**CHAPTER 43**

**Title: Ergonomics**

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**Instruction: None**

**Approving Official: Associate Director Level**

1. **Purpose and Scope**.
2. This chapter specifies the minimum Occupational Safety and Health Program (Program) requirements for Department of the Interior (Department or DOI) and U.S. Geological Survey (Bureau or USGS) ergonomics.
3. This chapter applies to all USGS operations and activities.  Ergonomics is the study of work, which attempts to design the work environment to fit the employee’s physical capabilities and limitations.  The USGS is committed to preventing injuries associated with ergonomic hazards.  Through training, workplace evaluation, and redesign this Bureau hopes to greatly reduce the number and severity of musculoskeletal injuries experienced in the workplace.
4. **Authority/References**.
5. 29 Code of Federal Regulations (CFR) 1910.900, Subpart W.
6. Sections 4, 6, and 8, Occupational Safety and Health Act, 29 United States Code (U.S.C.) 653, 655, 657, Secretary of Labor's Order No. 3-2000 (65 FR 50017); and 29 CFR Part 1911.
7. **Definitions**.
8. *Ergonomics.*  The science that studies workers in their workplace and attempts through education, workplace design, job rotation, or use of specially designed tools and equipment to reduce the stress on the body.  The goal of an effective ergonomics program is to reduce the incidence of work-related musculoskeletal disorders (MSDs) caused by repetitive stress, awkward positioning, vibration, heavy lifting or bending, and reaching.  This policy is designed to reduce the number and severity of MSDs caused by exposure to risk factors found in the workplace.  This chapter establishes policy for implementing an effective ergonomics program that should virtually eliminate MSDs through personnel education, managerial support, and workplace evaluation and redesign.

This policy further encourages employee participation, as demonstrated by the early reporting of MSDs and active involvement by employees and their representatives in the implementation, evaluation, and continued development of the USGS program.  Finally, this policy incorporates job hazard analysis (JHA) and control, as demonstrated by a process that identifies, analyzes, and uses feasible engineering, work practice, and administrative controls to control MSD hazards or reduce MSD hazards to acceptable levels or to the extent feasible and evaluates controls to assure that they are effective.

1. *Musculoskeletal Disorders (MSDs).*  This includes a number of injuries to muscles, tendons, ligaments, nerves, joints, bones, and supporting blood vessels in the upper or lower extremities or back.  Such injuries include back injuries, carpal tunnel syndrome, and Raynaud’s syndrome.  These conditions are caused by ergonomic hazards in the workplace such as awkward positioning, repetition, force, mechanical compression, vibration, and duration of operation.  MSDs result from the cumulative effect of repeated trauma to a particular part of the body.  Cumulative trauma occurs when rest or overnight sleep fails to completely heal these small “microtraumas” that carry over and add to the total effect on the body.  Over time MSDs can result in permanent damage or disability.
2. **Requirements**.
3. USGS personnel shall be informed about the ergonomic risks associated with the jobs that they are expected to perform when they are initially assigned to the job or when they are reassigned to another position.  Personnel will be educated about the most common MSDs, their signs and symptoms, and the importance of early reporting.  Early reporting is a key element since repeated trauma can eventually lead to permanent disability.  All work-related MSDs will be reported using the DOI Safety Management Information System (SMIS) (see Chapter 7, Incident/Accident Reporting/Serious Incident Reporting).
4. Each organizational component will write and implement a plan for their individual location (a template is located in Appendix A).  The plan will include a means for identifying ergonomic hazards in the workplace (JHA), means for reporting ergonomic hazards (employee reporting) and requesting work area evaluations, and training of staff at all levels.  Appropriate levels of training will be provided to organizational staff as discussed later in this chapter.
5. Training will be provided to employees in jobs that have been identified as having ergonomic hazards during formal audits or during the supervisory job hazard analysis.  Supervisors and any other employees involved in setting up or managing the ergonomics program will also receive ergonomics training.
6. At a minimum, all full-time safety staff will be provided with an adequate amount of ergonomics training to be able to handle routine issues concerning ergonomics evaluations and work area design.  More complicated issues will be handled via the Public Health Service Memorandum of Agreement (MOA) or via contract with an Ergonomic Consultant.
7. The identification of ergonomic hazards is a joint responsibility shared by management, supervisors, collateral duty safety officers, and employees.  The formal means for identifying hazards is through the use of a JHA or through the use of appropriate checklists, which will consider the risk of musculoskeletal injuries as a part of the evaluation.  JHA is a supervisory responsibility.  JHAs are discussed in Chapter 15 in this Handbook and a number of actual templates for JHAs are available on the USGS website.  Sample checklists for different types of jobs with ergonomic hazards are provided as appendixes to this chapter.  If hazards are discovered, control measures will be implemented to reduce the hazards.  Control measures can be as simple as an adjustment to a workstation or chair. Control measures can also mean job rotation or more complex solutions such an operation redesign.
8. Personnel who report a recordable MSD incident will be provided with prompt access to a health care professional (HCP) for evaluation and follow-up subsequent to their injury or illness.  The HCP will determine if any modification of the regular duties are necessary.  Upon reporting, supervisors will investigate and the employees, along with management, will be involved in the process of suggesting solutions that are reasonable in terms of completing the job efficiently and safely.

1. **Responsibilities**.
2. *Bureau Safety Manager and Bureau Industrial Hygienist.*
3. Provide guidance and assistance to the regional offices in setting up their regional programs.
4. Provide checklists to assist the field component in evaluating work areas with identified ergonomic risk factors/hazards.
5. Assist regions with designing and arranging for appropriate training in ergonomics for staff at all levels (this may include web-based training, training-the-trainer training via PHS contract or a professional ergonomics trainer).
6. Provide materials and educational articles via the quarterly newsletter, for example.
7. *Regional Directors.*  Provide sufficient resources and delegate appropriate authority and responsibility to the Regional Ergonomics Program Managers (Regional Safety Managers or designee) and supervisory staff to develop and implement a viable ergonomics program to include training staff on ergonomics and to make work area modifications when work-related musculoskeletal injuries have occurred.
8. *Regional Safety Managers.*
9. Provide regional compliance oversight and assistance to Regional Safety Officers and field staff to implement the Bureau Ergonomics Program.  This policy will include:
10. How training will be accomplished for supervisors, collateral duty safety officers, and all employees working in jobs with ergonomic risks.
11. Procedures for requesting an ergonomic evaluation and how the ergonomic evaluations will be accomplished.
12. Provide training to regional staff and act as the regional consultant on ergonomic issues.
13. Develop an Action Plan and implement an across-the-board training plan for Supervisors, Collateral Duty Safety Program Coordinators (CDSPCs), and employees working in areas with ergonomic hazards.
14. Assist CDSPCs via providing consultation on unique ergonomic issues and engineering or design requests.
15. *Regional Safety Officers.*
16. Participate in appropriate training to be able to provide guidance to supervisors and CDSPCs on ergonomic issues.
17. Coordinate with the PHS for advice and consultation for unique or complex ergonomic hazards that require the expertise of a professional ergonomist or human factors engineer.
18. Assist the Regional Safety Manager with coordinating training for personnel throughout the region.
19. *Supervisors.*
20. Conduct JHAs to determine which jobs contain ergonomic hazards or risk factors.
21. Ensure that personnel participate in training on ergonomics and can identify the signs and symptoms of MSDs.
22. Ensure that sound ergonomic principles are integrated into all aspects of the work being performed.
23. Encourage early reporting of work-related MSDs, since early intervention is critical to minimize the damage which can be caused by repeated exposure to ergonomic risk factors.
24. Ensure that personnel are referred for medical evaluation if they sustain a work-related musculoskeletal injury.
25. Ensure that recommendations from ergonomics surveys, which may include purchase of new furniture or equipment, work rotation, or adjustment of existing furniture or equipment, are implemented.
26. *Collateral Duty Safety Program Coordinators (CDSPCs).*
27. Participate in initial training on ergonomics to be able to conduct basic ergonomics evaluations through the use of a checklist.
28. Perform workplace assessments upon request for work areas where ergonomic hazards have been identified during a JHA or for which complaints have been received. Examples of workplace assessment checklists have been provided in Appendices A through F.
29. Provide copies of the evaluations to the Regional Safety Managers.

CHAPTER 43, APPENDIX A

**Sample Local Ergonomics Standard Operating Procedures**

Note: Department of the Interior (Department or DOI) and U.S. Geological Survey (Bureau or USGS)

Local Ergonomics Standing Operating Procedure for\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(Facility Name)

Policy statement. Ergonomics is the study of work that attempts to design the work environment to fit the employee’s physical capabilities and limitations. The USGS is committed to preventing injuries associated with ergonomic hazards. Through training, workplace evaluation, and redesign this Bureau hopes to greatly reduce the number and severity of musculo-skeletal injuries experienced in the workplace.

**Definitions**.

*Ergonomics*. The science of studying the worker in the workplace. Ergonomics involves applying the knowledge of human strengths and weaknesses to the design of workplaces, jobs, tasks, tools, equipment, and the environment.

*Musculoskeletal Disorders (MSD’s).* This includes a number of injuries to muscles, tendons, ligaments, nerves, joints, bones, and supporting blood vessels in the upper or lower extremities or back. Such injuries include back injuries, carpal tunnel syndrome, and Raynaud’s syndrome. These conditions are caused by ergonomic hazards in the workplace such as awkward positioning, repetition, force, mechanical compression, vibration, and duration of operation. MSD’s result from the cumulative effect of repeated traumas to a particular part of the body. Cumulative trauma occurs when rest or overnight sleep fails to completely heal these small “microtraumas” that carry over and adds to the total effect on the body. Over time this can result in permanent damage or disability.

**Responsibilities**.

*Managers/Supervisors*. In consultation with employees, they:

(1) Identify ergonomic hazards and the associated risks relating to poor design of tools, equipment, workstation, or work practices.

(2) Provide all employees with adequate equipment for the tasks they are performing.

(3) Provide employees information, instruction, and training on ergonomics and the signs and symptoms of work-related musculoskeletal disorders so that they will recognize ergonomic hazards and understand the importance of early intervention in the prevention of these disorders.

(4) Encourage and reinforce proper work techniques and use of mechanical assist devices or specially designed tools.

(5) Encourage the early reporting of symptoms or injuries related to cumulative or traumatic stress (All recordable WMSD’s will be reported using the SMIS system).

(6) Facilitate medical intervention for individuals reporting a WMSD.

*Regional Safety Managers/Regional Ergonomics Advisor*.

(1) Promotes the Bureau ergonomics policy to locations in the field an assist them when necessary in developing their own local programs.

(2) Acts as a regional advisor to supervisors and collateral duty safety officers to assist them when necessary with evaluating work areas, interpreting those evaluations, and making suggestions for improvements to work areas with identified ergonomic hazards.

*Collateral Duty Safety Officers*.

(1) Assist management with the assessment of work areas that have been identified as having ergonomic risk factors or have documented work-related musculoskeletal disorders.

(2) Participate in any ergonomic-related training made available to them so that they can better advise management when ergonomic-related situations arise.

(3) Collaborate with the Regional Safety Manager when problematic situations outside of their scope of experience are encountered.

(4) Recommend to management changes that should be made to the work environment to control or eliminate the ergonomic risk factors.

*Employees*.

(1) Participate in any ergonomics training provided for them.

(2) Use equipment provided for them properly, as instructed (no short cuts).

(3) Employ proper work techniques such as proper lifting and using devices to assist in lifting.

(4) Provide input to supervisors on workstation design to enhance their comfort when performing repetitive or awkward tasks.

(5) Report any on the job injuries that occur to their supervisor immediately.

*Procedures*.

Identification of ergonomic hazards is essential to preventing WMSD’s. There are two basic ways workplace evaluations can be accomplished. One is to be proactive and identify ergonomic hazards while conducting the supervisory job hazard analysis. The other is reactive and evaluate the work area once a complaint is raised or an injury is reported. Of the two, obviously the first is preferable because it identifies the potential hazards upfront and prevents the injury from ever occurring.

Employees experiencing discomfort related to their work must bring this issue to the attention of their supervisor. In turn the supervisor will determine what steps need to be taken to report the injury and to evaluate the work area. The supervisor, in conjunction with the employee, will determine whether medical evaluation is required to determine the extent of the injury and to evaluate duty status. It is the responsibility of the agency to provide medical care for WRMD’s. The actual work relatedness and payment of medical expenses will be determined by the Department of Labor under the Federal Employees Compensation Act.

Once duty status has been determined it is the supervisor’s responsibility to accommodate the work restrictions (light duty) as outlined by the employee’s physician. Every attempt should be made to keep the employee at work, if there are tasks that they can accomplish within their physicians recommended restrictions.

Once the evaluation of a work area has occurred, it is the responsibility of the supervisor to follow-up on the recommended changes to the work area.

The primary means of controlling and preventing WMSD’s should be by eliminating the hazard or process. If that is not possible, engineering/mechanical controls may be employed such as using mechanical means to lift heavy objects. When that is not feasible, you would use administrative controls such as job rotation to eliminate the amount of time the person has to perform a particular task. For example, part of the shift performs one task such as grinding paint from a piece of equipment in the morning while the other half of the shift stencils shipment crates or completes administrative work. In the afternoon the groups switch places. Finally, if all those methods are ineffective, personal protective equipment (PPE) is a last resort. Examples of PPE would be the wearing of hearing protection or anti-vibration gloves.

*Job Hazard Analysis*. Supervisors must complete a job hazard analysis (JHA) of all work processes in their area of responsibility. Things to look for when considering ergonomic hazards would be tasks that require frequent bending and twisting, awkward body positioning, constant, repetitive motion, or lifting of heavy or unstable/awkward loads. Jobs that require the body to be outside of its neutral position for long periods of time will lead to fatigue and possible injury. Jobs where employees stand for long periods of time on hard surfaces can be stressful. Likewise, sitting for long periods of time can also create a tremendous stress on the body. Equipment or power tools that vibrate can also cause injury to muscles, nerves, and connective tissues over time. It is important to be able to provide a work area that maintains the body in a relatively neutral position where either standing or sitting is important. Individuals in administrative positions should be encouraged to take mini-breaks to stretch and stand up every hour or so. This provides needed rest which has been shown by research to greatly reduce the risk of injury.

For unique or problematic situations, the Regional Safety Staff or the Bureau Safety and Environmental Management Office can be contacted for assistance. Telephone numbers for the Regional Safety Managers or Regional Safety Officers can be obtained from the USGS Web site. The Bureau Industrial Hygienist can be reached at 703-648-7345.

CHAPTER 43, APPENDIX B

**Computer Workstation Checklist**

Is the chair adjusted to ensure proper posture, such as knees and hips bent at 90 °?

Chair adjusted so feet flat on floor or have a footrest?

Chair adjusted so arms comfortably at sides with elbows at 90°?

Straight wrists at keyboard?

Does chair adjust easily from the seated position?

Does chair have a padded seat that is adjustable for height and angle?

Does chair have an adjustable backrest?

Does the chair provide lumbar support?

Does chair have a stable (5 caster) base?

Is there sufficient space for knees and feet?

Are the height and tilt of the keyboard work surface adjustable?

Is the keyboard prevented from slipping when in use?

Is the mouse or pointing device at the same level as the keyboard?

Is there an adjustable document holder?

Are arm rests provided where needed?

Is the screen clean and free of flickering?

Is the top line of the screen slightly below eye level?

Does the monitor have brightness and contrast controls?

Is the monitor 18-30 inches from the worker for viewing?

Is there sufficient lighting without causing glare and is the screen glare-free?

Does keying require minimal force?

Are high stroke rates avoided?

Are employees trained in proper postures, work methods?

Are adequate rest breaks provided for task demands?

Are employees trained in proper work methods?

Do the employees know how to adjust their workstations?

Do employees know how to report symptoms that might be workstation related?

CHAPTER 43, APPENDIX C

**Workstation Checklist**

Does the working space allow for a full range of movement?

Are mechanical aids and equipment available?

Is the height of the work surface adjustable?

Can surface be tilted or angled?

Is the workstation designed to reduce or eliminate:

bending or twisting at the waist?

reaching above the shoulder?

static muscle loading?

extending the arms?

bending or twisting the wrists?

raised elbows?

Is the employee able to vary posture?

Are hands and arms free from pressure form sharp edges on work surfaces?

Is an armrest provided where needed?

Is a footrest provided where needed?

Is the floor surface flat?

Are anti-fatigue mats provided for those standing tasks?

Is the chair or stool easily adjustable and suited to the task?

Are all task requirements visible from comfortable positions?

Is there a Preventive Maintenance Program for mechanical aids, tools, and other equipment?

CHAPTER 43, APPENDIX D

**Task Analysis Checklist**

Does the design of the task reduce or eliminate:

bending or twisting?

crouching?

bending or twisting the wrists?

extending the arms?

raising elbows?

static muscle loading?

clothes-wringing motions?

finger pinch grip?

pushing or pulling forces?

Are mechanical devices used when necessary (heavy, awkward or unstable loads)?

Can the task be done with either hand?

Can the task be done with two hands?

Are the required forces acceptable?

Are the materials able to be held without slipping?

Are the materials easy to grasp?

Are the materials free from sharp edges or corners?

Do containers have good handholds?

Are jigs, fixtures and vises used where needed?

If gloves are needed, do they fit properly, and are they made of the proper fabric?

Does the task avoid contact with sharp edges?

When needed, are push buttons designed properly?

Does use of PPE keep from getting in the way of the task?

Are high rates of repetitive motion avoided?

CHAPTER 43, APPENDIX D

**Hand Tool Analysis Checklist**

Is the employee trained in:

proper work practices?

when and how to make adjustments?

signs and symptoms of potential physical problems?

reporting procedures?

Are tools selected to avoid:

excessive vibration?

excessive force?

bending or twisting the wrist?

finger pinch grip?

problems associated with trigger finger?

Are tools powered where necessary and feasible?

Are tools evenly balanced?

Are heavy tools counterbalanced?

Does the tool allow adequate visibility of the work?

Does the tool grip/handle prevent slipping during use?

Are tools equipped with handles:

of proper diameter?

that do not end in the palm area?

of textured non-conductive material?

Are different handle sizes available to fit a wide range of hand sizes?

Can the tool be used safely with gloves?

Can the tool be used by either hand?

Is there a Preventive Maintenance Program to keep tools operating as designed?

Have employees been trained in:

the proper use of tools?

when and how to report problems with tools?

proper tool maintenance?

CHAPTER 43, APPENDIX F

**Materials Handling Checklist**

Has excessive lifting been reduced?

Are materials moved over minimum distances?

Is the distance between the object and the body minimized?

Are walking surfaces:

level?

wide enough?

clean and dry?

well lit?

Are objects:

easy to grasp?

stable?

able to be held without slipping?

with handholds?

When required, do gloves fit properly?

Is the proper footwear worn?

Is there enough room to maneuver?

Are mechanical aids easily available and used whenever possible?

Are working surfaces adjustable to the best handling heights?

Does material handling avoid:

movements below knuckle height and above shoulder height?

static muscle loading?

sudden movements during handling?

twisting at the waist?

excessive reaching?

Is help available for heavy or awkward lifts?

Are high rates of repetition avoided?

Are pushing and pulling forces reduced or eliminated?

Does the employee have an unobstructed view of the handling task?

Is there a Preventive Maintenance Program for equipment?

Are workers trained in correct handling and lifting procedures?

Has the NIOSH lifting formula been used to ascertain risk?