National Park Service Ergonomics Policy

Parks will implement a program designed to prevent injuries and illness by eliminating or reducing worker exposure to work-related musculoskeletal disorder (WMSD) risk factors; to reduce the potential for fatigue, error and unsafe acts by adapting the job and workplace to the worker's capabilities and limitations; to increase the overall productivity of the work force; and to reduce workers' compensation claims and costs.

Scope

This section provides guidance for park ergonomics programs. It discusses the development of an ergonomics program that focuses on the identification and control of improper workplace and work process design.

Effects of WMSDs

Repeated biomechanical stress and microtrauma cause or aggravate WMSDs. Over time, repeated microtrauma can evolve into a painful, debilitating state involving muscles, tendons, tendon sheaths and nerves. Examples of WMDSs are tendonitis, tenosynovitis, bursitis, chronic muscle strain and nerve entrapment syndromes such as carpal tunnel syndrome.

The expense associated with a poorly designed workplace is considerable and includes both direct and indirect costs. Direct costs include medical treatment, rehabilitation and workers' compensation costs. Indirect costs include lost work time, decreased productivity, decreased work quality, retraining costs and diminished morale.

C. References

1. NIOSH. 1997. Health Hazard Evaluation Report HETA 97-0199-2680, U.S. Department of the Interior, Yosemite National Park, California.

2. NIOSH. 1997. Elements of Ergonomics Programs, 1997. NIOSH PUB 97-117

3. NIOSH. 1994. Workplace Use of Back Belts Review and Recommendations Publication No. 1994-122:

4. Department of the Army. 2000. Ergonomics program. DA Pam 40-21

5. ACGIH. 2002. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.

6. Brown, B.W., Greitzer, F.L., Pond, D. 1997. Ergonomics Education, Awareness System Evaluation and Recording (ErgoEASER2). US Dept of Energy.

Program Elements

1. Worksite Analysis and Risk Factors. Conduct an analysis of park facilities and operations to identify jobs and worksites with WMSD risk factors. There are several approaches that may be used to determine whether conditions in the workplace might be contributing to employees developing musculoskeletal disorders. These approaches can be used individually or in combination.

    a. Review and analyze injury and illness records such as OSHA 300 Logs and supporting 301 forms and Workers' Compensation claims to determine whether there is a pattern of ergonomic-related injuries in certain jobs or work tasks.

    b. Analyze jobs or work tasks to identify potential ergonomic problems before employee injuries occur. Determine if jobs present ergonomic risks that may contribute to musculoskeletal disorders. This should be completed as part of Job Hazard Analysis (see Section 3.1)

Analysis tools may help in analyzing jobs. There are numerous analysis tools that may be used to learn more about potential ergonomic risks associated with jobs. An example is ErgoEASER2 software . ErgoEASER2 is a software package that has been developed to aid in identifying, evaluating and preventing work-related musculoskeletal disorders. Evaluating video-display terminal (VDT) workstations and lifting task design, ErgoEASER offers suggestions on how to address ergonomic hazards and reduce worker disabilities.

Seek employee input about the existence of ergonomic problems related to particular jobs or work tasks. This may be accomplished by speaking with employees, conducting symptom surveys, or through employee questionnaires

1ErgoEASER2 is available for download at http://www.osti.gov/estsc/ . Federal Agencies and their contractors may obtain a Government Licensed version of ErgoEASER 2.0 from the U. S. Department of Energy's centralized software management facility (Energy Science and Technology Software Center http://www.osti.gov/html/osti/estsc/estsc.html).

The following conditions can contribute to the development of WMSDs. Injury may be more likely when several of these risk factors are combined in the workplace. These disorders include:

a. Repetitive motions, especially during prolonged activities.
b. Sustained or awkward postures.
c. Excessive bending or twisting of the wrists.
d. Continued elbow or shoulder elevation such as in overhead work.
e. Forceful exertions, especially in awkward positions.
f. Excessive use of small muscle groups such as with the pinch grip.
g. Acceleration and velocity of dynamic motions.
h. Vibration.
i. Mechanical compression.
j. Estrictive workstations such as those with inadequate clearances.
k. Improper seating or support.
l. Inappropriate hand tools.
m. Machine-pacing and production –based incentives.
n. Extreme temperatures.
o. Extended exposure to hazardous or annoying noise.

2. *Prevention and Control*. The primary method of preventing and controlling exposure to WMSD hazards is through effective design or redesign of a job or a worksite. There are six methods of controlling WMSD hazards. They should be considered in the order in which they are presented here.

   a. *Process Elimination*. Elimination of the demanding process essentially eradicates the WMSD hazard.

   b. *Engineering Controls*. Ergonomic engineering controls redesign the equipment or worksite to fit the limitation and capabilities of workers. Equipment or work-site redesign typically offers a permanent solution. For example, provide a video display terminal workstation that can be adjusted to a wide range of worker dimensions.

   c. *Substitution*. Substituting a new work process or tool without WMSD hazards for a work process with identified WMSD hazards can effectively eliminate the hazard. For example, replace hand tools that require awkward wrist positions of wrist flexion, extension or deviation, with tools that allow a neutral wrist position.

   d. *Work Practices*. Practices that decrease worker exposure to WMSD risk factors include changing work techniques, providing workforce conditioning programs and regularly monitoring work practices. Also included are maintenance, adjustment and modification of equipment and tools as needed.

1) Proper work techniques include methods that encourage correct posture, use of proper body mechanics, appropriate use and maintenance of hand and power tools and correct use of equipment and workstations.

2) Personnel conditioning refers to the use of a conditioning or break–in period. New and returning seasonal employees may need gradual integration into a full workload, depending on the job and the person. Supervisors, safety officers, industrial hygienists or health care personnel should identify those jobs that require a break–in period.

3) Regular monitoring of operations helps to ensure proper work practices and to confirm that the work practices do not contribute to WMSD or hazardous risk factors.

4) Effective schedules for facility, equipment and tool maintenance, adjustments and modifications will reduce WMSD hazards. This includes ensuring proper working conditions, having sufficient replacement tools to facilitate maintenance, and ensuring effective housekeeping programs. Tool and equipment maintenance may also include vibration monitoring.

e. Administrative Controls. Use administrative controls to limit the duration, frequency and severity of exposure to WMSD hazards. Examples of administrative controls include, but are not limited to:

1) Decreasing production rate requirements and limiting the duration of the process to reduce the number of repetitions.

2) Reducing the number and speed of repetitions by having worker input regarding production speed.

3) Provide for adequate warm-up before engaging in physically demanding tasks.

4) Providing rest breaks to relieve fatigued muscle–tendon groups or to stretch breaks for sedentary tasks. Determine the length of the rest break by the effort required, total cycle time and the muscle–tendon group involved.

5) Increasing the number of personnel assigned to the task (for example, lifting in teams rather than individually).

6) Instituting job rotation as a preventive measure, with the goal of alleviating physical fatigue and stress to a particular set of muscles and tendons. Do not use job rotation in response to symptoms of WMSD. This can contribute to symptom development in all personnel involved in the rotation schedule rather than preventing problems.

7) Providing modified or restricted duty assignments to allow injured muscle–tendon groups time to rest, which assists in the healing process. Make every effort to provide modified or restricted duty assignments when physical limitations as identified by a healthcare provider, allowing the worker to return to work performing less than his or her normal work requirements. In regard to modified or restricted duty assignments:

   I. A healthcare provider should specifically identify assignments or job tasks for the individual worker based on his or her symptoms, capabilities and limitations.

   II. Healthcare providers with specific knowledge in both occupational demands and cumulative trauma injuries should cooperate with trained ergonomics personnel to develop a list of jobs with low WMSD risk.

f. Personal Protective Equipment. Personal protective equipment (PPE) is not necessarily recommended for controlling exposure to WMSD hazards, since little research has been conducted to support claims of its usefulness.

   1) Appliances, such as wrist rests, back belts, back braces, etc., are not considered PPE. Before purchasing such devices, discuss their effectiveness with trained ergonomics personnel. (The NPS does not support the blanket use of back belts as a back injury preventive measure.) Anti-vibration gloves are an example of PPE that addresses WMSD hazards.

   2) Consider WMSD hazards when selecting PPE. The PPE should be properly worn or used according to the manufacturers' specifications, available in a variety of sizes, accommodate the physical requirements of personnel and the job, and it should not contribute to WMSD hazards.

3. Healthcare Management

Early recognition and healthcare management of WMSDs are critical to reducing the impact of injury on both the employee and the park. Common symptoms of WMSDs can include pain, tingling, numbness, stiffness and weakness in the neck, shoulders, arms, hands, back and legs. Other symptoms can include headaches, visual fatigue and increased errors. Employees should be encouraged to report symptoms of WMSDs early and to seek the services of their personal healthcare provider for evaluation and to determine work-relatedness.

Work-related musculoskeletal disorders do not require a general medical surveillance program. Rather, worksite analysis methods for the identification of problems and risk factors should be used. Periodic worksite surveys to update evaluations and recognize emerging problems should be conducted at least annually. Additional surveillance should be conducted for jobs where there is a high incidence of WMSDs or that have been identified as high risk.

4. Training and Employee Participation

Training must be provided to workers who are potentially exposed to WMSD risk factors. Workers must receive instruction in the following topics:

a. Potential risks and possible causes of WMSDs
b. How to recognize and report symptoms.
c. How to prevent WMSDs.
d. Sources of treatment.
e. Demonstration of the proper use and care of all tools and equipment.
f. Correct use of safety equipment (PPE)
g. Safe and proper work procedures, such as proper lifting techniques.

Employees must be encouraged to proactively participate in the park's efforts to reduce work-related injury, disease in general and ergonomic problems in particular. This may be accomplished by promoting direct individual input from employees. For example, knowledge of the work process and equipment characteristics directly support worksite ergonomic evaluations. Workers should also participate in safety committees or similar forums in order to effectively identify and resolve ergonomic issues.