

# Hearing Health Surveillance Data Review

## Military Hearing Conservation

### Calendar Year 2023

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Department of Defense Hearing Conservation Working Group



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# Definitions

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**Active duty:** Full-time duty in the active military service of the United States.

**Audiogram:** A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

**Hearing impairment:** Any tested frequency exceeding 25 decibel hearing level (dB HL) in either ear.

**Permanent Threshold Shift (PTS):** A Significant Threshold Shift (STS) that fails to resolve on follow-up testing. An STS with no follow-up testing within the required time limit is considered a PTS once the window for follow-up testing closes (generally after 30 days for civilian personnel and 90 days for military).

**Reserve Component (RC):** A term referring to the Army, Navy, Marine Corps, Air Force, Space Force, and Coast Guard Reserves, as well as the Army National Guard of the United States and the Air National Guard of the United States. 38 USC § 101(27)

**Significant Threshold Shift (STS):** An average change of plus (decreased hearing) or minus (improved hearing) 10 dB at 2000, 3000, and 4000 Hertz (Hz) relative to the reference audiogram, in either ear, without age corrections.

**STS Follow-up test compliance:** Compliance with required follow-up testing as defined by Department of Defense Instruction (DoDI) 6055.12 or service specific regulations. Compliance is determined by the number of members who completed required follow-up hearing tests following a positive STS on their periodic hearing test. Follow-up period for active duty, civilians, and Reserve Components (Reserve and National Guard) is determined by each service.

**Temporary Threshold Shift (TTS):** An STS that resolves on follow-up testing.

**Department of Veterans Affairs (VA) hearing threshold disability criteria:** Any reference or periodic test with a pure-tone average (PTA) of 26 dB HL or more at any three frequencies (500, 1000, 2000, 3000, or 4000 Hz), or a threshold of 40 dB HL or more at any one of those same individual frequencies per 38 CFR 3.385.

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# Executive Summary

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The Hearing Health Surveillance Data Review is a required report to DoD leadership and stakeholders of the Defense Department's hearing conservation program. This report includes data from all uniformed services and associated noise-exposed civilian personnel and reports agreed upon measures of effectiveness.

This report does not include surveillance audiometry data from noise-exposed civilian personnel in DOD agencies or activities external to the uniformed services.

DoDI 6055.12, Hearing Conservation Program [HCP], Change 1, November 22, 2023, p. 3:

- “Protects all military personnel and noise-exposed civilian personnel from hearing loss resulting from hazardous occupational and operational noise exposure through a continuing, effective, and comprehensive HCP, in accordance with Parts 1910 and 1960 of Title 29, Code of Federal Regulations (CFR).”
- “Reduces hazardous occupational and operational noise exposure to personnel to enhance mission readiness, communication, and safety.”
- “Considers hazardous noise control in military capabilities to support operational readiness and integrates noise control into the design and development of defense systems and equipment.”

Annually, the DOD Hearing Conservation Working Group (HCWG); Defense Centers for Public Health – Dayton, Public Health and Preventive Medicine Department, Epidemiology Consult Service Division; and the Defense Health Agency (DHA) Hearing Center of Excellence (HCE) collaborate to provide information on the effectiveness of DOD HCPs. This report covers calendar year\* (CY) 2015 through 2023 and includes DOD and Service-level measures of effectiveness (MOEs) on HCP metrics. It consolidates the MOEs from all uniformed services components and DoD noise-exposed civilians and examines Service-level efforts to prevent hearing loss resulting from occupational and operational illness and injury (MOEs, June 2019).<sup>1,2</sup>

\* At the request of the Office of the Secretary of Defense, the format of this report returned to a CY reporting format beginning in 2023. As a result, do not compare the fiscal year (FY) metrics in the FY20, 21 and 22 Hearing Health Surveillance Data Reviews with the CY metrics in this report.

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1 Service components include Active Component (referred to as active duty (AD) in this report), and Reserve Component (RC) that includes Reserves and National Guard (NG). This data is from DOD Components that use the Defense Occupational Environmental Health Readiness System – Hearing Conservation (DOEHRS-HC) to manage audiometric monitoring information.

2 Herein, the term “civilian” will be used throughout the report when discussing noise-exposed civilians in DOD HCPs.

The MOEs include:

- MOE 1: Examines the potential hearing injuries/illnesses by calculating the percentages of tested individuals who had results of significant threshold shift (STS), permanent threshold shift (PTS), and temporary threshold shift (TTS).
- MOE 2: Examines the STS follow-up testing compliance for individuals with STS on the annual audiogram.
- MOE 3: Focuses on the measure of the proportion of individuals in the HCP population who have hearing impairment (thresholds above 25 dB HL) vs. the proportion of those with normal hearing (25 dB HL or below) in the HCP population. The MOE also includes tracking the number of enlisted personnel entering the service with hearing impairment.
- MOE 4: Calculates the percentage of service members who might qualify for Department of Veterans Affairs (VA) disability due to impaired hearing, based only on auditory threshold disability criteria per 38 CFR §3.385.

Each DOD component establishes, maintains, and evaluates the effectiveness of their HCPs. Due to the unique differences in mission execution, service member requirements, and expected exposure to hazardous noise, not all service members are monitored as part of an HCP. The data reported herein only represent service members and civilians enrolled in an HCP. It is important to note that a 1% magnitude of change for the Army compared to the other services is significant due to the total number of Soldiers tested ([Table 1](#)). For example, a 1% change in the Army of total Soldiers tested is 7,444 versus 2,068 for the Air Force.

Figure 1 shows the percentage of service members broken out by service and service component who received a hearing test in CY23. The largest number of service members tested is from the AD component for all services.

**Figure 1. CY23 Percent of Service Members Hearing Tested by Service and Service Component**

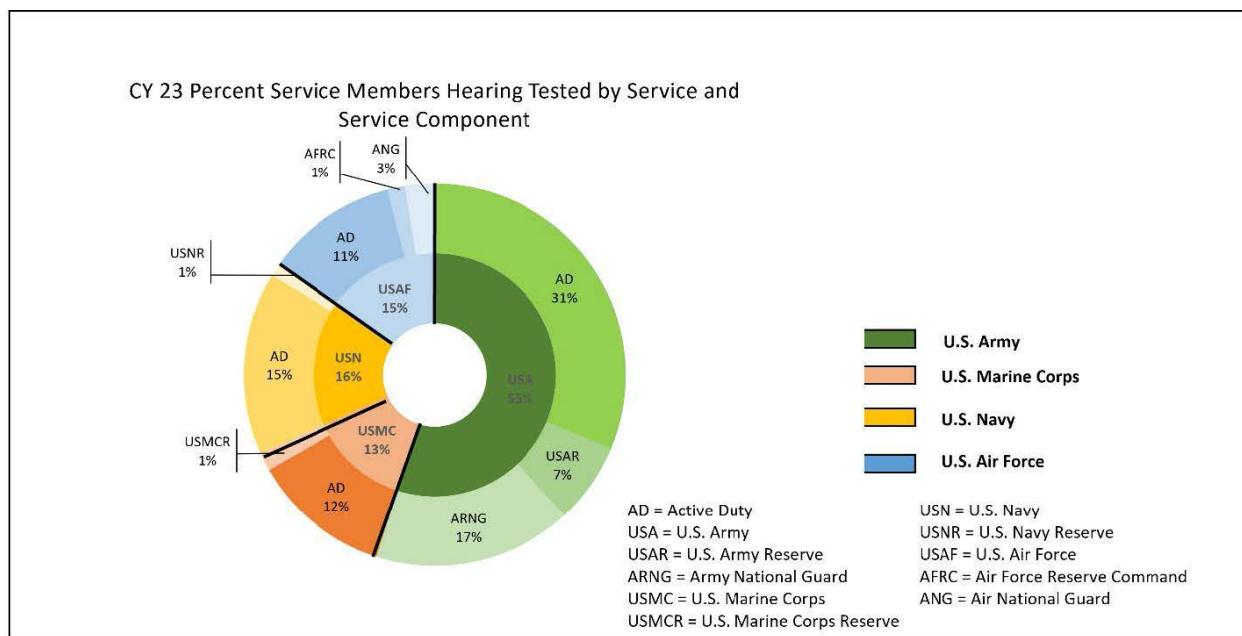


Table 1 includes the number of unique individuals tested in CY23 for each military service component as well as DOD civilians. U.S. Space Force medical surveillance is included within the U.S. Air Force data.

**Table 1. CY23 Unique Individuals Tested**

Calendar Year 2023 Unique Individuals Tested	Military	Active Duty	Reserve	National Guard	DOD Civilian
Army	744,469	424,059	92,492	227,918	20,013
Marine Corps	181,4333	160,164	21,269	*	3,039
Navy	222,526	208,961	13,565	*	54,167
Air and Space Forces	206,818	152,926	20,021	33,871*	23,097
Department of Defense	1,355,246	946,110	147,347	261,789	100,316

Source: Defense Occupational and Environmental Health Readiness System- Hearing Conservation Data Repository (DOEHRS-HC DR)

\*No National Guard Component in the Marine Corps, Navy, or Space Force

## Summary Findings for CY23

The sections below summarize the MOE findings from the HCP hearing testing data related to military and civilian personnel. [Table 2](#) identifies the percentages for all DoD military and civilian metrics discussed in this report.

## Unique Individuals Tested by Component (CY22 and CY23)

The number of unique individuals tested by Military component across the DOD in CY23 shows a decrease (5%) across all Military and noise-exposed Civilian personnel compared to CY22. The largest decrease in testing was for the Reserve component (RC) with a 6% decrease for the NG and a 24% decrease for the Reserves. DOD civilians showed a 2% increase in the number tested compared with CY22 ([Graph 1](#)). The overall decrease may be due to continued, reduced, scheduled hearing conservation (HC) appointments during the transition of Electronic Health Record (EHR) systems from Armed Forces Health Longitudinal Technology Application (AHLTA) to the Military Health System (MHS) GENESIS, decrease in the total force population -with a subsequent decrease in the number of personnel required to be tested, and/or challenges with the changes in contracted vendors for the Reserve Health Readiness Program (RHRP) program.

## Significant Threshold Shift Rates by CY

STS rates are the percentage of service members or civilians who have a decrease in hearing (an average change of +10dB HL or greater at 2000, 3000, and 4000 Hz in either ear on a surveillance audiogram compared to the individual's applicable baseline audiogram). Follow-up testing is required to determine if the STS is a TTS that resolves on follow-testing, a PTS that is confirmed on follow-up testing, or a lack of follow-up testing completed within the required service's time limit.

STS and PTS rates are trending slightly downward from CY22 to CY23, and TTS rates remain stable for all service members ([Graph 2](#)). CY23 STS rates for DOD service members are 10.7% for STS, 3.0% for TTS and 6.9% for PTS. In CY23, the NG and Reserve show PTS rates of 13.1% and 16.6%, respectively. [Graphs 3, 4](#), and [5](#) reflect the STS, TTS, and PTS rates for AD, NG, and Reserve, respectively. PTS rates for AD (5.1%) and civilians (9.0%) are lower than those for the NG and Reserve and may, in part, be due to AD and civilian higher follow-up testing compliance. STS, TTS, and PTS rates are essentially unchanged for civilians ([Graph 6](#)) in CY23 compared to CY22.

## STS Follow-up Test Compliance

The purpose of STS follow-up testing is to determine whether an STS noted on the periodic exam is temporary or permanent. Those who complete the follow-up testing process and still show an STS are referred for an audiological review and/or evaluation to better evaluate the change in hearing and make a work relatedness determination if necessary. Previous hearing health reports show that many STSs resolve on follow-up testing or the next surveillance examination; however, without completing follow-up testing an STS on the periodic exam will automatically be counted as a PTS due to regulatory requirements. Without completing required follow-up testing, the true STS rates across the DOD are unknown. Over the past nine years the effect of increased follow-up testing compliance is best seen in decreased PTS rates for AD service members and civilians. In CY23, AD and civilians have the highest follow-up compliance rates (70.5% and 70.7%, respectively). [Graphs 7](#) and [8](#) reflect the follow-up testing compliance for all service members and noise-exposed civilians, respectively.

## Hearing Impairment

The percentage of all hearing-impaired service members showed a slight decrease to 12.0% and civilians to 34.7% in CY23 compared to CY22. AD service members had the lowest rates of hearing impairment in CY23 (10.7%) compared to the NG (16.2%) and Reserve (15.2%). [Graphs 9](#) and [10](#) reflect hearing impaired rates for all service members and civilians.

The percentage of enlisted accessions with hearing impairments decreased in CY23 (7.8%) compared to CY22 (9.0%) and are similar across all service components ([Graph 11](#)).

## VA Auditory Threshold Disability Criteria

[Graph 12](#) provides the percent of service members meeting the established VA auditory threshold disability criteria. The percentage of all service members (3.2%) who met established VA auditory threshold disability criteria in CY23 remained stable for all service components when compared with CY22 (AD 2.6% and both NG and Reserve 4.8%). VA Auditory Disability Criteria includes other factors in addition to auditory thresholds in the actual determination of VA compensation due to impaired hearing.

## Conclusions

Overall, the hearing health in DOD was relatively stable for service members and civilians in HCPs for CY15-CY23. Threshold shift rates for STS and PTS show a slight decrease across all service components in CY23 compared to CY22. Civilian rates for STS and PTS are essentially unchanged in CY23 compared to CY22. Compliance for STS follow-up testing in CY23 continued to improve for all service members ([Graph 7](#)) and civilians ([Graph 8](#)) when compared to CY22. There was a decrease in hearing impairment ([Graph 9](#)) for all service members combined and for AD, NG, and Reserve Service members when CY23 data is compared to CY22. The number of service members who met established VA auditory threshold disability criteria remained stable from CY22 to CY23 ([Graph 12](#)). Be mindful of comparisons between the military groups as there are significant differences in their exposures, sizes, and contributions to the dataset including their inclusion criteria and HCP participation. The findings within this report indicate hearing loss trends have continued to trend slightly downward with notable room for improvement in all categories.

# Background

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The annual report from the DOD HCWG; the Defense Centers for Public Health - Dayton; and the DHA Hearing Center of Excellence, is a collaborative effort that covers DOD hearing health for CY 2015 through 2023. The report includes DOD and Service-level MOEs for HCP metrics. It consolidates data from all service components and noise-exposed civilians and examines Service-level efforts to prevent hearing loss resulting from occupational and operational illness and injury (MOEs, June 2019).<sup>34</sup>

All services use DOEHRS-HC common business practices and send hearing surveillance data to the DOEHRS-HC Data Repository (DR); however, each service varies in how hearing conservation data are gathered and reported. For example, STS and PTS rates are not always standardized and thus not always comparable due to different approaches to Service-level HCPs (Batchelor et al., 2020). The Air Force, Space Force, and Navy provide annual monitoring audiometry only to service members routinely exposed to hazardous noise (at risk approach) and the Army and Marine Corps provide annual monitoring audiometry to all AD service members (total force approach).

In 2018, the DOD HCWG agreed to use standard HCP MOEs to resolve discrepancies among the services' HCP reports. The DOD HCWG approved MOEs to include the following: STS rates, STS follow-up compliance, hearing impairment rates, and VA auditory threshold disability criteria. The metrics and data in this report are prepared and codified by the Defense Centers for Public Health-Dayton Epidemiology Consult Service Division and the Defense Health Agency Armed Forces Health Surveillance Branch Air Force Satellite at Wright-Patterson AFB, Ohio. This report provides a consistent method of reporting data on service HCPs using the standard MOEs described below:

- MOE 1 examines the potential hearing injuries/illnesses by calculating the percentages of tested individuals who had results of STS, PTS, and TTS. This calculation is determined by using the number of unique individuals meeting each STS criteria on an annual audiogram per CY and dividing the total number of individuals who received an annual audiogram.
- MOE 2 examines the STS follow-up testing compliance for individuals with STS on the annual audiogram. This is calculated by dividing the number of individuals with STS who did not obtain a follow-up audiogram within each service-specific required time limit by the total number of STS per CY. The graphs within the report include the STS follow-up compliance that is based on the non-compliance metric.

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3 Service components include Active Component (referred to as active duty (AD) in this report), and Reserve Component (RC) that includes Reserves and National Guard (NG).

4 Herein, the term “civilian” will be used throughout the report when discussing noise-exposed civilians in DOD HCPs.

- MOE 3 measures the proportion of individuals in the HCP population who have hearing impairment (thresholds above 25 dB HL) vs. the proportion of those with normal hearing (25 dB HL or below). The total is calculated by taking the number of individuals with results showing hearing impairment on a periodic or reference audiogram test per CY and dividing by the total number of individuals who received a periodic or reference audiogram in the same CY. The percent of enlisted accessions with hearing impairment helps distinguish between service members who are accepted into the service with hearing impairment from those that develop hearing impairment because of service.
- MOE 4 calculates the percentage of service members who might qualify for VA disability benefits based only on auditory threshold disability criteria per 38 CFR §3.385, disability due to impaired hearing. This percentage is determined by the number of individuals who met the VA hearing (auditory) threshold level criteria per CY divided by the total number of individuals obtaining an audiogram within that same CY.<sup>5</sup>

This report includes a graphic representation of unique individuals tested, by each service component, in CY22 vs. CY23 ([Graph 1](#)). The difference in total unique individuals tested from CY22 to CY23 was divided into the total number of unique individuals tested in CY22 to determine the percent increase or decrease for CY23. [Figure 1](#), shows the CY23 ratio of service members tested by service and service component using the number of unique individuals tested in CY23 for each military service component.

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5 The award of VA service-connected disability benefits for hearing loss are made by Veterans Benefits Administration (VBA), Department of Veterans Affairs (VA) based on many factors - not only changes in hearing (auditory) threshold levels during military service. For example, in granting service-connection for hearing loss VBA considers:

- Word Recognition Scores (testing to determine the veteran's optimum performance for word recognition under controlled and standardized listening conditions) of less than 94%.
- A permanent positive threshold shift worse than the reference audiogram threshold "greater than normal measurement variability" at any frequency between 500 – 6000 Hz; and
- Determination of etiology affected by several facts, per court decisions and/or directed by VBA, for instance:
  - Instead of conceding noise exposure for a military occupational specialty (MOS) with moderate or high probability for noise exposure, Veteran Service Representatives and Rating Veteran Service Representatives must now concede noise exposure for ALL military occupational specialties (low, moderate, and high probability of noise exposure MOS) for the purposes of establishing an event in service.
  - When hazardous noise exposure is conceded based on the veteran engaging in combat, accept satisfactory lay or other evidence of service incurrence or aggravation of such injury or disease, if consistent with the circumstances, conditions, or hardships of such service, even if there is no official record of such incurrence or aggravation in such service. There is a requirement to resolve every reasonable doubt in favor of the veteran unless there is clear and convincing evidence to the contrary. (*Reeves v. Shinseki*, 682 F.3d 988, Fed.Cir. 2012)

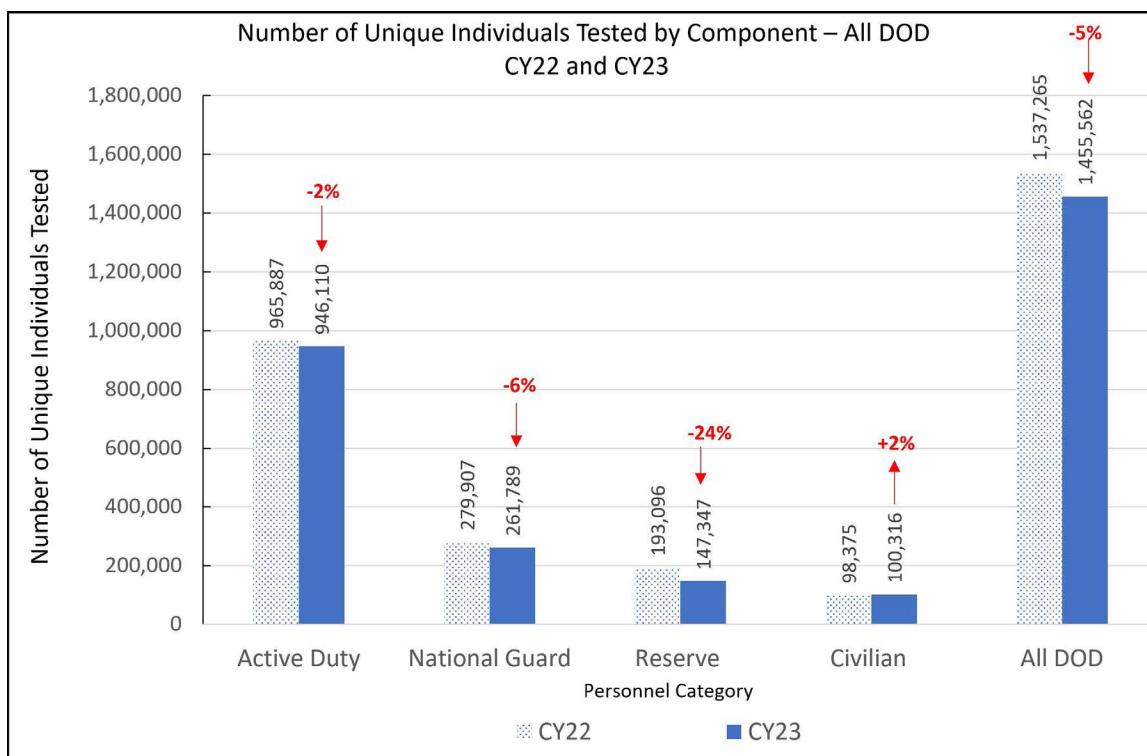
There are two important caveats for this report. First, the report is not intended to provide a comprehensive, descriptive, epidemiological analysis of exposed versus unexposed populations. Rather, this report is a summary of HCP participants' hearing health trends to assist HCP managers with identifying HCP performance gaps. Second, the FY21 and going forward Hearing Health Surveillance Data Review Military Hearing Conservation reports were constructed using a different methodology than previous years' reports. Data from the Defense Occupational and Environmental Health Readiness System - Hearing Conservation Data Repository (DOEHRS-HC DR) used for the CY18 and 19, and FY20 reports are no longer available as the method of retrieval changed with a server migration between the FY20 and FY21 reports. Data validations were run by the U.S. Air Force School of Aerospace Medicine Epidemiology Consultation Services Division at Wright Patterson AFB to ensure the queries using the new methodology were within acceptable ranges (10% threshold) when compared to previous reports. No significant changes in trends were noted across all measures. All data contained in this CY15-CY23 report reflect the new data and methodology. *Therefore, reports prior to CY23 should not be used for comparison.* The leadership of each of the Military Services' HCPs reviewed and approved the metrics and data in this report. For questions regarding the data presented in this report, contact the DHA Hearing Center of Excellence, Prevention and Surveillance Section at: [do-not-reply-hearing@health.mil](mailto:do-not-reply-hearing@health.mil).

# Hearing Health - DOD

## Unique Individuals Tested by Component

The number of unique individuals tested for all service members and civilians showed an overall decrease of 5% during CY23 compared to CY22 (Graph 1). In CY23, data show a 2% decrease for AD, 6% decrease for the NG, and a 24% decrease for the Reserve compared with CY22. There was a 2% increase for civilian personnel in CY23 compared to CY22. Potential causes to the decrease in CY23 may be due to downsizing of the force, reduction in personnel requiring surveillance exams, and continued reduced scheduling of HC appointments during the transition of EHR systems from AHLTA to MHS GENESIS. The significant 24% decrease in the Reserve component may also be secondary to reduced operational deployments and challenges with a contract change of service providers for the RHRP.

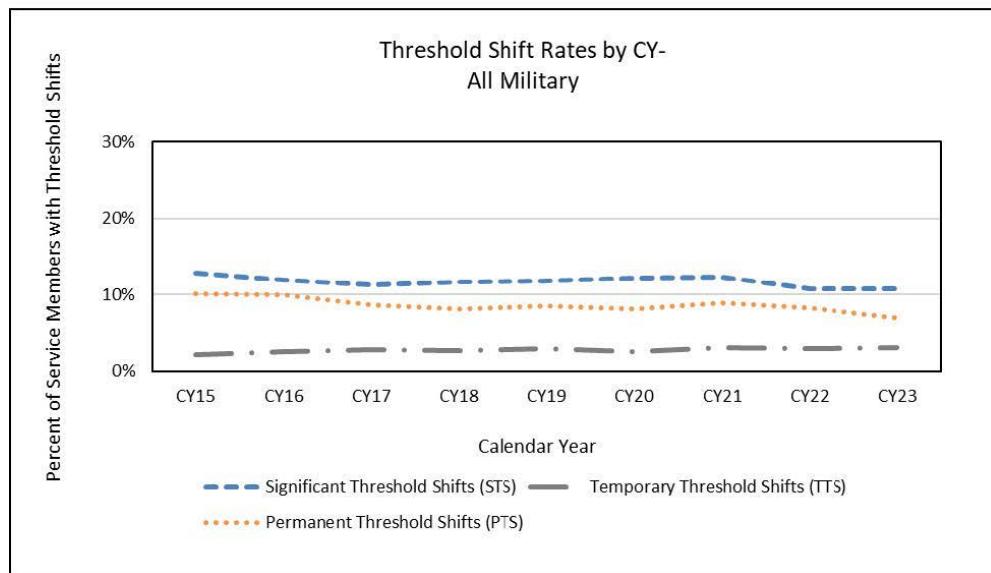
**Graph 1. Unique Individuals Tested by Component – All DOD (CY22 and CY23)**



## Significant Threshold Shift Rates by CY

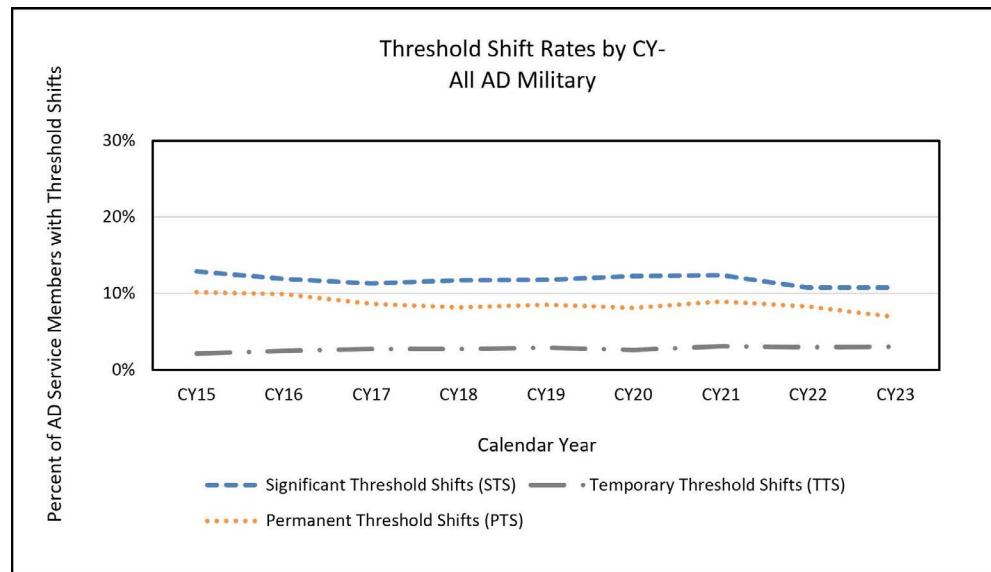
In CY23, all military STS and PTS rates showed a slight decrease while TTS rates remained stable compared to CY22. Threshold shift rates for all service members indicate 10.7% STS, 3.0% TTS, and 6.9% PTS rates in CY23 (Graph 2).

**Graph 2. Threshold Shift Rates by CY - All Service Members**



AD service members have the lowest PTS rates compared to other service components (NG and Reserve) for CY15 – CY23. Threshold shift rates for AD service members indicate 8.6% STS, 3.3% TTS, and 5.1% PTS rates in CY23 (Graph 3) with a decrease in STS rates from 9.1% in CY22 to 8.6% in CY23.

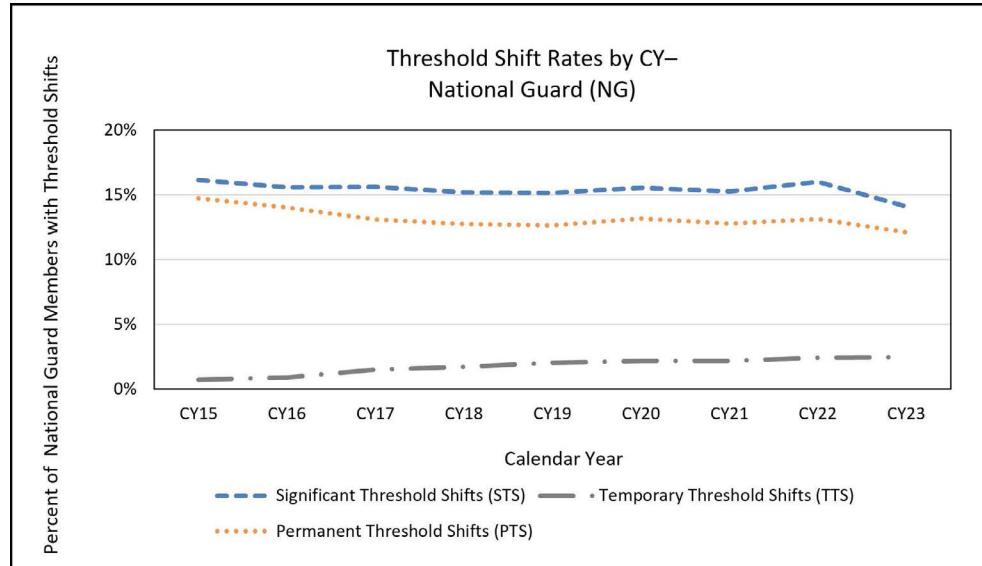
**Graph 3. Threshold Shift Rates by CY – AD Service Members**



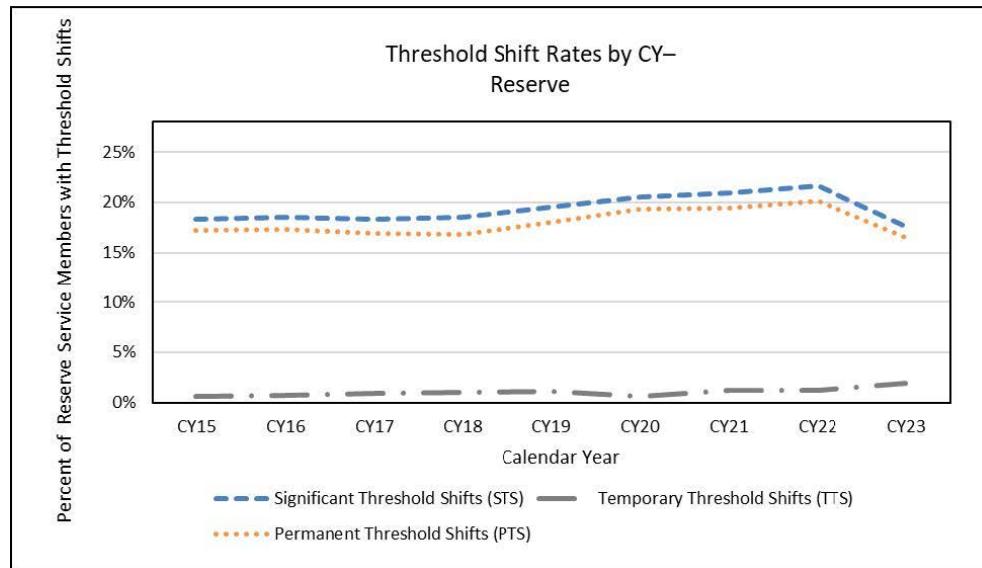
NG rates for CY23 were 14.1% STS, 2.5% TTS, and 13.1% PTS (Graph 4) with a decrease in STS rates from 16.0% in CY22 to 14.1% in CY23.

Reserve rates for CY23 were 17.6% STS, 2.0% TTS, and 16.6% PTS (Graph 5) with a decrease in STS rates from 21.7% in CY22 to 17.6% in CY23.

#### **Graph 4. Threshold Shift Rates by CY - National Guard (NG) Service Members**



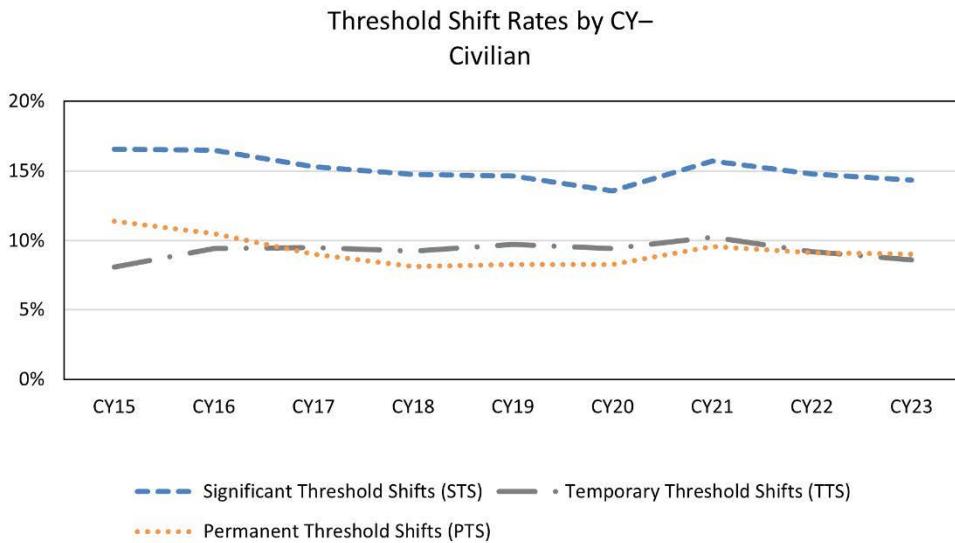
#### **Graph 5. Threshold Shift Rates by CY - Reserves Service Members**



NG and Reserve STS and PTS rates remain elevated due to a lack of STS follow-up testing and show a decrease from CY22. Failure to conduct STS follow-up testing prevents the accurate identification of TTS vs. PTS.

The DOD civilian STS rates for CY23 were 14.4% STS, 8.6% TTS, and 9.0% PTS (Graph 6). Civilian threshold shift data showed no meaningful change in STS, TTS, and PTS for CY23 compared to CY22.

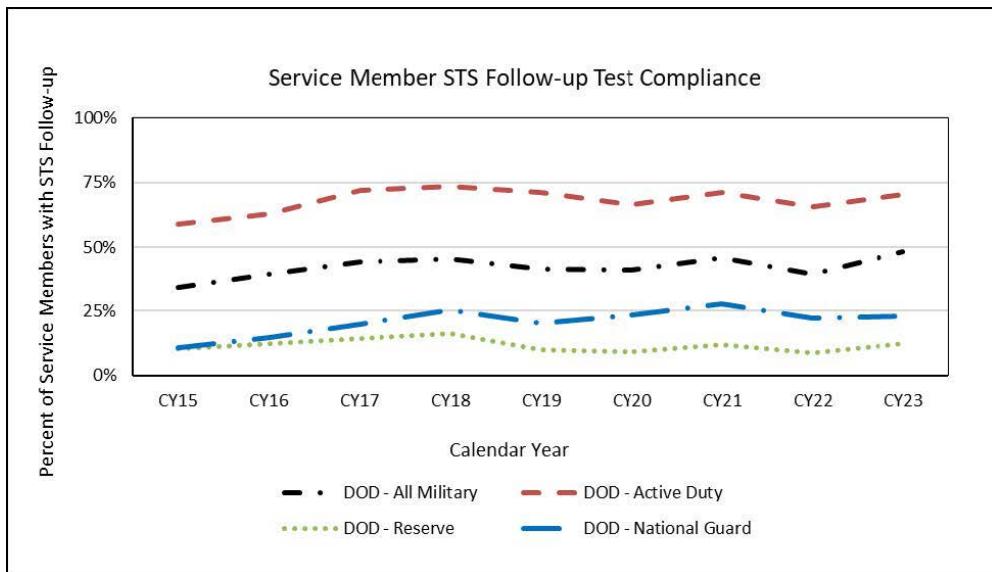
**Graph 6. Threshold Shift Rates by CY – DOD Civilians**



## STS Follow-up Test Compliance

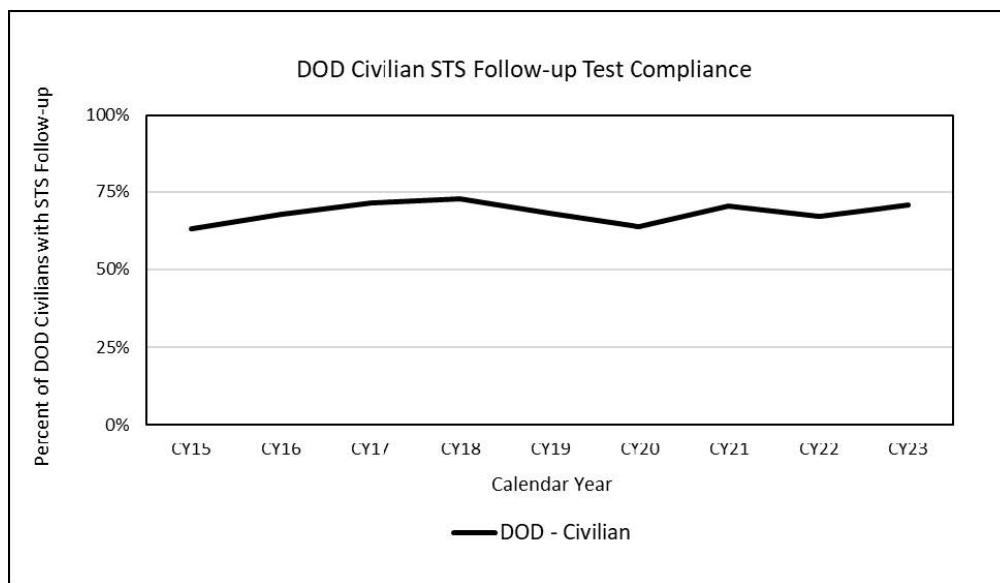
The STS follow-up testing compliance shows improvement in CY23 compared to CY22 (Graph 7). Overall compliance for military follow-up testing increased from 34.6% in CY15 to 48.1% in CY23. NG and Reserve follow-up compliance also showed improvement since 2015, however, NG and Reserve follow-up compliance remained low at 22.9% and 12.3%, respectively, in CY23. Failure to conduct STS follow-up testing will: 1) elevate STS rates, i.e., the initial STS may be identified every year until follow-up testing is performed and a new baseline is established, if required, and 2) prevent accurate identification of PTS and TTS, i.e., STS with no follow-up hearing test defaults to a PTS when the service-specific follow-up test window has closed. This results in artificially high STS and PTS rates that do not reflect the true incidence of new military hearing injuries (McKenna et al., 2018).

### **Graph 7. Service Members STS Follow-up Test Compliance**



DOD Civilian STS follow-up testing compliance increased from 67.1% in CY22 to 70.7% in CY23. Overall compliance improved from 63.0% in CY15 to 70.7% in CY23 (Graph 8).

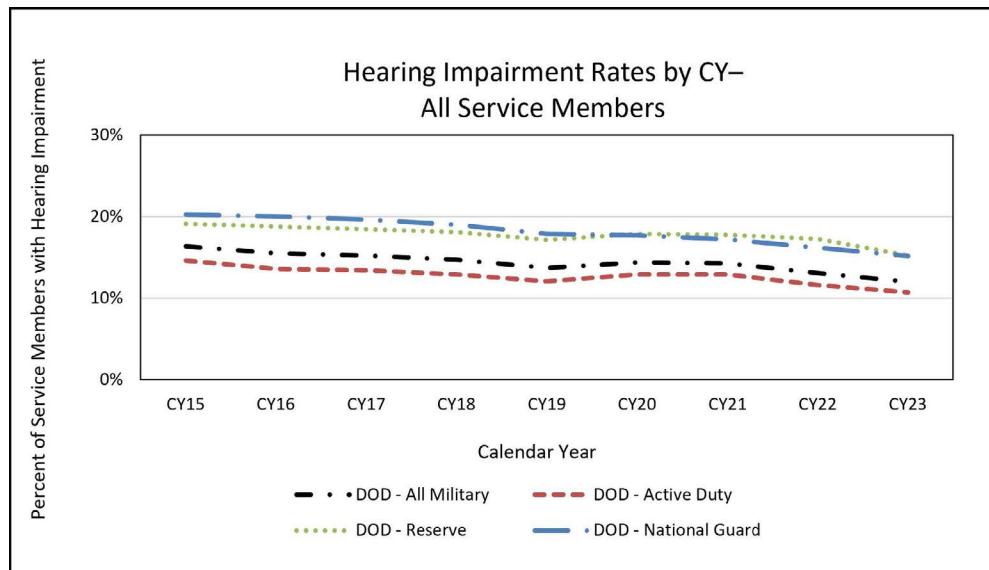
### **Graph 8. DOD Civilians STS Follow-up Test Compliance**



## Hearing Impairment

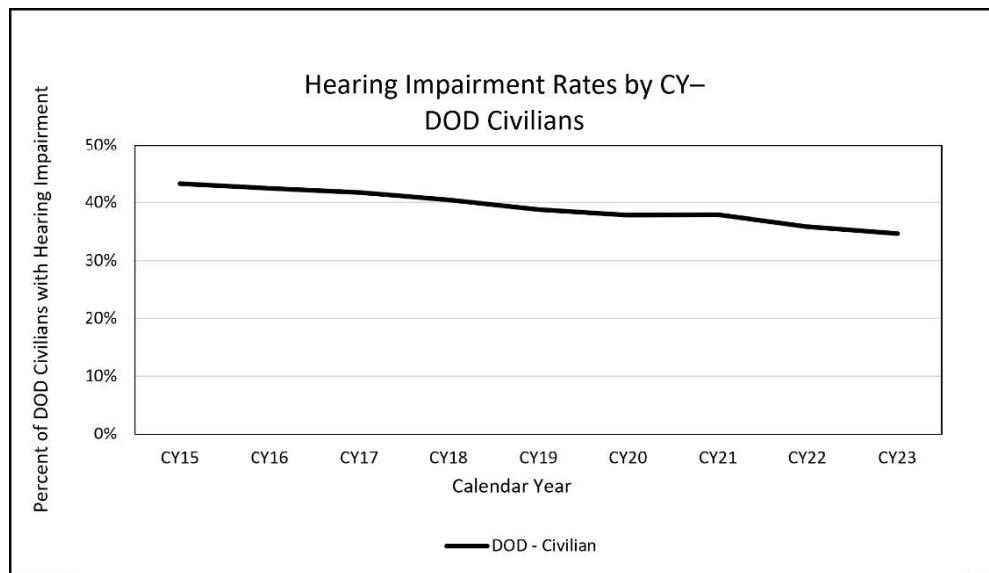
The percent of hearing impaired (hearing worse than 25 dB HL at any test frequency) service members gradually decreased from CY15 to CY23. Overall, hearing impaired rates in CY23 were 12.0% for all Components, 10.7% for AD, 16.2% for NG, and 15.2% for Reserve (Graph 9).

**Graph 9. Hearing Impairment Rates by CY - All Service Members**



The percentage of DOD civilians with hearing impairment showed a gradual decrease from 43.3% in CY15 to 34.7% in CY23 (Graph 10). The high percentage of hearing-impaired civilians is believed to be, in part, due to differences in age and/or years of noise exposure compared to service member populations (Batchelor et al., 2020).

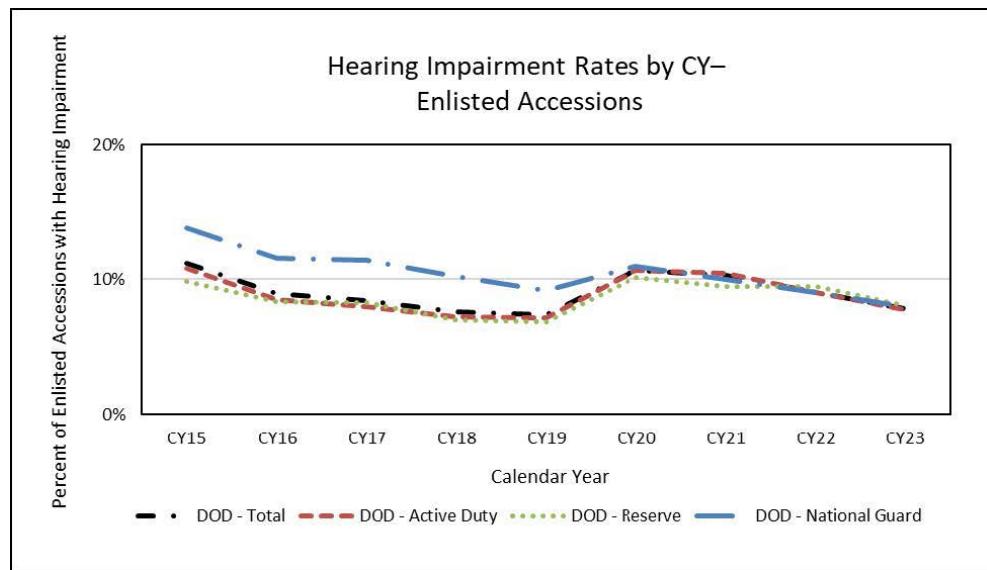
**Graph 10. Hearing Impairment Rates by CY – DOD Civilians**



## Hearing Impairment – Enlisted Accession Data

All service members receive a hearing test as part of basic training at their entrance to military service. Those reference audiograms are used to determine the percentage of all new recruits who come into the military with hearing impairment (hearing worse than 25 dB HL at any test frequency). The percentage of enlisted accessions with hearing impairment showed a decrease for all DOD components since CY15. The percentage of DOD enlisted accessions with hearing impairment decreased from 11.1% in CY15 to 7.8% in CY23 (Graph 11). Although CY20 and 21 showed an increase (10.7% and 10.4%, respectively) in the percentage of DoD enlisted accessions with existing hearing impairment, rates for CY23 (7.8%) are essentially back to CY18 and CY19 rates of 7.6% and 7.4%, respectively.

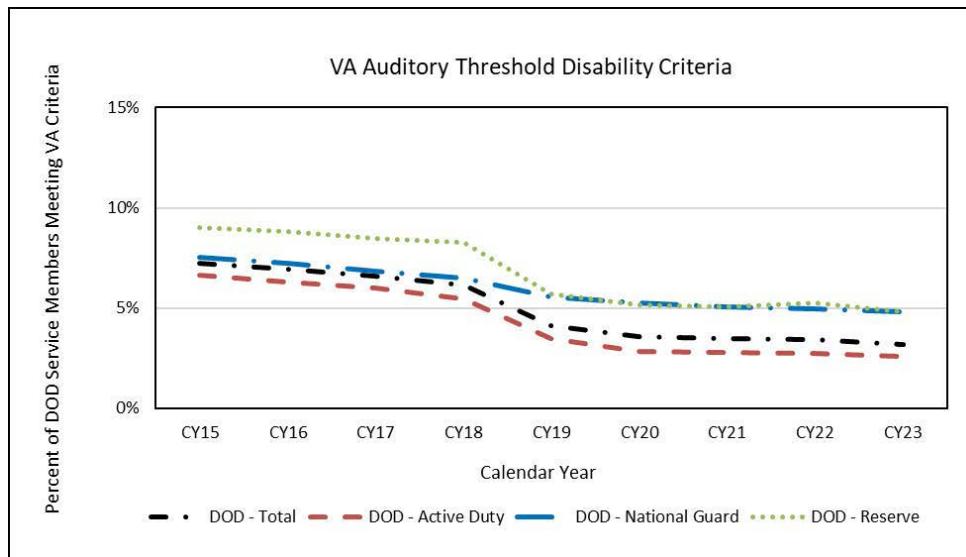
**Graph 11. Hearing Impairment Rates by CY – Enlisted Service Member Accessions**



## VA Auditory Threshold Disability Criteria

The percentage of all service members meeting established VA auditory threshold disability criteria has decreased for all DOD components. The percentage of DOD service members potentially eligible for VA service-connected disability compensation for hearing loss decreased from 7.2% in CY15 to 3.2% in CY23 (Graph 12). Potentially eligible AD service members decreased from 6.6% in CY15 to 2.6% in CY23 and potentially eligible NG and Reserve Service members decreased from 7.6% in CY15 to 4.8% in CY23 and from 9% in CY15 to 4.8% in CY23, respectively.

## Graph 12. VA Auditory Threshold Disability Criteria – All Service Members



## Summary and Conclusions

Hearing health data for all service members and civilians in the DOD HCP showed improvements from CY15 to CY23, and, on a smaller scale, from CY22 to CY23 with metrics trending in their desired direction. The STS rates for all military service members decreased from 12.7% in CY15, and 12.4% in CY22, to 10.7% in CY23. The STS rates for civilians decreased from 16.6% in CY15, and 14.8% in CY22, to 14.4% in CY23. In CY23, all service components showed improved STS follow-up test compliance with the highest follow-up testing compliance for the AD at 70.5% (up from 58.9% in CY15 and 65.6% in CY22) and the lowest follow-up testing compliance for the Reserves at 12.3% (up from 10.4% in CY15 and 8.9% in CY22). Civilian follow-up testing compliance was the highest at 70.7% in CY23 (up from 63% in CY15 and 67.1% in CY22). Hearing impairment rates for all military service members decreased from 16.3% in CY15, and 13.1% in CY22, to 12% in CY23. Hearing impairment rates for all military enlisted accessions also decreased from 11.1% (CY15) and 9% (CY 22), to 7.8% in CY23. The rates of VA auditory threshold eligibility criteria decreased from CY15 (7.2%) to CY23 (3.2%), and essentially plateaued from CY20 to CY23 for all service members. Overall comparisons among the military service components should be made with care because of the differences in their contributions to the dataset (AD 69%; NG 20%; and Reserves 10%). Changes in the AD population strongly affect the total numbers with smaller percentage changes being more significant for the large AD component. Additionally, comparisons of data between DoD and Service Components should be considered in relation to the size of the separate Components, their HCP program participation, recordkeeping requirements, and management focus.

**Table 2. Data Summary – DOD - Source: DOEHRS-HC DR, ad hoc MOE percentages**

Department of Defense - Total											
Chart Title	MOE	Category	Percent								
			CY15	CY16	CY17	CY18	CY19	CY20	CY21	CY23	
Threshold Shift Rates All Service Members	MOE 1	STS	12.7	12.8	11.9	11.3	11.7	11.8	12.3	12.4	10.7
		TTS	2.1	2.5	2.8	2.7	2.9	2.6	3.1	3.0	3.0
		PTS	10.0	9.9	8.6	8.1	8.5	8.1	8.9	8.3	6.9
Threshold Shift Rates AD Service Members	MOE 1	STS	10.0	10.6	9.1	8.3	8.7	8.8	9.5	9.1	8.6
		TTS	3.0	3.5	3.6	3.5	3.7	3.5	3.8	3.5	3.3
		PTS	6.8	6.8	5.2	4.5	4.9	5.4	5.5	5.5	5.1
Threshold Shift Rates NG Service Members	MOE 1	STS	16.2	15.6	15.6	15.2	15.2	15.6	15.3	16.0	14.1
		TTS	0.7	0.9	1.5	1.7	2.0	2.2	2.2	2.4	2.5
		PTS	14.7	14.0	13.1	12.8	12.6	13.2	12.8	13.2	13.1
Threshold Shift Rates Reserve Service Members	MOE 1	STS	18.3	18.5	18.4	18.5	19.5	20.6	21.0	21.7	17.6
		TTS	0.7	0.7	0.9	1.0	1.1	0.6	1.3	1.3	2.0
		PTS	17.2	17.4	16.9	16.9	18.0	19.3	19.4	20.2	16.6
Threshold Shift Rates DOD Civilian	MOE 1	STS	16.6	16.5	15.3	14.8	14.6	13.6	15.7	14.8	14.4
		TTS	8.1	9.4	9.5	9.3	9.7	9.5	10.3	9.2	8.6
		PTS	11.4	10.5	9.0	8.2	8.3	8.3	9.6	9.1	9.0
STS Follow-Up Test Compliance	MOE 2	All	34.6	39.6	44.1	45.3	41.6	41.1	46.0	39.7	48.1
		Active Duty	58.9	62.9	71.9	73.4	71.0	66.6	71.2	65.6	70.5
		National Guard	10.8	14.8	19.7	25.5	20.4	23.6	27.8	22.3	22.9
		Reserve	10.4	12.5	14.5	16.2	9.9	9.0	11.8	8.9	12.3
		Civilian	63.0	67.9	71.4	72.9	68.2	63.8	70.6	67.1	70.7
Hearing Impairment Rates	MOE 3	All	16.3	15.5	15.2	14.7	13.7	14.4	14.2	13.1	12.0
		Active Duty	14.6	13.6	13.4	12.9	12.0	12.9	12.9	11.6	10.7
		National Guard	20.2	20.0	19.6	19.0	17.8	17.7	17.2	16.1	16.2
		Reserve	19.1	18.8	18.5	18.1	17.1	17.9	17.8	17.2	15.2
		Civilian	43.3	42.4	41.7	40.5	38.8	37.8	37.9	35.8	34.7
Hearing Impairment Rates - Enlisted Accessions	MOE 3	All	11.1	8.9	8.4	7.6	7.4	10.7	10.3	9.0	7.8
		Active Duty	10.8	8.5	8.0	7.2	7.1	10.7	10.4	9.0	7.8
		National Guard	13.8	11.6	11.4	10.2	9.2	11.0	9.9	9.0	8.0
		Reserve	9.8	8.3	8.2	7.0	6.8	10.1	9.4	9.4	8.0
VA Auditory Threshold Criteria	MOE 4	All	7.2	6.9	6.6	6.1	4.1	3.6	3.5	3.4	3.2
		Active Duty	6.6	6.3	6.0	5.4	3.5	2.8	2.8	2.7	2.6
		National Guard	7.6	7.2	6.9	6.5	5.6	5.3	5.1	5.0	4.8
		Reserve	9.0	8.8	8.5	8.3	5.7	5.1	5.1	5.3	4.8

# Appendix A: Hearing Health - Army

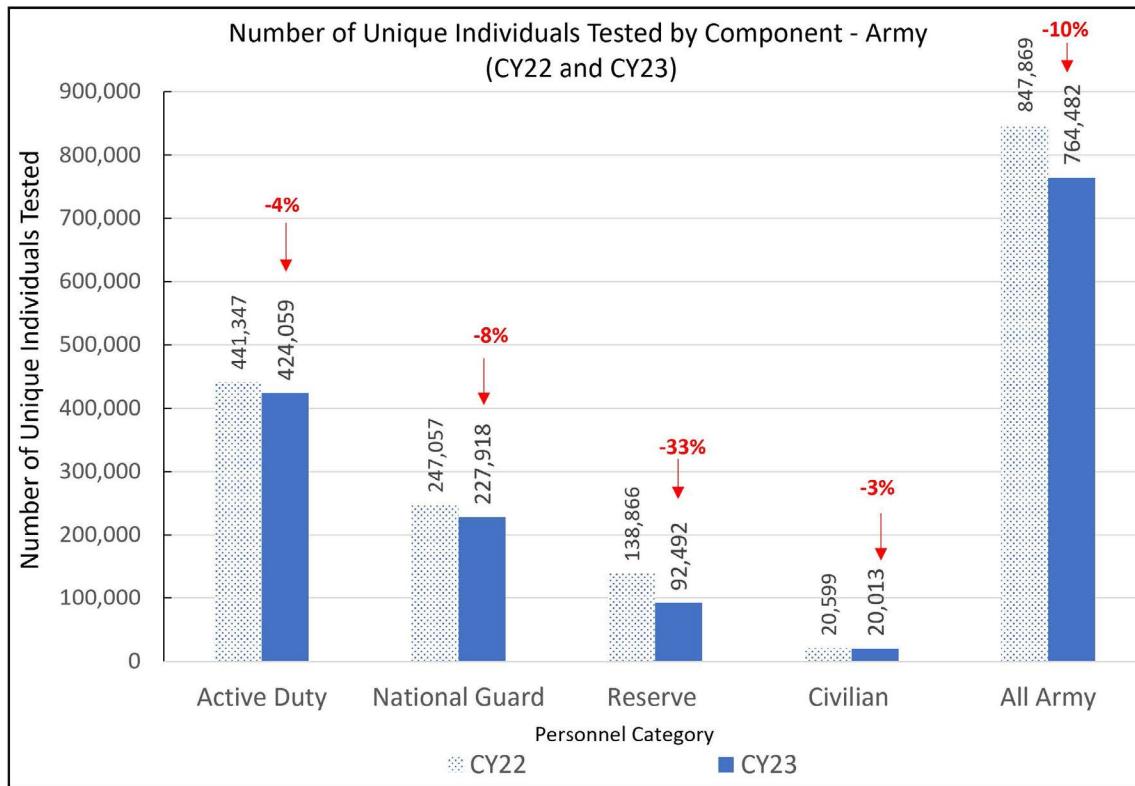
The mission of the Army Hearing Program (AHP) is to maximize Soldier and Department of the Army (DA) civilian hearing and communication abilities through implementation of the components of hearing readiness, clinical services, operational hearing services, and hearing conservation, thus contributing to survivability, lethality, mission effectiveness, and quality of life. All AD Soldiers require an annual hearing readiness evaluation regardless of their noise-exposure risk. All Army National Guard (ARNG) and Army Reserve (USAR) Soldiers assigned to Table of Organization and Equipment (TOE) units, or ARNG and USAR Soldiers, routinely exposed to hazardous noise, assigned to Table of Distribution and Allowances (TDA) units, require annual hearing tests. Soldiers experiencing a change in hearing or other hearing-related issues, regardless of exposure, are treated as if they were at risk and receive follow-up testing, counseling, and referrals, as needed. DA civilians are also enrolled in the AHP when they meet HCP noise-exposure criteria.

Data in Graphs 13 through 24 and [Table 3](#) represent Army military and DA civilian metrics discussed in this report. This review indicated the overall hearing health for Soldiers in CY23 was good with room for continued improvement, particularly for ARNG and USAR Soldiers. The overall hearing health for DA civilians in CY23 was only fair with plenty of room for improvement.

## Unique Individuals Tested by Component

The number of Soldiers and noise-exposed civilians tested in CY23, compared to CY22, decreased by 10% (Graph 13). The ARNG and USAR show significant decreases in individual Soldiers tested during CY23 (down 8% and 33%, respectively), compared to CY22. Potential causes for the decrease in CY23 may be due to downsizing of the force, fewer personnel requiring surveillance exams, decreases in the number of operational deployments, and challenges with the rollout of newly contracted RHRP services.

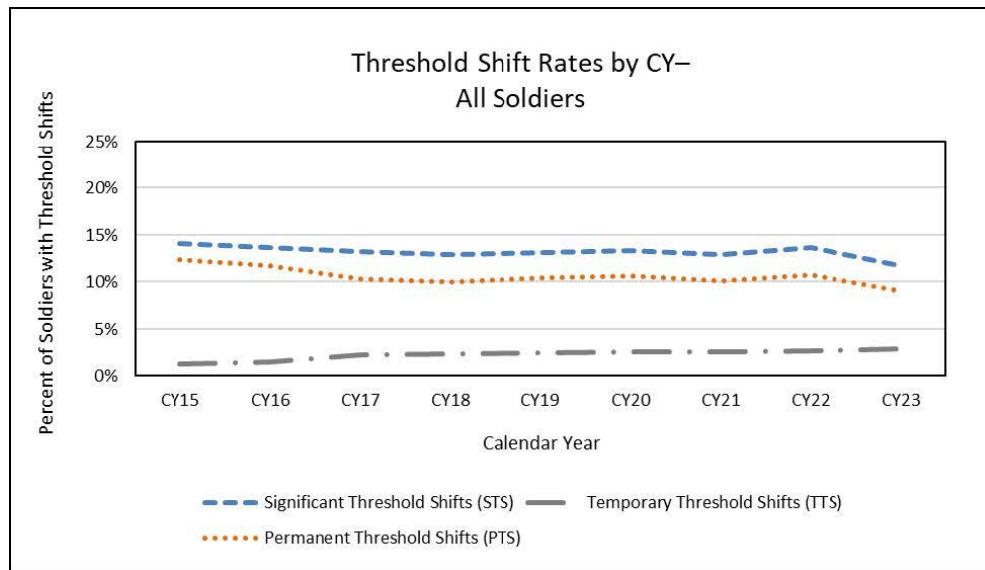
### Graph 13. Unique Individuals Tested by Component – Army (CY22 and CY23)



### Significant Threshold Shift Rates by CY

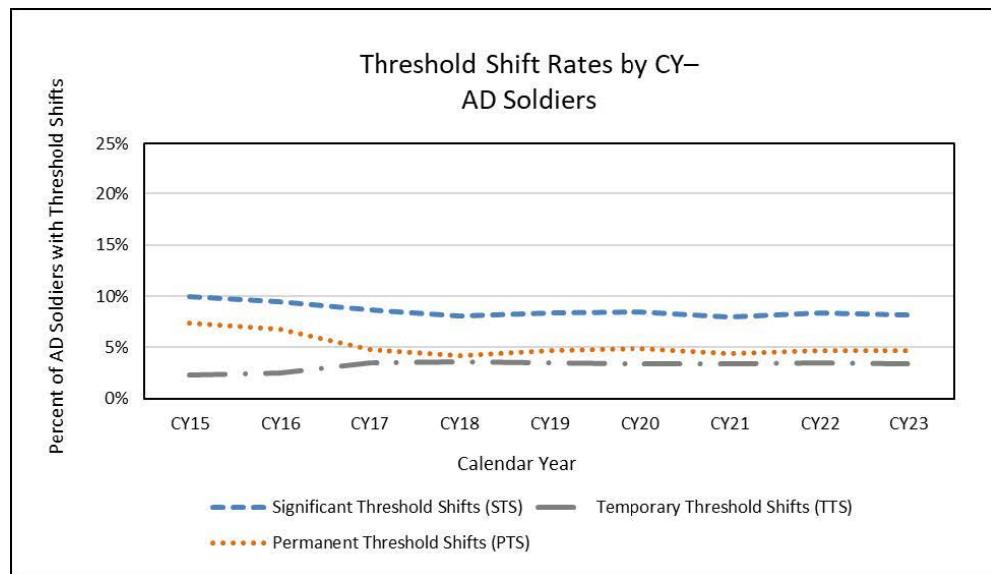
In CY23, STS and PTS rates for all Soldiers showed a decrease when compared to CY15 and CY22 (Graph 14). CY23 threshold shift rates for all Soldiers were 11.7% STS, 2.9% TTS, and 9% PTS. The accuracy of PTS and TTS are influenced by STS follow-up test compliance (Graph 19).

### Graph 14. Threshold Shift Rates by CY - All Soldiers



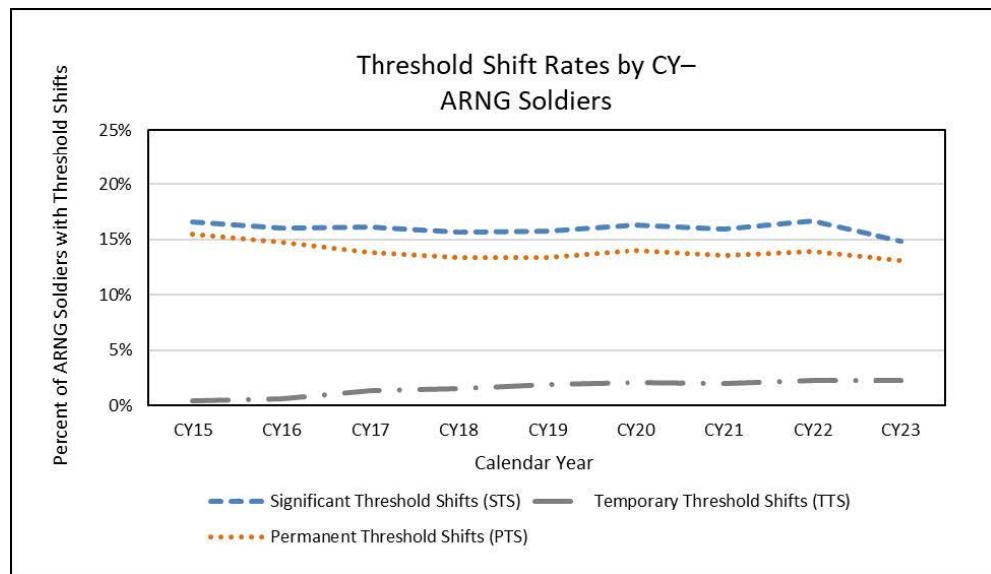
AD Soldiers threshold shift rates remained stable at 8.2% STS, 3.4% TTS, and 4.7% PTS in CY23 (Graph 15), compared to CY22. Improved CY23 STS follow-up testing (75.7%) for AD Soldiers showed that 3.5% of all STSs identified were PTSs.

**Graph 15. Threshold Shift Rates by CY – AD Soldiers**



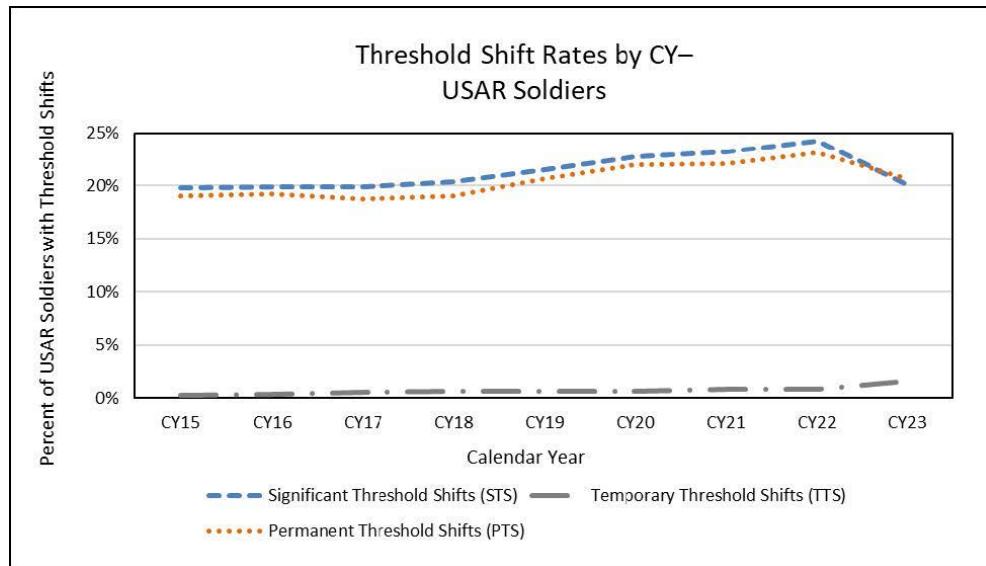
ARNG Soldiers threshold shift rates showed a decrease to 14.8% STS, 2.3% TTS, and 13.1% PTS in CY23, compared to 16.7% STS, 2.3% TTS, and 14% PTS in CY22 (Graph 16). STS and PTS rates remain high, consistent with continued poor follow-up test compliance of 18.7% in CY23.

**Graph 16. Threshold Shift Rates by CY – ARNG Soldiers**



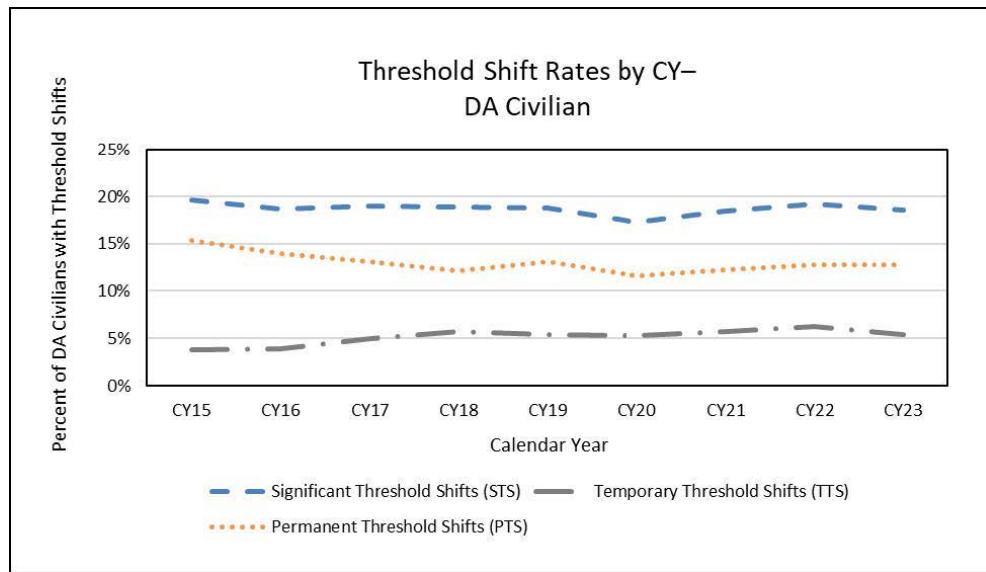
USAR Soldiers threshold shift rates for CY23 are 20.1% STS, 1.6% TTS, and 20.6% PTS (Graph 17) and show a 4.2% decrease in CY23, compared to an STS rate of 24.3% in CY22. Both STS and PTS rates remain high, consistent with minimal STS follow-up testing compliance throughout CY15 to CY23.

**Graph 17. Threshold Shift Rates by CY - USAR Soldiers**



DA civilian threshold shift rates for CY23 are 18.5% STS, 5.4% TTS, and 12.7% PTS (Graph 18), with a slight decrease in STS and TTS from CY22 (Graph 18).

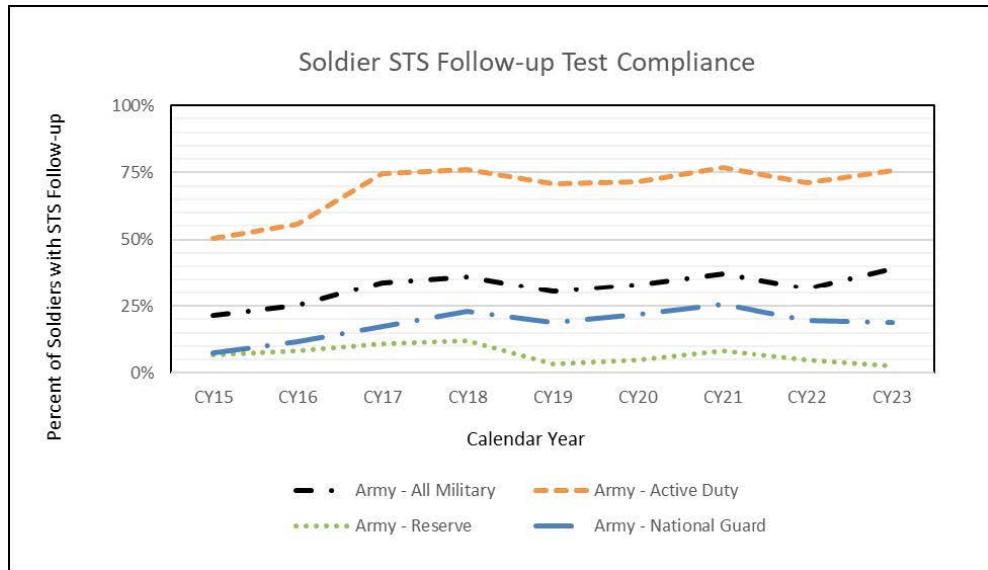
**Graph 18. Threshold Shift Rates by CY - DA Civilians**



## STS Follow-up Test Compliance

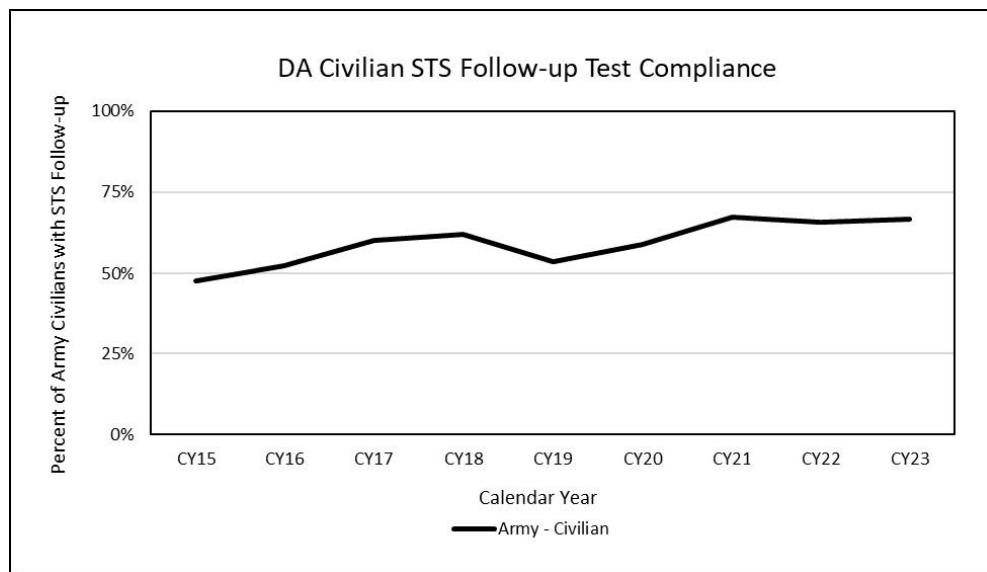
STS follow-up hearing test compliance rates showed continued improvement for all Soldiers from 21.5% in CY15, and 31.4% in CY22, to 39.2% in CY23. Follow-up test compliance rates for AD Soldiers showed continued improvement, to above the Army goal of 70%, with 75.7% compliance in CY23, increased from 50.4% in CY15, and 71.3% in CY22. ARNG Soldiers follow-up test compliance rates improved from 7.4% in CY15 to 18.7% in CY23, however, their CY23 compliance rate remains well below the 70% Army goal. USAR Soldiers follow-up testing decreased to 2.6% in CY23, from 6.6% in CY15, and 4.9% in CY22 (Graph 19). Failure to conduct follow-up testing will: 1) Elevate STS rates as the initial STS will be identified every year until follow-up testing is performed and a new baseline is established, if required, and 2) Prevent accurate identification of PTS and TTS, i.e., increase PTS and decrease TTS rates.

**Graph 19. Soldier STS Follow-up Test Compliance**



DA civilian follow-up test compliance continued to show increased compliance rates from 47.5% in CY15 to 66.9% in CY23 (Graph 20).

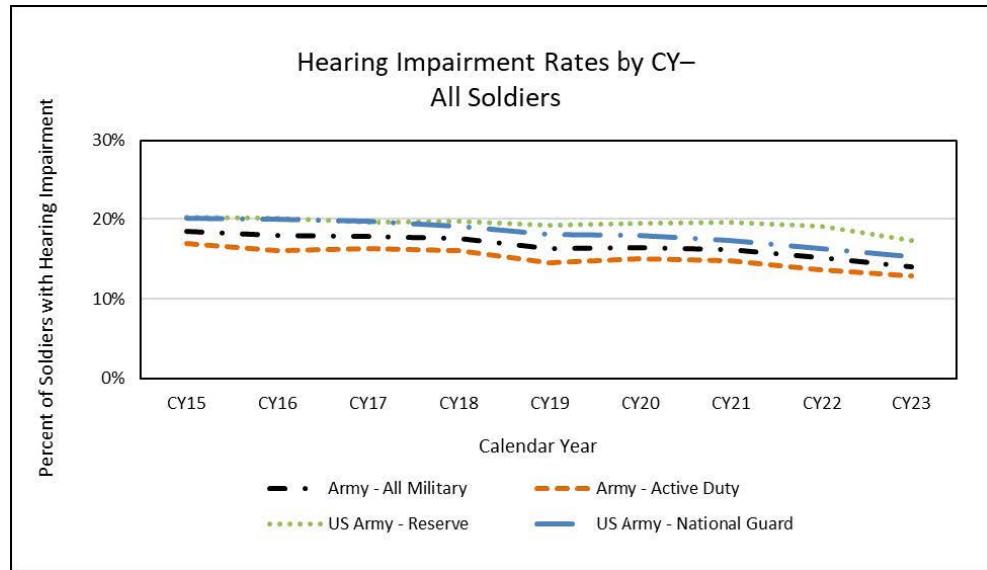
**Graph 20. DA Civilians STS Follow-up Test Compliance**



## Hearing Impairment

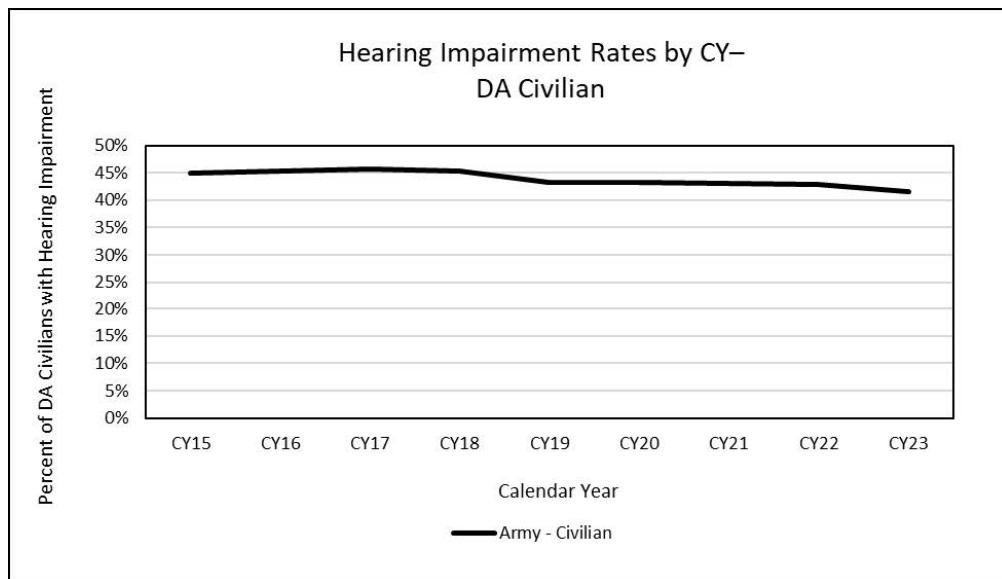
The rate of all Soldiers with hearing impairment showed a decrease for all Army components combined, and individually, since CY15. The rate of all Soldiers with hearing impairment decreased from 18.5% in CY15, and 15.2% in CY22, to 14.1% in CY23 (Graph 21). Decreases in hearing impairment rates for all Army components were consistent at approximately 4% from CY15 to CY23.

**Graph 21. Hearing Impairment Rates by CY – All Soldiers**



The rate of DA civilians with hearing impairment is high at 41.6%, but decreased in CY23 compared to 45.1% in CY15, and 42.8% in CY22 (Graph 22). Data indicates that 58.4% of civilians have normal hearing in CY23.

**Graph 22. Hearing Impairment Rates by CY – DA Civilians**

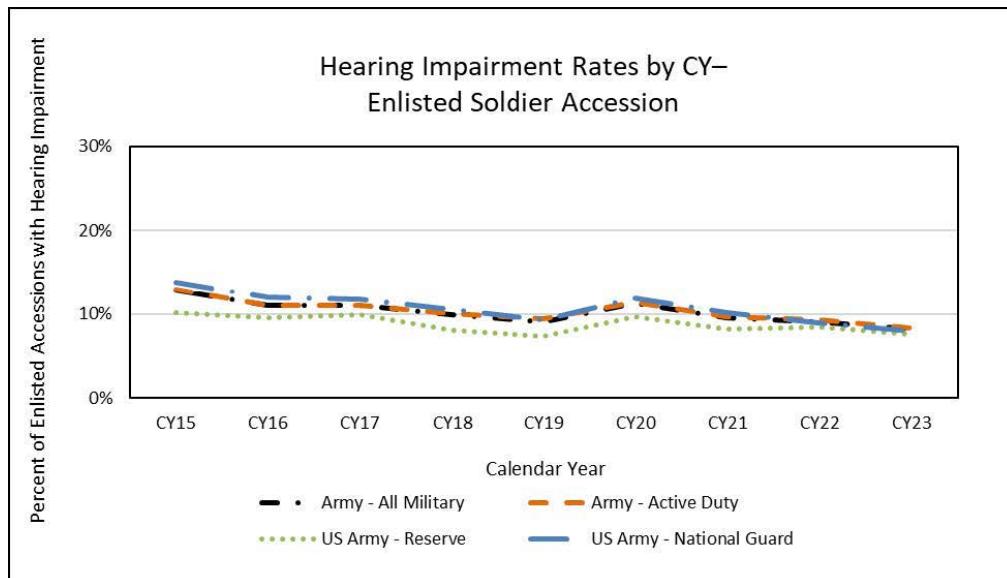


## Hearing Impairment – Enlisted Soldier Accession Data

All Soldiers receive a hearing test as part of basic training at their entrance to military service.<sup>6</sup> These tests help determine the percent of new recruits who come into the Army with hearing impairment, i.e., hearing worse than 25 dB HL at any test frequency. The rate of all enlisted Soldier accessions with hearing impairment decreased by 4.7%, from 12.8% in CY15, to 8.1% in CY23 (Graph 23). There was a 1% decrease in all enlisted Soldier accessions hearing impairment rate in CY23 compared to CY22 (9.1%).

<sup>6</sup> The Military Services refer to training at the onset of military service as Basic Combat Training (Army), Basic Training (Navy), Recruit Training (Marine Corps), and Basic Military Training (Air Force). For the purposes of this report the initial training of service members at entry to military service will be referred to as basic training.

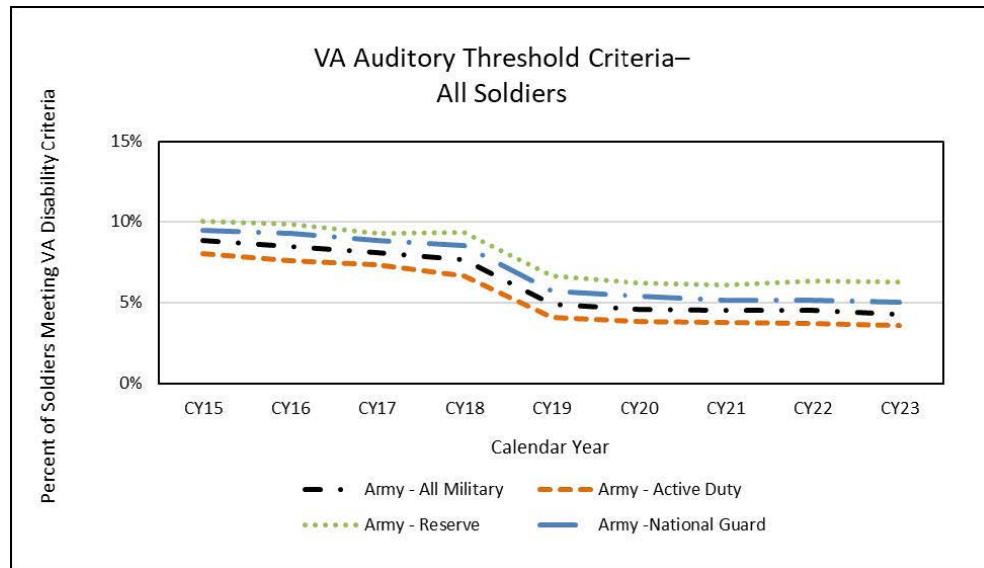
### **Graph 23. Hearing Impairment Rates by CY – Enlisted Soldier Accessions**



### **VA Auditory Threshold Disability Criteria**

The rate of Soldiers meeting established VA auditory threshold disability criteria remained stable from CY20 to CY23. The rate of Soldiers potentially eligible for VA service-connected disability compensation for hearing loss decreased from 8.8% in CY15, to 4.3% in CY23 (Graph 24).

### **Graph 24. VA Auditory Threshold Disability Criteria – All Soldiers**



**Table 3. Data Summary – Army - Source: DOEHRS-HC DR, ad hoc MOE percentages**

Chart Title		MOE	Category	Percent								
				CY15	CY16	CY17	CY18	CY19	CY20	CY21	CY22	CY23
Threshold Shift Rates - All Soldiers	MOE 1	STS	14.0	13.6	13.2	12.9	13.1	13.3	12.0	13.7	11.7	
		TTS	1.3	1.5	2.2	2.4	2.5	2.5	2.6	2.6	2.9	
		PTS	12.4	11.8	10.4	10.0	10.4	10.6	10.1	10.8	9	
	MOE 2	STS	9.9	9.4	8.7	8.1	8.4	8.5	7.9	8.3	8.2	
		TTS	2.3	2.5	3.5	3.6	3.5	3.4	3.4	3.5	3.4	
		PTS	7.4	6.7	4.8	4.2	4.7	4.9	4.4	4.7	4.7	
	MOE 3	STS	16.6	16.0	16.2	15.7	15.8	16.3	16.0	16.7	14.8	
		TTS	0.4	0.6	1.3	1.6	1.9	2.1	2.0	2.3	2.3	
		PTS	15.5	14.7	13.8	13.4	13.4	14.1	13.6	14.0	13.1	
Threshold Shift Rates - USAR Soldiers	MOE 1	STS	19.8	19.9	19.9	20.3	21.5	22.8	23.2	24.3	20.1	
		TTS	0.3	0.3	0.5	0.6	0.6	0.6	0.8	0.9	1.6	
		PTS	19.0	19.2	18.7	19.0	20.6	22.0	22.1	23.1	20.6	
	MOE 2	STS	19.6	18.7	18.9	18.8	18.7	17.3	18.5	19.2	18.5	
		TTS	3.7	4.0	5.0	5.8	5.4	5.3	5.7	6.2	5.4	
		PTS	15.4	14.0	13.0	12.1	13.1	11.6	12.3	12.7	12.7	
	MOE 3	All Soldiers	21.5	25.4	33.7	36.0	30.6	33.3	37.2	31.4	39.2	
		Active Duty	50.4	55.5	74.6	76.2	70.9	71.5	76.7	71.3	75.7	
		National Guard	7.4	11.5	17.1	23.1	18.7	21.7	25.5	19.6	18.7	
		Reserve	6.6	8.2	10.7	12.1	3.3	5.0	8.1	4.9	2.6	
		DA Civilians	47.5	52.2	60.1	61.9	53.6	59.0	67.5	65.6	66.9	
Hearing Impaired	MOE 3	All Soldiers	18.5	17.9	17.9	17.5	16.2	16.4	16.1	15.2	14.1	
		Active Duty	17.0	16.1	16.3	16.0	14.5	15.0	14.7	13.6	12.9	
		National Guard	20.2	19.9	19.7	19.1	18.1	17.9	17.4	16.3	16.3	
		Reserve	20.2	20.1	19.7	19.8	19.2	19.5	19.5	19.1	17.3	
		DA Civilians	45.1	45.4	45.6	45.3	43.4	43.2	43.1	42.8	41.6	
Hearing Impaired - Enlisted Soldier Accessions	MOE 4	All Soldiers	12.8	11.1	11.1	9.9	9.1	11.3	9.6	9.1	8.1	
		Active Duty	12.9	11.0	11.1	10.0	9.4	11.4	9.7	9.3	8.4	
		National Guard	13.8	12.0	11.7	10.5	9.3	11.9	10.1	8.9	9.1	
		Reserve	10.2	9.6	9.9	8.1	7.3	9.6	8.2	8.5	7.6	
VA Auditory Threshold Criteria	MOE 4	All Soldiers	8.8	8.5	8.1	7.6	4.9	4.6	4.5	4.5	4.3	
		Active Duty	8.0	7.6	7.3	6.6	4.1	3.8	3.8	3.7	3.6	
		National Guard	9.5	9.3	8.8	8.5	5.7	5.4	5.2	5.1	6.0	
		Reserve	10.0	9.8	9.2	9.3	6.6	6.2	6.1	6.3	6.3	

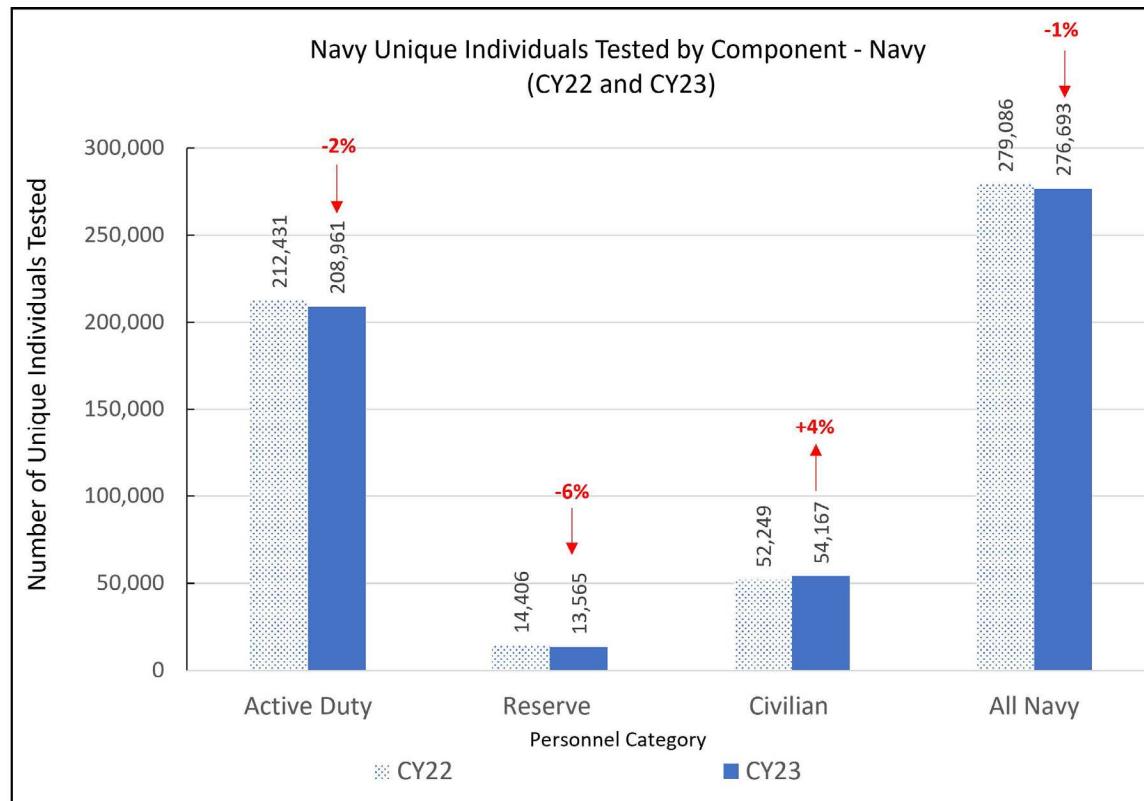
## Appendix B: Hearing Health – Navy

The goal of the U.S Navy's Hearing Conservation and Noise Abatement initiative is to proactively prevent noise-induced hearing loss and ensure optimal auditory readiness. Sailors and U.S. Navy (USN) civilians are enrolled in the HCP based on noise survey data. The following data represents the test results from all Sailors and USN civilians who received audiometric testing.

### Unique Individuals Tested by Component

The number of unique individuals tested in the Navy shows a slight decrease in all Navy components except Navy civilians during CY23 compared to CY22. Overall, there is a 1% decrease in testing for all Navy. USN Civilian testing shows a 4% increase in CY 23 compared to CY22 (Graph 25). Potential causes to the decrease among the uniformed components, especially in the Reserve Component in CY23 may be due to downsizing of the force, continued reduced scheduling of HC appointments during the transition of EHR systems from AHLTA to MHS GENESIS, and changes in RHRP contracted service providers. Increased civilian testing may be the result of increased hiring into noise-hazardous jobs, several ships making homeport shifts, high operation tempo, and changes in hearing conservation program inclusion criteria.

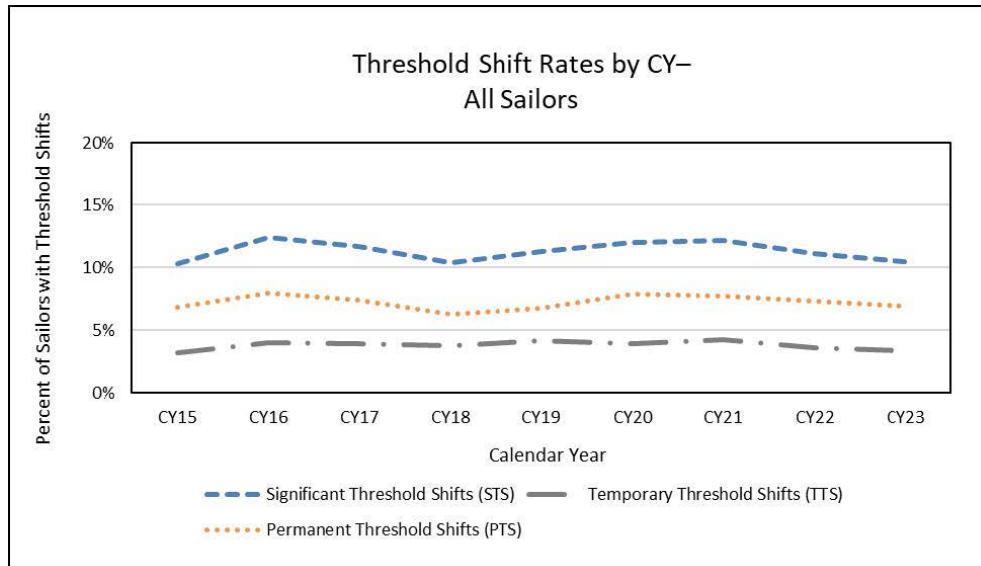
**Graph 25. Unique Individuals Tested by Component - Navy (CY22 and CY23)**



## Significant Threshold Shift Rates by CY

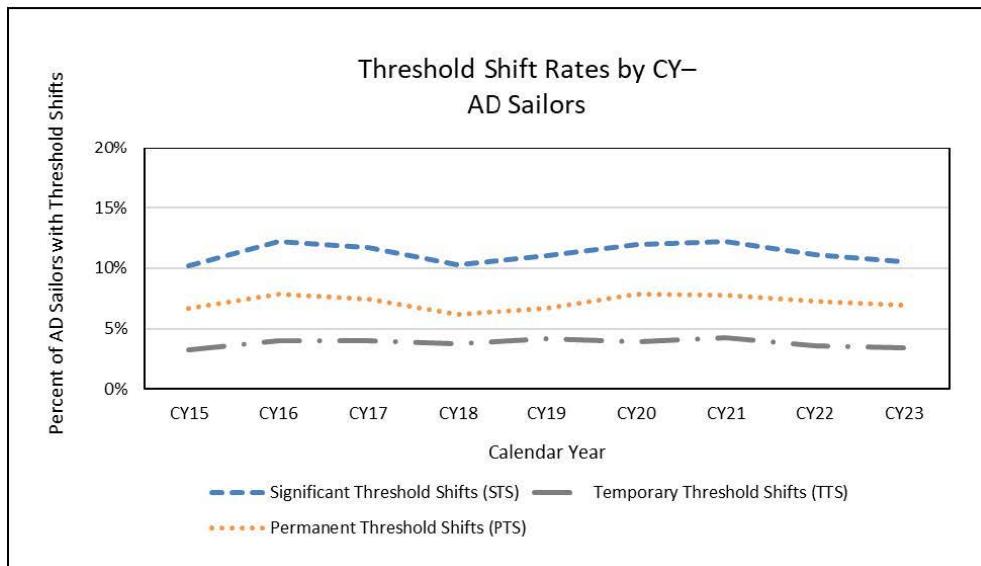
In CY23, Sailor STS, TTS, and PTS show a slight decrease when compared to CY22 STS, TTS, and PTS rates. Threshold shift rates for all Sailors indicate 10.5% STS, 3.4% TTS, and 6.9% PTS rates in CY23 (Graph 26).

**Graph 26. Threshold Shift Rates by CY – All Sailors**



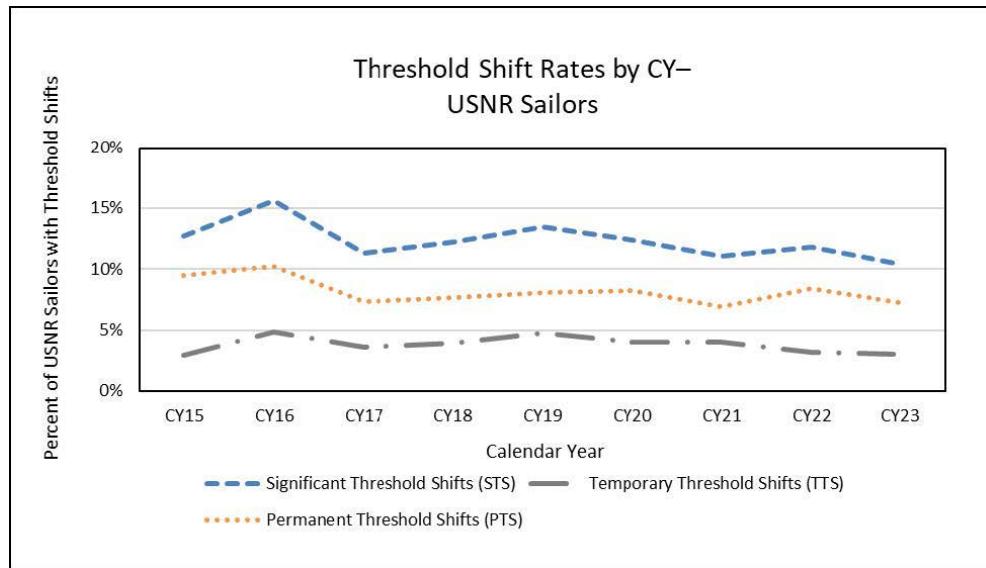
The AD Sailor threshold shift rates show a decrease from CY22 to CY23. Threshold shift rates for AD Sailors were the same as all Sailors rate (10.5% STS, 3.4% for TTS, and 6.9% PTS) in CY23 (Graph 27).

**Graph 27. Threshold Shift Rates by CY - AD Sailors**



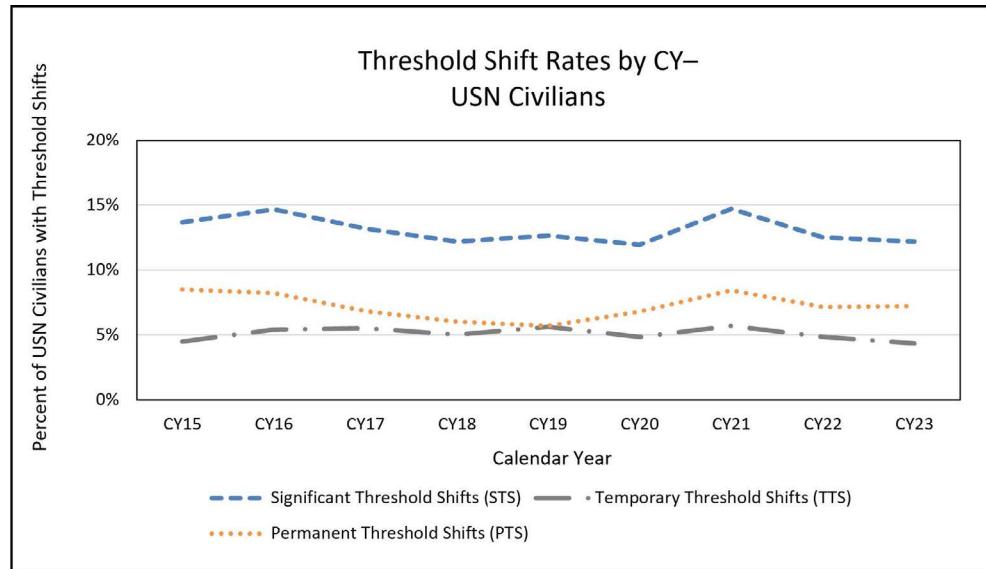
The Navy (USNR) Sailor threshold rates for CY23 are 10.4% STS, 3.0% TTS, and 7.3% PTS (Graph 28). STS (10.4%) and PTS (7.3%) rates show a decrease in CY23 compared to CY22 (11.8% and 8.4%) respectively. Failure to conduct STS follow-up testing prevents the accurate identification of TTS vs. PTS.

**Graph 28. Threshold Shift Rates by CY - USNR Sailors**



The USN civilian STS and PTS rates show a decrease in CY23 compared to CY22. The USN civilian rates for CY23 are: 12.2% STS, 4.3% TTS, and 7.2% PTS (Graph 29). Improved STS follow-up testing for civilians (Graph 31) shows that more than half of all STS identified are found to be PTS.

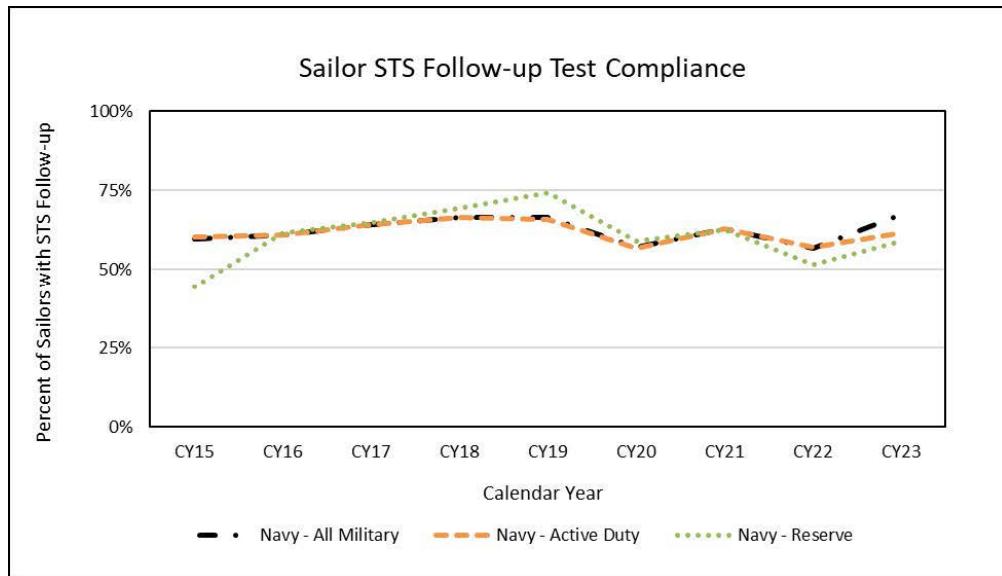
**Graph 29. Threshold Shift Rates by CY - USN Civilians**



## STS Follow-up Test Compliance

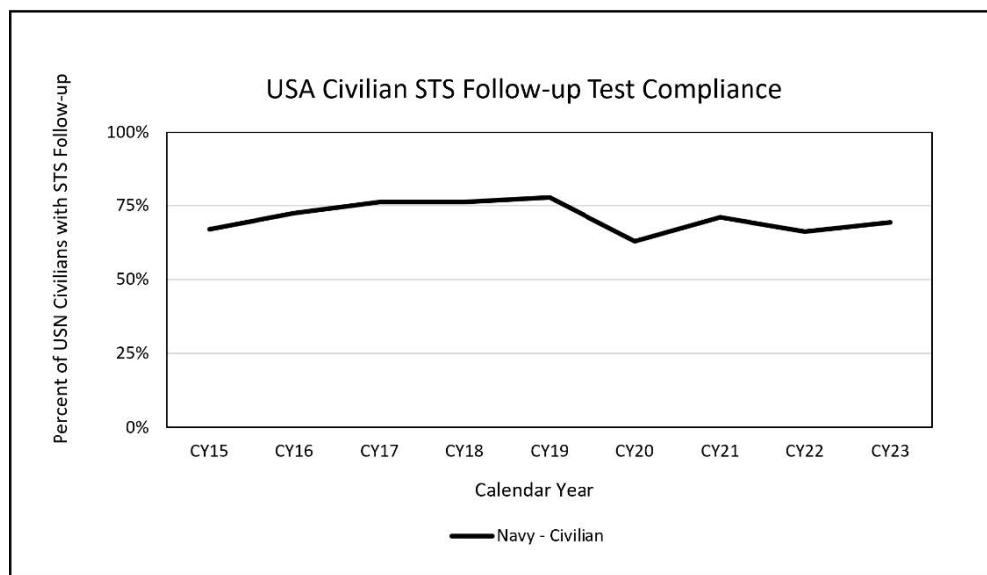
The STS follow-up testing increased in CY23 (Graph 30) when compared to CY22 for all components. Overall compliance for follow-up testing increased from 59.7% in CY15 to 67.4% in CY23. The AD compliance increases to 61.6% in CY23 compared to 57.1% in CY22 and USNR compliance increased from 51.5% in CY22 to 59% in CY23.

**Graph 30. Sailor STS Follow-up Test Compliance**



The USN civilian STS follow-up test compliance shows an increase in CY23 (69.4%) compared to CY22 (66.3%). Overall compliance improves from 67.1% in CY15 to 69.4% in CY23 (Graph 31).

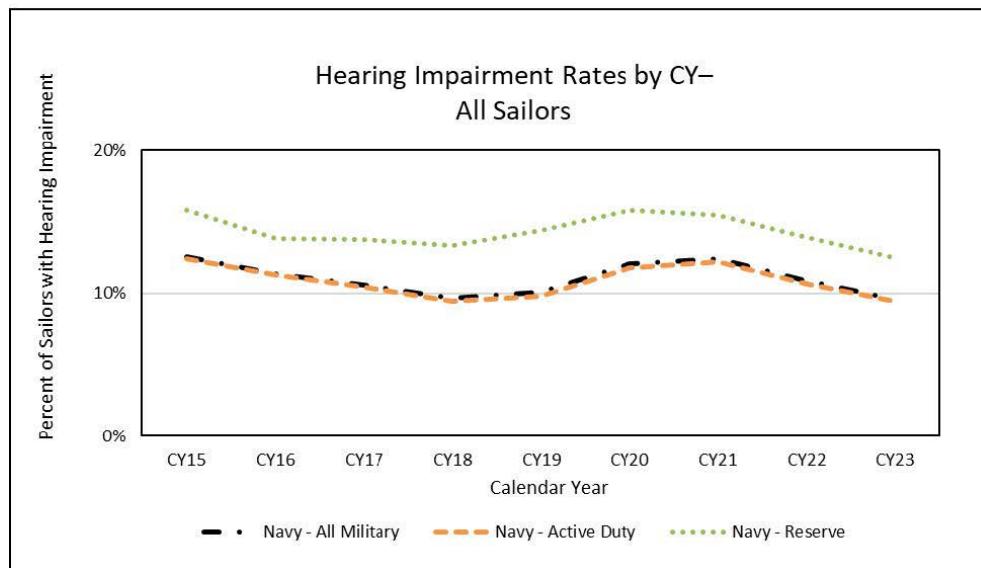
**Graph 31. USN Civilian STS Follow-up Test Compliance**



## Hearing Impairment

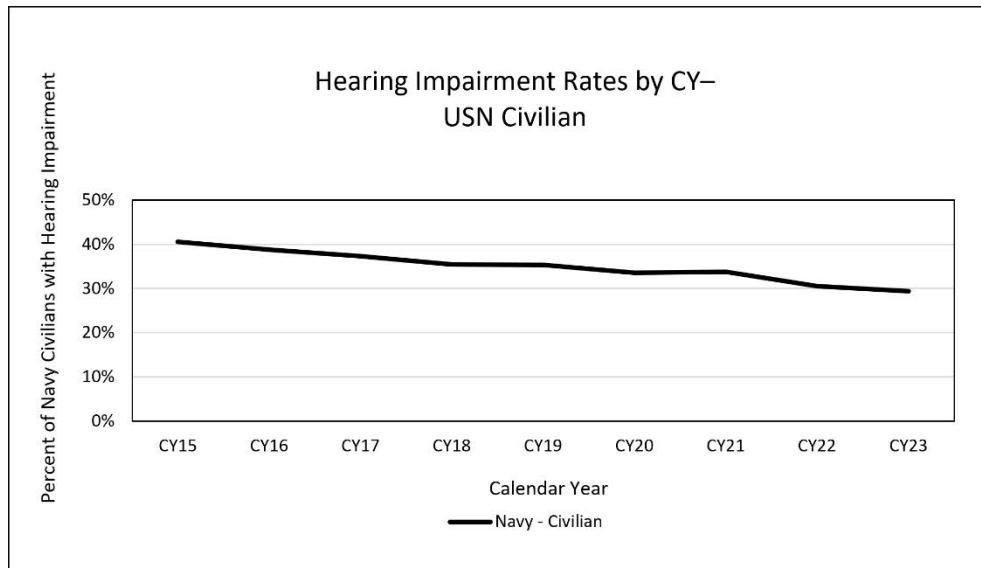
The percentage of all Sailors with hearing impairment shows a decrease for all Navy components combined and individual since CY15 (Graph 32). Sailors with hearing impairment decreased from 10.9% in CY22 to 9.6% in CY23. The USNR Sailors exhibit the greatest amount of hearing impairment with 15.8% in CY15 to 12.5% in CY23 with only a very marginal improvement in hearing over these years. The number of sailors with normal hearing thresholds in CY23 is 90.4%.

**Graph 32. Hearing Impairment Rates by CY - All Sailors**



The percentage of USN civilians with hearing impairment is high but decreased in CY23 compared to CY22. Data indicate that 70.7% of USN civilians have normal hearing in CY23. The percentage of USN civilians with hearing impairment decreased from 40.5% in CY15 to 29.3% in CY23 (Graph 33).

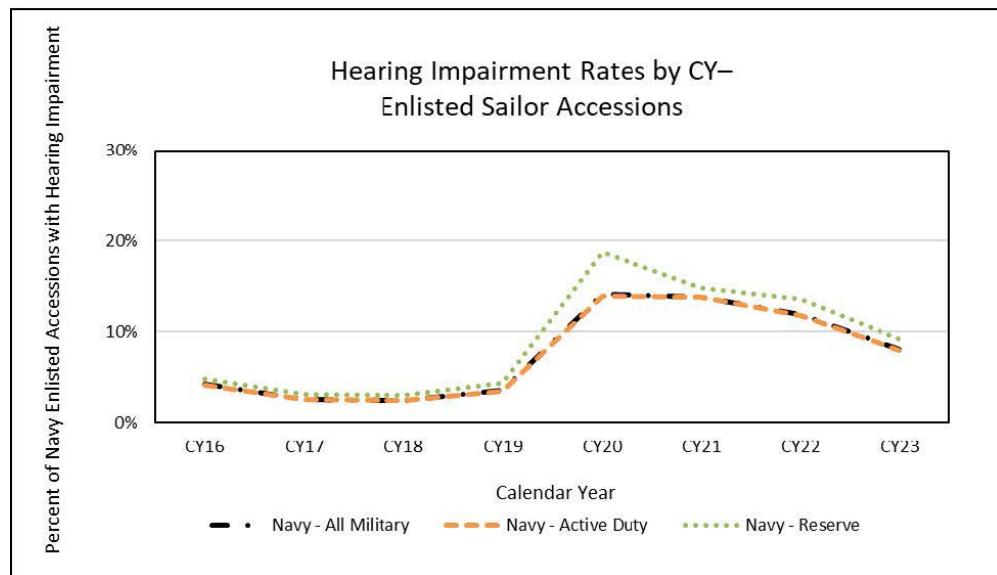
**Graph 33. Hearing Impairment Rates by CY – USN Civilian**



## Hearing Impairment – Enlisted Accession Data

U.S Navy accessions receive a hearing test as part of basic training when they enter military service. These tests are used to determine the percentage of all new recruits who come into the USN with hearing impairment (hearing worse than 25 dB HL at any test frequency). The percentage of enlisted sailor accessions with hearing impairment for all Navy components shows a decrease to 8.1% in CY23 compared to 11.8% in CY22 (Graph 34). The percentage of USNR enlisted Sailor accessions with hearing impairment increased from 7.4% in CY15 to 8.1% in CY23. In CY23, 91.9% of all enlisted Sailor accessions had normal hearing.

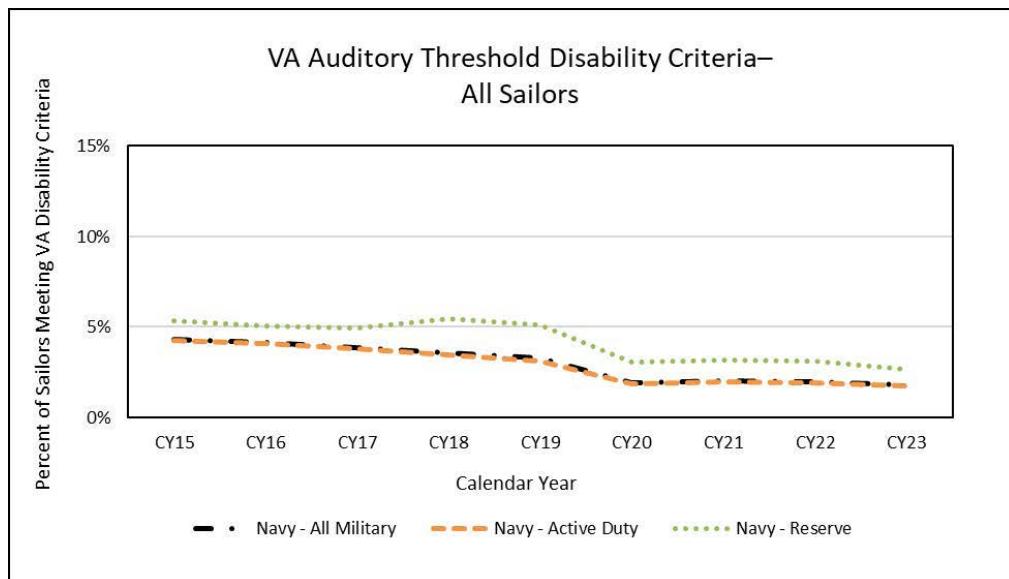
**Graph 34. Hearing Impairment Rates by CY - Enlisted Sailor Accessions**



## VA Auditory Threshold Disability Criteria

The percentage of Sailors meeting established VA auditory threshold disability criteria remains stable for all Navy components combined and separate over the past nine years, CY15-CY23. The percentage of Sailors (all components combined) potentially eligible for VA service-connected disability compensation for hearing loss shows a decrease from 4.3% in CY15 to 1.8% in CY23. The highest percentage of Sailors (2.6%) potentially eligible for VA service-connected disability compensation for hearing loss was in the USNR with 5.3% in CY15 to 2.6% in CY23. (Graph 35). VA Auditory Threshold Disability Criteria includes other factors in the determination of VA compensation due to impaired hearing.

**Graph 35. VA Auditory Threshold Disability Criteria – All Sailors**



**Table 4. Data Summary – Navy - Source: DOEHRS-HC DR, ad hoc MOE percentages**

Chart Title		MOE	Category	Percent								
				CY15	CY16	CY17	CY18	CY19	CY20	CY21	CY22	CY23
Threshold Shift Rates - All Sailors		MOE 1	STS	10.3	12.4	11.7	10.4	11.2	12.0	12.2	11.1	10.5
			TTS	3.2	4.0	4.0	3.7	4.2	3.9	4.2	3.6	3.4
			PTS	6.8	8.0	7.4	6.3	6.7	7.9	7.7	7.3	6.9
Threshold Shift Rates - AD Sailors		MOE 1	STS	10.2	12.2	11.7	10.3	11.1	12.0	12.2	11.1	10.5
			TTS	3.2	4.0	4.0	3.7	4.2	3.9	4.2	3.6	3.4
			PTS	6.7	7.9	7.4	6.2	6.6	7.8	7.8	7.2	6.9
Threshold Shift Rates - USNR Sailors		MOE 1	STS	12.7	15.6	11.3	12.2	13.4	12.4	11.0	11.8	10.4
			TTS	2.9	4.8	3.6	4.0	4.7	4.0	4.0	3.2	3.0
			PTS	9.4	10.3	7.3	7.6	8.0	8.3	6.9	8.4	7.3
Threshold Shift Rates - USN Civilians		MOE 1	STS	13.7	14.6	13.2	12.2	12.6	11.9	14.7	12.5	12.2
			TTS	4.5	5.4	5.5	5.0	5.6	4.8	5.7	4.9	4.3
			PTS	8.5	8.2	6.8	6.0	5.7	6.8	8.4	7.1	7.2
STS Follow-Up Test Compliance		MOE 2	All Sailors	59.7	61.0	64.3	66.6	66.4	56.9	63.0	56.7	67.4
			Active Duty	60.4	60.9	64.3	66.4	65.7	56.8	63.0	57.1	61.6
			Reserve	44.4	61.5	64.8	69.4	74.4	59.0	62.7	51.5	59.0
			USN Civilians	67.1	72.5	76.3	76.2	77.8	62.9	71.0	66.3	69.4
Hearing Impaired		MOE 3	All Sailors	12.6	11.4	10.6	9.7	10.1	12.0	12.4	10.9	9.6
			Active Duty	12.4	11.3	10.4	9.5	9.8	11.8	12.2	10.7	9.4
			Reserve	15.8	13.9	13.7	13.7	14.4	15.8	15.5	13.9	12.5
			USN Civilians	40.5	38.8	37.3	35.4	35.3	33.5	33.8	30.5	29.3
Hearing Impaired - Enlisted Sailor Accessions		MOE 3	All Sailors	7.4	4.2	2.6	2.5	3.5	14.1	13.9	11.8	8.1
			Active Duty	7.4	4.2	2.5	2.4	3.5	13.9	13.8	11.7	8.0
			Reserve	8.4	4.8	3.2	3.1	4.4	18.7	14.8	13.6	9.2
A Auditory Threshold Criteria		MOE 4	All Sailors	4.3	4.1	3.8	3.6	3.2	1.9	2.0	2.0	1.8
			Active Duty	4.1	4.1	3.8	3.4	3.1	1.8	1.9	1.9	1.7
			Reserve	5.3	5.0	4.9	5.4	5.1	3.0	3.2	3.1	2.6

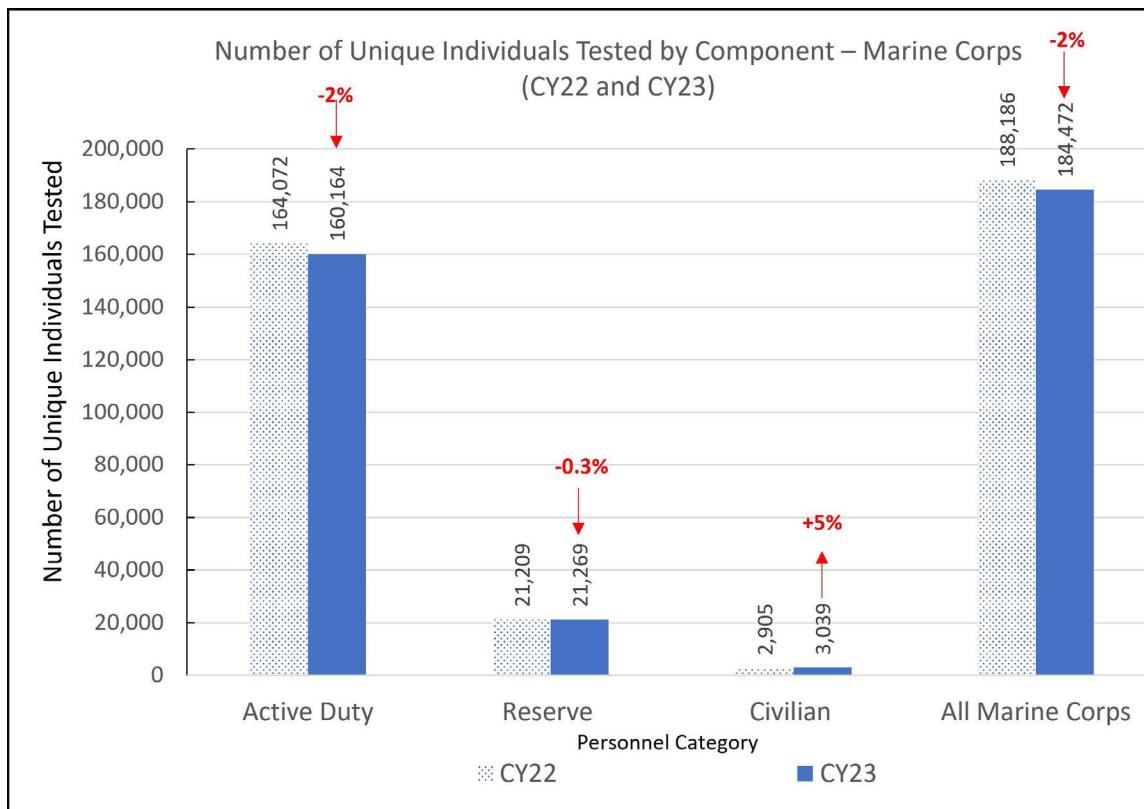
## Appendix C: Hearing Health – Marine Corps

The goal of the Department of Navy's Hearing Conservation and Noise Abatement initiative is to proactively prevent noise-induced hearing loss and ensure optimal auditory readiness for Marines. The United States Marine Corps (USMC) enrolls all AD Marines in the HCP. USMC civilians are enrolled in the HCP based on their individual noise exposure.

### Unique Individuals Tested by Component

The number of unique individuals tested in the USMC shows a decrease in all components except USMC civilians during CY23 compared to CY22. Overall, there was a 2% decrease in testing for all Marines and a 5% increase for USMC civilian personnel in CY23 compared to CY22 (Graph 36). This decrease in unique hearing tests in CY23 compared to CY22 is likely due to downsizing of the force, continued reduced scheduling of HC appointments during the transition of EHR systems from AHLTA to MHS GENESIS, and changes in contracted RHRP service providers. Increased civilian testing may be the result of increased hiring into noise-hazardous jobs and changes in hearing conservation program inclusion criteria.

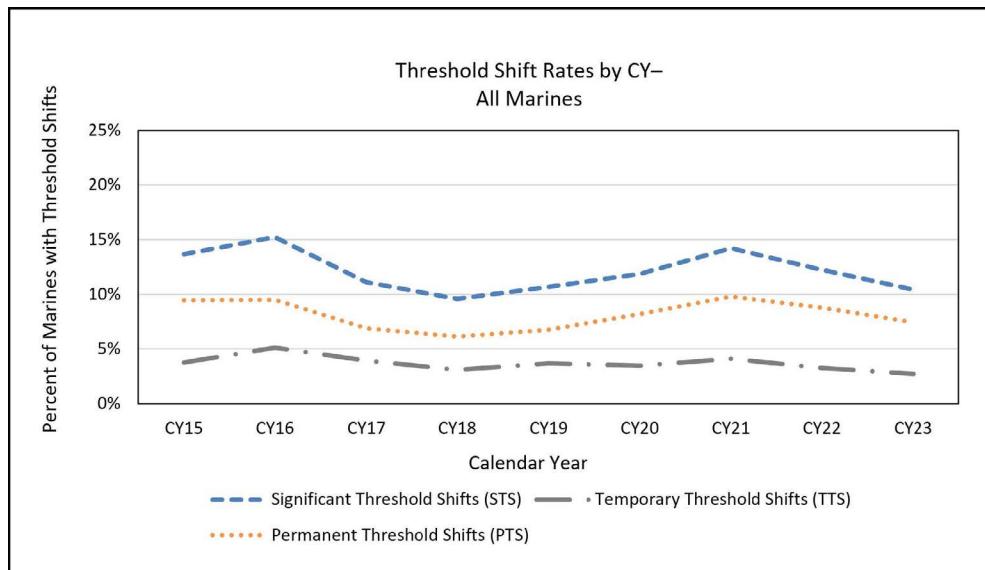
**Graph 36. Unique Individuals Tested by Component – Marine Corps (CY22 and CY23)**



## Significant Threshold Shift Rates by CY

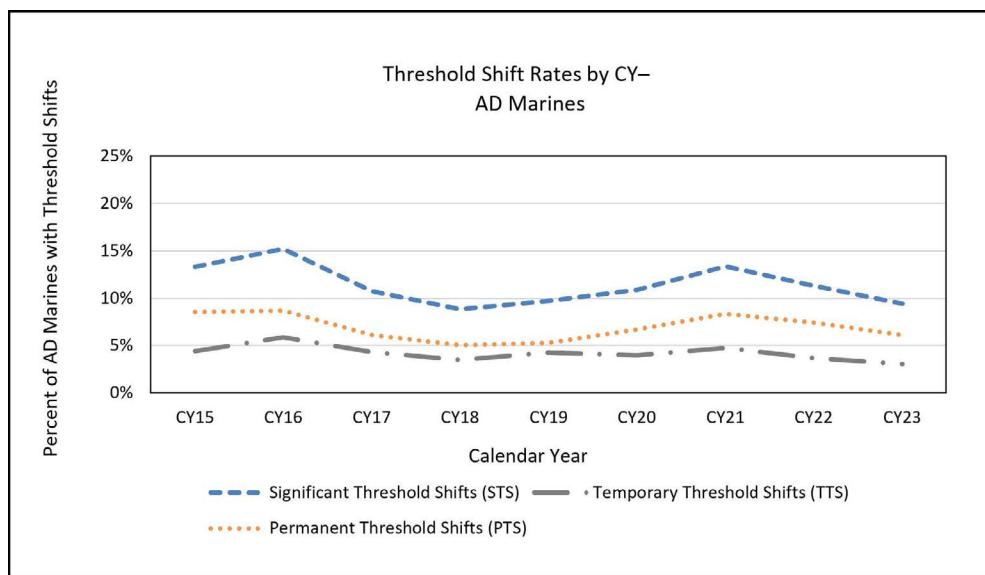
In CY23, USMC STS, TTS, and PTS show a slight decrease when compared to CY22 STS, TTS, and PTS rates. Threshold shift rates for all Marines indicate 10.4% STS, 2.7% TTS, and 7.4% PTS rates in CY23 (Graph 37).

**Graph 37. Threshold Shift Rates by CY - All Marines**



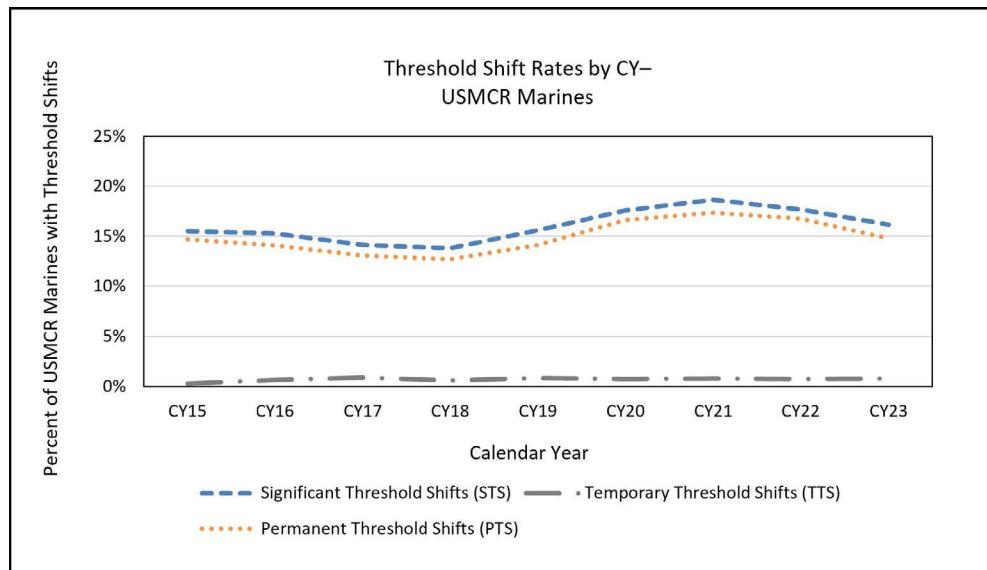
The AD Marines have the lowest PTS rates of all USMC components during CY15 - CY23. This may be due to improved follow-up testing compliance as seen in [Graph 41](#) resulting in accurate identification of PTS and TTS. Threshold shift rates for AD Marines indicate 9.4% STS, 3.1% TTS, and 6.1% PTS rates in CY23. STS rates show a decrease in CY23 (9.4%) compared to CY22 (11.3%). (Graph 38).

**Graph 38. Threshold Shift Rates by CY - AD Marines**



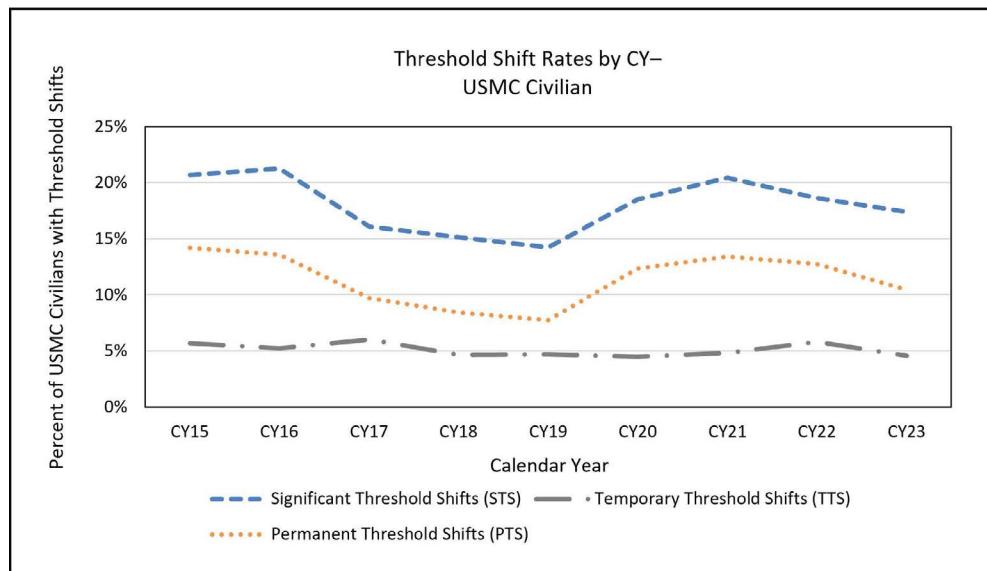
The USMC Reserve (USMCR) rates for CY23 are: 16.1% STS, 0.8% TTS, and 14.8% PTS. PTS rates and STS rates show a decrease from CY22. PTS rates decreased in CY23 (16.1%) compared to CY22 (17.6%). STS and PTS rates remain high likely due to lack of STS follow-up testing shown in Graph 41. Follow-up testing is a requirement of DODI 6055.12 and MCO 6260.3A, "Marine Corps Hearing Conservation Program." Failure to conduct STS follow-up testing prevents the accurate identification of TTS vs. PTS.

**Graph 39. Threshold Shift Rates by CY – USMCR Marines**



The USMC civilian PTS rates show a decrease in CY23 compared to CY22. The USMC civilian rates for CY23 are: 17.4% STS, 4.6% TTS, and 10.4% PTS (Graph 40). STS and PTS rates for USN civilian appear to fluctuate from CY15 to CY21.

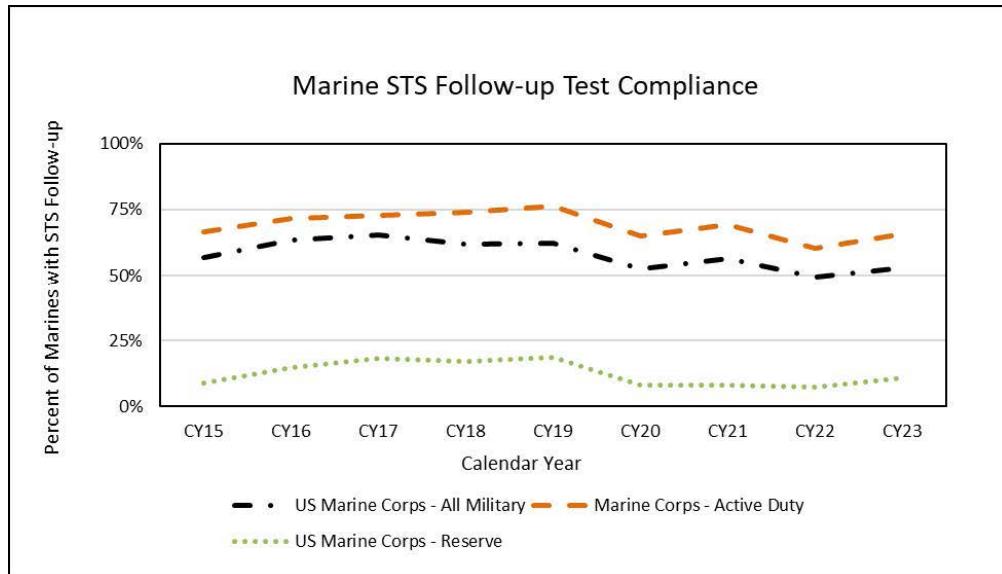
**Graph 40. Threshold Shift Rates by CY – USMC Civilian**



## STS Follow-up Test Compliance

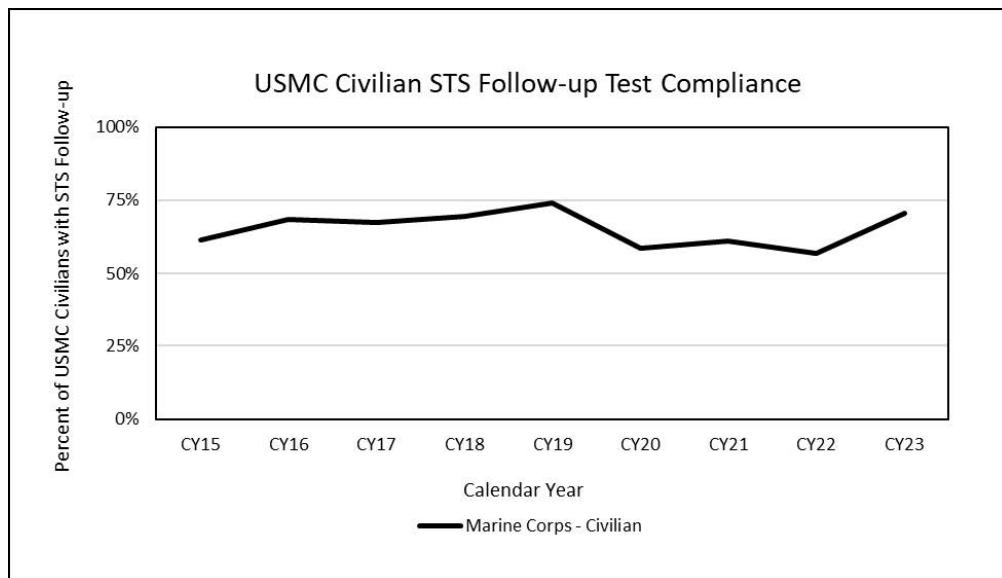
The STS follow-up testing compliance showed a slight increase from CY22 to CY23 (Graph 41) for all Marine components combined. Overall compliance for follow-up testing for all Marine components combined increased from 49.3% in CY22 to 50.0% in CY23. Follow-up testing compliance in the USMCR showed a slight increase in compliance from 9.1% in CY15 to 10.8% in CY23. The AD Marine follow-up testing compliance increased from 60.5% in CY22 to 65.8% in CY23.

**Graph 41. Marine STS Follow-up Test Compliance**



The USMC civilian STS follow-up testing compliance continued to show improvement from 57.0% in CY22 to 70.4% in CY23 (Graph 42).

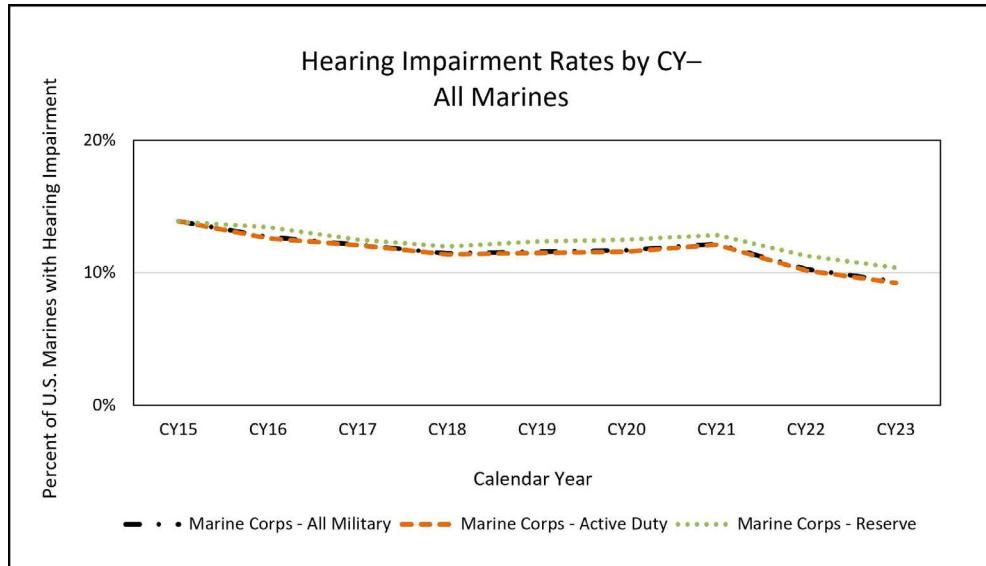
**Graph 42. USMC Civilian STS Follow-up Test Compliance**



## Hearing Impairment

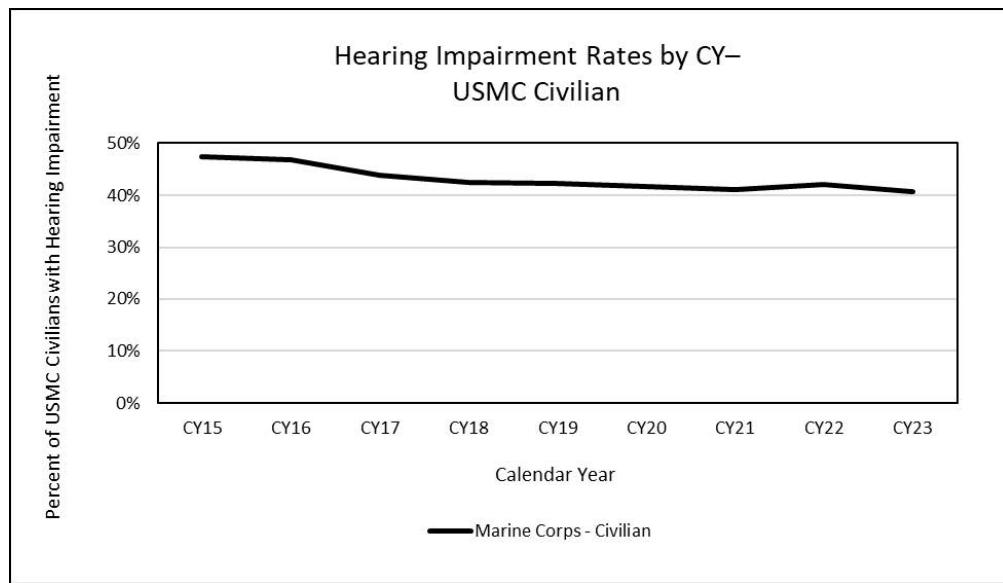
The percentage of Marines with hearing impairment (for combined and individual components) shows a decrease from CY22 to CY23. Marines (combined components) with hearing impairment decreased from 13.9% in CY15 to 9.3% in CY23 (Graph 43). Marines (all components combined) with normal hearing thresholds in CY23 was 90.7.

**Graph 43. Hearing Impairment Rates by CY - All Marines**



The percentage of USMC civilians with hearing impairment is high but remains stable since CY18. Data indicate that 59.4% of USMC civilians have normal hearing in CY23. The percentage of USMC civilians with hearing impairment decreased from 47.5% in CY15 to 40.6% in CY23 (Graph 44).

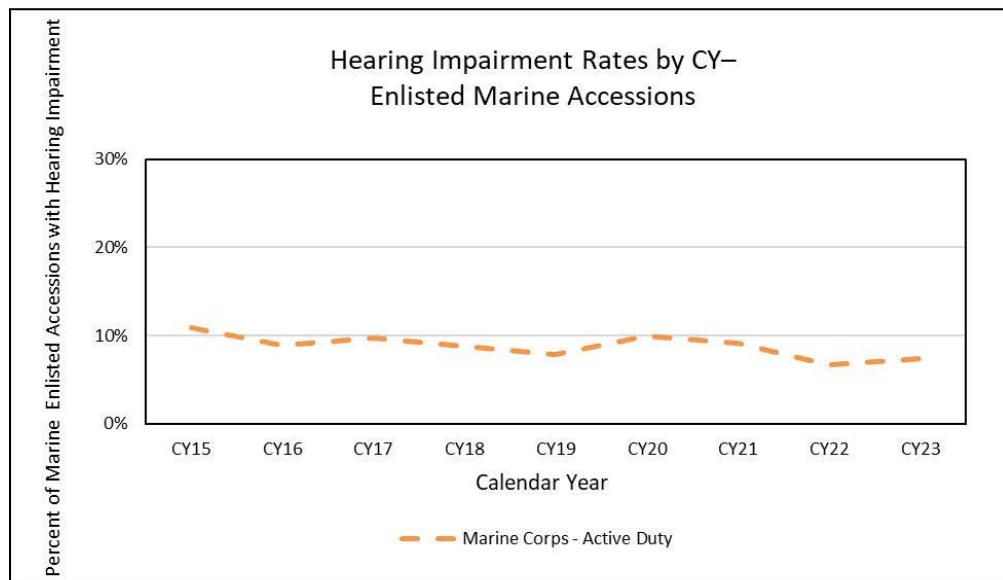
**Graph 44. Hearing Impairment Rates by CY - USMC Civilian**



## Hearing Impairment – Enlisted Accession Data

Marines receive a hearing test as part of basic training when they enter military service. These tests are used to determine the percentage of all new recruits who enter the USMC with hearing impairment (hearing worse than 25 dB HL at any test frequency). The percentage of enlisted USMC accessions with hearing impairment for AD shows a decrease from 10.9% in CY15 to 7.5% in CY23 (Graph 45). The percentage of USMCR enlisted accessions with hearing impairment has been lacking for five of the last nine years and has not been reported here. In CY23, 92.5% enlisted Marine accessions had normal hearing.

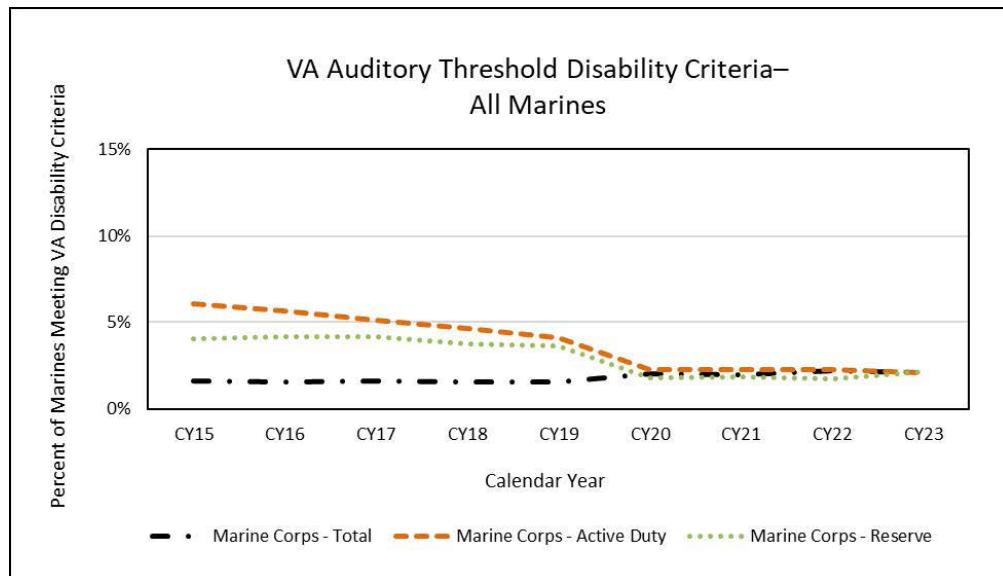
**Graph 45. Hearing Impairment Rates by CY - Enlisted Marine Accessions**



## VA Auditory Threshold Disability Criteria

The percentage of Marines meeting established VA auditory threshold disability criteria remains essentially stable for all USMC components. The percentage of Marines (components combined) potentially eligible for VA service-connected disability compensation for hearing loss show a slight increase from 1.6% in CY15 to 2.1% in CY23 (Graph 46). VA Auditory Threshold Disability Criteria includes other factors in the determination of VA compensation due to impaired hearing.

**Graph 46. VA Auditory Threshold Disability Criteria - All Marines**



**Table 5. Data Summary – Marine Corps - Source: DOEHRS-HC DR, ad hoc MOE percentages**

U.S. Marine Corps											
Chart Title	MOE	Category	Percent								
			CY15	CY16	CY17	CY18	CY19	CY20	CY21	CY22	CY23
Threshold Shift Rates - All Marines	MOE 1	STS	13.6	15.2	11.1	9.6	10.7	11.9	14.2	12.3	10.4
		TTS	3.8	5.1	4.0	3.1	3.7	3.5	4.1	3.3	2.7
		PTS	9.5	9.5	6.9	6.1	6.8	8.2	9.8	8.8	7.4
Threshold Shift Rates - AD Marines	MOE 1	STS	13.3	15.2	10.7	8.8	9.7	10.9	13.4	11.3	9.4
		TTS	4.4	5.9	4.3	3.5	4.3	4.0	4.7	3.7	3.1
		PTS	8.5	8.7	6.1	5.0	5.3	6.7	8.3	7.4	6.1
Threshold Shift Rates - USMCR Marines	MOE 1	STS	15.5	15.3	14.1	13.8	15.6	17.6	18.6	17.6	16.1
		TTS	0.3	0.7	0.9	0.6	0.9	0.8	0.8	0.8	0.8
		PTS	14.7	14.1	13.1	12.7	14.1	16.6	17.4	16.7	14.8
Threshold Shift Rates - USMC Civilians	MOE 1	STS	20.7	21.3	16.1	15.1	14.2	18.5	20.4	18.6	17.4
		TTS	5.7	5.2	6.0	4.7	4.7	4.5	4.8	5.8	4.6
		PTS	14.2	13.6	9.7	8.4	7.8	12.4	13.4	12.8	10.4
STS Follow-Up Test Compliance	MOE 2	All Marines	56.7	63.3	65.2	62.0	62.2	52.3	56.3	49.3	50.0
		Active Duty	66.7	71.7	72.8	73.9	76.4	65.0	69.2	60.5	65.8
		Reserve	9.1	14.7	18.1	16.9	18.8	8.1	8.0	7.4	10.8
		USMC Civilians	61.5	68.4	67.5	69.5	74.1	58.5	61.0	57.0	70.4
Hearing Impaired	MOE 3	All Marines	13.9	12.7	12.1	11.4	11.6	11.7	12.2	10.2	9.3
		Active Duty	13.9	12.6	12.1	11.4	11.5	11.6	12.1	10.1	9.2
		Reserve	13.8	13.4	12.5	12.0	12.3	12.5	12.8	11.3	10.4
		USMC Civilians	47.5	46.7	43.9	42.5	42.3	41.6	41.0	42.1	40.6
Hearing Impaired - Enlisted Marine Accessions	MOE 3	All Marines	10.9	9.0	9.7	8.8	7.9	10.1	9.2	6.7	7.5
		Active Duty	10.9	8.9	9.7	8.8	7.9	10.0	9.1	6.6	7.5
		Reserve	0.0	0.0	0.0	7.9	30.0	13.0	10.6	0.0	0.0
VA Auditory Threshold Criteria	MOE 4	All Marines	1.6	1.6	1.6	1.6	1.5	2.0	1.9	2.2	2.1
		Active Duty	6.1	5.6	5.1	4.6	4.1	2.3	2.2	2.2	2.1
		Reserve	4.0	4.2	4.1	3.8	3.6	1.8	1.9	1.7	2.1

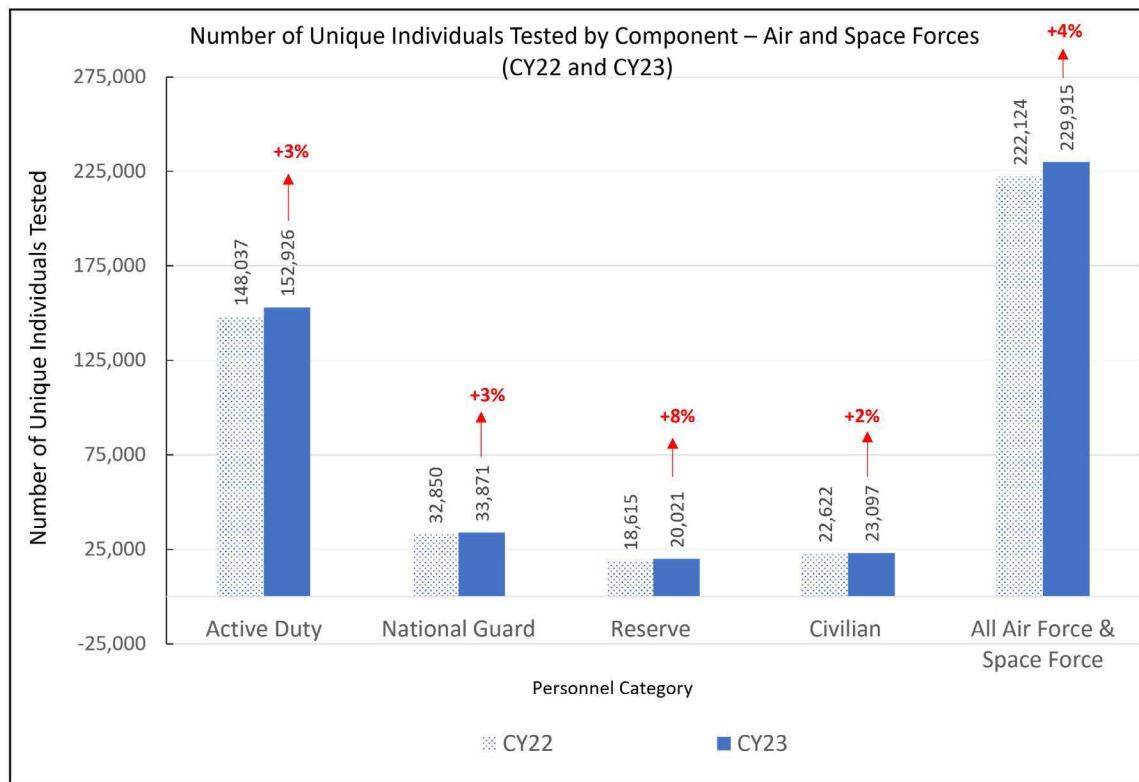
# Appendix D: Hearing Health - Air and Space Force

The Air Force (AF) and Space Force (SF) HCPs are risk-based programs, enrolling Airmen, Guardians, and civilians based on occupational exposure to hazardous noise. In 2015, the Air Force started hearing testing at basic training for all enlisted Airmen, Guardians and officers, regardless of noise exposure risk. Likewise, the Air Force completes Separation Health Physical Exams (SHPE) for all Airmen and Guardians, using the DOEHRS-HC system, regardless of HCP enrollment. As a result, hearing tests completed at the beginning and end of military service, regardless of HCP enrollment, shown in the graphs below, are not completely reflective of actual HCP effectiveness or hearing health of the total AF and SF populations.

## Air and Space Force Unique Individuals Tested by Component

The number of unique individuals tested in the Air Force and Space Force shows an increase in all components during CY23 compared to CY22. There was a 4% increase in testing for all Airmen and Guardians and a 2% increase for AF/SF civilian personnel in CY23 compared to CY22 (Graph 47). An 8% increase in the Reserve component is remarkable and may reflect improved use of in-house testing capabilities at Reserve sites. The increase in testing for all Airmen and Guardians may be influenced by reduced COVID-19 pandemic restrictions resulting in easier access to hearing health services. It should be noted that the Space Force does not contain a Reserve or National Guard component.

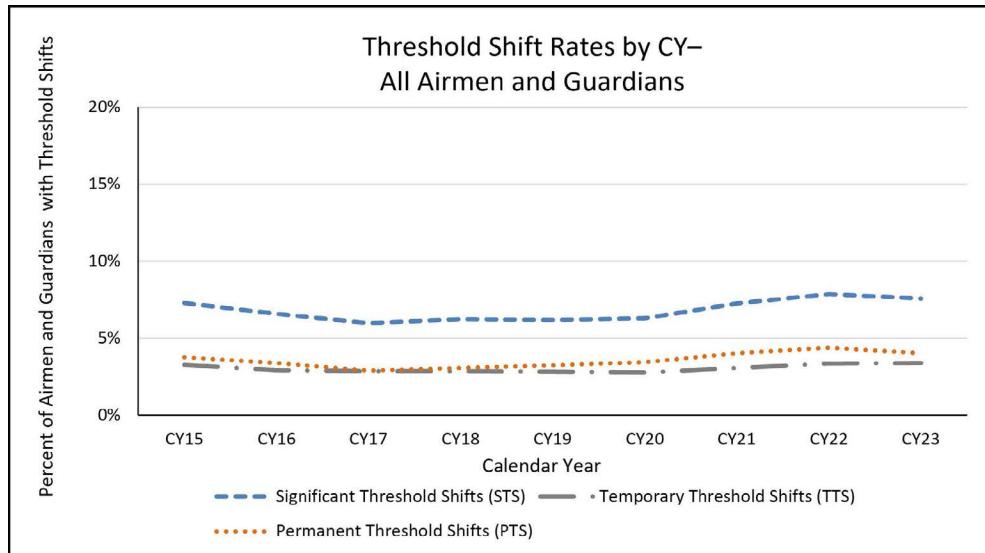
**Graph 47. Unique Individuals Tested by Component – Air and Space Forces (CY22 and CY23)**



## Significant Threshold Shift Rates by CY

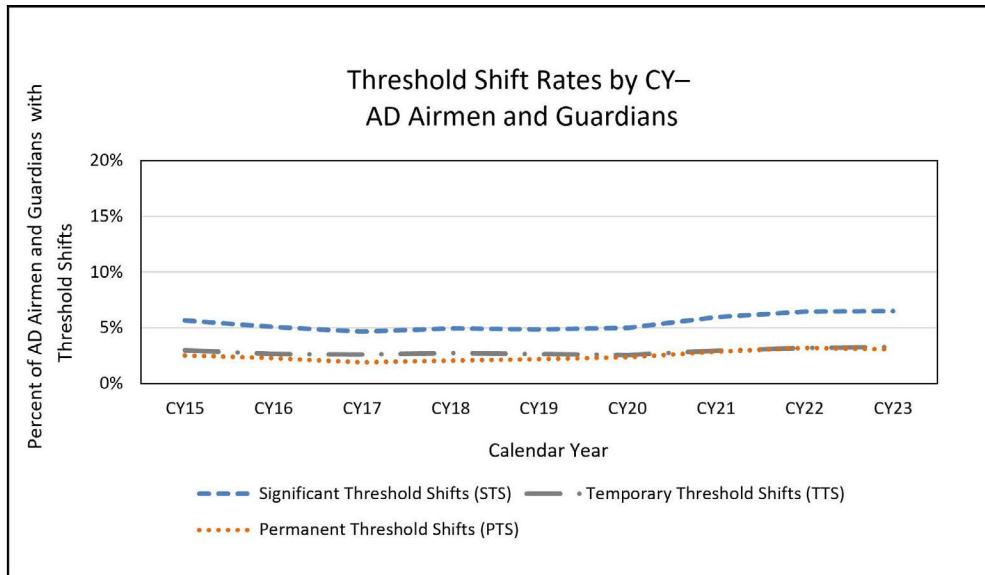
In CY23, all Airmen and Guardians (all AF components combined) STS and PTS rates show a slight decrease compared to CY22. TTS rates are stable. Threshold shift rates for all Airmen and Guardians indicate 7.6% STS, 3.4% TTS, and 4% PTS rates in CY23 (Graph 48).

**Graph 48. Threshold Shift Rates by CY - All Airmen and Guardians**



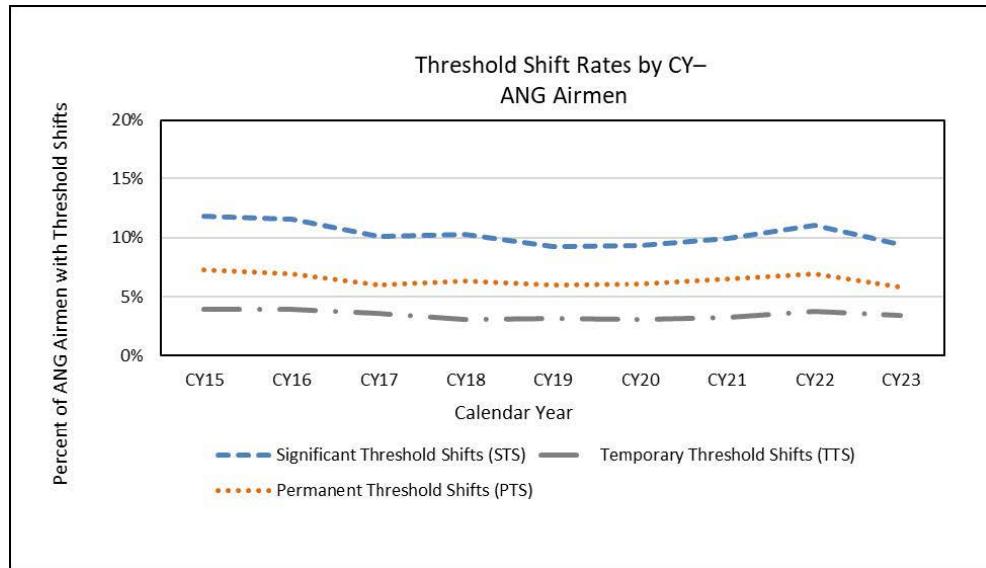
The AD Airmen and Guardians have the lowest PTS rates of all Air and Space Force components during CY15 - CY23. This may be due to improved STS follow-up testing compliance resulting in accurate identification of PTS and TTS as seen in [Graph 53](#). Threshold shift rates for AD Airmen and Guardians indicate 6.5% STS, 3.3% for TTS, and 3.1% PTS rate in CY23 (Graph 49). The STS rate remains stable at 6.5% from CY22 to CY23 for AD Airmen and Guardians.

**Graph 49. Threshold Shift Rates by CY – AD Airmen and Guardians**



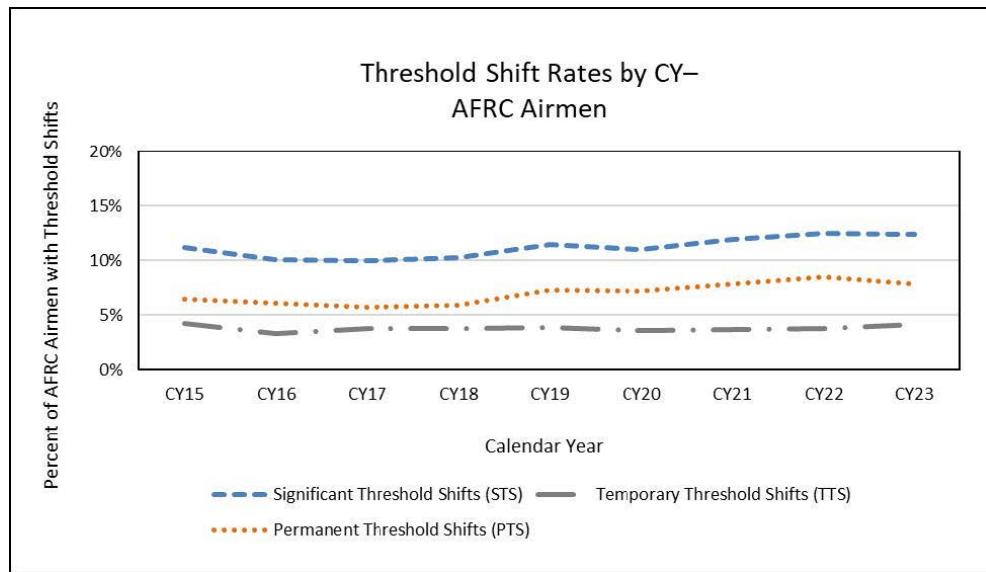
Air National Guard (ANG) threshold shift rates for CY23 are: 9.4% STS, 3.5% TTS, and 5.8% PTS (Graph 50). The STS, TTS, and PTS rates are decreased for ANG Airmen from CY22 to CY23.

**Graph 50. Threshold Shift Rates by CY – ANG Airmen**



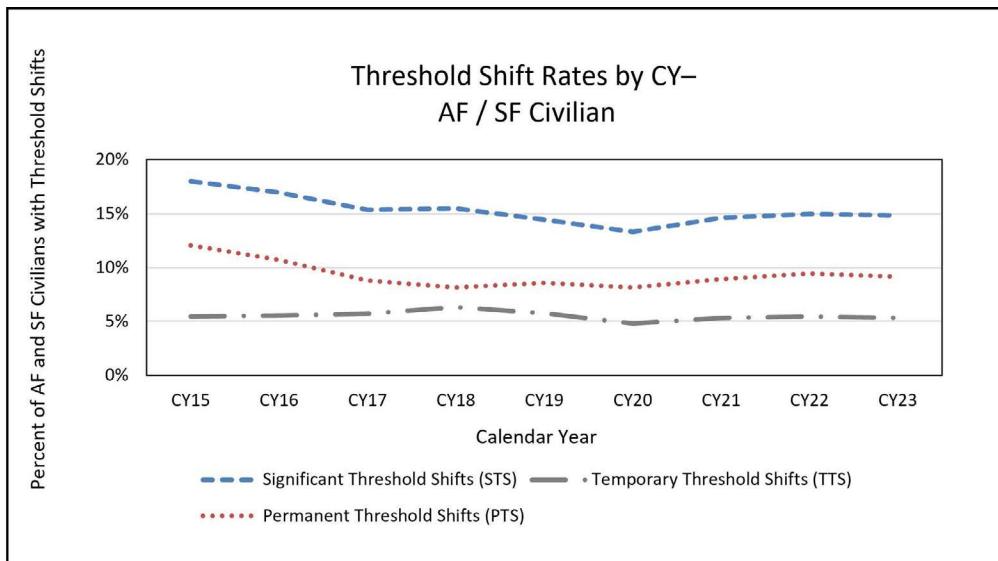
Air Force Reserve (AFR) all threshold shift rates show an essentially stable STS rate of 12.4% and a PTS rate of 7.9% from CY22 to CY23 (Graph 51). Threshold shift rates for CY23 are: 12.4% STS, 4.1% TTS, and 7.9% PTS.

**Graph 51. Threshold Shift Rates by CY - AFR Airmen**



The AF civilian STS rates show decreased rates from 18% in CY15 to 14.8% in CY23. The AF civilian threshold shift rates for CY23 are: 14.8% STS, 5.3% TTS, and 9.2% PTS (Graph 52). The AF civilian STS rates are higher than AF military components.

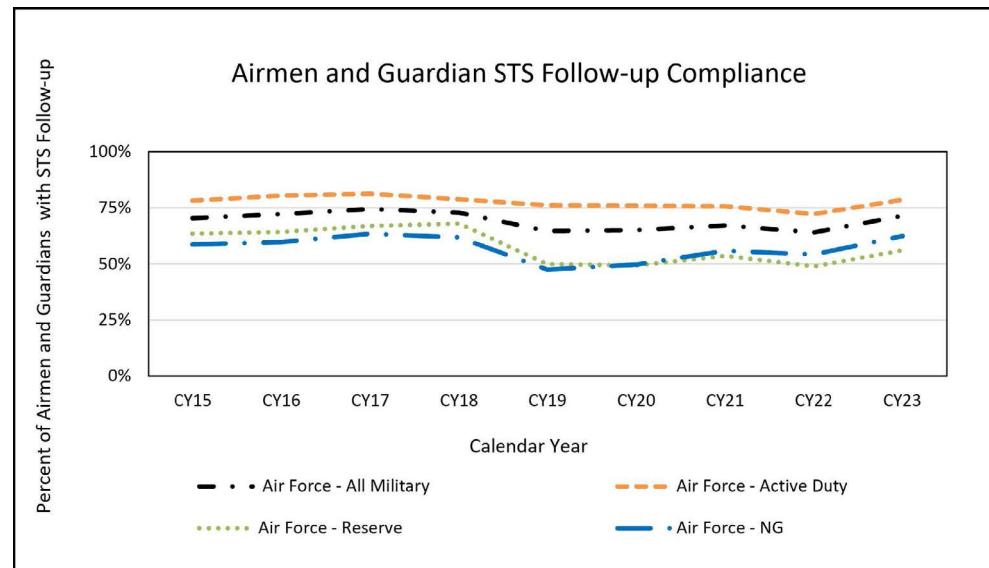
**Graph 52. Threshold Shift Rates by CY – AF and SF Civilian**



## STS Follow-up Test Compliance

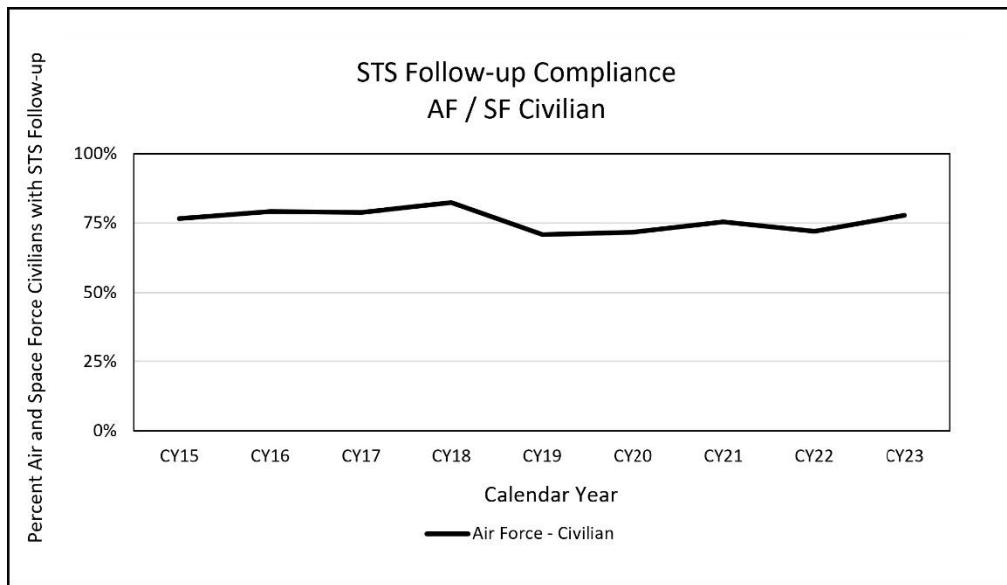
There is an increase in STS follow-up testing compliance in CY23 when compared to CY15 (Graph 53) for Airmen and Guardians components except the AFR. Overall compliance for STS follow-up testing (all Airmen and Guardians) increased from 58.8% in CY15 to 62.5% in CY23. Compliance for STS follow-up testing for AD Airmen and Guardians remains stable from CY15 to CY23 with a marginal increase in compliance from CY22 to CY23. Compliance in the ANG increased from 58.8% in CY15 to 62.5% in CY23. Compliance in the AFR decreased from 63.5% in CY15 to 56% in CY23.

**Graph 53. Airmen and Guardian STS Follow-up Test Compliance**



The AF civilian STS follow-up testing continues to show increased compliance from 72.1% in CY22 to 77.9% in CY23 (Graph 54).

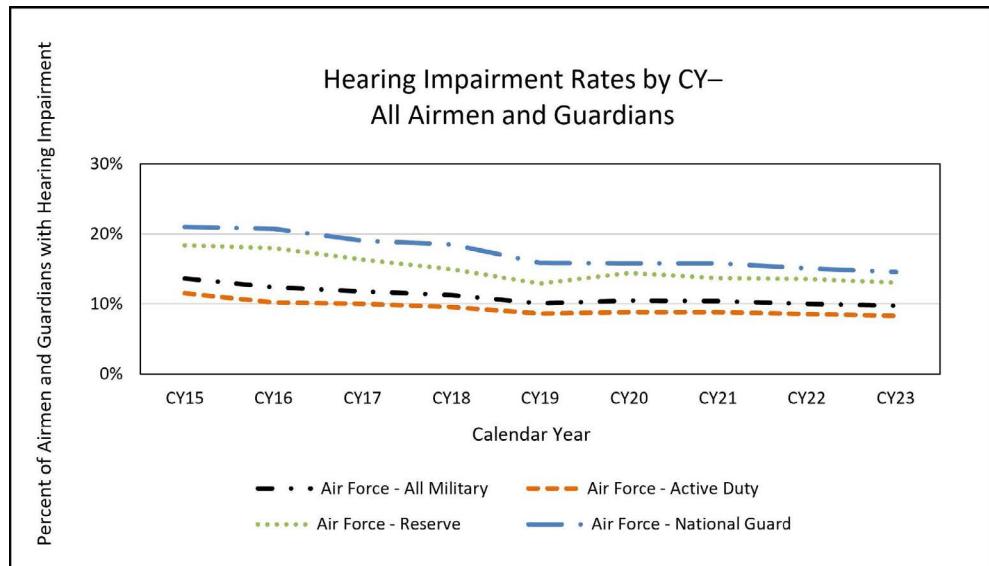
**Graph 54. AF and SF Civilian STS Follow-up Test Compliance**



## Hearing Impairment

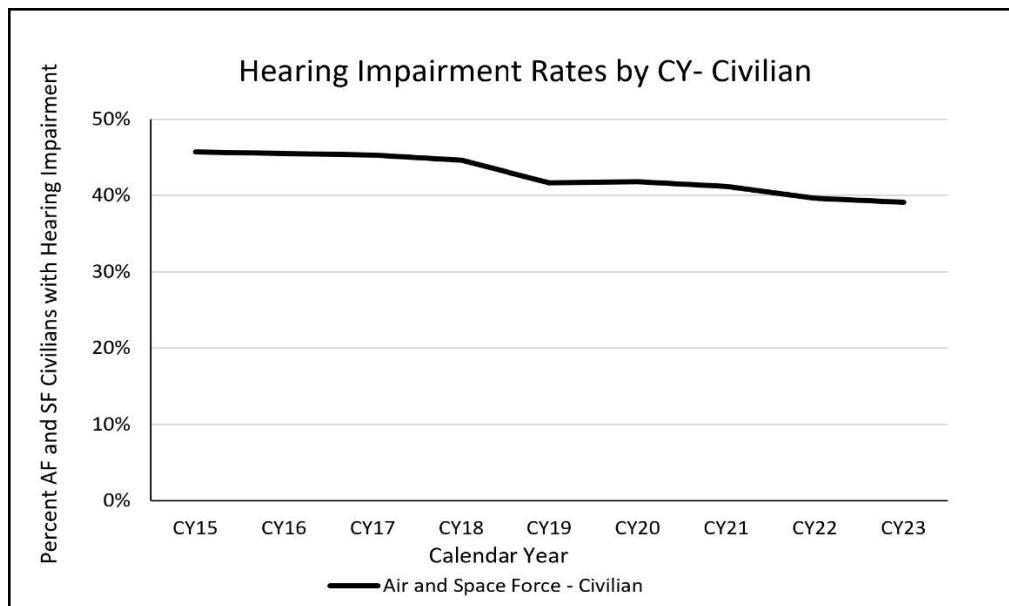
The percent of Airmen with hearing impairment is decreasing for all AF components. All Airmen with hearing impairment decreased from 13.6% in CY15 to 9.7% in CY23 (Graph 55). However, from CY19 to CY23 Airmen hearing impairment remains stable for all AF combined and individual components.

**Graph 55. Hearing Impairment Rates by CY - All Airmen and Guardians**



The percentage of AF civilians with hearing impairment shows a marginal decrease from CY15 to CY23 and from CY22 and CY23 (Graph 56). The percentage of AF civilians with hearing impairment decreased from 45.7% in CY15 to 39.1% in CY23. In CY23, 60.9% of civilians had normal hearing.

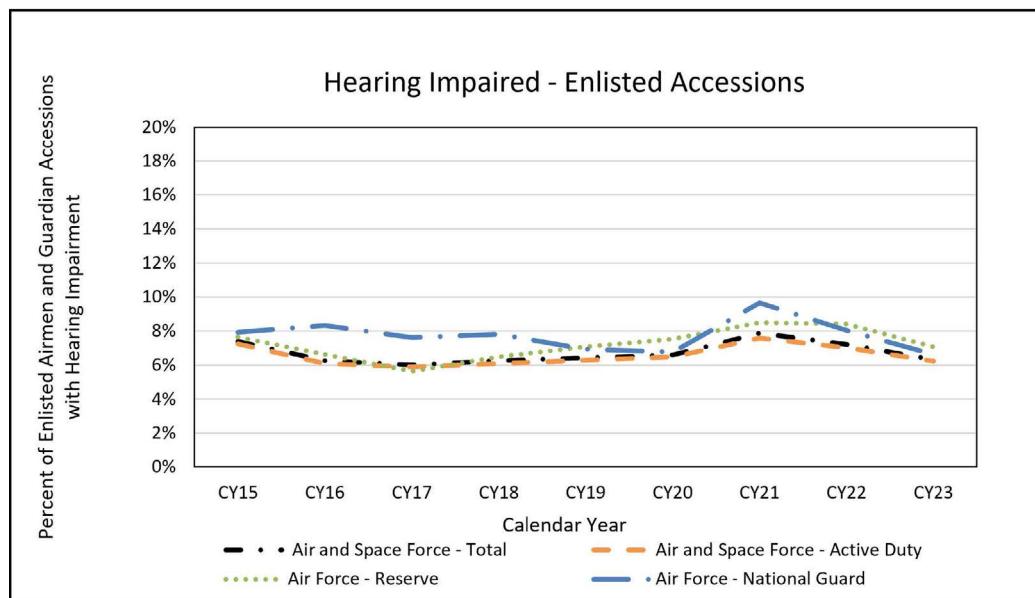
**Graph 56. Hearing Impairment Rates by CY – AF and SF Civilian**



## Hearing Impairment – Enlisted Accession Data

Airmen receive a hearing test as part of basic training when they enter military service. These tests are used to determine the percentage of all new recruits who enter the AF with hearing impairment (hearing worse than 25 dB HL at any test frequency). For all enlisted Airmen, accessions hearing impairment show a decreased rate from CY15 (7.4%) to CY23 (6.3%). The percentage of enlisted AD Airmen accessions with hearing impairment decreased from 7.4% in CY15 to 6.2% in CY23. The percentage of enlisted ANG Airmen accessions with hearing impairment decreased from 8.2% in CY22 to 6.6% in CY23. A slight decrease in hearing impairment is seen for enlisted AFR Airmen accessions from CY15 (7.7%) to CY23 (7.1%) in (Graph 57).

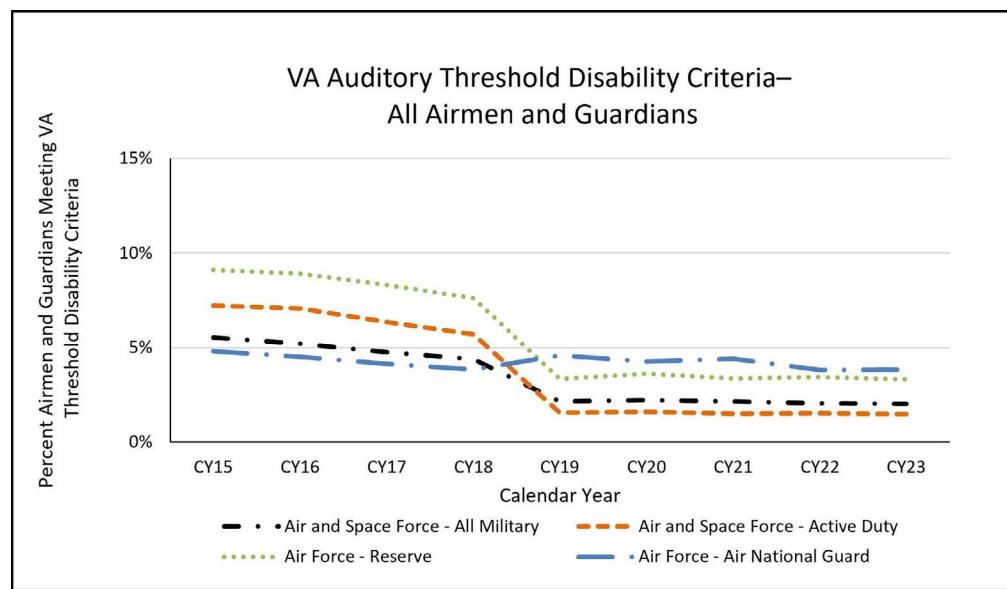
### **Graph 57. Hearing Impairment Rates by CY - Enlisted Airmen and Guardian Accessions**



### **VA Auditory Threshold Disability Criteria**

The percentage of all Airmen potentially eligible for VA service-connected disability compensation for hearing loss remains stable from CY19 to CY23 (Graph 58). All individual AF component Airmen (AD, ANG, and AFR) had decreases in eligibility for VA disability for hearing loss from CY19 to CY23 based on VA auditory threshold disability criteria. No change in eligibility is found from CY22 to CY23 for AD and AFR, and ANG VA Auditory Threshold Disability Criteria includes other factors in the determination of VA compensation due to impaired hearing.

### **Graph 58. VA Auditory Threshold Disability Criteria – All Airmen and Guardians**



**Table 6. Data Summary – Air and Space Forces - Source: DOEHRS-HC DR, ad hoc MOE percentages**

U.S. Air and Space Forces											
Chart Title	MOE	Category	Percent								
			CY15	CY16	CY17	CY18	CY19	CY20	CY21	CY23	
Threshold Shift Rates - All Airmen/ Guardians	MOE 1	STS	7.3	6.6	6.0	6.2	6.2	6.3	7.3	7.9	7.6
		TTS	3.3	2.9	2.9	2.9	2.9	2.8	3.1	3.3	3.4
		PTS	3.8	3.4	2.9	3.1	3.3	3.4	4.0	4.4	4.0
Threshold Shift Rates - AD Airmen/ Guardians	MOE 1	STS	5.7	5.1	4.7	5.0	4.9	5.0	5.9	6.5	6.5
		TTS	3.0	2.6	2.6	2.7	2.7	2.6	3.0	3.2	3.3
		PTS	2.5	2.3	1.9	2.1	2.2	2.3	2.9	3.2	3.1
Threshold Shift Rates - ANG Airmen	MOE 1	STS	11.8	11.6	10.1	10.2	9.3	9.3	10.0	11.0	9.4
		TTS	3.9	3.9	3.6	3.1	3.1	3.0	3.2	3.8	3.5
		PTS	7.3	7.0	6.0	6.4	6.0	6.0	6.5	6.9	5.8
Threshold Shift Rates - AFR Airmen	MOE 1	STS	11.1	10.0	10.0	10.3	11.4	11.0	11.9	12.5	12.4
		TTS	4.2	3.3	3.8	3.8	3.9	3.6	3.7	3.7	4.1
		PTS	6.5	6.0	5.7	5.9	7.3	7.2	7.9	8.5	7.9
Threshold Shift Rates - AF Civilians	MOE 1	STS	18.0	17.0	15.3	15.5	14.4	13.3	14.6	15.0	14.8
		TTS	5.4	5.5	5.7	6.3	5.7	4.8	5.3	5.4	5.3
		PTS	12.1	10.7	8.8	8.2	8.6	8.2	9.0	9.4	9.2
STS Follow-Up Test Compliance	MOE 2	All Amn/Grdn	58.8	59.9	63.4	61.9	47.6	49.8	56.0	54.3	62.5
		Active Duty	78.1	80.4	81.2	78.8	76.1	76.0	75.7	72.2	78.5
		National Guard	58.8	59.9	63.4	61.9	47.6	49.8	56.0	54.3	62.5
		Reserve	63.5	63.3	66.9	67.9	49.9	49.3	53.7	49.1	56.0
		AF Civilians	76.7	79.3	78.9	82.4	70.9	71.7	75.5	72.1	77.9
Hearing Impaired	MOE 3	All Amn/Grdn	13.6	12.3	11.8	11.3	10.0	10.5	10.4	10.0	9.7
		Active Duty	11.5	10.2	10.0	9.5	8.6	8.8	8.8	8.5	8.3
		National Guard	21.0	20.7	19.0	18.5	19.9	15.8	15.8	15.0	14.5
		Reserve	18.4	17.9	16.3	15.0	12.9	14.4	13.7	13.6	13.1
		AF Civilians	45.7	45.5	45.3	44.6	41.7	41.8	41.2	39.7	39.1
Hearing Impaired - Enlisted Airmen Accessions	MOE 3	All Amn/Grdn	7.4	6.4	6.2	6.1	6.3	6.7	8.3	7.1	6.3
		Active Duty	7.4	6.2	6.2	5.9	6.2	6.5	8.0	6.9	6.2
		National Guard	7.5	8.7	7.9	7.5	7.1	6.9	9.9	8.2	6.6
		Reserve	7.7	6.5	5.5	7.1	6.8	7.5	8.4	8.3	7.1
VA Auditory Threshold Criteria	MOE 4	All Amn/Grdn	5.5	5.2	4.8	4.4	2.2	2.2	2.1	2.0	2.0
		Active Duty	7.2	7.1	6.3	5.7	1.6	1.6	1.5	1.5	1.5
		National Guard	4.8	4.5	4.1	3.8	4.6	4.2	4.4	3.8	3.8
		Reserve	9.1	8.9	8.3	7.6	3.3	3.6	3.4	3.4	3.3

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