

# Naval Audit Service



## Audit Report



# Implementation of the Department of the Navy Ergonomics Program

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N2007-0055  
21 September 2007

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MEMORANDUM FOR CHIEF OF NAVAL OPERATIONS FOR SAFETY MATTERS  
(CNO N09F)  
COMMANDANT OF THE MARINE CORPS  
COMMANDER, NAVAL SAFETY CENTER

Subj: **IMPLEMENTATION OF THE DEPARTMENT OF THE NAVY ERGONOMICS PROGRAM (AUDIT REPORT N2007-0055)**

Ref: (a) NAVAUDSVC memo 7540/N2006-NIA000-0030.000, dated 24 Feb 06  
(b) SECNAV Instruction 7510.7F, "Department of the Navy Internal Audit"

1. The report provides results of the subject audit announced in reference (a). Section A of this report provides our findings and recommendations, summarized management responses and our comments on the responses. Section B provides the status of the recommendations. The complete texts of the responses are included in the Appendices to this report.
2. The Commander, Naval Safety Center (COMNAVSAFECEN) who also serves as the Chief of Naval Operations Special Assistant for Safety Matters (CNO (N09F)) concurred with Recommendations 1, and 3 through 6. The Commandant of the Marine Corps (RFR) provided the response for Recommendation 2 addressed to the Marine Corps. The Commandant of the Marine Corps (RFR) concurred with Recommendation 2. Recommendations 1 through 6 are considered open pending completion of planned corrective actions. Open recommendations are subject to monitoring in accordance with reference (b). Management should provide a written status report on open recommendations within 30 days after target completion dates. Please submit correspondence in electronic format (Microsoft Word or Adobe Acrobat file) to the Assistant Auditor General for Installations and Environment Audits, Mr. Ronnie Booth, Ronnie.Booth@navy.mil with a copy to the Director, Policy and Oversight, Vicki McAdams, Vicki.McAdams@navy.mil. Please ensure that the electronic version is on letterhead and includes a scanned signature.
3. Any requests for this report under the Freedom of Information Act must be approved by the Auditor General of the Navy as required by reference (b). This audit report is also subject to follow-up in accordance with reference (b).

Subj: **IMPLEMENTATION OF THE DEPARTMENT OF THE NAVY ERGONOMICS  
PROGRAM (AUDIT REPORT N2007-0055)**

4. We appreciate the cooperation and courtesies extended to our auditors.



**RONNIE J. BOOTH**  
Assistant Auditor General  
Installations and Environment Audits

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# Executive Summary

## Overview

In 2001, the Center for Naval Analyses reported that, if left unchecked, the annual cost of ergonomic injuries to the Navy was expected to be \$111 million by Fiscal Year (FY) 2009. The Secretary of Defense, citing an increase in mishap rates, established specific mishap reduction goals for Department of Defense (DoD) Military Departments in May 2003. The Secretary's mishap reduction initiative was based on the premise that most mishaps are preventable and that preventing mishaps increases readiness. Using FY 2002 as a baseline, the mishap<sup>1</sup> reduction goal for the Military Services was a 50 percent reduction by the end of FY 2005, and a 75 percent reduction by the end of FY 2008. The Department of the Navy (DON) Naval Facilities Engineering Command (NAVFAC), citing results from a Center for Naval Analyses research study,<sup>2</sup> reported that ergonomics<sup>3</sup> was the single largest source of civilian injury claims and costs, and the second largest for active duty Navy personnel. The Marine Corps reported that work-related musculoskeletal disorders (WMSDs),<sup>4</sup> which are often caused by ergonomic risk factors such as repetitive motion and awkward or static postures, account for over one-third of all reported civilian injuries and illnesses. In February 2006, DON leadership published, "Department of the Navy Objectives for 2006," which included improving safety performance to meet Secretary of Defense Strategic Planning Guidance to reduce mishap rates.

Since September 1998 and January 1999, the Marine Corps and the Navy, respectively, have had occupational health and safety instructions and directives to guide implementation of ergonomics programs at their installations. Each program was updated at least once since the initial issuance. However, the goal of each of the ergonomics programs remained the same: to prevent injuries and illnesses by applying ergonomic principles to identify, evaluate, and control risk factors for WMSDs. The Assistant Secretary of the Navy for Installations and Environment (ASN (I&E)) is required to establish, maintain, and modify safety and occupational health programs that implement DoD policy requirements. The Chief of Naval Operations (CNO) is required to issue appropriate directives

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<sup>1</sup> Per Office of the Chief of Naval Operations Instruction (OPNAVINST) 5100.23G, a mishap is any unplanned or unexpected event or series of events that results in damage to DoD property or an occupational illness or injury to on-duty DoD military or civilian personnel.

<sup>2</sup> Center for Naval Analyses Research Study, CRM D0004949.A2, "Analyzing the Navy's Safety Data" of December 2001

<sup>3</sup> Ergonomics involves fitting the workplace to the worker to enhance worker performance, safety, and health, and to reduce the potential for fatigue, error, or unsafe acts.

<sup>4</sup> WMSDs are muscular disorders to which the work environment and the performance of work contribute significantly, or musculoskeletal disorders that are aggravated or prolonged by work conditions. WMSDs are injuries and illnesses that affect muscles, nerves, tendons, ligaments, joints, spinal discs, skin, subcutaneous tissues, blood vessels, and bones.

supporting Secretary of the Navy (SECNAV) programs, including staffing, training, and budgeting, to ensure that all commands, activities, and personnel implement the programs. CNO guidance made activity Commanders, Commanding Officers, and Officers in Charge responsible for administering effective ergonomics programs.

In February 2006, the Deputy Assistant Secretary of the Navy for Safety (DASN (S)) requested an audit of DON ergonomics program implementation across DON commands and installations. The audit was to include a review of the resources available for DON Ergonomics Program enhancements as well as resource usage.

In conjunction with the Chief of Naval Operations Safety Liaison Office and the Navy Ergonomics Working Group, we developed an ergonomics program survey, and provided it to 35 Navy commands and Marine Corps shore-based installations to identify implementation and funding of DON Ergonomics Program requirements. We conducted our audit during the period 21 February 2006 to 26 July 2007.

## Objective

The objective of the audit was to verify DON Ergonomics Program implementation, as prescribed by DoD and DON policy, across DON commands and activities.

## Noteworthy Accomplishments

In 1998, NAVFAC established an ergonomic support resource service. This service made ergonomists available to DON activities (on a request basis and at no cost) to analyze operations, identify potential problem areas and hazards, recommend interventions, and design improvements to reduce ergonomic workplace stressors. As an example, the NAVFAC Ergonomics Team provided assistance to a Medical Logistics Command where workers routinely lifted heavy containers, which placed them at risk for back injuries. With the help of the Ergonomics Team, scissor lift carts, pallet movers, and a flexible conveyor system were identified and acquired which reduced heavy lifting and carrying, and improved productivity. One individual at the command was facing a medical discharge due to back injuries but was allowed to stay because the new equipment eliminated the need for heavy lifting.

NAVFAC also managed the Navy's Hazard Abatement and Mishap Prevention (HAMP) Program, which provided funding assistance to Navy activities for safety and health hazard initiatives that may have been beyond the activities' funding capability. Since 1998, HAMP provided \$10 million for ergonomics improvement projects to Navy commands. Additionally NAVFAC provided web-based and classroom ergonomics training. The NAVFAC Ergonomics Team



conducts the “Navy Ergonomics Course” through a memorandum of understanding (MOU) with the Navy Occupational Safety and Health (NAVOSH) and Environmental Training Center. The course is designed as a hands-on approach to ergonomics, providing students with an understanding of ergonomic principles affecting their work environment. Attendees are safety personnel, industrial hygienists, and employees who will likely be members of ergonomics committees. During FYs 2005 and 2006, the course was presented on 11 occasions, including a presentation in Yokosuka, Japan. In addition, the NAVFAC Ergonomics Team provided ergonomics presentations at naval professional safety conferences.

## Conclusions

In December 2005 and May 2006, the Navy and the Marine Corps updated their respective comprehensive written plans to incorporate ergonomics programs within their commands. While the written plans addressed DoD required ergonomics program elements, overall implementation by DON activities/installations was inconsistent and needed improvement. DON Ergonomics Program guidance made installation commanders responsible for program implementation. Based on our audit, activities need DON executive level oversight to ensure compliance with DON ergonomics program requirements, and to measure program effectiveness and the levels of program participation. As the audit progressed, we provided formal interim briefings on audit results to senior Navy management and communicated our findings to middle management and working-level personnel. For example, we briefed the Shore Safety Committee of the Ergonomics Working Group on 13 June 2006. On 5 September 2006, we briefed the Marine Corps Headquarters Office of Policy Safety Division Engineer on the Marine Corps implementation of the ergonomics program. Also, issues identified as needing improvement were briefed to the Chief of Naval Operations Safety Liaison (CNO N09FB) on 20 March 2007, and to CNO N09FB, Commander Naval Safety Center (02), and Office of Navy Inspector General (N7B) officials on 19 June 2007. Specifically, the following ergonomics program requirements needed improvement.

**Ergonomic Program Budgeting and Training.** About 63 percent of the 28 DON respondents to the ergonomics program survey (see Exhibit D) reported that activity funds were made available for ergonomic corrective actions. However, funds spent on ergonomics improvements were generally not tracked by the activities. Thus, the activities could not provide support for their compliance with the ergonomics program requirement of identifying and budgeting resources to administer an effective ergonomics program. Therefore, the total amount of funds expended on ergonomic improvements was not clear. About 27 percent of commands reported that general awareness ergonomics training was not provided to all personnel. Twenty-five percent of activities reported their managers, supervisors, and professional safety staff had not received sufficient training on

ergonomic issues to effectively carry out their health and safety program responsibilities, including ergonomic risk factor identification and reduction.

**Ergonomic Program Self-Assessments.** While most Navy activities reported compliance with ergonomics program self-assessment requirements, only about 53 percent of Navy installations provided any documentation supporting completion of a self-assessment as part of a Process Review and Measurement System (PR&MS), or equivalent. Marine Corps guidance did not require activity self-assessments as part of a PR&MS. Without documentation of ergonomic program self-assessments, DON executive level management cannot assess and monitor ergonomics program participation and effectiveness.

**Recording, Reporting, and Analyzing Ergonomic Related Injuries.** In order to meet ergonomics program requirements, DON needs to improve identification, reporting, and analysis of ergonomics related mishaps. The Naval Safety Center reported that they did not have an accurate list of DON Unit Identification Codes (UICs). Therefore, they had no means of assuring that all activities participated in the ergonomics program and that all ergonomic injuries were reported to the Commander, Naval Safety Center (COMNAVSAFECEN). Only about 54 percent (15 of 28) of activities responding to our ergonomic program survey conducted the required ergonomics injuries analysis. Also, the COMNAVSAFECEN had not conducted the required 5 year WMSDs trend analysis.

**Management Oversight.** Our audit conclusions were based on the results of information made available by 28 DON activities in response to our ergonomics program survey. However, based on the inconsistencies in program implementation identified by our audit work and responses to our survey, we concluded that, to achieve improved program implementation, DON senior management needed to establish a process to monitor Echelon 2 and/or Command Headquarters, and Naval Safety Center compliance with their Ergonomics Program responsibilities identified in the Navy and the Marine Corps Safety and Occupational Health Program Manuals.

## Federal Managers' Financial Integrity Act

The Federal Managers' Financial Integrity Act of 1982, as codified in Title 31, United States Code, requires each Federal agency head to annually certify the effectiveness of the agency's internal and accounting system controls. Recommendations 1 through 6 address issues related to the internal controls over implementation of the DON Ergonomics Program. In our opinion, the weaknesses noted in this report may warrant reporting in the Auditor General's annual FMFIA memorandum identifying management control weaknesses to the Secretary of the Navy.

## Corrective Actions

We recommended the Chief of Naval Operations for Safety Matters (N09F) establish a process to monitor Echelon 2 and Headquarters Commands' compliance with their Ergonomic Program responsibilities as identified in the Navy Safety and Occupational Health Program Manual. We also recommended the Commandant of the Marine Corps (CMC) direct the CMC (Safety Division) establish a process to monitor Marine Corps compliance with their Ergonomics Program responsibilities as delineated in the Marine Corps Occupational Safety and Health Program Manual. Specifically, Navy and Marine Corps ergonomics program responsibilities relate to:

- Budgeting for ergonomic initiatives;
- Training all employees;
- Preparing program self-assessments and/or effectiveness reviews; and
- Recording, reporting, and analyzing ergonomic injuries and illness data at their subordinate commands, activities, and/or installations.

We recommended that COMNAVSAFECEN modify the current mishap data collection system to identify activities not reporting mishaps so follow-up action can be taken by Echelon 2 and Headquarters Commands with their subordinate commands, activities, and/or installations. We also recommended the COMNAVSAFECEN conduct required 5-year period mishap analyses to identify WMSDs by activity and command, and provide guidance and training to safety officials and supervisors on the identification, recording, and reporting and analyses of ergonomic type injuries to determine the need for ergonomic improvements and corrective actions within activities.

Management agreed with all recommendations and planned corrective actions that meet the intent of the recommendations.

## Section A:

# Findings, Recommendations, and Corrective Actions

## Finding 1: Implementation of the Department of the Navy Ergonomics Program Requirements

### Synopsis

Department of the Navy (DON) activity responses to our ergonomics program survey, follow up on their responses and supporting information, and discussions with Echelon 2 command personnel and Commander Naval Safety Center (COMNAVSAFECEN) personnel identified inconsistent implementation of ergonomics program requirements. Ergonomics program command requirements prescribed within Office of the Chief of Naval Operations Instruction (OPNAVINST) 5100.23G and DON Marine Corps (NAVMC) Directive 5100.8, were reported to have not been fully implemented at most of the 28 commands responding to our ergonomics program survey.<sup>5</sup> We provided our conclusions on the implementation of the DON Ergonomics Program to the Chief of Naval Operations Safety Liaison (CNO N09FB) on 20 March 2007. We also discussed our conclusions with CNO N09FB, Naval Safety Center (02) officials and the Office of the Navy Inspector General (Code N7B) on 19 June 2007. Information on the Marine Corps implementation of the ergonomics program was provided to Marine Corps Headquarters, Office of Policy Safety, Division Engineer, on 5 September 2006. The requirements receiving inconsistent implementation included:

- Budgeting for program administration (for example, 85 percent (23 of 27) activities reported that they did not budget for program administration);
- Training personnel to recognize, control, and report ergonomic workforce risk factors (for example, 25 percent (7 of 28) activities reported that their personnel lacked sufficient training to carry out their health and safety responsibilities); and
- Completing command/installation ergonomics program self-assessments as part of the Process Review and Measurement System (PR&MS) (for example, 15 percent (3 of 20) of Navy activities reportedly did not

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<sup>5</sup> The Ergonomics Program Survey was sent to 35 activities/installations. However, only 28 activities/installations responded to the survey. We did not receive responses from seven activities including one that was decommissioned. Additionally, not all of the 28 activities/installations responding to the survey answered all of the survey questions.

complete ergonomic program self-assessments as part of their Process Review and Measurement System).

These inconsistent conditions existed because ergonomics program implementation was the responsibility of commands and not all commands provided funding or other resource support for the DON Ergonomics Program. Only about 63 percent (17 of 28) of the activities responding to our survey reported that funds were made available for ergonomic corrective actions. Further, DON senior management provided insufficient oversight to ensure activity compliance and implementation of ergonomics program requirements. By not fully implementing DON Ergonomics Program requirements, personnel were at risk for work related illnesses and injuries. Also opportunities for attaining the Secretary of Defense's mishap reduction goals may have been lost.

## Discussion of Details

### Background

Ergonomics involves fitting the workplace to the worker. An ergonomics program's objective is to prevent injuries and illnesses by applying ergonomics principles to identify, evaluate, and control risk factors for work-related musculoskeletal disorders (WMSDs). WMSDs result from the cumulative effect of repeat traumas associated with specific workplace risk factors, such as vibration, repetitive motion, and awkward work positioning. The Naval Facilities Engineering Command, citing the results of a Center for Naval Analyses Research Study on the Navy's safety data,<sup>6</sup> reported that ergonomics represents the single largest source of civilian injury claims and costs, and the second largest for active duty Navy personnel. The Marine Corps reported that WMSDs represent over one-third of all reported civilian injuries and illnesses.

A successful ergonomics program requires commitment from management to provide program guidance and assistance to subordinate commands on program development and implementation. Commanders, Commanding Officers, and Officers in Charge are required to analyze injury and illness records to determine the need for ergonomic improvements within their activities, and identify and budget resources to fund effective ergonomics programs. Employees must also be trained in identifying and addressing ergonomics risk factors before they become injuries and illnesses.

### Pertinent Guidance

**Department of Defense (DoD) Instruction 6055.1, "DoD Safety and Occupational Health Program (SOHP)," dated 19 August 1998,** provides

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<sup>6</sup> Center for Naval Analyses Research Study, CRM D0004949.A2, "Analyzing the Navy's Safety Data" of December 2001.

policies, procedures, and responsibilities to each DoD component for administering a comprehensive DoD SOHP to reduce accidents and occupational illnesses and related costs. The instruction requires each DoD component to prepare a written plan for a comprehensive ergonomics program with six critical elements: intervention-workplace analysis, hazard prevention and control, health care management, education and training, evaluation, and acquisition.

**OPNAVINST 5100.23G, “Navy Safety and Occupational Health Program Manual,” dated 30 December 2005,** outlines the policies and responsibilities for Navy SOHP implementation, including the ergonomics program. The instruction provides ergonomics program requirements including program budgeting, training, program process review, WMSD data analysis, and ergonomic considerations during the acquisition process.

**OPNAVINST 5100.23G, Section 2310** requires Echelon 2 Commands to provide guidance and assistance as necessary to subordinate commands on ergonomics program development and implementation. Commanders, Commanding Officers, and Officers in Charge are required to identify and budget resources to fund effective ergonomics programs at their activities, and analyze injury/illness records and other pertinent information annually to determine the need for ergonomic improvements and corrective actions within their activities. Chapter 23 of the instruction states that, at a minimum, employees are to receive general awareness training to recognize, and to understand methods of controlling workplace risk factors. Additionally, section 0302 of the instruction indicates that Headquarters command designated safety officials shall assess the effectiveness of the command’s safety program by performing management evaluations and self-assessment reviews at subordinate commands.

**Navy and Marine Corps (NAVMC) Directive 5100.8, “Marine Corps Occupational Safety and Health (OSH) Program Manual,” dated 15 May 2006,** provides the requirements and guidance for commanders and Marine Corps OSH Program professionals to identify and manage risk and maintain safe and healthful operational requirements. The Directive requires installation commanders to allocate resources to ensure a comprehensive ergonomics program is implemented, and that ergonomics awareness training is provided to all Marine Corps personnel to enable each person to recognize and minimize ergonomics risk factors. The Directive requires installation ergonomics program coordinators to annually assess the implementation progress and effectiveness of the installation’s ergonomics program plan.

**OPNAVINST 5450.180D, “Mission and Functions of the Naval Safety Center,” dated 20 May 2005,** indicates that the Commander, Naval Safety Center develops safety policy, safety education and training programs, monitors the effectiveness of systems safety programs, and provides a variety of safety and mishap data-related services.

## Audit Results

We issued an ergonomics program survey (see Exhibit D) to 35 judgmentally selected DON activities out of a population of 144 activities for which DON maintained Lost Work Day rate information. We also followed up on activity responses to our survey by reviewing information supporting the responses. Additionally, we discussed ergonomics program implementation with CNO (N09FB); Marine Corps; Bureau of Medicine and Surgery; Naval Inspector General; Naval Facilities and Engineering Command; and Commander, Naval Safety Center (COMNAVSAFECEN) personnel during the audit. The activities selected to receive the survey were those having relatively high lost workday rates, large numbers of personnel, or were considered high injury risk activities. The survey contained 46 questions soliciting information on the activities' implementation of DON ergonomics program requirements. Survey responses were received from 28 of the 35 DON activities surveyed, which identified inconsistent implementation of program requirements. We did not receive responses from seven activities including one that was decommissioned. Additionally, not all of the 28 activities/installations responding to the survey answered all of the survey questions.

About 86 percent (24 of 28) of the activities responding to the survey reported having an ergonomics program. Audit work and activity responses to the survey indicated that ergonomics program budgeting, personnel training, and command/installation self-assessments were implemented inconsistently. These inconsistent conditions existed because the administration of ergonomics programs was the responsibility of activity/installation Commanders and some Navy and Marine Corps commands did not provide full support for the DON Ergonomics Program. Further, DON management provided insufficient oversight to ensure activity compliance and implementation of ergonomics program requirements.

### Budgeting for Ergonomics

OPNAVINST 5100.23G requires that Commanders, Commanding Officers, and Officers in Charge identify and budget resources to administer an effective ergonomics program. The majority of activities (about 85 percent (23 of 27)) responding to the survey question of whether their activity budgeted for ergonomics program implementation responded that they had not. One activity indicated they did not have a budget or line amount for an ergonomics program due to the scarce amount of resources. Program managers, installations, or installation divisions were responsible for funding their ergonomic corrective actions. One installation reported that ergonomics expenditures came from their general safety budget and nothing was budgeted specifically for ergonomics initiatives. The Safety personnel at 2 of the 28 activities responding to the survey stated their activities employed a "reactive" rather than a "proactive" approach for

funding ergonomics initiatives. If an ergonomics injury or illness was reported or a complaint was received, these two activities used Operations and Maintenance (O&M) funds to correct the condition. Two other Navy activities informed us they did not fully fund their ergonomics program implementations because they were funded to meet Federal SOH standards at Common Output Level-3 (COL-3). This means their activities' safety and health programs were to be funded to meet minimal Federal requirements but not all OPNAVINST 5100.23G or all DoD Ergonomics Program requirements. As a result, while industrial/high hazard workplaces were to be inspected annually, administrative workspaces may not have been inspected, and SOH offices may not have been staffed with fully qualified safety specialists.

About 85 percent (23 of 27) of the responding activities reported that they did not budget for an ergonomics program, but about 63 percent (17 of 28) reported that activity funds had been made available for some ergonomics corrective actions. However, most activities could not determine the amount spent on ergonomics interventions because they did not budget for ergonomics program implementation and the activities did not track spending for ergonomic initiatives.

Seventy-five percent (21 of 28) of the activities did not maintain a prioritized list of jobs/areas that needed ergonomics corrective action, while seven reported maintaining such a list. Although not a program requirement, a list of areas in need of ergonomic improvement would be useful in developing and supporting an ergonomics budget.

Without budget support for an ergonomics program, opportunities for training and equipment purchases to reduce exposure to unsafe or unhealthy conditions may be lost. Also lost are opportunities for savings on worker compensation claims. The benefits of a proactive ergonomics program to prevent ergonomic injuries were illustrated during a site visit to Naval Air Depot (NAD) Jacksonville. NAD Jacksonville budgeted and invested in "cost avoidance" items to prevent ergonomics-related injuries, reduce lost-day injuries, and reduce medical and compensation costs. Through a review of 2002 Federal Employee Compensation Act (FECA)<sup>7</sup> cumulative chargeback costs for back injuries, the installation identified costs related to ergonomic/WMSD back injuries. After implementing an ergonomic training program, NAD Jacksonville reduced costs related to back injuries from \$749,000 in FYs 1996 through 1998 to \$119,000 in FYs 1999 through 2002. Also, according to Commander Naval Air Systems Command's (NAVAIR's) Safety and Occupational Health Manager, Industrial Ergonomic best practices and interventions developed at NAD Jacksonville and disseminated to other sites were the major cause of reducing NAVAIR's lost work day rate from

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<sup>7</sup> ECA as amended (5 U.S.C. 8101 *et seq.*) provides for the payment of workers' compensation benefits to civilian officers and employees of all branches of Government. The payments benefits include compensation for wage loss, medical costs, and vocational rehabilitation services for conditions resulting from work-related injuries or disease. The act also provides for monetary compensation to specified survivors of an employee whose death resulted from a work-related injury and for payment of certain burial expenses.



41 per 100 employees per year in FY 2002, to about 17 per 100 employees in FY 2006.

### Ergonomics Training

A key to maintaining an effective ergonomics program involves the proper training of managers, supervisors, professional staff, ergonomics teams, and employees. As required by OPNAVINST 5100.23G, the training must include recognizing ergonomics risk factors for WMSDs, WMSD signs and symptoms, WMSD reporting, and measures to reduce or eliminate ergonomic hazards. All employees are required to receive general ergonomics training as applicable to their role in the workplace. While the instruction required periodic ergonomics refresher training, it allowed the refresher training to be provided at command discretion. Safety and occupational health professional staff responsible for conducting the ergonomics program are required to complete the Naval Occupational Safety and Health and Environmental Training Center (NAVOSHENVTRACEN) Ergonomics Program course (A-493-0085) or its equivalent. OPNAVINST 5100.23G requires Navy regions' and activities' safety offices to ensure maintenance of safety and occupational health training records for 5 years.

NAVMC Directive 5100.8 requires ergonomics awareness training to be provided to all Marine Corps personnel, and for commanders, safety managers, safety officers, and supervisors to ensure all safety and health training is properly documented.

Seventy-five percent (21 of 28) of the activities responding to the survey reported their managers, supervisors, and professional safety staff had received sufficient training on ergonomics issues to carry out their health and safety responsibilities and reduce ergonomics risk factors. One response indicated a need for more specific training for management on ergonomic issues, based on the number of phone calls their safety office received requesting assistance in identifying and correcting WMSD risk factors. The Safety Office Branch Head at another activity stated not enough time was available to provide in-depth training to managers and supervisors as a result of reducing overhead costs. They added that only one course was available through the Navy Safety School, and their staff had attended, some as long as 10 years ago. The safety office staff was not satisfied with the quality of the training received and their program had not been proactive or effective in reducing ergonomics risk factors. The safety officer also suggested that large industrial activities be required to have an onsite ergonomist.

About 27 percent (7 of 26)<sup>8</sup> of the activities/installations reported that general ergonomics awareness training was not provided to all employees. One of the seven activities responding that not all of their personnel received the subject

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<sup>8</sup> Twenty-six of the 28 activities responded with "yes" or "no" responses while one activity responded that most of their personnel had received the training, and a second responded that 71% of their personnel had received general ergonomics training.

training indicated all personnel did not complete the training because of the high military personnel turnover rate.

The majority (about 79 percent (22 of 28)) of the respondents reported that they maintained records of the ergonomics training completed. However, when we requested documentation to support their maintenance of training records, only about 45 percent (10 of 22) provided any records or documentation. Navy activities are required by OPNAVINST 5100.23G to maintain training records for 5 years. Marine Corps guidance NAVMC DIR 5100.8 states that activities are required to have their training records maintained and readily available.

We conducted an informal user survey at six activities to determine personnel familiarity with their activity's ergonomics program and whether they had received ergonomics training. Only about 55 percent (29 of 53) of employees surveyed reported they were aware of their activity's ergonomics program and only about 47 percent (25 of 53) surveyed reported that they received ergonomics training. While the user survey was informal, we concluded it supported the installation responses to our ergonomics survey that identified a need for increased ergonomics training to meet ergonomic program requirements.

#### Ergonomic Program Process Review

Sections 0505 and 2304 (a) of OPNAVINST 5100.23G, requires each activity to conduct self-assessments and program reviews to evaluate implementation of ergonomics programs. The purpose of the assessments is to identify areas that require improvement and development, and to support plans of action addressing those areas. All Navy command activities are required to perform a self-assessment of the command program at least annually following either the PR&MS Self-Assessment Model guidelines, additional guidance on the Naval Safety Center website, or equivalent. Section E6-1.6 of the DoD Instruction 6055.1 also states that each DoD component shall evaluate its ergonomic effort by measuring the effectiveness of ergonomics interventions and level of participation.

Eighty-five percent (17 of 20) of the Navy activities surveyed reported that they had conducted periodic ergonomics program self-assessments as part of their PR&MS. However, only about 53 percent (9 of 17 Navy activities) provided the documentation to support completion of the five PR&MS modules. Also, one of the three Navy activities that did not conduct self-assessments stated they did not have sufficient funding to complete them. They indicated they could only meet the requirement when the command made additional manpower available. Marine Corps ergonomics program guidance does not require activity self-assessments as part of the PR&MS. Therefore, the "no" responses from the eight Marine Corps activities to the survey question related to an assessment in regard to a PR&MS were treated as "not applicable" in our tally sheet. Marine Corps ergonomics program guidance issued on 15 May 2006 mandated annual

ergonomics program progress and effectiveness assessments by the installation's ergonomics coordinator, but not as part of a PR&MS.

## DON Installations Ergonomic Mishap Analysis

We found that only 54 percent (15 of 28) of the survey respondents indicated that an Ergonomics Point of Contact (POC)/Subcommittee/Worker-based team reviewed or analyzed mishap injury and illness data. Some DON installations reported that they did not analyze ergonomic injury or illness data because the workforce at their installations was highly mobile, causing difficulty in determining the root cause of ergonomics injuries.<sup>9</sup> One Navy installation reported they conducted limited analysis only for back injuries. Four DON installations stated they had not established or staffed an ergonomics POC, Subcommittee or Worker-based team to perform the mishap analysis function. Per OPNAVINST 5100.23G, Commanders, Commanding Officers, and Officers in Charge are required to analyze injury/illness records and other pertinent information annually to determine the need for ergonomic improvements and corrective actions within their activities. Without accurate analysis of ergonomics/WMSDs injuries, installations cannot determine the need for ergonomic improvements and assess the effectiveness of their ergonomics training and initiatives.

### Management Oversight

DoD SOHP Ergonomics Program guidance requires that military components evaluate their ongoing ergonomics efforts by measuring intervention effectiveness and levels of participation. Navy and Marine Corps ergonomics program policy placed much of the responsibility for administering ergonomics programs on individual commands and installations. Navy activities were to include self-assessments of their ergonomic program as part of the PR&MS. Marine Corps command ergonomics coordinators were required to assess ergonomic program progress and effectiveness. However, per OPNAV and Marine Corps Occupational Safety and Health Program guidance, Echelon 2 and Headquarters Commands, and the Naval and Marine Corps Inspector General Offices share responsibility for assisting in, and monitoring implementation of, safety programs. Echelon 2 commands were to provide guidance, as necessary, on program development and implementation. Headquarters safety officials were to provide technical advice, direction, and guidance on safety matters to organizational elements and subordinate field activities, as well as review illness/injury analyses from command activities. The Headquarters commands would then identify and initiate actions to improve the effectiveness of safety programs and ensure that safety officials in each region and field activity have the resources and the training required to ensure that an effective safety and occupational health program was implemented. However, only 25 percent (7 of 28) of the activities

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<sup>9</sup> Because ergonomic injuries usually occur over an extended period of time and may be the result of repetitive motion or working in an unnatural position, an employee may have moved to a new assignment and the injury may not have been reported until they are at their new assignment.

reported receiving guidance or assistance from their Echelon 2 command during program development. One Echelon 2 command official reported that they did not provide assistance or guidance to their activities because the activities had safety professionals and engineering expertise capable of implementing ergonomics program requirements.

OPNAVINST 5100.23G requires the Naval Inspector General (NAVINSGEN) to conduct shore oversight inspections, as deemed appropriate, of headquarters and subordinate commands to evaluate compliance with requirements of all SOH programs. The ergonomics program review was reported to be one of approximately 25 programs evaluated during NAVINSGEN health and safety inspections. When an oversight inspection of an activity's ergonomics program was conducted, five basic ergonomic questions were asked, including whether injury and illness records are analyzed annually and whether general ergonomics training was provided to all employees. Responses to the questions provided minimal verification of the implementation of a command's ergonomics program. During FY 2002 through 2005, NAVINSGEN issued 45 activity inspection reports. Seven of these reports included ergonomic-related findings with recommendations that addressed either a lack of training documentation, no monitoring of WMSD trends, and/or the lack of injury/illness data analysis. According to OPNAVINST 5100.23 guidance, regions and activities are responsible for followup on workplace inspections to verify that commands took corrective actions addressing specific problems. Based on discussions with Marine Corps personnel, Marine Corp Inspector General Ergonomics Program inspections were similarly limited in scope due to resource constraints.

OPNAVINST 5450.180D guidance states that COMNAVSAFECEN provides safety surveys, assessments, and targeted evaluations of shore, aviation, Fleet and field unit safety programs upon request. However, COMNAVSAFECEN personnel informed us that they could not recall having received any requests during the past 3 years.

## Recommendations and Corrective Actions

We made recommendations to improve the monitoring of Echelon 2 and Headquarters Commands' compliance with their Ergonomics Program responsibilities. The Commander, Naval Safety Center/Special Assistant for Safety Matters, and the Commandant of the Marine Corps (RFR) responded to the recommendations. A summary of the responses to our recommendations and our comments are provided below. The Appendices contain the complete responses.

We recommend that the Chief of Naval Operations for Safety Matters (CNO (N09F)):

**Recommendation 1.** Establish a process to monitor Echelon 2 and Headquarters Commands' compliance with their Ergonomics Program

responsibilities as identified in the Navy Safety and Occupational Health Program Manual (OPNAVINST 5100.23G) to include ergonomic training, self-assessments, budgeting, and analyses of injury and illness records at their subordinate commands, activities, and/or installations.

**Naval Safety Center/Special Assistant for Safety Matters (CNO (N09F)) response to Recommendation 1. Concur in principle.**

Further monitoring of compliance with the Ergonomics Program is needed. An oversight process already exists and is delineated in OPNAVINST 5100.23G, Chapter 9. The Navy has a three-tiered approach to Safety and Occupational Health program oversight. The first tier is workplace inspections, which are to be conducted annually by regional safety service providers and activity commands. Tier two is command evaluations, where headquarters commands are tasked to ensure appropriate evaluations of Safety Program effectiveness are conducted at subordinate commands and field activities at a minimum of every 3 years. Tier three is oversight evaluations by the Naval Inspector General, which are done, as deemed appropriate, by headquarters and subordinate commands to evaluate compliance with requirements of the program. CNO (N09F) will coordinate with the Naval Inspector General to request that ergonomics programs be evaluated as a “special interest” item during Naval Inspector General shore oversight inspections. Date to initiate coordination is by 1 October 2007.

**Naval Audit Service comment on response to Recommendation**

**1.** The CNO (N09F) plan to coordinate action with the Naval Inspector General to include the evaluation of Ergonomics Programs as a “special interest” item during Naval Inspector General shore oversight inspections meets the intent of the recommendation. Including the Ergonomics Program as a “special interest” item during inspections should allow for oversight of Headquarters Commands’ compliance with their Safety and Occupational Health program responsibilities, as delineated in OPNAVINST 5100.23G, Chapters 9 and 23 for ensuring that appropriate evaluations of program effectiveness are conducted at subordinate commands at a minimum of every 3 years. The command evaluations should include compliance with program requirements related to ergonomics training, quality of self-assessments, budgeting, and analyses of injury and illness trends at their subordinate commands, activities, and/or installations.

We recommend that the Commandant of the Marine Corps (CMC):

**Recommendation 2.** Direct the CMC (Safety Division) to establish a process to monitor Marine Corps compliance with Ergonomics Program responsibilities identified in the Marine Corps Occupational Safety and Health Program Manual (NAVMC DIR 5100.8), which includes responsibilities related to Command/Installation implementation of ergonomic program training, program effectiveness reviews, reviews of injury and illness records, and budgeting requirements at Marine Corps activities and/or installations.

**Commandant of the Marine Corps (CMC) response to Recommendation 2. Concur.** To resolve this finding, the Safety Division will implement a Command Safety Assessment Program that will include an evaluation of the inspected command's Ergonomics Program. CMC (SD) will assess each installation triennially and forward a report documenting the assessment to the inspected commander. Initial operational capability for the Command Safety Assessment Program will be 30 September 2007, with full operational capability reached by 31 March 2008.

**Naval Audit Service comment on response to Recommendation 2.** The Commandant of the Marine Corps Safety Division's plan to implement a Command Safety Assessment Program and include an evaluation and a report documenting the assessment of the command's Ergonomic Program meets the intent of the recommendation.

## Finding 2: Ergonomic Mishap Reporting and Analysis

### Synopsis

Department of the Navy (DON) installations need to improve their identification, reporting, and analysis of ergonomics-related mishaps. Specifically, we found:

- About 57 percent (16 of 28)<sup>10</sup> of the DON installations that responded to the Naval Audit Service (NAVAUDSVC) ergonomics program survey reported their mishaps to the Commander Naval Safety Center<sup>11</sup> (COMNAVSAFECEN) using the Web-Enabled Safety System<sup>12</sup> (WESS), as required by DON guidance.
- Significant discrepancies were noted in the number of DON ergonomic injuries and illnesses reported. For example, Navy hospitals and clinics reported diagnosing a total of 5,763 cases of work-related musculoskeletal disorders (WMSDs) in Fiscal Years 2004 and 2005 while the Navy's Annual Reports to the Occupational Safety and Health Administration (OSHA) only reported 1,834 civilian WMSDs during the same period.
- COMNAVSAFECEN reported that an analyses of WMSD injuries and illnesses as required by the Office of the Chief of Naval Operations Instruction (OPNAVINST) 5100.23G had not been conducted.

The conditions noted above were discussed with the COMNAVSAFECEN Executive Assistant of the Director for Installation/Industrial Safety Department during our 27 March 2006 visit and during correspondence with the Head of the COMNAVSAFECEN Data Management and Analyses Department on 18 December 2006. Based on our audit, we believe the conditions occurred for several reasons. About 9,398 Unit Identification Code (UICs) of active DON activities/installations did not have a WESS account to allow the required use of WESS to report mishap data to the COMNAVSAFECEN. WESS does not allow for the clear identification or categorization of injuries, such as strains or sprains, as ergonomics-related injuries. As a result, DON activities and the Naval Safety Center could not use WESS information to determine an accurate number of ergonomics/WMSDs injuries, conduct ergonomics/WMSDs analysis to identify illness and injury trends, or identify the root causes of injuries. Without accurate injury and illness information, the DON could not verify the effectiveness of ergonomic training and initiatives.

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<sup>10</sup> The Ergonomics Program Survey was sent to 35 activities/installations. However, only 28 activities/installations responded to the survey. We did not receive responses from seven activities including one that was decommissioned.

<sup>11</sup> The COMNAVSAFECEN serves as Special Assistant for Safety Matters to the Chief of Naval Operations, (CNO N09F) and assists the CNO by managing the Navy Safety and Occupational Health (SOH) Program.

<sup>12</sup> WESS is a data collection system developed to allow submission of all recordable/reportable mishaps by electronic means. Data entered into WESS uses the Bureau of Labor Statistics (BLS) codes for accident type, injury type, body part, and object involved.

## Discussion of Details

### Background

OPNAV guidance states that all mishaps involving Secretary of the Navy personnel shall be reported to COMNAVSAFECEN. The guidance further states that any medically diagnosed, work-related illness and injury, such as cumulative trauma or musculoskeletal disorders must be investigated, recorded, and reported. Accurate injury/illness information must be collected and analyzed to determine the need for, and effectiveness of, ergonomic corrective actions. A December 2001 Center for Naval Analyses (CNA)<sup>13</sup> report, “Analyzing the Navy’s Safety Data,” found that if left unchecked, the annual cost of ergonomic injuries to the Navy was expected to rise from about \$90 million in 1999 to \$111 million by FY 2009.

All DON installations are required to report recordable mishaps electronically to the COMNAVSAFECEN using WESS. COMNAVSAFECEN maintains WESS to report and record mishaps, hazards, work-related injuries, and illnesses.

### Pertinent Guidance

Navy instructions and Marine Corps directives provide guidance to identify, report, and analyze ergonomic related mishap data. See Exhibit A for detailed guidance.

**OPNAVINST 5102.1D/Marine Corps Order (MCO) P5102.1B, “Navy and Marine Corps Mishaps and Safety Investigation, Reporting, and Record Keeping Manual,”** dated 7 January 2005, Chapter 3 provides standardized mishap record keeping requirements and reporting procedures. The instruction states all Navy and Marine Corps recordable/reportable mishaps shall be reported electronically to COMNAVSAFECEN using WESS.

**OPNAVINST 5450.180D, “Mission and Functions of the Naval Safety Center,”** dated 20 May 2005, states that the COMNAVSAFECEN provides safety data services to collect, analyze, and disseminate mishap data with emphasis on cause and statistical trend analysis, and maintains the WESS for all reporting and recording of mishaps and work-related injuries and illnesses.

**OPNAVINST 5100.23 G, “Navy Safety and Occupational (SOH) Program Manual,”** dated 30 December 2005, details Navy Ergonomics Program requirements and lays out the responsibilities of the COMNAVSAFECEN to conduct mishap analyses to identify WMSDs and analyze injury and illness pertinent data. COMNAVSAFECEN must conduct a mishap analysis that reviews available data for a 5-year period to identify WMSDs by activity and

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<sup>13</sup> The CNA is a Federally funded research and development center serving the DON and other defense agencies.



command, including number or rate of WMSD, injury/illness type, and body part.

**Marine Corps Directive (NAVMC DIR) 5100.8, “Marine Corps Occupational Safety and Health (OSH) Program Manual,” dated 15 May 2006**, establishes Marine Corps procedures and requirements to implement an ergonomics program per Department of Defense (DoD) Instruction 6055.1, “Department of Defense Safety and Occupational Health Program” including the review and analyses of injuries and illnesses related to WMSDs.

## Audit Results

With input from the Chief of Naval Operations Safety Liaison, and the Navy Ergonomics Working Group, we developed an ergonomics program survey containing 46 questions concerning DON commands and installations implementation of the DON Ergonomics Program. We issued the ergonomics program survey to 35 judgmentally selected DON installations. Activities were selected to receive the survey if they had relatively high Lost Work Day rates, large numbers of personnel, or were considered high injury risk activities. Details of our audit scope and methodology are contained in Exhibit B.

Responses to the Ergonomics Program Survey were received from 28 of the 35 activities to whom the survey was provided. We did not receive responses from seven activities including one that was decommissioned. Additionally, not all of the 28 activities/installations responding to the survey answered all of the survey questions. Our analysis of the survey results, as well as meetings with DON Ergonomics Program and Safety officials, disclosed that DON commands and installations needed to improve the identification, reporting, and analysis of ergonomics related mishaps. Our Ergonomics Program survey results were discussed with CNO (N09FB) personnel on 20 March 2007, and with the COMNAVSAFECEN Head, Data Management and Analysis Department (Code 26), and Executive Director (Code 02) on 18 December 2006 and 18 May 2007, respectively.

### WESS Users

All DON activities are required to use WESS to record and report mishaps to the COMNAVSAFECEN. According to survey responses, only 16 of the 28 DON activities/installations, including all 8 Marine Corps installations that responded to the survey, indicated they reported their ergonomic injuries to the COMNAVSAFECEN using WESS. Most Navy installations, especially those under the Commander, Naval Installations Command (CNIC), used the Enterprise Safety Application Management System<sup>14</sup> (ESAMS) for reporting mishaps.

<sup>14</sup>ESAMS was selected as the Safety Management System by CNIC to provide a secure Navy Marine Corps Intranet (NMCI) compliant web-based means to manage Office of Safety and Health (OSH) data requirements, including mishap reports, training, etc.

While ESAMS provides some of the injury/illness data required to complete WESS, it does not go into the detail on injuries and illnesses required by WESS, which COMNAVSAFECEN uses to complete Occupational Safety and Health Administration information requirements. Shipyards used a third reporting system, the Injury Tracking Database (INJTRAK),<sup>15</sup> to track occupational injuries and illnesses, and submit data to WESS.

As discussed with NAVSAFECEN management personnel on 18 December 2006 (Code 26) and 19 June 2007 (Code 02), COMNAVSAFECEN did not have a mechanism in place to identify commands, installations, or units that had not reported injuries and illness data through WESS, ESAMS, or INJTRAK. COMNAVSAFECEN did not have an accurate list of DON UICs to identify activities that had not submitted illness/injury reports. COMNAVSAFECEN injury/illness reports only account for activities/installations that have reported mishaps. COMNAVSAFECEN identified a total of 9,398 UICs and activity names as active commands that did not have a WESS account, or had not accessed WESS, during the period 1 June 2005 to 30 March 2006. As a result, without input from all activities, the numbers of DON ergonomics injuries identified by COMNAVSAFECEN through input from WESS are most likely underreported.

Activities indicated that the process of reporting, recording and retrieving mishap data using WESS was cumbersome because of the amount of detailed information required by the system. One installation indicated that entering mishap information was a challenge and inputting information on a single mishap could take up to 2 hours. Another installation indicated WESS was a step backwards in regard to installation-level data collection. Another installation claimed INJTRAK was much more user friendly and time efficient than WESS. The inability to efficiently use a single system for reporting of ergonomics injuries and illnesses adversely affects the accurate reporting and analysis of WMSDs.

During our audit, the COMNAVSAFECEN awarded a contract through the Fleet and Industrial Supply Center, Norfolk to study DON, other Government, and commercial database systems used to track and trend worker injuries and illnesses, and to recommend a single Department-wide web-based Risk Management Information System (RMIS). The contract Statement of Work did not clearly specify whether the RMIS should include a mechanism to ensure mishap information is received from all DON installations. According to COMNAVSAFECEN personnel, common complaints for all safety systems are that they are hard to use, take too long to use, collect too much data, and cannot be easily accessed. COMNAVSAFECEN's goal is to create a single system that collects RMIS data and allows customers to easily input and extract required

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<sup>15</sup> The purpose of INJTRAK is to provide a means to establish accurate recordkeeping. This database was created to store specific information about occupational mishaps and serves as the Log of Occupational Injuries and Illnesses. The information stored in the database is to be used for the sole purpose of mishap prevention. INJTRAK uses the U.S. Bureau of Labor Statistics (BLS) Occupational Injury and Illness Classification.

information. However, according to the May 2007 COMNAVSAFECEN briefing charts for the Deputy, Assistant Secretary of the Navy (Safety) (DASN(S)), COMNAVSAFECEN personnel concluded that the contractor study results were insufficient to allow them to make a decision on the selection of a single system. COMNAVSAFECEN leadership briefed the study results to the DASN(S) on 23 May 2007 and recommended that additional analyses of alternative systems be conducted.

### Discrepancy in the Number of DON Ergonomics Injuries

Installations are required to report all work-related mishaps electronically to COMNAVSAFECEN. Any medically diagnosed work-related illness and injury, such as cumulative trauma disorder or musculoskeletal disease, whether or not involving further medical treatment or time away from work, are reportable mishaps. We found discrepancies in the numbers of ergonomic/WMSDs injuries and illnesses reported by DON installations in response to our ergonomic survey when compared with the ergonomic injuries reported by the COMNAVSAFECEN in their Annual Occupational Safety and Health Program reports, and the numbers of WMSDs diagnosed at DON installation health clinics. For example, based on activity input to WESS, COMNAVSAFECEN reported through the “Navy FY 2005 Annual Report to Occupational Safety and Health Administration (OSHA)” 16 ergonomics injuries; 1,577 sprains and strains; 184 injuries to muscles, tendons, and ligaments; and about 57 back injuries, for a total of 1,834 civilian work related injuries in FYs 2004 and 2005 (see Table 1).

**Table 1**

<b>Number of DON Ergonomics/WMSDs injuries</b>			
<b>Medical Diagnosis</b>	<b>FY 2004</b>	<b>FY 2005</b>	<b>Total</b>
Ergonomics injuries	13	3	16
Sprains and strains	704	873	1,577
Injuries to muscles, tendons, ligaments	71	113	184
Back injuries	43	14	57
Total	831	1,003	1,834
<b>Source:</b> Navy FY 2005 Annual Report to OSHA			

In contrast to the injuries/illnesses reported by the COMNAVSAFECEN in their annual OSHA report, the Bureau of Medicine and Surgery (BUMED), Occupational Medicine Indicator Metrics diagnosed about 5,763 Navy civilian

and military WMSDs at Navy hospitals and clinics in FYs 2004 and 2005. Most of BUMED’s WMSD metrics (see Table 2) were not reported in WESS.

**Table 2**

<b>Number of Military members and Civilian employees diagnosed with WMSDs at Navy Medical Treatment Facilities</b>		
<b>FY 2004</b>	<b>FY 2005</b>	<b>Total</b>
2,850	2,913	5,763
<b>Source:</b> BUMED Occupational Medicine Indicator Metrics		

At the National Naval Medical Center (NNMC), Bethesda, we identified inconsistencies with the number of back injuries reported when compared to information in the WESS database. Records maintained by the NNMC safety officer showed 49 back injuries for FYs 2001 through 2005. However, information obtained from WESS by BUMED Occupational Health Program staff indicated a total of 20 cases of back injuries at the hospital during FYs 2001 through 2005. The BUMED staff stated this could be due to either coding issues (different codes used by individual(s) to identify back injuries), or some injuries/illnesses not being reported into WESS.

According to one COMNAVSAFECEN official, the mishap profiles maintained by the COMNAVSAFECEN could differ from data provided at the local level because the COMNAVSAFECEN relied on field activity safety professionals to input data into WESS. Recording and reporting ergonomics/WMSDs injuries in WESS depended on how the WESS user, or the person recording/reporting the injuries/illness, interpreted the BLS injury codes. WESS lacked the capability to clearly distinguishing WMSDs/ergonomics injuries from sprains and strains.

Lack of a specific ergonomics injury code hindered DON personnel in accurately reporting and recording ergonomics injuries. Therefore, identifying ergonomics injuries must be inferred from injury type and cause of injury. Also, inaccurate ergonomics mishap records encumber DON’s ability to establish trends and conduct analysis of ergonomics injuries.

### COMNAVSAFECEN Ergonomics Mishap Analysis

The Executive Assistant for the Director, Installation/Industrial Safety Department, and an Industrial Hygienist, at the COMNAVSAFECEN indicated that COMNAVSAFECEN did not conduct a mishap analysis covering a 5-year period, as required by Navy guidance. They stated the analysis was not being conducted because of the difficulty in distinguishing WMSDs from sprains and strains. They stated the ergonomic-type injuries were difficult to diagnose and

were usually encompassed in other broader injury types. Therefore, most ergonomic-related injuries were classified as sprains and strains or back injuries, and could not be effectively categorized or quantified. They added that the result of any data analysis of work-related musculoskeletal injuries depended on how the data analyst interpreted the particular BLS Injury Code entered in the injury/illness reports, along with the mishap narratives provided by the activities.

A previous 2004 CNA study, "Analysis of DON Mishap Rates," stated that mishap rates improved during the 1990s but there was insufficient analysis and understanding of the extent that those improvements were the result of safety efforts or other factors. This condition created an insufficient basis for establishing goals to reduce future mishaps. Also, without accurate injury/illness data, COMNAVSAFECEN cannot disseminate accurate ergonomic statistical trend data, and they are unable to identify appropriate ergonomics correction initiatives.

## Recommendations and Corrective Actions

We made recommendations to the Commander, Naval Safety Center (COMNAVSAFECEN) for improving the identification, analyses, and reporting of ergonomic illnesses/injuries. The COMNAVSAFECEN responded to the recommendations. A summary of the responses and our comments are provided below. Appendix 1 contains the complete management response.

We recommend that the Commander Naval Safety Center:

**Recommendation 3.** Modify the WESS data collection system, or ensure any new system implemented as a result of the RMIS or other studies provide for system identification of activities not reporting mishaps and provide this information to Echelon 2 and Headquarters Commands for followup action with their subordinate commands, activities, and/or installations.

### **Commander Naval Safety Center response to**

**Recommendation 3. Concur.** Naval Safety Center will ensure the Navy's new RMIS provides for interface with authoritative data sources to improve data quality and visibility, and a business process workflow that includes automatic notification of an injury or mishap to the service member's chain-of-command. The requirements definition phase for the new RMIS is estimated to be completed by 1 December 2007. Additionally, the Naval Safety Center shall make unit level mishap and injury reporting information available to Echelon 2 commands on a yearly basis in order to increase chain-of-command visibility of mishap and injury reporting. The first annual report will be provided to Echelon 2 commands by 1 December 2007.

**Naval Audit Service comment on response to Recommendation 3.** COMNAVSAFECEN's planned actions to ensure the Navy's new RMIS provides improved data quality and visibility, and to make unit-level mishap and injury report information available to Echelon 2 commands on a yearly basis, meets the intent of the recommendation.

**Recommendation 4.** Modify the WESS data collection system or ensure any new system implemented as a result of the RMIS or other studies allow for the clear identification of ergonomic type illnesses/injuries so ergonomic illness/injury trends and areas for improvement can be identified.

**Commander Naval Safety Center response to**

**Recommendation 4. Concur.** The WESS data collection system currently uses data fields that could be used to delineate ergonomic WMSD illnesses/injuries based on BLS codes that parallel the DoD Ergonomic Working Group. We also agree that additional ergonomic type illness/injury data fields can be added with little time involvement, and no cost, to help better identify repetitive motion and WMSD concerns. The Naval Safety Center conducted in-depth review of BLS codes that paralleled the DoD Ergonomic Working Group and added data fields to help build additional granularity. Testing of these program changes is on schedule. Date to complete action is 30 September 2007.

**Naval Audit Service comment on response to Recommendation 4.** The COMNAVSAFECEN plan to better identify repetitive motion and WMSD injuries by using available and added data fields meets the intent of the recommendation.

**Recommendation 5.** Provide guidance and training to Safety Officers and Safety Specialists, managers, and supervisors on the identification, recording, and reporting of Ergonomics/WMSDs injuries through WESS or any new system being developed.

**Commander Naval Safety Center response to**

**Recommendation 5. Concur.** Many avenues are used to provide training and guidance to installations. ALSAFE messages, magazine articles with a focus on specific ergonomic/WMSD concerns, mishap reporting video tele-training (VTT), and the Voluntary Protection Program process are but a few examples of how we are proactively working with the DON ergonomic education process for ashore and afloat commands. Collaborative efforts with multiple DoD working groups provide additional information to those commands needing assistance with ergonomic trending and analysis.

**Naval Audit Service comment on response to Recommendation**

**5.** COMNAVSAFECEN subsequent correspondence of 7 September 2007 clarified their August 23 initial response that the COMNAVSAFECEN currently provides Mobile Training Team (MTT) and VTT training on WESS to DON customers. The training is based on and compliant with the reporting/recording thresholds driven by OSHA's 29 CFR 1904 and OPNAVINST 5102.1D requirements. As such, ergonomic injury/illness events are captured in the same manner as any reportable mishap. Additional BLS Nature (Type) of Injury coding is currently being incorporated into WESS to better identify ergonomic and WMSDs. The target completion date for these additional data elements is 30 September 2007. Coincident with expansion of these data fields, the Naval Safety Center will incorporate additional training on ergonomic injury/illness reporting into MTT and VTT sessions beginning 1 October 2007.

COMNAVSAFECEN's planned actions to better identify and report ergonomic injuries/illnesses, and to provide additional training on reporting ergonomic injuries/illnesses meet the intent of the recommendation. The COMNAVSAFECEN response identifies plans to develop a web-based WESS training package that will be posted for use on NKO. Development of the training package is to be completed by 1 September 2008, but an estimated date for hosting the training on NKO was not made available. When COMNAVSAFECEN provides notification that development of the training package has been completed, COMNAVSAFECEN should provide interim action completion dates for posting the training package on NKO which would complete implementation of the recommendation.

**Recommendation 6.** In accordance with OPNAV guidance, conduct a mishap analyses for a 5-year period to identify ergonomics or WMSDs by activity and command showing rate of WMSDs, injury type, and body part.

**Commander Naval Safety Center response to**

**Recommendation 6. Concur with one caveat.** As stated in the report, the WESS data collection system does not currently have data fields associated with ergonomics or WMSDs, and cannot perform rigorous analysis of subject areas. We will modify WESS to collect this data. To fill the gap between the current state and the development of ergonomic/WMSD data fields, we will coordinate with BUMED to determine if medical data can provide trending of ergonomic/WMSDs. COMNAVSAFECEN will identify International Classification of Diseases (ICD9) codes that are uniquely associated with ergonomic-type medical attention

(similar to the past determination of ICD9 codes that are associated with mishaps) between 13–17 August 2007. Additionally, COMNAVSAFECEN will pass the ICD9 list to EpiData Center of the Navy Environmental Health Center<sup>16</sup> for use in querying Standard Ambulatory Data Record (SADR)/Standard Inpatient Data Record (SIDR) data to obtain a list of Ergonomic medical visits over the past 5 years between 20–31 August 2007. Naval Safety Center will analyze data and provide a summary report for the Naval Audit Service by 30 September 2007.

**Naval Audit Service comment on response to Recommendation**

**6.** COMNAVSAFECEN's plans to modify WESS to collect ergonomics data needed to conduct mishap analyses and to coordinate with BUMED to gather medical data for use in trending ergonomic injuries/illnesses meets the intent of the recommendation.

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<sup>16</sup> The EpiData Center of the Navy Environmental Health Center provides descriptive and multi-tiered analyses for cluster investigations, disease and injury risk, public health assessments, and business case analysis. Source: Presentation by the head of the EprData Center at the 45<sup>th</sup> Navy Occupational Health and Preventive Medicine Conference.



Section B:

# Status of Recommendations and Corrective Actions

RECOMMENDATIONS						
Finding	Rec. No.	Page No.	Subject	Status <sup>17</sup>	Action Command	Target or Actual Completion Date
1	1	14	Establish a process to monitor Echelon 2 and Headquarters Commands' compliance with their Ergonomics Program responsibilities as identified in the Navy Safety and Occupational Health Program Manual (OPNAVINST 5100.23G) to include ergonomic training, self-assessments, budgeting, and analyses of injury and illness records at their subordinate commands, activities, and/or installations.	O	CNO (N09F)	10/1/07
1	2	16	Direct the CMC (Safety Division) to establish a process to monitor Marine Corps compliance with Ergonomics Program responsibilities identified in the Marine Corps Occupational Safety and Health Program Manual (NAVMC DIR 5100.8), which includes responsibilities related to Command/Installation implementation of ergonomic program training, program effectiveness reviews, reviews of injury and illness records, and budgeting requirements at Marine Corps activities and/or installations.	O	CMC	3/31/08
2	3	23	Modify the WESS data collection system, or ensure any new system implemented as a result of the RMIS or other studies provide for system identification of activities not reporting mishaps and provide this information to Echelon 2 and Headquarters Commands for followup action with their subordinate commands, activities, and/or installations.	O	COMNAVSAFECEN	12/1/07
2	4	24	Modify the WESS data collection system or ensure any new system implemented as a result of the RMIS or other studies allow for the clear identification of ergonomic type illnesses/injuries so ergonomic illness/injury trends and areas for improvement can be identified.	O	COMNAVSAFECEN	9/30/07
2	5	24	Provide guidance and training to Safety Officers and Safety Specialists, managers, and supervisors on the identification, recording, and reporting of Ergonomics/WMSDs injuries through WESS or any new system being developed.	O	COMNAVSAFECEN	10/1/07
2	6	25	In accordance with OPNAV guidance, conduct a mishap analyses for a 5-year period to identify ergonomics or WMSDs by activity and command showing rate of WMSDs, injury type, and body part.	O	COMNAVSAFECEN	9/30/07

<sup>17</sup> / O = Recommendation is open with agreed-to corrective actions; C = Recommendation is closed with all action completed; U = Recommendation is undecided with resolution efforts in progress

# Background and Pertinent Guidance

## Background

The Department of the Navy's (DON) Objectives for 2006 included an emphasis on safety. Improvements in safety would help achieve the Secretary of Defense's goal of reducing baseline mishap rates by 75 percent by the end of FY 2008. The Secretary of the Navy, the Chief of Naval Operations (CNO), and the Commandant of the Marine Corps (CMC) have provided guidance on the prevention of mishaps that include work-related musculoskeletal disorders (WMSDs).

WMSDs are injuries or illnesses in either the upper or lower extremities, back, or neck resulting from the cumulative effect of repeated stress to the body associated with workplace risk factors. These risks include force, repetition, awkward or static postures, vibration, and contact stress. The Marine Corps Occupational Safety and Health Program Manual indicates that WMSDs harm and reduce human performance and are often the result of a mismatch between workers and their tasking. Some common WMSDs are: Carpal Tunnel Syndrome, Low Back sprain, Tendonitis, and lateral epicondylitis, also known as "tennis elbow."

Ergonomics involves adapting the workplace to the worker. The DON ergonomics program seeks to prevent WMSDs injuries and illnesses by applying ergonomic principles to the planning, design, and evaluation of work environments, jobs, tools and equipment to enhance worker performance, safety and health.

A Center for Naval Analyses report, "Analyzing the Navy's Safety Data," of December 2001, estimated that ergonomic injuries cost the Navy approximately \$90 million annually, and account for one-third of all compensation claims. The report also stated the annual cost of ergonomic injuries is projected to increase to \$111 million by FY 2009. A prior Naval Audit Service (NAVAUDSVC) report titled, "Reducing Lost Work Time Due to On-the-Job Injuries at Navy and Marine Corps Commands," issued on March 2004, concluded that DON management needed to take additional action to reduce lost workdays resulting from on-the-job injuries.

## Pertinent Guidance

**Department of Defense (DoD) Instruction 6055.1, "DoD Safety and Occupational Health Program," dated 19 August 1998**, provides policies, procedures, and responsibilities to each DoD component for administering a comprehensive DoD safety and occupational health program. Section E6.1.1 requires each DoD component to prepare a written plan for a comprehensive ergonomics program

with six critical elements: intervention-workplace analysis, hazard prevention and control, health care management, education and training, evaluation, and acquisition. Section E6.1.6., “Program Evaluation and Review,” states that each component shall be responsible for evaluating its ongoing ergonomic effort to measure the effectiveness of interventions and level of participation.

**Office of the Chief of Naval Operations Instruction (OPNAVINST) 5100.23G, “Navy Safety and Occupational Health (SOH) Program Manual,” dated 30 December 2005**, outlines the policies and responsibilities of the total Navy SOH Program, including training, budgeting, reporting, and data analysis and oversight. Section 1401 states that accurate records are necessary to establish trends, to conduct analyses, and to assess the effectiveness of the overall Navy SOH Program. Section 1402 states that a complete comprehensive mishap investigation is an essential tool in identifying the root cause of a mishap and thereby prevent recurrence. Section 1404 states that everyone within the chain of command shall report all mishaps to their supervisors and ultimately to the regional or safety office.

Section 0302 of OPNAVINST 5100.23G states that Headquarters command safety officials shall assess the effectiveness of the command’s safety programs by performing assessments and reviews at subordinate commands. Section 2310 of OPNAVINST 5100.23G requires Echelon 2 Commands to provide guidance and assistance as necessary to subordinate commands on ergonomics program development and implementation. The same guidance requires the Commander, Naval Safety Center to conduct mishap analyses, and reviews of available data for a 5-year period, identifying WMSDs by activity and command, including the number or rate of WMSDs, injury/illness types, and body parts. Commanders, Commanding Officers, and Officers in Charge are required to analyze injury and illness records to determine the need for ergonomic improvements within their activities, and identify and budget resources to fund effective ergonomics programs at their activities. The instruction also states that, at a minimum, employees are to receive general awareness training to recognize, and to understand methods of controlling, workplace risk factors.

Section 2304 requires that each activity include a self-assessment of its ergonomics program as part of the Process Review and Measurement System (PR&MS), or equivalent management system.

Section 2307j and Section 1204b indicate some projects developed to address ergonomic hazards that exceed the funding capability of local organizations may qualify for centrally-managed Navy (SOH) funds through the Hazard Abatement Mishaps Program (HAMP). Operations and Maintenance, Navy funds are used for HAMP. Navy Working Capital Funded and Marine Corps activities do not qualify for HAMP funds. To be considered for HAMP funding, the cost of an ergonomics project must equal or exceed \$10,000.

Section 2308 states that a key to maintaining an effective ergonomics program is the proper training of managers, supervisors, professional staff, ergonomic teams, and employees. General ergonomics training shall be provided to all employees as applicable to the employee's role in the workplace. Training elements shall include the definition of ergonomics, recognition of musculoskeletal disorders signs and symptoms, methods to identify and reduce ergonomics risk factors, elements of an effective case management process, and elements on how to administer an effective ergonomics program.

**OPNAVINST 5450.180D, “Mission and Functions of the Naval Safety Center,” Section B, dated 20 May 2005,** states that Commander, Naval Safety Center monitors implementation and effectiveness of system safety programs.

Section 2 states the COMNAVSAFECEN maintains the Web-Enabled Safety System (WESS) for all mishap reporting and recording of mishaps, hazards, work-related injuries and illnesses, and manages and provides safety data and reports, on-line, for access by external customers. COMNAVSAFECEN also collects, analyzes, and disseminates mishap data with special emphasis on cause and statistical trend analysis, and provides on-line data access to safety customers.

**OPNAVINST 5102.1D /Marine Corps Order (MCO) P5102.1B, “Navy and Marine Corps Mishaps and Safety Investigation, Reporting, and Record Keeping Manual”, dated 7 January 2005** states the CNO for Safety (CNO (N09F)) and the CMC Safety Division (CMC) (SD) provide policy sponsorships and service approval of DON safety investigation and reporting. CNO (N09F) and CMC (SD) also implement improvements and changes in mishaps reporting procedures as recommended by subordinate units or required by higher authority.

Section 3000 states all recordable mishaps are to be reported electronically to the COMNAVSAFECEN mishap database. Section 3001 states the purpose of Chapter 3 of this instruction is to standardize mishap record keeping requirements and reporting procedures. Section 3004 states any medically diagnosed work-related illness and injury, such as cumulative trauma disorder or musculoskeletal disease, whether or not involving further medical treatment or any time away from work are reportable mishaps. Section 3007.1 states all DON recordable/reportable mishaps shall be reported using WESS.

**Navy and Marine Corps (NAVMC) Directive 5100.8, SD, “Marine Corps Occupational Safety and Health Program Manual” dated 15 May 2006** provides the requirements and guidance for commanders and Marine Corps OSH Program professionals to identify and manage risk and maintain safe and healthful operational requirements. Chapter 19 addresses the ergonomics program as required by DoD 6055.1.

Section 19002 states that the ergonomics coordinator shall annually assess the implementation progress and effectiveness of the installation or unit ergonomic plan. It also states that installation commanders are required to allocate resources

to ensure the development and implementation of a comprehensive ergonomics program.

Section 19003 states that ergonomics awareness training shall be provided to all Marine Corps personnel and prescribes the content of the training. It also states that the development and implementation of an ergonomics program is the responsibility of the installation commanders.

# Scope and Methodology

## Scope

The audit focused on the Department of the Navy's (DON's) Ergonomics Program implementation across DON commands and installations.

With input from Chief of Naval Operations Safety Liaison and the Navy Ergonomics Working Group, we developed an ergonomics program survey containing 46 questions. The survey was used to solicit ergonomics program implementation information and supporting documentation from 35 judgmentally selected DON installations.<sup>18</sup> Specifically, the survey solicited information on measures taken by the installations in the following program areas: management; process review; resource and funding levels; personnel training, and ergonomics/work-related musculoskeletal (WMSDs) related mishap recording, reporting, and analysis.

A review of DON activity ergonomic program acquisition procedures was outside the scope of this audit. However, we agreed to include three CNO Safety Liaison Office acquisition related questions in our Ergonomics Survey. One question asked if activity ergonomics team members were consulted before such items as tools, furniture, and equipment were purchased (Exhibit D question 42). About 54 percent (15 of 28) of survey responses indicated such consultations occurred. A second question asked if activities had mechanisms in place to communicate ergonomics improvements needed in future acquisitions (Exhibit D question 43). About 18 percent (5 of 28) of activities reported having such mechanisms in place. A third survey question asked if activities used Lean Six Sigma concepts that could affect the acquisition area if acquisitions improved efficiencies and processes (Exhibit D question 46). About 30 percent (8 of 27) of the activities reported using Lean Six Sigma concepts. While the results of the three acquisition related questions are provided here, we caution that the activities responses were not verified since such a review of ergonomic related acquisition procedures was outside the scope of this audit. Exhibit D lists all the questions included in our ergonomics program survey.

Exhibit C lists the selected 35 DON installations and other activities we contacted and/or visited to obtain information on ergonomics program implementation. The Methodology section describes the procedures used to select the 35 DON installations. The other 7 installations either did not respond to our follow-up efforts, or indicated that the installations were decommissioned and functions were absorbed by other units, or that they did not have the staff to complete the survey.

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<sup>18</sup> Twenty-eight of the 35 DON installations responded to the survey.

We visited 8 of the 28 installations to verify support for the responses provided. The remaining 20 activities were contacted electronically to request additional support for their responses to the ergonomics program survey. We also distributed an informal “User Survey” to personnel at six of the activities visited to determine individual employee familiarity with their activities ergonomics program. We manually tabulated the ergonomics program survey results and the user survey results.

We evaluated applicable Department of Defense (DoD) and DON policies related to the DON Ergonomics Program and identified Navy instructions and Marine Corps orders and directives for implementing the program.

There were no previous audits relating to the DON Ergonomics Program by the Naval Audit Service, the Inspector General Department of Defense, or the Government Accountability Office. Therefore, audit follow-up work was not required.

We performed the audit from 21 February 2006 to 26 July 2007.

## Methodology

To verify DON Ergonomics Program implementation across DON activities, we judgmentally selected 35 of 144 installations using the Department of Defense (DoD) Personnel Safety Metrics List, published by the Defense Manpower Data Center (DMDC). The 144 installations were derived from 122 installations on the “Navy Lost Day Rate by Installations List,” and 22 installations on the “Marine Corps Lost Day Rate by Installations List.” Both lists covered lost time day rate data for the pay period which ended 1 April 2006.

- The sample selected consisted of 11 Navy and 3 Marine Corps installations identified in the “DoD Top 40 Installations List,” with the highest Total Lost Work Day for the Fiscal Year as of 18 March 2006.
- The sample also included 10 Navy installations selected from the “Navy Lost Day Rate by Installations List,” that were among the highest in terms of hours charged for the pay period ended 1 April 2006. These Navy installations with the largest number of work hours charged in a pay period were selected because of their size. In addition, 3 Navy installations with a total lost work day rate of less than 10 days were selected in order to provide us greater insight into possible varying ergonomics programs.
- Three BUMED installations were added because medical installations are in the high-risk category regarding potential for work-related injuries to personnel.
- We selected the other 5 Marine Corps installations from the 22 “Marine Corps Lost Day Rate by Installations List,” to provide coverage of Marine Corps activities.

Exhibit C lists the 35 DON installations we contacted to perform the audit.

We requested that activities' responses to the survey questions include documentation to support their responses. The supporting documents requested included, but were not limited to:

1. Local or Regional Ergonomic Policy or Plan, including its source and transmittal memorandum (Question #3).
2. List of ergonomics subcommittee/work-based team members (Question #9).
3. Self-assessment of the ergonomics program as part of the Process Review and Measurement System (PR&MS) or any equivalent management system, i.e. Occupational Safety and Health Administration (OSHA VPP) Voluntary Protection Program (OSHA VPP) or Commander Naval Safety Center (COMNAVSAFECEN) guidance (Question 11).
4. Job-task analysis and/or workplace inspection conducted. (Questions #12, 13, and 14).
5. Navy Inspector General (NAVINSGEN) oversight inspection report of the Ergonomics Program (Question #16).
6. Injury/Mishap Logs (Question #22)
7. Documentation supporting reduction of ergonomics injuries (Questions #6, 25, and 27).
8. Documentation supporting cost-benefit analysis of ergonomics intervention at the installation/region (Question #31).
9. Policy for returning injured workers to duty (Question #41).

We contacted Echelon 2 Commands such as Commander, Naval Installation Command, Naval Air Systems Command, and Naval Sea Systems Command to identify any guidance and assistance they provided to subordinate commands on their ergonomics program development and implementation. We also contacted the NAVINSGEN and Marine Corps Office of Policy to determine the extent of oversight inspections of their respective activities ergonomics programs.

We determined whether DON installations conducted self-assessment of their ergonomics program as well as job-task analyses and/or workplace inspections to identify:

- Ergonomics risk factors,
- Budgeting for ergonomics program implementation or interventions,
- Receipt of Navy Hazard Abatement and Mishap Prevention Program funds for ergonomics projects,



- Cost-benefits analyses of ergonomics interventions,
- Whether ergonomics training was provided to all personnel, and
- Whether ergonomics training records were maintained.

We also identified the injury recording and reporting systems used at selected DON installations, as well as the number of ergonomics/WMSDs injuries logged and reported. Exhibit D lists the 46 questions included in the ergonomics program survey and the summary of the results.

To review the level of resources available for the DON Ergonomics Program, we contacted the NAVFAC Lead Safety Engineer and the Navy Ergonomics Program Manager. We obtained a table of the activities that received HAMP funds for ergonomics projects from 1999 to 2006. We checked if selected DON installations received funds from Navy (HAMP) for ergonomics intervention at their installations.

We interviewed responsible personnel at COMNAVSAFECEN: (a) to identify DON installations not reporting mishaps through the Web-Enabled Safety System (WESS); (b) to obtain an understanding/overview of the process to record and report ergonomics/WMSDs injuries using WESS; and (c) to determine if the COMNAVSAFECEN conducted a mishaps analysis for a 5-year period. We also identified other electronic databases for mishaps recording and reporting.

To verify the accuracy of the number of ergonomics injuries logged and reported by selected DON installations to COMNAVSAFECEN, we compared the number of accident types and injury types, using Bureau of Labor Statistic (BLS) codes that were associated with ergonomics/ WMSDs, with the mishaps profiles maintained by COMNAVSAFECEN through the WESS for Fiscal Years 2004 through 31 May 2006.

We also determined if recordable and reportable ergonomics/WMSDs injuries were analyzed at least annually by DON installations to identify significant trends, causes, and preventive actions, and to determine the need for ergonomics improvement by checking responses to question #23 of the ergonomics program survey.

The audit was performed in accordance with Generally Accepted Government Audit Standards. Data quality was adequate for use in the audit.

# Activities Visited and/or Contacted

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## Activities Visited \* and/or Contacted that Responded to our Ergonomics Program Survey

Naval Amphibious Base Little Creek, Virginia Beach, VA  
Naval Air Station Joint Reserve Base, Fort Worth, TX  
Naval Base Pearl Harbor Commander Navy Region Hawaii, HI  
Norfolk Naval Base, Norfolk, VA  
Naval Region Southwest, San Diego, CA  
Norfolk Naval Shipyard, Norfolk, VA  
Puget Sound Naval Shipyard, Bremerton, WA  
\* Naval Air Station Jacksonville, FL  
\* Naval Air Warfare Center Weapons, China Lake, CA  
Naval Vessel Weapons Station, Charleston, SC  
\* Naval Air Depot Jacksonville, FL  
North Island Aviation Depot, San Diego, CA  
\* Kings Bay Trident Refit Facility, St. Mary's, GA  
Naval Surface Warfare Center, Crane, IN  
Pearl Harbor Naval Shipyard, Pearl Harbor, HI  
Portsmouth Naval Shipyard, NH  
\* Naval Air Station Patuxent River, MD  
\* Naval Surface Weapons Center Dahlgren, VA  
\* National Naval Medical Center, Bethesda, MD  
Naval Hospital Great Lakes, IL  
Marine Corps Base Quantico, VA  
Marine Corps Air Station Cherry Point, NC  
Marine Corps Base Camp Lejeune, NC  
Marine Corps Logistics Base Albany, GA  
Marine Air Ground Task Force Training Command, 29 Palms, CA  
Marine Corps Air Station Camp Pendleton, CA  
Marine Corps Base Camp Pendleton, CA  
\*Marine Corps Logistics Base Barstow, CA

## Activities contacted who did not respond to our Ergonomics Program Survey

Annapolis Naval Station, Annapolis, MD  
Washington Naval District Headquarters, Washington, DC  
Naval Air Depot Cherry Point, NC  
Newport Naval Education Training Center, Newport, RI  
Naval Air Station Bremerton, WA  
Naval Submarine Base San Diego, CA  
Naval Hospital Bremerton, WA

**Other Activities Visited\* and/or Contacted**

Chief of Naval Operations Safety Liaison Office

\*Naval Safety Center, Norfolk, VA

\*Marine Corps Headquarters, Safety Division, Washington, DC

Naval Facilities Engineering Command, San Diego, CA

\*Bureau of Medicine and Surgery, Washington, DC

Commander, Naval Installations Command, Washington, DC

Naval Air Systems Command, Patuxent River, MD

Naval Sea Systems Command, Washington, DC

Exhibit D:

# Ergonomics Program Survey

Questions included in the ergonomics program survey issued to audit the implementation of the DON Ergonomics Program across DON activities.

#	Ergonomics Survey Questions	Yes	No	N/A	Total
<b>Note: If a question is not applicable, mark it as “N/A”.</b>					
<b>Program Management</b>					
1	Does your activity, facility or installation have an ergonomics program?	24	4	0	28
2	If your answer to #1 was yes, when did you implement the DON Ergonomics Program				
3	If your answer to #1 was yes, does your activity/installation have a written ergonomics policy, plan, and/or command statement of support for the DON Ergonomics Program?	19	5	4	28
4	If your answer to #3 was yes, has the ergonomics program policy/guidance been communicated/distributed to all activity personnel?	18	4	6	28
5	If your answer to #1 was no, are budget constraints the reason for not having an ergonomics program in place?	1	3	24	28
6	If your response to #1 was no, is a lack of policy/guidance the reason for not having an ergonomics program in place? Explain	1	3	24	28
7	If your answer to #1 was no, are there other reasons for not having an ergonomics program in place? If yes, please identify the reason.	4	0	24	28
8	Has your activity received guidance and assistance from your Echelon 2 Command on the development of your ergonomics program? Please provide the name of your Echelon 2 Command and the guidance received.	7	21	0	28
9	Do you have an activity/installation ergonomics subcommittee/worker-based team? If yes, list name and title of members and whether they are full-time or part-time.	6	22	0	28
10	Do health care providers participate in installation ergonomics programs (e.g., surveillance, training activities)? If yes, identify the program(s)	18	9	1	28
<b>Program and Process Review</b>					
11	Has the command/activity conducted a self-assessment of the ergonomics program as part of the Process Review and Measurement System (PR&MS)? If yes, provide support. How do you identify suspected problem areas (injury logs, supervisor input, worker concerns, etc)?	17	3	8 <sup>19</sup>	28
12	Do you conduct job-task analysis/workplace inspections to identify ergonomics risk factors? If yes, who conducts the inspections? How often does your installations/facility conduct the inspections?	27	1	0	28
13	Have you documented the job-task analysis/workplace inspections? Ref. Same as above	25	3	0	28

<sup>19</sup> The eight N/As were the result of Marine Corps guidance not requiring self-assessments as part of a PR&MS.

#	Ergonomics Survey Questions	Yes	No	N/A	Total
	If yes, please provide copy of one or two inspections conducted. If not, why?				
14	Have you documented the actions required to eliminate or reduce any ergonomics risk factors as a result of the inspections conducted? Ref. Same as above. If yes, what actions were required to eliminate or reduce any ergonomics risk factors identified?	26	2	0	28
15	Do you have a prioritized list of jobs/areas that need ergonomics corrective action?	7	21	0	28
16	Has NAVINSGEN conducted oversight inspections of the ergonomic program at your activity? If yes, please provide month/year of last inspection.	16	4	8	28
<b>Mishaps Reporting and Data Analysis</b>					
17	What injury recording and reporting system do you use?				
	a. Web Enabled Safety Systems (WESS)	16	0	0	16 <sup>20</sup>
	b. Enterprise and Safety Application Management Systems (ESAMS)	11	1	0	12
	c. Other - Please identify the system used and the reason for using it	4	1	0	5
18	Do you receive feedback from the injury recording system used by your activity? If yes, What type of feedback do you receive? If not, what feedback would be of benefit to you?	19	8	1	28
19	How do you define ergonomics related injuries?				
20	How are ergonomic injuries/illnesses differentiated from strains and sprains?				
21	Who determine if an injury/illness is ergonomics/work-related musculoskeletal disorders (WMSDs)?				
22	Do you maintain separate mishap records and logs for civilian and military personnel either manually or electronically? If yes, please provide a sample of each log.	20	8	0	28
23	Has the Ergonomics POC/Subcommittee/worker-based team reviewed or analyzed injury and illness data or log at least once in the past year to determine the need for ergonomic improvement and corrective actions with the activity? If yes, please provide support. If not, Why?	15	12	1	28
24 <sup>21</sup>	What is your most frequently occurring source or cause of ergonomics/WMSDs related injury				
	a. Awkward work position?			5	
	b. Repetitive motion?			7	
	c. Bending/Climbing/Reaching/Lifting/Twisting?			7	
	d. Back injuries?			6	
	e. Carpal Tunnel?			1	
	f. Excessive force/overexertion?			7	
	g. Vibration?			1	
25 <sup>22</sup>	How many ergonomics injuries/illnesses were logged at your activity during				

<sup>20</sup> Totals exceed 28 because 3 activities responded that they used both WESS and ESAMS.

<sup>21</sup> Totals exceed 28 because 2 activities reported more than one cause for their most frequently occurring WMSDs.

<sup>22</sup> FY 2004 and FY 2005 ergonomics injuries/illnesses figures represent the totals for the 28 activities responding to the survey.

#	Ergonomics Survey Questions	Yes	No	N/A	Total
	a. FY 2004?	733			
	b. FY 2005?	705			
	c. FY 2006 (October 2005 thru May 2006?)	427			
26	Do employees have an established means for reporting ergonomics concerns in the workplace? If yes, please detail methods of reporting. What types of ergonomics concerns have been reported in the past 3 years?	27	1	0	28
27	Have you seen a reduction in injuries (incidents or cost) since the start of your ergonomics program? If yes, please attach supporting data.	12	11	3	26 <sup>23</sup>
<b>Program Funds/Budget</b>					
28	Does your installation budget for ergonomics program implementation? What is your annual ergonomics budget (spent directly on awareness or interventions)? (Do not include Military or Civilian salaries?)	4	23	0	27 <sup>24</sup>
29	Have you received any Navy Hazard Abatement and Mishap Prevention Program funding for Ergonomics projects during the past 3 years? If yes, please identify the project(s) and the amount received.	8	10	10	28
30	Have activity funds been made available for ergonomics corrective actions? If yes, please identify the project(s) and the amount received. Identify the Corrective Actions. How much has been provided during the past 3 years? What funding source was used?	17	9	1	27 <sup>25</sup>
31	Have you completed a cost benefit analysis of ergonomic interventions? If yes, please attach supporting information.	3	25	0	28
32	Has the Ergonomics POC/Subcommittee/worker-based team assigned risk assessment codes (RACs) to ergonomic projects to allow application for centrally managed Mishap Prevention and Hazard Abatement funds?	9	16	3	28
<b>Ergonomics Training</b>					
33	Has the ergonomics POC received formal training in ergonomics, specifically the "Navy Ergonomics Program course (A-493-0085) offered by Naval Occupational Safety and Health and Environmental Training Center (NAVOSHENVTRACEN) or its equivalents (35-hour accredited university course or Occupational Safety and Health Administration (OSHA) course #2250-Principles of Ergonomics applied to work-related Musculoskeletal and Nerve Disorders)? Please identify the course taken.	26	2	0	28
34	Have managers, supervisors, and professional safety staff received sufficient training on ergonomic issues to effectively carry out their responsibilities for the health and safety of their employees to identify and reduce ergonomic risk factors? If yes, please detail types of training. If not, Why?	21	7	0	28
35	What percentage of managers, supervisors, and professional safety				

<sup>23</sup> Two activities responded that they did not know the effect of their ergonomics program on their injury/illness totals.

<sup>24</sup> One activity did not respond to the survey question.

<sup>25</sup> One activity did not respond to the survey question.

#	Ergonomics Survey Questions	Yes	No	N/A	Total
	staff completed ergonomics training? Please provide support.				
36	Has general ergonomics awareness training been provided to all employees? If yes, how was the training administered? How has the training been documented?	19	7	0	26 <sup>26</sup>
37	Are records maintained of the ergonomics training completed by all employees? If not, why?	22	5	1	28
38	How was the training completion documented?				
39	Have efforts been made to increase general awareness of ergonomics through public information (printed materials) and health promotion/safety campaigns? If yes, please detail types of materials.	22	6	0	28
<b>Prevention and Control</b>					
40	Are work restrictions planned and managed collaboratively by line and health care providers?	19	7	1	27 <sup>27</sup>
41	Does your activity have a plan or policy for returning injured workers to duty? If yes, please provide a copy of the plan.	21	7	0	28
42	Is the Ergonomics POC/Subcommittee/worker-based team consulted before tools, furniture, or equipment is purchased to ensure the items resolve existing ergonomics hazards or at least do not introduce new ergonomics hazards? If yes, please give an example.	15	12	2	29
43	To ensure feedback from Navy workplaces back to the acquisition community is there a mechanism in place to communicate ergonomics improvements needed in future acquisitions? If yes, please give an example.	5	23	0	28
<b>Other</b>					
44	Has management expressed any concerns with, or provided support for implementation of the DON Ergonomics Program? Please provide a brief summary supporting your response.	4	23	1	28
45	Has management provided support for the implementation of the DON Ergonomics Program? Please provide a brief summary supporting your response.	18	9	1	28
46	Is your activity using lean six sigma concepts? If Yes, are you providing ergonomics tools to lean six sigma to improve efficiencies?	8	19	0	27 <sup>28</sup>

<sup>26</sup> Twenty-six activities responded with "yes" or "no" responses while one activity responded that most of their personnel had received the training, and a second responded that 71% of their personnel had received general ergonomics training.

<sup>27</sup> One activity responded that they did not have information to respond to the question.

<sup>28</sup> One activity reported that they had not yet received Lean Six Sigma training.

Appendix 1:

# Management Responses from Commander, Naval Safety Center



DEPARTMENT OF THE NAVY  
NAVAL SAFETY CENTER  
376 A STREET  
NORFOLK, VA 23511-4399

7510  
Ser 40/0501  
23 Aug 07

From: Commander, Naval Safety Center/Special Assistant for  
Safety Matters (CNO N09F)  
To: Assistant Auditor General for Installations and  
Environment Audits, Naval Audit Service (NAVAUDSVC), 1006  
Beatty Place SE, Washington Navy Yard DC 20374-5005  
Subj: DRAFT NAVAUDSVC AUDIT REPORT ON IMPLEMENTATION OF THE  
DEPARTMENT OF THE NAVY ERGONOMICS PROGRAM (N2006-NIA000-  
0030)  
Ref: (a) NAVAUDSVC memo 7510 N2006-NIA000-0030.000 of 26  
Jul 07  
Encl: (1) Commander, Naval Safety Center responses to subject  
draft report

1. We reviewed reference (a) and enclosure (1) provides our responses to the draft report findings and recommendations. We also reviewed reference (a) from a Freedom of Information Act (FOIA) perspective and submit that the audit report does not require the "For Official Use Only" (FOUO) designation.

2. My point of contact for further questions or assistance is [REDACTED] Shore Programs Director, Code 40, COMM: [REDACTED]

G. E. MAYER

Paragraph 2 contains personal identifying information that is exempt from release under Exemption (b)(6) of the Freedom of Information Act



Commander, Naval Safety Center Responses to  
NAVAUDSVC Draft Audit Report on "Implementation of the  
Department of the Navy Ergonomics Program" (N2006-NIA000-0030)

We've reviewed the draft audit report and concur with the Navy findings and recommendations. Below are our responses to recommendation 1 addressed to the Commander, Naval Safety Center/Special Assistant for Safety Matters (CNO N09F) and recommendations 3-6 addressed to the Commander, Naval Safety Center.

1. Finding 1, Recommendation 1. We recommend that the Chief of Naval Operations for Safety Matters (CNO N09F) establish a process to monitor Echelon 2 and Headquarters Commands' compliance with Ergonomics Program responsibilities as identified in the Navy Safety and Occupational Health Program Manual (OPNAVINST 5100.23G), to include ergonomic training, self-assessments, budgeting, and analyses of injury and illness records at their subordinate commands, activities, and/or installations.

Response: CNO (N09F) concurs in principle that further monitoring of compliance with the Ergonomics Program is needed. An oversight process already exists and is delineated in OPNAVINST 5100.23G, chapter 9. The Navy has a three-tiered approach to safety and occupational health program oversight. The first tier is workplace inspections, which are to be conducted annually by regional safety service providers and activity commands. Tier two is command evaluations, where headquarters commands are tasked to ensure appropriate evaluations of safety program effectiveness are conducted at subordinate commands and field activities at a minimum of every three years. Tier three is oversight evaluations by the Naval Inspector General, which are done, as deemed appropriate, of headquarters and subordinate commands to evaluate compliance with requirements of the program. CNO (N09F) will coordinate with the Naval Inspector General to request that ergonomics programs be evaluated as a "special interest" item during Naval Inspector General shore oversight inspections. Date to initiate coordination is by 1 October 2007.

2. Finding 2, Recommendation 3. We recommend that the Commander, Naval Safety Center modify the WESS data collection system or ensure any new system implemented as a result of RMIS or other studies provide for system identification of activities not reporting mishaps and provide this information to Echelon 2

Enclosure (1)

and Headquarters Commands for follow-up action with their subordinate commands, activities, and/or installations.

Response: Concur. Naval Safety Center will ensure the Navy's new Enterprise Risk Management Information System (RMIS) provides for interface with authoritative data sources to improve data quality and visibility, and a business process workflow that includes automatic notification of an injury or mishap to the service member's chain of command. The requirement definition phase for the new RMIS is estimated to be completed by 1 Dec 07. Additionally, the Naval Safety Center shall make unit level mishap and injury reporting information available to Echelon 2 commands on a yearly basis in order to increase chain of command visibility of mishap and injury reporting. The first annual report will be provided to Echelon 2 commands by 1 Dec 2007.

3. Finding 2, Recommendation 4. We recommend that the Commander, Naval Safety Center modify the WESS data collection system or ensure any new system implemented as a result of the RMIS or other studies allow for the clear identification of ergonomic type illnesses/injuries so ergonomic illness/injury trends and areas for improvement can be identified.

Response: Concur. The WESS data collection system is currently using data fields that could be used to delineate ergonomic/work-related musculoskeletal disorders (WMSD) illnesses/injuries based on Bureau of Labor Statistics (BLS) codes that parallel the DOD Ergonomic Working Group. We also agree that additional granularity can be added with little time involvement and no cost to help better identify repetitive motion and WMSD concerns. The Naval Safety Center conducted in-depth review of BLS codes that paralleled the DOD Ergonomic Working Group and added data fields to help build additional granularity. Testing of these program changes is on schedule. Date to complete action is September 30, 2007.

4. Finding 2, Recommendation 5. We recommend that the Commander, Naval Safety Center provide guidance and training to Safety Officers and Safety Specialists, managers, and supervisors on the identification, recording, and reporting of Ergonomics/WMSDs injuries through WESS or any new system being developed.

Response: Concur. Many avenues are used to provide training and guidance to installations. ALSAFE messages, magazine articles with a focus on specific ergonomic/WMSD

concerns, mishap reporting video tele-training (VTT), and the Voluntary Protection Program process are but a few examples of how we are proactively working with the DON ergonomic education process for ashore and afloat commands. Collaborative efforts with multiple DOD working groups provide additional information to those commands needing assistance with ergonomic trending and analysis. Naval Safety Center has completed this action.

5. Finding 2, Recommendation 6. We recommend that the Commander, Naval Safety Center, in accordance with OPNAV guidance, conduct a mishap analyses for a 5-year period to identify ergonomics or WMSDs by activity and command showing rate of WMSDs, injury type, and body part.

Response: Concur with one caveat. As stated in the report, the WESS data collection system does not currently have data fields associated with ergonomics or WMSDs and cannot perform rigorous analysis of subject areas. We will modify WESS to collect this data. To fill the gap between the current state and the development of ergonomic/WMSD data fields, we will coordinate with Bureau of Medicine (BUMED) to determine if medical data can provide trending of ergonomic/WMSDs. Naval Safety Center will identify International Classification of Diseases (ICD9) codes that are uniquely associated with Ergonomic-type medical attention (similar to the past determination of ICD9 codes that are associated with mishaps) during the time period 13-17 August 2007. Additionally, Naval Safety Center will pass ICD9 list to EpiData Center of the Navy Environmental Health Center for use in querying Standard Ambulatory Data Record (SADR)/Standard Inpatient Data Record (SIDR) data to obtain a list of Ergonomic medical visits over the past 5 years during the time frame 20-31 August 2007. Naval Safety Center will analyze data and provide a summary report for the Naval Audit Service by 30 September 2007.

Appendix 2:

# Management Responses from Commandant of the Marine Corps



DEPARTMENT OF THE NAVY  
HEADQUARTERS UNITED STATES MARINE CORPS  
3000 MARINE CORPS PENTAGON  
WASHINGTON, DC 20350-3000

IN REPLY REFER TO:  
06-0030  
RFR-50  
22 Aug 07

From: Commandant of the Marine Corps (RFR)  
To: Assistant Auditor General for Installations and  
Environment Audits

Subj: NAVAUDSVC DRAFT REPORT- "IMPLEMENTATION OF THE DEPARTMENT  
OF THE NAVY ERGONOMICS PROGRAM",  
DRAFT AUDIT REPORT N2006-NIA000-0030.000

Ref: (a) NAVAUDSVC memo 7510/N2006-NIA000-0030  
dated 26 Jul 2007

Encl: (1) Marine Corps (Safety Division) response dated  
21 August 2007

1. The reference transmitted the subject draft report requesting  
Marine Corps comments. Enclosure (1) provides the Marine Corps  
response to the audit recommendation.

  
S. L. Ritter  
By direction



DEPARTMENT OF THE NAVY  
HEADQUARTERS UNITED STATES MARINE CORPS  
3000 MARINE CORPS PENTAGON  
WASHINGTON, DC 20360-3000

IN REPLY REFER TO:  
7510  
SDO  
AUG 21 2007

From: Commandant of the Marine Corps  
To: Deputy Commandant, Programs and Resources (RFR)

Subj: NAVAUDSVC DRAFT REPORT- "Implementation of the Department  
of the Navy Ergonomics Program", Report # N2006-NIA000-  
0030.000

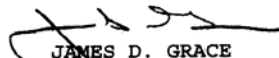
Ref: (a) NAVAUDSVC memo 7510/N2006-NIA000-0030.000  
dated 26 July 2007

1. The reference transmitted the subject draft report requesting Marine Corps comments.
2. The following comments are provided in response to the Naval Audit Service recommendations:

a. Recommendation 2. Direct CMC (Safety Division) to establish a process to monitor Marine Corps compliance with Ergonomics program responsibilities identified in the Marine Corps Occupational Safety and Health Program Manual (NAVMC DIR 5100.8), which includes responsibilities related to Command/Installation implementation of ergonomic program training, program effectiveness reviews, reviews of injury and illness records, and budgeting requirements at Marine Corps activities and/or installations.

b. Response: Safety Division concurs with the recommendation. To resolve this finding, Safety Division will implement a command safety assessment program that will include an evaluation of the inspected command's Ergonomics program. CMC (SD) will conduct an assessment at each installation triennially and forward a report documenting the assessment to the inspected commander. Initial operational capability for the command safety assessment program will be 30 September 2007, with full operational capability reached by 31 March 2008.

3. This report does not contain information that is deemed "For Official Use Only".

  
JAMES D. GRACE  
By Direction

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