision making processes occurring within the context of tactical decision making teams, and the extent to which these processes differ among teams varying in gender composition. Tactical decision making teams require interdependent members to interpret and coordinate information with speed and synergy. Team performance is dependent not only on individual proficiency but also the ability of the team members to integrate their behaviors to form efficient processes. Gender composition in teams have been related to both positive and negative characteristics in team communications and outcomes. This study investigates differences in communication and coordination patterns

among members of teams differing in gender compositions and gender of team leader. The rationale and method are described in this report. Data collection has just been completed.
DTIC
Decision Making; Human Performance

19970014430 McDonnell-Douglas Aerospace, Saint Louis, MO USA
Methods for Clustering Occupational Tasks to Support Training Decision Making ***Interim Report, Oct. - Dec. 1994***
Perrin, Bruce M., McDonnell-Douglas Aerospace, USA; Vaughan, David S., McDonnell-Douglas Aerospace, USA; Mitchell, Jimmy L., McDonnell-Douglas Aerospace, USA; Yadrick, Robert M., McDonnell-Douglas Aerospace, USA; Bennett, Winston, Jr, McDonnell-Douglas Aerospace, USA; Jun. 1996; 18p; In English
Contract(s)/Grant(s): F33615-89-C-0001; AF Proj. 1123
Report No.(s): AD-A311368; AL/HR-TR-1996-0013; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Estimates of the cost of providing training, in forms ranging from classroom instruction to on-the-job training, are needed to support decisions about who gets trained, when, where, and on what skills. to counter the myriad of uncontrollable factors that may obscure the relationship between manpower, personnel, and training policy changes and organizational outcomes, an organizational simulation of Air Force occupations called the Training Impact Decisions System (TIDES) was developed. An important first step in obtaining these occupation-level outcome estimates in TIDES is to identify groups of tasks with similar knowledge and skill requirements, because economies will be realized when these tasks are trained at the same time. This report compares results from using two different methods to identify groups of Air Force Occupational Survey tasks where these training economies would occur, including methods based on subject matter experts' judgments and statistical clustering using task coperformance. The results from two field applications indicated that the statistical methods could replicate much of the structure of the experts' clusters, and so, could be used to facilitate the process of identifying these task groups. Use of these methods to form task clusters which could be used to support a broad range of training and personnel decisions is also discussed.
DTIC
Decision Making; Education; Armed Forces; Simulation

19970014489 Army Research Lab., Adelphi, MD USA
Visual and Cognitive Issues in the Design of Displays ***Final Report, Oct. 1995 - May 1996***
Walrath, James D., Army Research Lab., USA; Aug. 1996; 30p; In English
Contract(s)/Grant(s): PE:61102A
Report No.(s): AD-A311433; ARL-TR-1116; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

In order for a visual display to be useful, the human user must be able to see and understand what is displayed--allowing information to become knowledge. It follows, then, that for a display to be of maximum utility, characteristics of human vision and cognition must be considered in the design process. This report contains both general design guidelines as well as specific information that can be useful to the display designer wishing to optimize a display for the user. Because human vision and cognition are such complex topics, references to in-depth treatments of specific issues are provided. Therefore, the report serves a dual purpose: to acquaint the display designer with basic human issues in the design of visual displays, and to serve as a pointer to classical and contemporary research into human visual perception and cognition.
DTIC
Display Devices; Visual Perception; Cognition

19970014511 Naval Health Research Center, San Diego, CA USA
COMPTRACK: A Compensatory Tracking Task for Monitoring Alertness ***Final Report, Jan. - Sep. 1995***
Makeig, Scott, Naval Health Research Center, USA; Jolley, Keith, Ogden Government Services Corp., USA; Jul. 09, 1995; 14p; In English
Report No.(s): AD-A311977; NHRC-TD-96-30; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

A compensatory visual tracking task (COMPTRACK) has been programmed to operate on an IBM-compatible computer for use in vigilance research. The task meets four goals established in the course of previous research to develop an objective alertness monitoring system based on EEG and other psychophysiological data (Makeig & Inlow, 1993; Makeig, Elliott & Potstal, 1993): (1) to distinguish it from an auditory detection task used in previous research, the task should not involve auditory stimuli. (2) to allow study of vigilance decrements, the task should be monotonous enough to produce deficits associated with underarousal and loss of vigilance. (3) to allow study of rapid (20 sec) fluctuations in vigilance, the task should require continuous user input at near-one second intervals. (4) The task program should allow msec-scale synchronization with external psychophysiological

or other data collection processes. This report describes the COMPTRACK task in detail, and presents control, training, and pilot data supporting the conclusion that the task is suitable for further use in vigilance research.
DTIC
Visual Perception; Auditory Perception; Alertness; Auditory Stimuli; Human Performance; Tracking (Position); Tasks

19970014514 Army Command and General Staff Coll., Fort Leavenworth, KS USA
The Role Leader Competence Plays in the Trust-Building Process
Sweeny, Patrick J., Army Command and General Staff Coll., USA; Jun. 07, 1996; 73p; In English
Report No.(s): AD-A312244; No Copyright; Avail: CASI; A04, Hardcopy; A01, Microfiche

This study focused on testing a portion of Kelley and Thibaut's trust-building model. This model asserted that an individual could earn an attribution of dependability by: behaving cooperatively, sharing similar interests, and sharing interdependence with the other person. The model suggested that an individual's competence was a separate factor and that it did not influence the earning of an attribution of dependability. However, the author hypothesized that in military leader-follower relationships, competence was a significant factor in a leader earning an attribution of dependability. In addition, the author hypothesized a strong, positive relationship between a leader's perceived dependability and the follower's willingness to trust the leader. Similarly, the author hypothesized a strong, positive relationship between followers' trust in the leader and their willingness to be influenced (lead) by the leader. The hypotheses were tested using a two-by-two factorial design which manipulated leader's competence and Kelley and Thibaut's three factors for earning an attribution of dependability as one variable. The results supported all hypotheses.
DTIC
Dependence; Psychology; Hypotheses

19970014635 Naval Surface Warfare Center, Bethesda, MD USA
Potential Benefits to Navy Training Programs Resulting from Increased Use of Interactive Electronic Technical Manuals, Phase 1, Initial evaluation of IETM applicability to schoolhouse and worksite training functions ***Interim Report, Mar. - Oct. 1995***
Jorgensen, Eric J., Naval Surface Warfare Center, USA; Fuller, Joseph J., Naval Surface Warfare Center, USA; Rainey, Samuel C., Support Systems Technology Corp., USA; Post, Theodore J., Support Systems Technology Corp., USA; Oct. 1995; 118p; In English
Report No.(s): AD-A309992; NSWCCARDIV-TR-96/016; No Copyright; Avail: CASI; A06, Hardcopy; A02, Microfiche

This report summarizes Phase-1 of a study entitled Training Benefit Analysis of the Accelerated Use of Interactive Electronic Technical Manuals (IETM's). An initial evaluation of the interactive, computer controlled display of technical information has been carried out by the Navy training community. Results indicate the use of IETM's, integrated with automated courseware, could significantly improve training processes. Forty-seven candidate projects covering surface, air and submarine warfare areas were identified. Fifteen IETM hypotheses and associated implementation scenarios were evaluated. of these, twelve were supported by more than two-thirds of the participants in this study. Candidate projects were identified for business-case-analyses to be performed in Phase-2. This report also identifies technical and administrative issues which must be addressed before the full potential of IETM's can be realized. Measures needed for greater integration, infrastructure support and standardization of IETM's in training are recommended. Phase-2 of the study will consist of a more detailed analysis of the selected candidate projects, particularly from the standpoint of return on investment. This will provide the Chief of Naval Operations with the basis for training input to the Program Objective Memorandum (POM) '98 preparation process.
DTIC
Computer Assisted Instruction; Training Analysis; Education; Manuals; Computer Graphics; Computer Programs

19970014766 Armstrong Lab., Aerospace Medicine Directorate, Brooks AFB, TX USA
Psychological Characteristics of USA Air Force Pilots ***Final Report, 23 Jan. - 30 Sep. 1995***
McGlohn, Suzanne E., Armstrong Lab., USA; King, Raymond E., Armstrong Lab., USA; Retzlaff, Paul D., Armstrong Lab., USA; Flynn, Christopher F., Armstrong Lab., USA; Butler, James W., Armstrong Lab., USA; Jun. 1996; 28p; In English
Contract(s)/Grant(s): AF Proj. 7755
Report No.(s): AD-A311379; AL/AO-TR-1996-0097; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

This document represents the final report of the protocol entitled Assessment of Psychological Factors in Aviators, funded in fiscal year 1995 by the Department of Defense Women's Health Research Program (DWRHP). This protocol studied the psychological and psychiatric health of 64 male and 50 female non-referred USA Air Force (USAF) pilots. A number of psychological tests were administered as well as a structured interview. The Multidimensional Aptitude Battery (MAB), the NEO Five Factor Inventory (NEO-FFI), the Crew Management Attitude Questionnaire (CMAQ), and the Personal Characteristics Inventory (PCI)

were presented on IBM ThinkPad computers. While MAB intelligence scores were nearly identical for men and women, women were found to have higher scores on the Extraversion, Agreeableness, and Conscientiousness scales of the NEO-FFI. CMAQ results, however, suggest no significant male/female 'resource management' differences. The semi-structured interview sought information about personal/family health, squadron relationships, and career/deployment stresses. The interview findings suggest that the USAF Academy is an important avenue for women to enter military aviation, many young female pilots are delaying childbearing for their aviation career, and the squadron members most often reported as having trouble with mixed- gender squadrons are older male enlisted crew members and male supervisors. An important area for future training proved to be men's desire to protect women in combat.
DTIC
Aircraft Pilots; Psychological Factors; Mental Health; Armed Forces (USA)

19970014929 Maryland Univ., Computer Vision Lab., College Park, MD USA
Explaining Human Visual Space Distortion
Fermueller, Cornelia, Maryland Univ., USA; Cheong, Loong-Fah, Maryland Univ., USA; Aloimono, Yiannis, Maryland Univ., USA; Jul. 1996; 30p; In English
Contract(s)/Grant(s): N00014-96-I-0587; DAAH04-93-G-0419; NSF IRI-90-57934
Report No.(s): AD-A311304; CAR-TR-833; CS-TR-3662; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

A number of experiments have recently been conducted to compare aspects of depth judgment due to stereoscopic and monocular motion perception. In these experiments, it has been shown that from stereo vision humans over-estimate depth (relative to fronto-parallel size) at near fixations and under-estimate it at far fixations, whereas human depth estimates from visual motion are not affected by the fixation point. On the other hand, the orientation of an object in space does not affect depth judgment in stereo vision while it has a strong effect in motion vision, for the class of motions tested. This paper develops a computational geometric model that explains why such distortion might take place. The basic idea is that, both in stereo and motion, we perceive the world from multiple views. Given the rigid transformation between the views and the properties of the image correspondence, the depth of the scene can be obtained. Even a slight error in the rigid transformation parameters causes distortion of the computed depth of the scene. The unified framework introduced here describes this distortion in computational terms, in order to explain a number of recent psychophysical experiments on the perception of depth from motion or stereo.
DTIC
Visual Perception; Motion Perception; Stereoscopic Vision; Space Perception

19970015071 Waikato Univ., Hamilton, New Zealand
Modeling Visual, Vestibular and Oculomotor Interactions in Self-Motion Estimation ***Final Report, 31 May 1995 - 30 Jun. 1996***
Perrone, John, Waikato Univ., New Zealand; Feb. 04, 1997; 18p; In English
Contract(s)/Grant(s): NAGw-4127
Report No.(s): NASA-CR-204195; NAS 1.26:204195; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

A computational model of human self-motion perception has been developed in collaboration with Dr. Leland S. Stone at NASA Ames Research Center. The research included in the grant proposal sought to extend the utility of this model so that it could be used for explaining and predicting human performance in a greater variety of aerospace applications. This extension has been achieved along with physiological validation of the basic operation of the model.
Author
Vestibules; Motion Perception; Human Performance; Physiological Effects; Mathematical Models; Sensors

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MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering; biotechnology; and space suits and protective clothing. For related information see also 16 Space Transportation.

19970013789 Army Aeromedical Research Lab., Fort Rucker, AL USA
Subjective Evaluation of the Communications Earplug with Flexible Harness (CEP/FH) Among CH-47D Crewmembers ***Final Report***
Ribera, John E., Army Aeromedical Research Lab., USA; Mozo, Ben T., Army Aeromedical Research Lab., USA; Murphy, Barbara A., Army Aeromedical Research Lab., USA; Jul. 1996; 18p; In English

Contract(s)/Grant(s): 3016287A878
Report No.(s): AD-A312045; USAARL-96-29; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Noise levels in Army rotary-wing aircraft, particularly the CH-47D (Chinook), can reach as high as 115 dBA. Current aviator helmets provide adequate hearing protection. However, speech communication is less than optimum. The Communication Earplug with Flexible Harness (CEP/FH), developed at the USA Army Aeromedical Research Laboratory, may provide an answer to the problem. Seventeen aviators and crewmembers of a U.S. Army Reserve CH-47D unit field tested the CEP/FH and subsequently were queried. Results of the posttrial survey are presented and discussed. When compared with the standard issue SPH-4 series aviator helmet, crewmembers wearing the CEP/FH perceived improved speech clarity and reduced levels of noise. Based on weaknesses relative to the harness and microphone components of the CEP/ FH, an advanced prototype of the CEP has evolved. It promises to be more compatible within the CH-47D environment, and more acceptable to crewmembers than the CEP/FH, while providing hearing protection and enhancing speech intelligibility in noise.
DTIC
Ear Protectors; Rotary Wing Aircraft; Noise Intensity; Harnesses; Aircraft Noise; Aerospace Medicine; Helmets

19970014199 Sigmatech, Inc., Missions Operations Lab., Huntsville, AL USA
Launch Deployment Assembly Human Engineering Analysis
Loughead, T., Sigmatech, Inc., USA; Dec. 1996; 58p; In English
Contract(s)/Grant(s): NAS8-40586
Report No.(s): NASA-CR-203944; NAS 1.26:203944; E066(96-21); No Copyright; Avail: CASI; A04, Hardcopy; A01, Microfiche

This report documents the human engineering analysis performed by the Systems Branch in support of the 6A cargo element design. The human engineering analysis is limited to the extra vehicular activities (EVA) which are involved in removal of various cargo items from the LDA and specific activities concerning deployment of the Space Station Remote Manipulator System (SSRMS).
Derived from text
Extravehicular Activity; Remote Manipulator System; Space Stations; Cargo; Launching

19970014256 Center for Hazardous Materials Research, Pittsburgh, PA USA
Tolerance of Biofilters to Paint Spray Booth Operating Conditions ***Final Report, Jan. 1994 - Feb. 1995***
Paff, S. W., Center for Hazardous Materials Research, USA; Bosilovich, B. E., Center for Hazardous Materials Research, USA; Apr. 1995; 90p; In English
Contract(s)/Grant(s): DAAA21-93-C-0046; AF Proj. 1900
Report No.(s): AD-A308728; AL/EQ-TR-1995-0015; No Copyright; Avail: CASI; A05, Hardcopy; A01, Microfiche

Spray painting operations contribute a large fraction of the volatile organic compounds (VOCs) and hazardous air pollutants (HAPs) emitted by operational Air Force installations. The Center for Hazardous Materials Research (CHMR) was commissioned to perform a study to determine the technical and economic feasibility of using biofiltration technology to control VOC emissions from spray painting facilities. Biofiltration is a firmly established method conventionally applied as a steady-state treatment for relatively clean air streams slightly contaminated with organic odors. Whereas paint facility exhausts contain compatible concentrations of metabolically accessible VOCs, they also include fine paint particulates that contain such toxins as chromate salts (from primers) and isocyanates (from topcoats). In addition, the pattern of delivery is not constant, the load typically being heavy for about two consecutive days every second week and essentially zero the remaining 12 days.
DTIC
Air Pollution; Hazardous Materials; Isocyanates; Toxins and Antitoxins; Contamination; Air Quality

19970014350 Institute for Human Factors TNO, Soesterberg, Netherlands
Evaluation of the Usability of the PG1MS Night-Vision Goggle ***Interim Report Evaluatie Inzetbaarheid van de PG1MS Nachtzichtkijker***
Kooi, F. L., Institute for Human Factors TNO, Netherlands; Jun. 17, 1996; 26p; In Dutch
Report No.(s): AD-A311634; TNO-TM-96-A025; TDCK-RP-96-0161; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

The PG1MS night-vision goggle (NVG) was compared to more modern NVGs on visual acuity and vehicle detection. Visual acuity was measured over a large range, covering all relevant light levels. When possible, the percentage of nights a NVG yields sufficient resolution to perform a task was calculated, using the statistical distribution of nighttime light levels in the Netherlands.

The more modern NVGs can be used in up to 50% more of the nights for target detection. Suggestions are made for possible further use of the PG1MS NVGs.
DTIC
Night Vision; Goggles; Visual Acuity

19970014363 Institute for Human Factors TNO, Soesterberg, Netherlands
Climate and Work Load Both Interact with Individual Characteristics in Determining the Human Heat Stress Response ***Interim Report Klimaat en Werkbelasting Beinvloeden Beide de Individuele Karakteristieken bij het Bepalen van de Menselijke Reactie op Hittebelasting***
Havenith, G., Institute for Human Factors TNO, Netherlands; Coenen, J. M., Institute for Human Factors TNO, Netherlands; Kistemaker, J. A., Institute for Human Factors TNO, Netherlands; Dec. 08, 1995; 28p; In English
Contract(s)/Grant(s): B95-003
Report No.(s): AD-A309613; TNO-TM-1995-B-14; TDCK-TD-95-1495; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Heat exposure data from comparable heterogeneous subject groups (Large variations in VO(2max), mass, body surface area (A%), fat content, A(du)/mass ratio) who worked on a cycle ergometer at a Load relative to their V0(2max) (RL) in a cool (CO; 2l C, 50% rh), warm humid (WH; 35 C, 80%) and a hot dry (HD; 45 C, 20%) environment (n=24) or who worked at a fixed toad (FL; 60W) in a WH (n=27) and a HD (n=30) climate, were analysed for the interaction of individual characteristics with climate type and work load. Exposures lasted 75 to 90 minutes for different conditions (constant within each condition). The observed results can be explained by a model, in which heat production and heat dissipation capacities are correlated with the subjects VO(2max), the internal heat liberation is based on metabolic rate, heat loss capacity is determined by the climate, body mass acts as a heat sink and skin fat layers only exert an insulative effect at low blood perfusion rates. This study showed, that effects of individual characteristics on human heat stress response cannot be interpreted without taking into consideration the heat transfer properties of the climate used and the metabolic heat load resulting from the type of workload.
DTIC
Climate; Workloads (Psychophysiology); Heat Tolerance; Stress (Physiology); Human Body

19970014513 Michigan Univ., Div. of Research and Development, Ann Arbor, MI USA
The Subgoal Structure as a Cognitive Control Mechanism in a Human-Computer Interaction Framework ***Interim Report, Dec. 1988 - Dec 1993***
Jong, Hee Sen, Michigan Univ., USA; Mar. 1996; 205p; In English
Contract(s)/Grant(s): MDA903-89-K-0025
Report No.(s): AD-A312094; ARI-RN-96-58; No Copyright; Avail: CASI; A10, Hardcopy; A03, Microfiche

Human/Computer Interaction (HCI) research has gained prominence due to the need to make computers easier to learn and use. This research (1) develops an HCI framework to structure and review HCI models, (2) develops a subgoal theory that investigates some pieces missing from current models, and (3) tests the subgoal theory.
DTIC
Human-Computer Interface; Human Factors Engineering; Tasks

19970014646 Virginia Univ., Office of Sponsored Programs, Charlottesville, VA USA
Effects of Humidity Swings on Adsorption Columns for Air Revitalization: Modeling and Experiments ***Final Report, 16 Jan. 1994 - 15 Jan. 1997***
LeVan, M. Douglas, Virginia Univ., USA; Finn, John E., NASA Ames Research Center, USA; Jan. 15, 1997; 13p; In English
Contract(s)/Grant(s): NCC2-5024
Report No.(s): NASA-CR-204108; NAS 1.26:204108; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Air purification systems are necessary to provide clean air in the closed environments aboard spacecraft. Trace contaminants are removed using adsorption. One major factor concerning the removal of trace contaminants is relative humidity. Water can reduce adsorption capacity and, due to constant fluctuations, its presence is difficult to incorporate into adsorption column designs. The purpose of the research was to allow for better design techniques in trace contaminant adsorption systems, especially for feeds with water present. Experiments and mathematical modeling research on effects of humidity swings on adsorption columns for air revitalization were carried out.
Derived from text
Air Purification; Humidity; Mathematical Models; Experiment Design

19970014931 Hughes Training, Link Operations, Inc. Mesa, AZ USA

Procedures for Conducting a Field Evaluation of Night Vision Goggle-Compatible Cockpit Lighting ***Final Report, Dec. 1994 - Aug. 1995***

Reising, Jack D., Hughes Training, USA; Antonio, Joseph C., Armstrong Lab., USA; Fields, Bruce, Armstrong Lab., USA; Mar. 1996; 24p; In English

Contract(s)/Grant(s): F41624-95-C-5011; AF Proj. 1123

Report No.(s): AD-A308777; AL/HR-TR-1995-0167; No Copyright; Avail: Issuing Activity (Defense Technical Information Center (DTIC)), Microfiche

The requirements to assess the compatibility of aircraft cockpit lighting with Night Vision Goggles (NVGs) are defined in MIL-L-85762A, Lighting, Aircraft, Interior, Night Vision Imaging System (NVIS) Compatible. However, the procedures specified to evaluate cockpit lighting are primarily specific to the laboratory environment, with only a few assessments specific to the field environment. This report describes the procedures used by Armstrong Laboratory's Aircrew Training Research Division (AL/HRA) to conduct a field evaluation of aircraft cockpit lighting. The evaluation procedures are divided into Planning, Evaluation Preparation, Assessment Procedures, and Results. This report can also be used as a guideline for other organizations that need to conduct NVG-compatible cockpit lighting evaluations.

DTIC

Lighting Equipment; Evaluation; Night Vision; Goggles

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