AFRL-SA-WP-TP-2011-0001

USAF HEARING CONSERVATION PROGRAM, DOEHRS DATA REPOSITORY ANNUAL REPORT: CY2009-2010

Elizabeth McKenna, Capt, USAF
Michelle LeMond, SSgt, USAF
Epidemiology Consult Service

June 2011

Air Force Research Laboratory
711th Human Performance Wing
School of Aerospace Medicine
Epidemiology Consult Service
2510 Fifth St.
Wright-Patterson AFB, OH 45433-7913

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From – To)*
01-06-2011	Technical Paper	Jan 2009 – Dec 2010

4. TITLE AND SUBTITLE

USAF HEARING CONSERVATION PROGRAM, DOEHRS DATA REPOSITORY ANNUAL REPORT: CY2009-2010

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
Elizabeth McKenna, Capt, USAF
Michelle LeMond, SSgt, USAF

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
USAF School of Aerospace Medicine
Epidemiology Consult Service
2947 Fifth St.
Wright-Patterson AFB, OH 45433-7913

8. PERFORMING ORGANIZATION REPORT NUMBER

AFRL-SA-WP-TP-2011-0001

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSORING/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT

Distribution Statement A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2011-5181, 26 Sep 2011

13. SUPPLEMENTARY NOTES

14. ABSTRACT

The United States Air Force (USAF) School of Aerospace Medicine (USAFSAM), Epidemiology Consult Service (PHR), Hearing Conservation Program (HCP) prepares an annual status report on the USAF HCP. This report covers both CY2009 and CY2010 and provides a corporate view of the current status of the USAF HCP with data reported from the Defense Occupational and Environmental Health Readiness System Data Repository (DOEHRS-DR). This report covers an overview of a few standard reports currently available in the DOEHRS-DR database, software implementation status data, hearing conservation program metrics, and recommendations. The DOEHRS-DR reports cited in this document reflect the data available in the data repository. Local hearing conservation program records may reflect a lower permanent threshold shift (PTS) rate due to the inability to resolve certain types of PTS cases within the DR and to import/export difficulties. The differences between the locally reported PTS rate and the PTS rate with the DR are currently being investigated by USAFSAM/PHR. We strongly recommend installation and major command (MAJCOM) HCP managers review their respective programs using the metrics given in this report, as they give an initial guideline to estimate program effectiveness.

15. SUBJECT TERMS

Hearing conservation, permanent threshold shift, threshold shift trends, Defense Occupational and Environmental Health Readiness System Data Repository (DOEHRS-DR)

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Capt Elizabeth McKenna
U	U	U	SAR	8	19b. TELEPHONE NUMBER *(include area code)*

I. Introduction

The United States Air Force (USAF) School of Aerospace Medicine (USAFSAM), Epidemiology Consult Service (PHR), Hearing Conservation Program (HCP) prepares an annual status report on the USAF HCP in accordance with Air Force Occupational Safety and Health (AFOSH) Standard 48-20, Occupational Noise and Hearing Conservation Program, 2.5.8-9, and Department of Defense Instruction (DoDI) 6055.12, Hearing Conservation Program. This report covers both CY2009 and CY2010.

The purpose of this report is to provide a corporate view of the current status of the USAF HCP with data reported from the Defense Occupational and Environmental Health Readiness System Data Repository (DOEHRS-DR). Major command (MAJCOM) and installation level reports are available quarterly and by request from USAFSAM/PHR, as well as by those who have user-defined roles in the data repository. This report covers an overview of a few standard reports currently available in the DOEHRS-DR database, software implementation status data, hearing conservation program metrics, and recommendations.

II. Discussion

A. *Software Implementation Status Data*

During 2009–2010, the DOEHRS Program Management Office released two software updates. DOERHS-HC software version 3.1.2.112 was deployed March 2009, with mandatory installation by June 2009. This update now uses the earliest initial, or type 3, baseline (DD 2215) as the reference. Baselines that were entered later in time and coded as a type 1 or type 2 will not be referenced. A letter was disseminated in July 2009 advising technicians to manually enter or reestablish the actual, current baseline of the individual if DOEHRS-HC is using an older or original baseline that is inaccurate. Temporarily inflated standard threshold shift (STS) rates were expected due to this software change.

The Benson Medical Audiometer (CCA-200) software version 6.21 (Benson Medical Instruments, Minneapolis, MN) was deployed in September 2010. The v6.21 update addressed the system administrator password requirements for the Air Force Standard Desktop Configuration for the Windows Vista operating system (Microsoft Corp., Redmond, WA). Department of Defense subject matter expert testing of the DOERHS-HC version 4.0 single-ear testing software was completed in May 2011.

B. *HCP Effectiveness Metrics*

Program Compliance:

One measure of the effectiveness of any HCP is program compliance. Compliance is defined as the number of people in a particular program who should receive annual audiograms (denominator data) compared to those people who received their audiograms (numerator data). This is one of the metrics specified in DoDI 6055.12. While it is a useful metric, it does have limitations that can influence its accuracy. The number of people on the HCP at each installation is manually entered by the DOEHRS-DR user-defined role HCP Managers (HCPMs) when they log into the DOEHRS-DR website. Towards the beginning of March 2011, aggregate data from Preventive Health Assessment Individual Medical Readiness (PIMR) were obtained that outlined the number of individuals on the majority of the HCP across the AF; this allowed for missing data to be entered directly by HCP functionals.

Tables 1 and 2 represent the compliance data for the USAF for the years 2009 and 2010. Due to the current lack of real-time methods of updating the denominator in the DOEHRS–DR database, these rates are only approximate but are representative of the most current denominator in the USAF HCP.

Table 1. HCP Compliance CY2010 (28 Mar 11 report)

Noise Exposed	People Tested	Compliance Rate
Military: 166,736	Military: 163,834	Military: 98.26%
Civilian: 29,395	Civilian: 25,952	Civilian: 88.29%
Total: 196,131	Total: 190,732	Total: 97.25%

Table 2. HCP Compliance CY 2009 (10 Feb 11 report)

Noise Exposed	People Tested	Compliance Rate
Military: 166,861	Military: 159,628	Military: 95.67%
Civilian: 32,172	Civilian: 25,748	Civilian: 80.03%
Total: 199,033	Total: 186,275	Total: 93.59%

Threshold Shift Trends:

The key metric for any HCP is the standard threshold shift (STS) as specified in DoDI 6055.12. The current data follow the STS criterion specified in DoDI 6055.12. Permanent threshold shift (PTS) is any STS that persists after the follow-up audiograms are completed and is a measure of permanent changes in hearing. Temporary threshold shift (TTS) is any STS that resolves after the follow-up audiograms are completed. TTS is a temporary loss of hearing due most likely to hazardous noise exposure and can be used to target intervention efforts for engineering controls and effective use of hearing protective devices. While PTS can be due to hazardous noise exposure, other factors, such as aging, can cause permanent hearing changes. Care is necessary when reviewing STS rates. The current rates can only be compared to themselves for a given point in time. Therefore, inquiries into the DR for threshold shift information are best viewed as a "snapshot" of the data in the repository for a given day. For DOEHRS purposes, TTS and PTS rates are directly influenced by the 30-day completion deadline for civilians and a 90-day completion deadline for military. Therefore, PTS rates are influenced by follow–up audiograms obtained outside the assigned window.

Table 3 represents the STS/PTS trend data for CY2009 to the end of CY2010. The PTS rates are essentially unchanged for 2009-2010. These data can be further broken down into military and civilian trend rates to determine if there are significant differences between these groups.

A review of the data suggests civilian rates continue to be somewhat higher than military rates. The difference is most pronounced for the PTS rates. As noted above, factors other than hazardous noise exposure can influence PTS rates, the most prevalent of which is aging effects and length of time working in hazardous noise environments. In some instances, military members retire and may return to the base as civilian employees in the same job duty. The effects of working in hazardous noise environments for many years will negatively affect the auditory status of many workers, as exposure over time accumulates. Some individuals will be

affected by a predisposition for age-related hearing loss and/or noise-induced hearing loss. Installation and MAJCOM HCP managers are encouraged to pay particular attention to efforts directed toward civilian worker areas.

Table 3. STS/PTS Trends: CY2009-2010 (10 Feb 11 report)

Year	N with Periodic	STS (%)	TTS (%)	PTS (%)
CY 2009	**164,378**	**10.01**	**2.90**	**7.12**
Military	140,323	8.60	2.69	5.90
Civilian	23,415	18.62	4.12	14.50
CY 2010	**168,964**	**9.59**	**3.19**	**6.40**
Military	144,788	8.19	2.89	5.30
Civilian	23,469	18.25	4.94	13.31

Table 4 represents STS rates for MAJCOMs and the difference in percent between 2009 and 2010 data.

Table 4. MAJCOM PTS Trends: CY2009-2010 (16 Mar 11 report)

MAJCOM	2009 (%)	2010 (%)	Delta
ACC	4.07	3.76	-0.31
AETC	9.47	8.76	-0.71
AFDW	5.83	5.62	-0.21
AFGSC	5.54	2.83	-2.71
AFMC	8.53	7.45	-1.08
AFR	11.23	10.40	-0.83
AFSOC	3.37	3.38	+0.01
AFSPC	14.19	11.44	-2.75
AMC	5.65	5.20	-0.45
ANG	10.16	9.03	-1.13
PACAF	5.16	5.18	+0.02
USAFA	8.96	11.50	+2.54
USAFE	3.86	3.26	-0.60

Table 5 displays hearing profile levels for H-1, H-2, and H-3 levels for military members. These data change little from year to year. Note that the numbers for cadets differ significantly from officers and enlisted.

Table 5. Hearing Profiles (Military) (10 Feb 11 report)

Year	No. of Personnel	H-1		H-2		≥H-3	
		No.	%	No.	%	No.	%
CY2010	**156,924**	**144,797**	**92.2**	**8,024**	**5.1**	**4,103**	**2.6**
Cadet	276	229	82.9	18	6.5	29	10.5
Enlisted	124,934	115,316	92.3	6,314	5.0	3,304	2.6
Officer	31,713	29,252	92.2	1,692	5.3	769	2.4
CY2009	**154,387**	**142,240**	**92.1**	**7,943**	**92.1**	**4,204**	**2.7**
Cadet	279	237	84.9	20	7.1	22	7.8
Enlisted	123,045	113,428	92.1	6,244	5.0	3,373	2.7
Officer	31,063	28,578	91.9	1,679	5.4	809	2.6

Hazard Assessment Metrics:

Two hazard assessment metrics have been identified in the DoDI 6055.12 hearing conservation program published December 2010. Specifically, the document requests reporting of percentage of noise hazardous workplace characterizations completed and index of unacceptable noise exposures. Calculation of these metrics is outlined in DoDI 6055.05 Occupational and Environmental Health and is under investigation by USAFSAM/PHR to determine appropriate reporting details.

III. Recommendations

The DOEHRS-DR reports cited in this document reflect the data available in the data repository. Local hearing conservation program records may reflect a lower PTS rate due to the inability to resolve certain types of PTS cases within the DR, and to import/export difficulties related to baselines older than 1998. The differences between the locally reported PTS rate and the PTS rate with the DR continue to be investigated by USAFSAM/PHR, which will soon provide additional guidance on management of this discrepancy (Attachment 1).

We strongly recommend installation and MAJCOM HCP managers review their respective programs using the metrics given in this report, as they give an initial guideline to estimate program effectiveness. Installation level reports are available for installation HCP managers to use. If not already obtained, HCPMs are encouraged to apply for a DOEHRS-DR website password to gain access to these reports. MAJCOM HCP managers can also request MAJCOM access to assess trends in their respective MAJCOM. All are encouraged to contact the Hearing Conservation Program Manager at USAFSAM/PHR for assistance.

Attachment 1

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON DC

4 February 2010

MEMORANDUM FOR ALMAJCOM/SG

FROM: HQ USAF/SG3
1500 Wilson Boulevard, Suite 1200
Arlington, VA 22209

SUBJECT: Use of Defense Occupational and Environmental Health Readiness System Hearing Conservation (DOEHRS-HC) v3.2.0.112 to Perform Hearing Conservation Program (HCP) Audiograms

The newest version of DOEHRS-HC v3.2.0.112, issued in March 2009, incorporates a major change in the way significant threshold shifts (STS) are calculated. DOEHRS-HC now uses the earliest dated DD Form 2215 "Baseline Audiogram" (*reason 1 or 2 DD Form 2215*) to determine the presence of an STS for an annual audiogram, unless a later baseline has been reestablished following an STS (*reason-3 DD Form 2215*). In previous versions of DOEHRS software, the baseline audiogram used to calculate an STS was the most recent baseline, regardless of the reason.

As a result of the software change, annual occupational audiograms which would otherwise "pass" compared with their most current reference may be STSs compared with their earliest dated reference. This has affected STS and permanent threshold shift (PTS) rates across the Air Force. A recent DOEHRS report for May-Oct 2009 indicated the overall Air Force PTS rate increased nearly 3 percentage points compared with the previous reporting period, which gained AF leadership visibility and scrutiny. With these new DOEHRS-HC business rules, the following actions should be taken to minimize the impact to Air Force data and the HCP:

a. When an annual audiogram results in an STS based on the new business rules, technicians should treat the audiogram as an STS and conduct a follow-up IAW AFOSH STD 48-20. After a physician or audiologist confirms the PTS, reestablish the reference based on this annual audiogram as a *reason-3 DD Form 2215*. The reestablishment of a *reason-3 DD Form 2215* is a crucial step in ensuring that future annual audiograms are calculated appropriately.

b. Technicians performing audiograms should apply the correct reason when they establish a reference baseline in accordance with instructions for box 15 on the DD Form 2215. Note: a *reason-2* baseline audiogram should only be applied to individuals who do not have a *reason-1 DD Form 2215* in DOEHRS-HC and have previously worked in hazardous noise areas.

c. In accordance with AFOSH STD 48-20; "workers terminated from the HCP who subsequently return to hazardous noise duties should have a current audiogram compared to their original reference audiogram. If the current results do not indicate a STS, the original DD

Form 2215 will serve as the reference audiogram. If an STS is present, use the new audiogram to establish a reference." This new reference should be a *reason-3 DD Form 2215*. No follow-up is required for an STS in this situation.

My POCs for this memorandum are Maj Natalie Johns, (703) 588-6468, DSN 426-6468, natalie.johns@pentagon.af.mil, and Maj Bridget McMullen, (210) 536-2940, DSN 240-2940, bridget.mcmullen@brooks.af.mil.

THOMAS J. LOFTUS
Major General, USAF, MC, CFS
Assistant Surgeon General, Health Care Operations
Office of the Surgeon General

SG3 Doc 2010-013