MANPRINT Quarterly

PEOPLE TECHNOLOGY ORGANIZATION

Vol. IV, No. 4 Fall 1996

The Director's Corner

This is a special issue containing a valuable monograph by Dr. Don Headley on the relationships between a variety of heat measures and a variety of human performance decrements. This monograph should become a frequently used tool for MANPRINT practitioners, and we are indebted to Dr. Headley and the U.S Army Research Laboratory, Human Research and Engineering Directorate.

Jack H. Hiller
Director for MANPRINT

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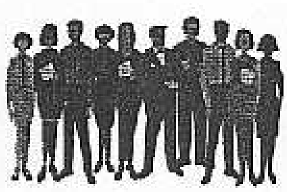
Meetings of Interest



HHA/MANPRINT Symposium

24-26 September 1996
Comfort Inn—Conference Center
Edgewood, MD

Hosted by:
U.S. Army Center for Health Promotion and Preventive Medicine
Aberdeen Proving Ground, MD 21010-5422

POC:
Ms. Ann Chaney
Commercial: 410-671-2925
DSN: 584-2925

TAG 37

4-7 November 1996
Renaissance Harbor Place Hotel
Baltimore, MD

Hosted by:
U.S. Army Research Laboratory
Human Research and Engineering Directorate
Aberdeen Proving Ground, MD 21005-5425

POC:
Ms. Sheryl Cosing
Commercial: 703-758-2574

Chair:
Dr. Robert Smillie
Commercial: 619-553-8015

Ground Armored Vehicles, Heat, and Crew Performance Considerations

by Dr. Donald B. Headley
ODCSPER Liaison
U.S. Army Research Laboratory—Human Research & Engineering Directorate

Two timely articles in the MANPRINT Quarterly by Ajoy Muralidhar (Winter & Spring, 1996; references 1 & 2) discuss heat stress and performance issues and show that the topic is a legitimate MANPRINT concern. His articles summarize the physiological aspects of thermal stress and focus on crew members of ground combat vehicles. This report extends the discussion of thermal stress by providing quantitative information about interior temperatures of ground vehicles and summarizes endurance and performance problems for physical and cognitive tasks.

1. Ground vehicles are heat traps because of their enclosed metal structure, and interior temperatures can reach the 90's or even higher.

a. As an extreme example, FM 90-3, Desert Operations states, "The highest known ambient temperature recorded in a desert was 136 degrees Fahrenheit (58 degrees Celsius). Lower temperatures than this produced internal tank temperatures approaching 160 degrees Fahrenheit (71 degrees Celsius) in the Sahara Desert during the Second World War" (pp. 1-8; reference 3).

b. Recordings during field studies showed the following:

(1) Temperatures in an M60A1 tank (closed-hatched, parked in the sun from 0700 to 1700) reached 93°F wet bulb globe temperature (WBGT) (reference 4). Figure 1 shows the inside and outside temperatures as a function of the time of day. Inside temperatures reached 85 degrees by 1130 and continued to climb throughout the recording period. As outside temperatures decreased after 1400, interior temperatures remained high, suggesting that the tank acts as a heat sink.

(2) Crew Compartment temperatures of an M113 armored personnel carrier (thinner skinned than a tank) parked in the sun also reached high temperatures (reference 5), as shown in Table 1.

Day	Period of Recording	High Vehicle Temperature	Corresponding Ambient Temp	Time
1	0830-1730	109	84	1400
2	1330-2200	127	84	1600
3	0800-1730	127	90	1600
4	0800-1600	118	95	1430
5	1300-1500	117	91	1430

Table 1. Interior M113 Temperature as a Function of Outside Temperature

Notes: On days 2 and 3, body heat of 13 occupants was simulated via heat lamps. On day 5, the engine was left running to see if limited forced ventilation would have an effect on interior temperatures (no measureable effect was observed).

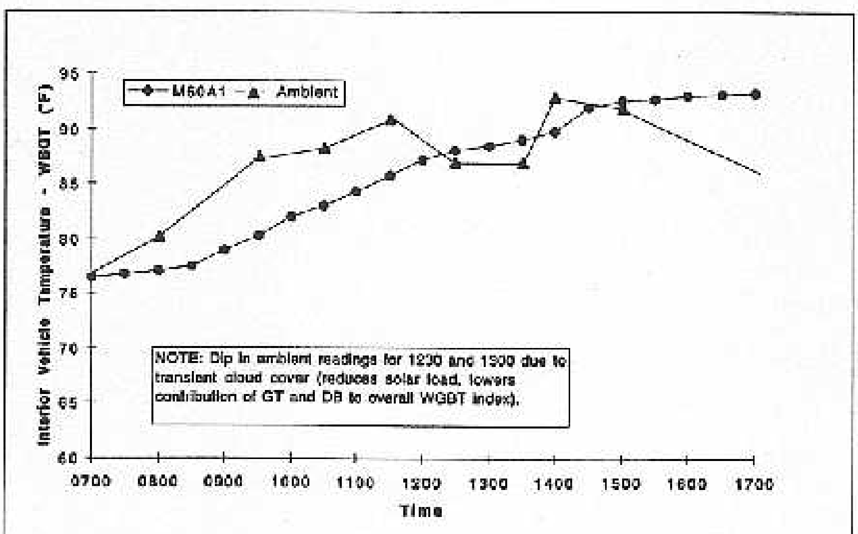


Figure 1. Ambient and interior vehicle WBGT temperature as a function of time of day.

(3) As part of a larger study, ambient temperatures and temperatures inside an M1 Tank were periodically recorded (reference 6). A summary of the recordings is as follows (see Table 2).

	Period of Recording	High Vehicle Temperature	Corresponding Ambient Temp	Time
Day 1	1100-1600	97	93	1400
Night 1	2200-0400	92	71	2200
Night 2	1900-0400	84	61	2100
Day 3	0900-1400	88	84	1400
Night 3	1900-0400	84	73	1900
Day 4	0900-1600	93	85	1500

Table 2. Interior M1 Temperature as a Function of Outside Temperature

Note: Recordings not made on Day 2 or Night 4. Hatch was periodically opened and closed during testing on a driving course. Vehicle was moving during most of the testing.

(4) In an earlier study (reference 7), it was shown that with an ambient temperature of 81 to 83°F and light to moderate clouds, the solar load on a helicopter canopy will raise the internal temperature of the cockpit to more than 120° F (dry bulb) and cause a crewman's temperature to reach 104 to 106°F in less than an hour.

(5) In an artillery crew study (reference 8), ambient temperatures and interior temperatures of an M109A3 howitzer and an M992 resupply vehicle were as shown in Table 3.

	Start of Firing			End of Firing		
Crew Attire	Ambient	How. Int.	FAASV Int.	Ambient	How. Int.	FAASV Int.
	71.2	70.7	73.5	69.4	73.2	80.5
BDU	73.6	72.3	78.4	76.4	76.5	86.6
	81.0	87.9	92.3	85.5	100.4	102.9
	67.8	71.9	69.9	70.3	81.1	84.0
SMOPP	78.4	82.6	84.7	81.9	89.4	93.1
	80.0	88.2	90.5	80.0	90.1	97.8
	72.8	79.2	89.9	75.9	92.5	97.1
CMOPP	84.7	86.7	96.8	87.0	99.5	106.4
	73.2	74.2	76.2	75.4	75.7	81.0

Table 3. Interior M109A3 and FAASV Temperatures as a Function of Outside Temperatures

Notes: Temperatures are in degrees Fahrenheit. Abbreviations: How. = howitzer; Int. = interior; FAASV = field artillery ammunition supply vehicle. BDU = battle dress uniform; MOPP = mission oriented protective posture; SMOPP = standard MOPP; and CMOPP = standard MOPP with individual cooling.

Each row represents one day of testing, which began mid to late morning; the actual firing lasted from 53 to 91 minutes.

2. Performance Deficits:

a. Given the relatively hot temperatures inside ground vehicles, it is reasonable to assume that the soldier is affected if operating in hot environments for long periods. The effects of heat can be considered to be on a continuum ranging from discomfort (i.e., feeling hot) to heat casualty (heat exhaustion, heat stroke). What may not be readily apparent is the performance degradation (physical & cognitive) that can occur before symptoms become strong enough to cause heat illness.

b. Tasks requiring physical performance are decremented by heat, so care must be taken to account for the variables of intensity of work and work duration in hot environments.

(1) For example, the National Institute for Occupational Safety and Health (NIOSH) recommended exposure limits (REL) for heat-acclimatized workers as a function of environmental heat and metabolic heat are shown in Table 4 (from reference 9).

Exertion Level in Watts (W)*	Work Environment (degrees F WBGT)														
	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91
	Recommended Exposure Limit (REL) in min. is:														
233										60		45	30		15
349							60		45	30		15			
465			60			45		30		15					
580	60			45			30		15						

Table 4. Recommended Exposure Limits as a Function of Exertion Level and Ambient Temperature

* Note: Values are derived from Table 2 of NIOSH publication. Descriptive labels are not given for the Watts values, but examples of workload and energy production, in Watts (from Reference 10) are: sitting, moderate arm & trunk movements (e.g., desk work, typing)—131-162 W; standing, light work at machine or bench, mostly arms—162-191 W; sitting, heavy arm and leg movements—191-235 W; standing, light work at machine or bench, some walking about—191-220 W; standing, moderate work at machine or bench, some walking about—220-411 W; walking about with moderate lifting or pushing—292-411 W; intermittent heavy lifting, pushing or pulling—440-586 W; hardest sustained work—586-704 W.

As an example, if one had to perform moderately heavy work (the "465" Watts row) in an environment around 80 degrees F (WBGT), the REL is 60 minutes per hour, but if the environment were 86 degrees, then the REL is 15 minutes per hour.

(2) Recommended threshold guidelines for instituting hot weather practices in industrial type settings

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(from the military's TB Med 507, "Prevention, Treatment and Control of Heat Injury," reference 10) are shown in Table 5.

Level of Work	Threshold (WBGT °F) for 2-hr Work Duration
Light (177 Watts)	86
Moderate (223 Watts)	82
Heavy (270 Watts)	77

Table 5. Guidelines for Hot Weather Practices, Industrial Settings

Notes: (1) The metabolic heat production values in Watts are based on time-weighted averages which include all activities in a given period (say 1 hour), including rest periods, and are somewhat lower than other definitions used for work load categories. (2) Threshold values are to "apply to the hottest two hour period" of the shift.

(3) The Army uses the guide shown in Table 6 for regulating outdoor physical activity in the heat and as a supervisory guide to limit heat-induced casualties.

Conditions (Wet Bulb Globe Temperature (WBGT))	Guidelines
Category I - 82 degrees	Scheduled work can be maintained if the workload is light to moderate.
Category II - 85 degrees	Usually a light to moderate workload can be maintained, 45 minutes of each hour with a 15-minute rest period each hour.
Category III - 88 degrees	Supervisors observe conditions and personnel. Take appropriate action to avoid heat related injury. Usually a light to moderate workload can be maintained, 30 minutes of each hour with a 30-minute rest period each hour.
Category IV - 90 degrees	Supervisors stop outside activities. Move personnel inside with fans or air conditioning.

Table 6. Guide for Outdoor Physical Activity

(4) A tool that can be used to estimate the duration one can perform physical work in a hot environment without becoming a heat casualty is the Heat Strain Decision Aid model which was developed by the U.S. Army Research Institute of Environmental Medicine. This model was used to estimate maximum work duration at varying degrees of work intensity (reference 11). For purposes of the model, soldiers were assumed to be in desert battle dress uniform (DBDU) with a closed flack vest. Results for two environments during varying degrees of relative humidity (RH), temperatures, and work intensity (moderate and field assault) are shown in Table 7.

In Vehicle Minutes Duration, Moderate Workload

Temp	20% RH	40% RH	60% RH	80% RH
85	143	100	79	66
90	106	80	65	55
95	87	67	55	47
100	74	58	48	40
105	65	51	41	34
110	57	45	36	28

Tactical Environment Minutes Duration

	20% RH		40% RH		60% RH		80% RH	
Temp	Mod	FA	Mod	FA	Mod	FA	Mod	FA
85	72	60	62	53	54	47	48	43
90	64	55	55	48	48	42	43	38
95	58	50	49	44	43	38	37	33
100	53	46	43	39	38	34	32	28
105	48	43	40	36	33	29	27	23
110	44	39	36	32	28	24	21	18

Table 7. Estimated Durations in Scenarios of Varying Temperatures, Humidity, and Exertion Levels

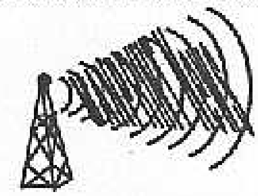
Notes: Values listed are the estimated maximum number of minutes a soldier can perform the indicated level of physical work without incurring greater than a 5% chance of becoming a heat casualty. Soldiers were assumed to be acclimated and hydrated. Wind speed was set at 0.5 meter per second. A moderate (Mod) workload is 425 watts; a field assault (FA) workload is 477 watts. RH = relative humidity. Temperatures (Temp) are dry bulb. Tactical environment is under full solar load (full daytime sun).

It can be seen that estimated durations are affected by temperature and humidity in the conditions specified earlier. (It should be noted that durations would be longer if just the DBDU were worn without body armor; wearing of the chemical defense ensemble would likely reduce endurance.) A potential cost of a crew conducting field assault in high temperatures and then being placed in a warm vehicular environment is that they may have trouble

(Continued on page 6)

Getting the Word Out

• Training Analysis. As discussed in the Summer 1996 MANPRINT Quarterly, DCSPLANS, PERSCOM is working in coordination with the Army Logistics Management College (ALMC) in an assessment of MANPRINT training. A training questionnaire was developed and sent to over 350 randomly selected practitioners, with a response rate of over 50%. Analysis of the results is complete, and we are in the process of preparing a report. A summary of the findings will be presented in the Winter 1997 MANPRINT Quarterly, which will be published in the December 1996 to January 1997 timeframe. Once again, we'd like to sincerely thank all of the individuals who took the time to respond to the questionnaire.



• Directory. The annual MANPRINT Directory has been completed! We will be mailing copies to key Government Points of Contact (POCs). If you are part of the initial mail out, you should be receiving the Directory by 15 October 1996. We think you will find it very useful as a vehicle for maintaining communications with other MANPRINT practitioners. If you have not received a MANPRINT Directory by mid-October, but would like to, you can fax your request using the "Reader's Response" located on page 11 of the Quarterly. You can also contact us via email (simmons@pentagon-hqdadss.army.mil) or mail a request to:

MANPRINT Directory
HQDA (DAPE-MR)
300 Army Pentagon
Washington, DC 20310-0300

• AR 602-2. DCSPER is in the process of finalizing the update of AR 602-2, "Manpower and Personnel Integration (MANPRINT), the Army's Human Systems Integration Process for Systems Acquisition." We would like to thank all of the individuals that reviewed and commented. The new regulation reflects the spirit of the new DoD 5000 series, stressing the importance of cooperation among everyone involved in acquisition.

MANPRINT Training Schedule

MANPRINT Action Officer Courses

Class	Date	Location
97-701	22-31 Oct 96	Fort Bliss, TX
97-702	3-12 Dec 96	Fort Hood, TX
97-001	27 Jan - 6 Feb 97	Fort Lee, VA
97-703	11-20 Mar 97	Fort Huachuca, AZ
97-704	15-24 Apr 97	Fort Eustis, VA
97-002	12-22 May 97	Fort Lee, VA
97-705	11-21 Aug 97	Redstone Arsenal, AL
97-003	15-25 Sep 97	Fort Lee, VA

MAISRC Workshop

Class	Date	Location
96-715	24-27 Sep 96	Fort Huachuca, AZ

MANPRINT Workshops

Class	Date	Location
97-701	8-11 Oct 96	Rock Island Arsenal, IL
97-702	23-24 Oct 96	Fort Knox, KY
97-703	5-8 Nov 96	Fort Sill, OK
97-704	19-22 Nov 96	Fort Huachuca, AZ
97-705	14-17 Jan 97	Fort Rucker, AL
97-706	25-28 Feb 97	Fort Bragg, NC
97-707	25-28 Mar 97	Washington, DC (PERSCOM)
97-708	29 Apr - 2 May 97	Fort Bliss, TX
97-709	6-9 May 97	Redstone Arsenal, AL
97-710	10-13 Jun 97	TACOM, Warren, MI
97-711	17-20 Jun 97	TACOM, Warren, MI
97-712	24-27 Jun 97	Fort Gordon, GA
97-713	29 Jul - 1 Aug 97	Picatinny Arsenal, NJ
97-714	5-8 Aug 97	Fort Leonard Wood, MO
97-715	9-12 Sep 97	Fort Hood, TX
97-716	30 Sep - 3 Oct 97	Rock Island Arsenal, IL

MANPRINT Training POC: CPT Mark Carmody or SFC Irvin Raveneau, (703) 325-1560/8422, DSN 221-1560/8422.

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compensating physiologically for their existing workload.

c. The effects of heat on <u>cognitive performance</u> (as typically defined by perceptual, vigilance, reaction time, tracking, math, and short-term memory tasks) have also been studied. Army tasks requiring these key human abilities would be subject to performance decrements.

(1) Sample tasks likely to be affected are (taken from "Sustaining Health and Performance in the Desert," reference 12):

- "monotonous, repetitive, or boring tasks"
- "tasks which require attention to detail, concentration, and short-term memory (e.g., calculations, radio authentication, map plotting, coding messages, repeating communications, etc.)"
- "tasks which are not self-paced (i.e., any task that must be done quickly or according to a fixed schedule)"
- "tasks which require arm-hand steadiness (e.g., aiming and shooting a weapon)"

(2) Military Standard 1472D, "Human Engineering Design Criteria for Military Systems, Equipment, and Facilities," states that "the effective temperature or CET (corrected effective temperature) within personnel enclosures utilized for detail work during extended periods shall be maintained at or below 29.5C (85F)" (para. 5.8.1.3; reference 13). (Note: the meaning of the effective temperature indices is similar to WBGT for enclosed environments.)

(3) A review of the literature of the effects of heat on cognitive and psychomotor-type tasks was performed to summarize a wide body of literature into a quantitative form which could be used for predictive purposes (reference 14). Based on their review and analysis, the authors composed charts that predicted, for a given type of task, what the likelihood of impaired performance would be for a given temperature and duration in the environment. Mental tasks (e.g., coding, math, short-term memory) and reaction time tasks were found to depend on both duration and temperature. Examples for these variables at high likelihood that a decrement will occur are shown in Table 8.

Temperature (WBGT °F)	Probability of Decrement	
	0.8	1
85	175 min.	195 min.
90	170	185
95	157	180
100	145	170

Table 8. Probability of Decrement on Mental Tasks as a Function of Temperature

Thus, a deficit will occur at a 100% probability after 170 minutes in a 100°F (WBGT) environment; one could perform mental work for 195 minutes at 85°F before deficits are certain to occur.

Tracking, vigilance, and complex tasks were predicted to be more sensitive to the effects of heat, and are better characterized by the temperature variable only (i.e., effects are essentially independent of exposure time). For example, such tasks would have a 100% probability of being adversely affected in a 100°F environment after just a short duration. In an 85°F environment, the probability of deficits is a little higher than 50%.

3. Summary. To recognize and attempt to ameliorate the stress of working in a hot environment is similar to protecting one's self from the effects of severe cold weather, inclement weather, chemical weapons, sleep loss, or poor nutrition. Heat affects not only the duration of working in the environment but also the quality of both physical and mental work. Thus, endurance and performance are at stake. This article presented data showing that vehicle interior temperatures in warm-hot environments frequently exceeded acceptable levels for effective performance of many kinds of tasks. The guidelines for conducting physical and mental work in hot environments indicate that many types of tasks are at risk in environments over 85°F (WBGT) if sustained work duration is required. Heat-related human performance degradation will occur even before overt signs and symptoms of heat illness appear. It must be recognized that strict application of guidelines is often impractical in battlefield settings—but with a downsized Army, the frequency of crew rotations is also likely to be reduced, thereby increasing the importance of the command guidelines or cooling systems for Army vehicles. Maintaining a vehicle environment at a sustaining level of around 85-90 degrees WBGT (note that this level is not the same as a 'creature comfort' zone of 70° or 75° often maintained in a passenger

vehicle) will lead to better crew performance.

4. References.

(1) Thermal Stress as a Performance Restricting Factor in Ground Combat Vehicles. Muralidhar, A. MANPRINT Quarterly, Winter, 1996, pp. 5, 8-9.

(2) Determination of Crew Heat Stress Exposure in Ground Combat Vehicles: A MANPRINT Concern. Muralidhar, A. MANPRINT Quarterly, Spring, 1996, pp. 4-7.

(3) FM 90-3, Desert Operations.

(4) M60A1 Crew Station Thermal Environment. Jones, R. D. U.S. Army Human Engineering Laboratory Technical Note 5-80, April 1980.

(5) Crew-compartment Temperatures: The Effects of a Solar-Heat Reflecting Paint. Randall, R. B. U.S. Army Human Engineering Laboratory Technical Note 4-66, July 1966.

(6) The Development of a Driving Course for Assessment of Driver Performance in a CB Environment. Harrah, D. M., Ryan, W. C., & Armour, J. S. U.S. Army Human Engineering Laboratory Technical Note 6-86, May 1986.

(7) Breckenridge, J. R., & Levell, C. A. (1970). Heat stress in the cockpit of the AH-1G Huey cobra helicopter. Aerospace Medicine, 44, 621-626.

(8) Zubal, O., Doss, N. W., Faughn, J. A., Kysor, K. P., Szlyk, P. C., Caretti, D.M., & Sils, I. V. (1993). Evaluation of the effect of protective clothing on the ability of self-propelled artillery (M109) crews to conduct and sustain high firing rate missions. ARL-MR-98. Aberdeen Proving Ground, MD: U.S. Army Research Laboratory.

(9) Criteria for a Recommended Standard...Occupational Exposure to Hot Environments. Revised Criteria 1986. DHHS (NIOSH) Publications No. 86-113. National Institute for Occupational Safety and Health, April 1986.

(10) Department of the Army Technical Bulletin TB MED 507, Prevention, Treatment and Control of Heat Injury, July 1980.

(11) Effects of Temperature and Humidity on Squad Performance in the Proposed U.S. Marine Corps Advanced Assault Amphibious Vehicle. Unpublished ARL-Human Research and Engineering Directorate report. Tauson, R. A., and Doss, N. W., Jan. 1995.

(12) Sustaining Health and Performance in the Desert: Environmental Medicine Guidance for Operations in Southwest Asia. U.S. Army Research Institute of Environmental Medicine, Natick, MA, Dec. 1990

(13) Military Standard 1472D, Human Engineering Design Criteria for Military Systems, Equipment, and Facilities, 1989.

(14) Isodecrement Curves for Task Performance in Hot Environments. Ramsey, J. D., & Morrisey, S. J. Applied Ergonomics, 1978, 9 (2), 66-72.

This article is a shortened version of an information paper prepared for MG Van Prooyen, Deputy for Systems Management and International Cooperation, Assistant Secretary of the Army (Research, Development & Acquisition), who requested information on the impact of heat stress on armored vehicle crews.

Reminder

Association of the United States Army (AUSA) Annual Meeting

14 - 16 October 1996

Sheraton Washington Hotel
2660 Woodley Road, at Connecticut Avenue, N.W.
Washington, D.C. 20008

Omni Shoreham Hotel
2500 Calvert Street, N.W.
Washington, D.C. 20008

Please stop by the MANPRINT exhibit, in the Convention Registration Lobby of the Sheraton Washington near the Registration Desk.

Metro Rail Red Line: Woodley Park/Zoo Station
Non-members of the AUSA may register at the Sheraton Washington.

MANPRINT Training Steering Committee Meeting

by Diana Lueker

Chief, Training and Information Systems Branch, MANPRINT Division
Office of the Deputy Chief of Staff for Plans, Force Integration and Analysis
U.S. Total Army Personnel Command

The MANPRINT Training Steering Committee held its semi-annual meeting on 24 July 1996 at the U.S. Total Army Personnel Command (PERSCOM). Representatives from the U.S. Army Training and Doctrine Command (TRADOC); U.S. Army Materiel Command (AMC); U.S. Army Research Laboratory (ARL); U.S. Army Operational Test and Evaluation Command (OPTEC); U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM); Director for Command, Control, Communications and Computers (DISC4); DA ODCSPER; U.S. Army Logistics Management College (ALMC); and PERSCOM meet twice a year to exchange information and provide guidance to support the MANPRINT training mission.

PERSCOM, as the proponent for MANPRINT training, hosted the meeting. LTC Wayne Salls, Chief of PERSCOM's MANPRINT Division, opened this session and introduced Ms. Roscille Nelson, Deputy Director for MANPRINT, ODCSPER, who provided brief remarks and welcomed the attendees. Ms. Diana Lueker, PERSCOM, served as moderator for the remainder of the meeting.

FY95 saw several changes in the MANPRINT training program. The timing was right to dispense with the MANPRINT for Managers Course (MFMC) and introduce a MANPRINT Workshop in its place. This was a well-received and rewarding initiative. For the past several years, Army downsizing has made it difficult for supervisors to justify lengthy training for employees. The MFMC became the catch-all for students who wanted MANPRINT training, but could not be spared for two weeks. The Workshop option now allows installations to select the length and emphasis of the training desired. ALMC has done an outstanding job of transitioning to the new course by revamping course materials and meeting the increased demand for training.

During the annual Structure Manning Decision Review in April 1996, DA ODCSOPS recommended flagging [for possible elimination] any training offering titled a "seminar," "workshop," or other less than formal "course." PERSCOM's MANPRINT Workshop was one of those flagged courses. After review, the flag was lifted. This pointed up the need for a new designation for the MANPRINT "Workshop" that would reflect its identity as a formal training course tailored to the needs of a particular target audience. That audience can be, for example, a sponsoring organization or a group of specialists in some specific MANPRINT area such as Automated Information Systems. The group discussed some possibilities for a more descriptive name for this offering, but no decision was reached.

The committee discussed the recent changes to DoD acquisition practices and the revision of the DoD 5000 series, as well as the Army regulations that support the changes. Domain representatives are uncertain as to how these changes will ultimately affect the MANPRINT Program, but they will have a significant impact on MANPRINT training. Revising course materials cannot be adequately undertaken at this time until the revised Army regulations are published. Instructors have already made great strides in identifying the changes and relationship between the new practices and the existing ones.

Ideas for marketing MANPRINT training have almost always been an agenda item for the committee. This session was no exception. Establishing a MANPRINT Home Page was suggested, and several committee members offered assistance in setting one up. Other ideas to maximize course attendance were: advertising upcoming courses and periodically running the MANPRINT training schedule in post newspapers; posting flyers; E-mail messages to the MANPRINT points of contact (POCs); and also making occasional site visits to develop or strengthen relationships between the training proponent and the installations POCs.

A suggestion was made to look at the feasibility of teaching the MANPRINT Action Officers Course

(MAOC) only at Fort Lee, Virginia and Huntsville, Alabama. ALMC feels the course should no longer be marketed as an exportable course. The suggested two sites could accommodate the longer course more effectively and have computer facilities and lodging available. After discussion, an agreement was reached to look at teaching the MAOC at three rather than two regional sites. Precise locations were considered but not decided on at the meeting.

The MANPRINT domain representatives provided updates on activities in their areas of expertise. This forum continues to be one of the best ways for all committee members to learn what is happening and what is new with regard to the various domains. Ideas for new training offerings, training materials, and alternative methods for current training often surface first at these semi-annual meetings.

PERSCOM plans to host the next committee meeting in January 1997. CPT Mark Carmody, the new Training Officer for the MANPRINT Division, PERSCOM, will coordinate that effort. CPT Carmody joined PERSCOM in June 1996 and serves as the proponent liaison to ALMC. If you have questions, ideas, or are interested in more about MANPRINT training or the committee's activities, please feel free to contact CPT Carmody at (703) 325-1560 or DSN 221-1560.

FOOTPRINT RELATIONAL DATA BASE

by Harold Robinett

Project Manager, FOOTPRINT
Office of the Deputy Chief of Staff for Plans, Force Integration and Analysis
U.S. Total Army Personnel Command

The ODCSPER, in conjunction with the Deputy Chief of Staff for Plans, Force Integration and Analysis (DCSPLANS), PERSCOM, has developed an automated Manpower, Personnel, and Training (MPT) relational data base known as FOOTPRINT. The goal was to develop a "tool" which uses existing data bases to display quickly the MPT characteristics/demographics of each Military Occupational Specialty (MOS) and Career Management Field (CMF) for Enlisted Personnel; Branch (BR), Functional Area (FA), and Area of Concentration (AOC) for Commissioned Officers; and Branch (BR) and Military Occupational Specialty (MOS) for Warrant Officers.

On 15 March 1996, the FOOTPRINT Relational Data Base became a part of the Proponent Integration Division of DCSPLANS. This division was formed to help strengthen the Personnel Proponent System and to assist the Personnel Proponents manage the personnel life cycle functions of their force. FOOTPRINT will now provide data for the Army Personnel Proponent System, AR 600-3; Manpower and Personnel Integration (MANPRINT) in the System Acquisition Process, AR 602-2; and Training Development Management, Processes, and Products, TRADOC Regulation 350-70.

The FOOTPRINT data base resides on a VM mainframe system at HQDA. Data is compiled from 14 automated sources, e.g., Enlisted Master File (EMF), Officer Master File (OMF), Personnel Management Authorization Document System (PMADS), Army Training Requirements and Resource System (ATRRS), Dependent Enrollment Eligibility Reporting System (DEERS), Standard Installation/Division Personnel System, United States Army Reserve (SIDPERS USAR); and the Personnel Structure and Accounting System (PERSACS). It is then stored by component: Active Army, Army Reserve, and Army National Guard.

Individuals who wish to use FOOTPRINT may do so with a valid HQDA DSS ID and password. Comments, questions, or requests for copies of "FOOTPRINT on Decision Support System" Users Guides may be addressed to the FOOTPRINT Manager, Mr. Harold Robinett, at DSN 221-2092 or COM (703) 325-2092, FAX xxx-6389, or via E-mail to:

robinett@pentagon-hqdadss.army.mil

or

robinett@hoffman-emh1.army.mil.