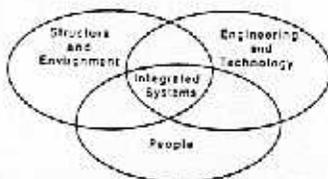




MANPRINT BULLETIN



Vol. II No. 5

"Remember the Soldier"

January/February 1988

A Framework for Human Factors Engineering Research Requests

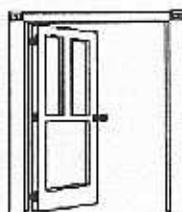


by Joseph Jones
Headquarters, Armament Division
Eglin Air Force Base, FL

In an attempt to provide Human Factors Engineering (HFE) support to major Eglin AFB programs, it was found that the complexities of these systems are not easily resolved by readily available HFE tools. For example, the Strategic Air Command training system, known as the Strategic Training Route Complex/Route Integration Instrumentation System (STRC/RIIS), had three major goals: (1) to promote growth and flexibility in crew situational awareness and judgement, (2) to enhance aircrew confidence/capability in bomber tactics, and (3) to enhance aircrew execution and timing of proper individual and coordinated tasks. Such goals generate many questions. For example, how do we measure crew-situational awareness, judgement, confidence, and coordination well enough to establish training flight scenarios that differentiate each crew member's separate growth program? How do we effectively debrief crews so that growth in situational awareness, judgement, and timely coordination is optimally facilitated? How does scenario generation interact with crew awareness, crew selection, planning for future tactics, and future interface design?

Air Force Regulations (AFR)-800-15 contains many of the same requirements as the Army's

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GEN Wagner Underscores AMC's Commitment to MANPRINT at One-Day Seminar

by Jack Dice
Automation Research Systems, Ltd.

The Army Materiel Command (AMC) expressed its commitment to MANPRINT by holding a MANPRINT seminar for the AMC leadership. The event, hosted by GEN Louis C. Wagner, Jr., Commanding General, US Army Materiel Command, was held at Fort Belvoir, VA on December 16, 1987.

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HFE Research Requests (continued from page 1)

MANPRINT program regulations (AR-602-2). These regulations require design trade-offs that integrate cross-discipline or macro parameters such as those related to the STRC/RIIS program. Human factors engineers are required to request research involving micro-parameters; these requests should be coordinated among the engineers in order to decrease redundancy and promote sharing of results.

Coordinated requests for macro-related research require a theoretical framework that interrelates tasks, system design, reliability, and performance measures responsive to MANPRINT and AFR-800-15 elements. This theory must also account for present knowledge and be sufficiently predictive to suggest progressive steps in a research agenda. This need for coordination, as well as the increasing complexity of the human factors engineer's responsibilities, has encouraged formation of an acquisition interest-group within the DOD HFE Technical Group (TG). The group's objectives include facilitating technology transfer from the laboratories to new systems, feedback to researchers on the application of laboratory products, a research request agenda, user feedback, and all HFE-related weapon systems acquisition concerns.

As organizer of the acquisition interest group, I have reviewed HFE- technology needs, compiled associated specifications for an HFE theory, and evolved a trial theory, primarily from DOD-funded research literature. The resulting report will be offered to the group along with a sample set of requirements from the STRC/RIIS program for consideration in the development of a theory and research request agenda. The title of the report is "Mental Model Theory: Awareness (Processes) Psychology," (DTIC number AD B 110 567).

Your contributions to a weapons systems acquisition-oriented HFE theory and research request agenda, support for the acquisition HFE interest-group, and contributions toward achieving the STRC/RIIS program goals will be appreciated.

For additional information, contact Mr. Joe Jones, AD/ENPS, Eglin AFB, FL 32542-5000, AV 872-8652, COMM (904) 882-8652, or Maj Glissel, STRC/RIIS Program Manager, AD/YII, Eglin AFB, FL, 32542-5000, AV 872-9307 or COMM (904) 882-9307.



**IMPLEMENTING MANPRINT:
SOME INCONSISTENCIES**



by Daniel McCrobie
General Dynamics Corporation

Editor's Note: Mr. McCrobie's comments are reflective of his own point of view, and do not in any way reflect the views of Valley Systems Division employees or those of General Dynamics Corporation.

Having recently participated in a MANPRINT panel session at the 31st Annual Meeting of the Human Factors Society, I was able to learn much about current MANPRINT efforts from both Army and industry perspectives. Two questions remain, however, that need to be addressed in order to further my understanding of MANPRINT and enable me to be an effective MANPRINT agent in my organization.



1. How can I perform MANPRINT analyses if there is no request for such work in the Request for Proposal (RFP) or in the contract?



The Army is currently implementing a streamlined acquisition process (ASAP) for the development and procurement of weapon systems. This gives the Army "more bang for less bucks" by encouraging low-priced developmental programs that proceed quickly from the conceptual phases through production. To stay competitive and win these types of contracts, companies will cut costs by deleting functions from the usual list of analyses and design processes that are offered to the customer—usually removing those functions not required by the Contract Data Requirements List (CDRL).

MANPRINT has not yet been universally applied to all new Army systems. For MANPRINT tasks to be performed during a system development effort, there must be specific deliverable data items requested by the customer, specified in either the CDRL or as items in the Statement of Work (SOW). All Requests for Proposals (RFP), likewise, must clearly state that active MANPRINT analyses will be required, and that MANPRINT criteria will be included in the source selection decision. A description of the specific analyses required should also be included.

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AMC (continued from page 1)

LTG Jerry M. Bunyard, Deputy Commanding General for Research, Development, and Acquisition, chaired the session.

The seminar began with an overview of MANPRINT, followed by presentations on how to make MANPRINT work, how to implement MANPRINT in the RFP and the NDI process, and the role of the Human Engineering Laboratory. These briefings set the stage for an afternoon review of MANPRINT in the Line-of-Sight Forward (Heavy) component of the Forward Area Air Defense Systems. BG Donald M. Lionetti, Asst. Commandant of the US Army Air Defense School, and BG William J. Fiorentino, Program Executive Officer for the Forward Area Air Defense Program, discussed MANPRINT's role in the Required Operational Capability (ROC), the Request For Proposal (RFP), test and evaluation, and source selection. Their review effectively illustrated the actual application of MANPRINT in a major Non-Developmental Item (NDI) procurement.

MANPRINT management and training were also discussed during the seminar. AMC MANPRINT management through Integrated Logistic Support (ILS), particularly those efforts early in the acquisition process, generated a great deal of discussion; some seminar participants preferred research, development, and engineering centers as the focal point of MANPRINT management. LTG Bunyard provided mission-type guidance for getting the job done and left the organizational solution at the discretion of the major subordinate command commanders.

The need for MANPRINT training for AMC and industry was another topic of discussion. A number of participants expressed an interest in similar one-day seminars tailored to their needs, AMC/industry seminars, and other exportable training to supplement the current MANPRINT training programs.

The 16 December seminar ensured that the AMC leadership was fully informed of the MANPRINT program. GEN Wagner expressed his personal commitment to the program, relevant issues and concerns were discussed, and the consensus judged the day to have been well-spent.



Inconsistencies (continued from page 2)

Not mentioning MANPRINT when defining a program generally conveys customer disinterest in these issues; this in turn makes it difficult for MANPRINT engineers to get funding for specific analyses.

.....
2. Are MANPRINT and Non-Developmental Item (NDI) acquisition programs mutually exclusive?
.....

A second trend in Army weapon acquisition is the NDI weapons procurement process. This type of program requires that components selected for inclusion in the weapon system be in the current Army inventory. Program engineering is limited to subsystem integration and the development of interface software and electronics. MANPRINT should play an active role in the selection of components, but these decisions are more likely made by program managers who consider cost to be the major selection factor. MANPRINT is doomed to exclusion because managers can only choose from hardware that is already approved for military use. The effectiveness of the MANPRINT engineer is further hampered by NDI contracts which specifically state that no modification may be done to the selected hardware. Components developed prior to the MANPRINT initiative are not necessarily well-engineered from either a human factors or other MANPRINT domain standpoint. Unless some incentive is provided to industry for choosing well-designed, human-engineered components, MANPRINT will probably not be a factor in these types of programs.

The success of the MANPRINT program depends upon the Army's commitment to funding the MANPRINT tasks and analyses for all new weapon acquisition programs. Specific analyses must be requested by the customer; source selection criteria must reward those contractors whose proposals demonstrate an understanding of and a willingness to meet MANPRINT objectives. It has been proven that systems designed to fit the soldier are easier to operate, more effective, and require less maintenance support. The Department of Defense needs to support the MANPRINT effort to ensure that all newly fielded equipment will contribute to total system performance.

Comments and suggestions may be directed to Mr. D. McCrobie, General Dynamics, POB 50-800, MZ 601-19, Ontario, CA 91761-1085, (714) 945-7000.

Some Inconsistencies in Implementing MANPRINT: A Response

by LTC Keith Fender

MANPRINT, Research and Studies Directorate
Office of the Deputy Chief of Staff for Personnel,
HQDA

Mr. McCrobie brings out some excellent points (in his article "Implementing MANPRINT: Some Inconsistencies") regarding the competing requirements of several new Army acquisition initiatives, specifically, the Army Streamlined Acquisition Process (ASAP), Non-Developmental Items (NDI), and MANPRINT.

The role of the government is key because the contractor will deliver whatever the government requests. The MANPRINT effort cannot be reduced to a bureaucratic process or checklist; however, the government must think smart and tailor its requirements to fit the program and the soldiers who will ultimately operate and maintain the new systems. These new initiatives will produce equipment that incorporates the human into its total system performance requirements, thereby lowering operating and support costs.

Mr. McCrobie's first question asks how MANPRINT analyses can be performed if there is no request for such work in the Request for Proposal (RFP) or in the contract. His concern centers around the lack of a MANPRINT Data Item Description (DID) that can be enforced as industry looks for ways to meet the reduced timelines of the ASAP process. There are several new developments that will assist the materiel developer in communicating MANPRINT requirements. In September 1987, the US Army Research Institute (ARI) published the "MANPRINT Handbook for RFP Development," which contains detailed guidance on how MANPRINT specifications might appear in an RFP. The handbook also includes a sample RFP for a major notional weapon system being acquired under the ASAP process.

A second development is in the area of source selection. A "MANPRINT in the Source Selection Process" guide, presently waiting HQDA approval, addresses the source selection process by providing specific information on MANPRINT source selection panel organization and staffing, MANPRINT evaluation criteria (to include individual domain evaluation as well as overall MANPRINT integration and man-

agement structure), and the impact of ASAP and NDI. Experience has shown that MANPRINT can be successfully included in source selection evaluation, including NDI types A, B, and "other." The Army must write RFPs and selection criteria to select the "best value;" MANPRINT and soldier performance consideration is clearly part of that formula. The level of interest at HQDA in this area is reflected in a 16 June 1987 message from the Office of the Under Secretary of the Army stating that "MANPRINT shall be a separate major evaluation criterion of the same visibility as technical, management and cost. No factor or sub-factor of any other criterion may be ranked above MANPRINT."

Mr. McCrobie also expresses concern about the MANPRINT DID. There are several reasons that may explain why no DID exists to date. Because the MANPRINT process is new, there has been insufficient time and experience to develop a DID that contains all contract deliverables. Also, MANPRINT is not a structured administrative drill; instead, it is a thought process that asks combat and materiel developers as well as industry to look at the soldiers who will operate and maintain the new system. MANPRINT asks that those involved understand the problems with the predecessor system to be replaced and to anticipate the human performance problems of the technologies being considered before a final design is selected. Such a process requires analyses tailored to the system and soldiers in question. Many of these analyses are already being done as a part of the human factors engineering, training, system safety, and ILS/LSA requirements of the contract. MANPRINT is not asking for new analyses; it asks that both Army and industry management visibility be given to the continuous integration of human performance and materiel design considerations throughout the acquisition process.

Mr. McCrobie asks if MANPRINT and Non-Developmental Item (NDI) acquisition programs are mutually exclusive. He is concerned that in NDI acquisitions, program engineering is limited to subsystem integration and the development of interface software and electronics. Though MANPRINT may appear to have little impact on programs where no modification may be done to selected hardware, it does indeed play a role in the NDI process. According to the forthcoming US Army Research Institute guide "The Application of MANPRINT in NDI Acquisitions," the MANPRINT

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Response (continued from page 4)

effort can be initiated early on as part of the market analysis process. MANPRINT goals, constraints, and issues developed by the combat and materiel developers in the System MANPRINT Management Plan (SMMP) must be addressed in the marketplace environment to determine whether or not critical user requirements can be met using an NDI strategy. Up-front analysis and management structure must be in place before the market investigation begins. If significant MANPRINT issues cannot be addressed because of inadequate data or other reasons, additional effort may be required before NDI is considered as a feasible and viable acquisition strategy; the user-developed MANPRINT performance requirements can then be used for source selection criteria. By including MANPRINT in NDI, the government has a better basis to select the "best value," and industry can market their products not only on cost and technical specifications, but also on demonstrated customer-realized performance and effectiveness. Front-end MANPRINT analyses will also provide early identification of possible trade-offs.

It is difficult, as Mr. McCrobie points out, to make MANPRINT happen while other acquisition process initiatives are being introduced. MANPRINT is a new process and is not fully understood or implemented throughout the Army. A new one-week training program is bringing together senior-level managers from TRADOC and AMC to help increase the understanding and dialogue between these two commands. As previously stated, key guides on the RFP, the source selection process, and NDI acquisitions have been or are being developed to assist Army and industry action officers and managers in implementing MANPRINT. Finally, industry is now being given the opportunity to provide their comments on draft Army requirement and procurement documents. This should improve the Army-industry partnership that is so vital to the success of the MANPRINT program.

For more information, contact LTC Fender at AV 225-9213 or COMM (202) 695-9213.

POC LIST UPDATE

The MANPRINT Points of Contact List will be updated during the month of February. POCs should check the current list to verify address and phone number. For updates or additions, return the Readers Response form with "POC" checked to ARS, 4480 King St., Ste. 500, Alexandria, VA 22302.

Manpower, Personnel, Training and Safety Conference

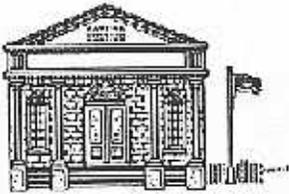
The National Security Industrial Association Manpower and Training Committee is sponsoring an "Integration of Manpower, Personnel, Training, and Safety in Systems Acquisition" conference to be held in Orlando, FL, 3-5 May 1988. The conference will focus on issues related to Congressional and DOD actions directly affecting MPTS during systems acquisition. Highlighted will be presentations and discussions concerning Congressional action (Title 10), DOD reaction (5000.1 and 5000.2), the MPTS requirements of the military services, and their implementation by industry. Resulting participant recommendations will be submitted by the NSIA to the Department of Defense for their consideration and implementation. See "Meetings of Interest" on page 6 for registration information.

**MANPRINT Training for Industry**

by CPT Joseph Rozmeski
Soldier Support Center - National Capital Region

The MANPRINT training program includes courses for staff officers and middle/senior management, as well as specially-tailored courses/seminars. The MANPRINT Staff Officer Course (MSOC) is a three week course designed to train officers, warrant officers, non-commissioned officers, civilian personnel, and industry to perform duties as Staff Officers responsible for integrating MANPRINT considerations throughout the materiel development and acquisition process. The MANPRINT Senior Training Course (MSTC) is a one week course designed to bring together middle and senior level managers from AMC, TRADOC, and industry to discuss the impact of MANPRINT on the materiel acquisition process. The 1988 schedule for both courses is listed on page 6. Specially-tailored courses/seminars address specific needs and are conducted as those needs are identified.

For more information on registration for courses/seminars, contact Commander, Soldier Support Center - National Capital Region, Attention: ATNC-NMF-B (SFC Usher), Alexandria, VA 22332-0400. Commercial telephone: (703) 325-3706.



Schedule of MANPRINT Courses for FY88

MANPRINT Senior Training Courses

22-26 Feb 88 (Bliss)	23-27 May 88 (TACOM)
28 Mar - 1 Apr 88 (Sill)	27 Jun - 1 Jul 88 (Knax)
25-29 Apr 88 (Rock Island)	

MANPRINT Staff Officers Courses*

7- 25 Mar 88	11-29 Jul 88
4- 22 Apr 88	8-26 Aug 88
2-20 May 88	12-30 Sept 88
6-24 June 88	

*All courses will be held at the Casey Building, Humphrey's Engineer Support Activity Complex, Ft. Belvoir, VA.

MANPRINT INFORMATION

POLICY-MANPRINT, Research and Studies Directorate, HQDA (DAPE-MR), Washington, DC 20310-0300. AV 225-9213, COMM (202) 695-9213.

MANPRINT TRAINING - Soldier Support Center-National Capital Region, ATTN: ATNC NM, Alexandria, VA 22332-0400. AV 221-3706, COMM (703) 325-3706.

PROCUREMENT & ACQUISITION - US Army Materiel Command, ATTN: AMCDE-PQ, Alexandria, VA 22333-0001. AV 284-5696, COMM (202) 274-5696.

HUMAN FACTORS ENGINEERING STANDARDS AND APPLICATIONS - Human Engineering Laboratory - MICOM Detachment, ATTN: SLCHE-MI, Redstone Arsenal, AL 35898-7290. AV 746-2048, COMM (205) 876-2048.

MANPOWER, PERSONNEL AND TRAINING RESEARCH - Army Research Institute, ATTN: PERI-SM, Alexandria, VA 22333-5600. AV 284-9420, COMM (202) 274-9420.

LTG Allen K. Ono, Deputy Chief of Staff for Personnel

Mr. Harry Chipman, ODCSPER Coordinator

Ms. Nan B. Irick, Editor, ARS



11 February 1988

MANPRINT Methodology Workshop, Alexandria, VA. To provide TRADOC Action Officers MANPRINT analysis methods. For more information contact: Mr. J. Dykhuis. Telephone: AV 221-2074 or (202) 325-2074.

3-5 May 1988

Manpower, Personnel, Training, and Safety Conference, Orlando, FL. Contact: National Security Industrial Assn., 1015 15th St., NW, Ste. 901, Washington, D.C. 20005. Telephone: (202) 393-3620.

9-11 May 88

Human Factors Engineering Technical Group Meeting, Baltimore, MD. Contact: Louida Murray, 6714 West Geddes Ave., Littleton, CO 80123. Telephone: (303) 979-7441.

10-13 May 1988

Applications of Human Performance Models to System Design: A Technology Demonstration Workshop, Orlando, FL. NATO sponsored. Contact: Dr. Michael H. Strub, US Army Research Institute-Fort Bliss Field Unit, PO Box 6057, Ft. Bliss, TX 79906-0057.



GENERAL INFORMATION



• Proposed articles, comments, and suggestions are welcomed, and should be mailed to: MANPRINT Bulletin, ATTN: HQDA (DAPE-MR), Washington, D.C. 20310-0300. Telephone: AV 225-9213, COMM (202) 695-9213.

Harold R. Booher
Director, MANPRINT, Research and Studies

The MANPRINT Bulletin is an official bulletin of the Office of the Deputy Chief of Staff for Personnel (ODCSPER), Department of the Army. The Manpower and Personnel Integration (MANPRINT) program (AR 602-2) is a comprehensive management and technical initiative to enhance human performance and reliability during weapons system and equipment design, development, and production. MANPRINT encompasses the six domains of manpower, personnel, training, human factors engineering, system safety, and health hazard assessment. The focus of MANPRINT is to integrate technology, people, and force structure to meet mission objectives under all environmental conditions at the lowest possible life-cycle cost. Information contained in this bulletin covers policies, procedures, and other items of interest concerning the MANPRINT Program. Statements and opinions expressed are not necessarily those of the Department of the Army. This bulletin is published monthly under contract by Automation Research Systems, Ltd., 4480 King Street, Suite 500, Alexandria, Virginia 22302, for MANPRINT, Research and Studies Directorate, Office of the Deputy Chief of Staff for Personnel under the provisions of AR 310-2 as a functional bulletin.