# Contents



# List of Tables

# 1.0 INTRODUCTION

## 1.1 Purpose

The purpose of this policy is to ensure that ergonomic risks are anticipated, identified, evaluated and controlled to reduce the potential of work-related musculoskeletal disorders (WMSD).

Program Objectives:

- Reduce ergonomic risk factors in existing job tasks, tools, and equipment to meet the capabilities and limitations of all employees.
- Prevent the introduction of new ergonomic risk factors in future job tasks, tools, and equipment through engineering design.
- Increase ergonomic awareness.
- Promote and support the safety and health of all employees.

This procedure is intended to comply with the requirements of Marathon HLT-2006 Ergonomics Stress Exposure Control Program.

## 1.2 Scope

This policy applies to all Anacortes Refinery employees and contractors.

# 2.0 REFERENCES

## 2.1 Marathon Standards, Policies & Procedures

- HLT-2006 Ergonomics Stress Exposure Control

## 2.2 Ergonomic Tools

- BRIEF™ Survey
- NIOSH Lifting Equation
- Snook Push/Pull/Carry Tables
- Basic and Detailed Data Collection forms
- Employee Surveys

# 3.0 DEFINITIONS

The following definitions are applicable to this procedure.

**Table 1 Definitions**

| Term | Description |
| --- | --- |
| BEST Form | BRIEF™ Exposure Scoring Technique; A ranking tool developed by Humantech, Inc. that assists in determining the ergonomic priority of jobs and tasks based on the BRIEF™ Survey results. See Attachment 2 for an example of the BEST. |

## Table 1 Definitions

| Term | Description |
| --- | --- |
| BRIEF Survey | Baseline Risk Identification of Ergonomic Factors; A job hazard analysis tool developed by Humantech, Inc. that provides a baseline identification of ergonomic factors. This job hazard survey identifies the presence or absence of ergonomic risk factors. See Attachment 1 for an example of the BRIEF. |
| Ergonomics | The scientific study of people and the work they perform with the goal of minimizing risk of injury/illness through improved workstation design; reducing non-value added motions and improving worker morale, productivity and product quality. |
| Ergonomic Risk Assessment | An objective and comprehensive examination of a job task performed by an observer trained in identifying ergonomic risk factors. |
| NIOSH Lifting Guideline | A spreadsheet calculation tool that was designed by Humantech, Inc and based on the Revised NIOSH (National Institute for Occupational Safety and Health) Lifting Equation. The Revised NIOSH Lifting Equation was designed to assist in the identification of ergonomic solutions for reducing the physical stresses associated with manual lifting. See Attachment 3 for an example of this spreadsheet. |
| Work Related Musculoskeletal Disorders (WMSD) | Disorders of the muscles, nerves, tendons, ligaments, joints, cartilage, blood vessels, or spinal discs that are the result of exposure to ergonomic risk factors at a workplace over time.<br><br>Examples may include the following:<br><br>• muscle strains and tears<br>• ligament sprains<br>• joint and tendon inflammation<br>• pinched nerves<br>• spinal disc degeneration<br>• low back pain<br>• tension neck syndrome<br>• carpal tunnel syndrome<br>• rotator cuff syndrome<br>• DeQuervain's syndrome<br>• trigger finger<br>• tarsal tunnel syndrome<br>• sciatica<br>• epicondylitis<br>• tendonitis<br>• Reynaud's phenomenon<br>• hand-arm vibration syndrome<br>• carpet layer's knee<br>• and herniated spinal disc<br><br>Not included are injuries caused by slips, trips, falls, vehicle accidents, or similar accidents. |
| Worksite Analysis | The result of a baseline review of records, investigations, incident rates, trends, and employee feedback for the entire refinery that is used in comparison with future periodic program reviews to determine the effectiveness of this Ergonomic Program. |

# 4.0 ROLES AND RESPONSIBILITIES

## 4.1 Program Administrator

The site industrial hygienist is the ergonomics subject matter expert, shall act as the ergonomics program administrator and is responsible for the program's implementation. The program administrator will facilitate the creation, maintenance, and organization of all needed documentation, administrative tools, and equipment for the ergonomics program.

- The program administrator will enlist ergonomic expertise either internally or externally to evaluate facility needs and develop a strategy to address them as required.
- The Corporate Occupational and Environmental Hygiene (OEH) group is available for assistance in ergonomic expertise as well as other facility safety and health professionals.

## 4.2 Ergonomics Team

The refinery Ergonomics Team is part of SHAC. The multi-disciplinary team is led by the industrial hygienist and members include operators, maintenance and safety representatives. The team has worked to identify and address ergonomic issues at the site. Tasks include the assessment or survey of ergonomic hazards, prioritization of the hazards, implementation of solutions, and reevaluation of the implementations.

## 4.3 Refinery and Department Leadership

Refinery Leadership Team (RLT) shall ensure that the program requirements are administered and shall designate necessary resources to make implementation of the plan possible where feasible and effective.

Department leadership will work with the program administrator and the Ergonomics Team to properly address ergonomic hazards and implement solutions to existing risks where feasible.

## 4.4 Employees

Employee participation and involvement will be accomplished through the following means:

- Provide all employees basic ergonomic hazard awareness training.
- Employees are encouraged to report ergonomic concerns and suggestions for improvements.
- Involve employees in the investigation of reported work-related ergonomic injuries or illnesses along with the supervisor, safety or ergonomics team to help determine the nature, causes and, where appropriate, implementation of control measures.

## 4.5 Training Department

The Training Department is responsible for the following:

- Providing field and workstation ergonomic training materials.
- Ensuring employees are current on relevant trainings.

# 5.0 RISK ASSESSMENT, PRIORITIZATION, IMPLEMENTATION AND EVALUATION

## 5.1 Risk Assessment

The Ergonomics Team has worked with all of the operating units and teams to identify potential ergonomic hazards in the field. The team has also conducted evaluations of computer workstations. When conducting a risk assessment, a variety of sources of information on the job/task should be used including the following:

- video tapes
- pictures
- sketches
- dimensions
- weights
- vertical and horizontal distances
- force measurements
- frequency
- postures
- repetition
- duration
- other physical risk factors like vibration, heat, cold and pressure points will be collected.

Employees who perform the task or job should be interviewed to discuss the job, any discomfort they may be experiencing, tools, and techniques used, job cycles, recovery times, job rotation and their physical ability. It is important that the evaluation team is able to get out into the field to witness tasks being performed or to watch someone working at their workstation to observe postures and working conditions.

The following tools may be utilized to help conduct ergonomic risk assessments:

- BRIEF™ Survey
- NIOSH Lifting Equation
- Snook Push/Pull/Carry Tables
- Basic and Detailed Data Collection Forms
- Employee Surveys

The collective information including the reviewing of data may be assessed and the results placed in a risk model to establish the impact to various parts of the body. Risk levels may be scored as high, moderate or low concern.

The results surveys will establish a benchmark of overall risk levels and provide the program administrator and ergonomics team the information needed to set priorities and create short and long-term action plans.

## 5.2 Prioritization

Prioritization of potential ergonomic at-risk jobs/tasks shall be based on risk factors. Prioritization will utilize a mix of the following tools or information:

- BEST™ assessments
- Injury data
- Cost and ease of implementation
- Employee feedback
- Recommendations for improvements

The program administrator will develop an action plan to address the prioritized potentially at-risk jobs and tasks.

## 5.3 Implementation

The program administrator will assist corresponding department management with implementing ergonomic job improvements.

Improvements to reduce or control hazards should be considered in the following order:

- Risk elimination if the job or task can be performed in a safer method.
- Engineering controls to consider workstation layout, tool and handle design, and design of work methods. Examples include but are not limited to:
    - lift and tilt tables
    - conveyors
    - articulating arms
    - work platforms
    - better tools
    - adjustable tables or chairs
    - better lighting
    - baskets with drop-down side
- Work practice controls to ensure proper work techniques, physical conditioning, and modifications/adjustments to work conditions, and administrative controls to reduce the duration, frequency, and severity of exposures to ergonomic stressors may include job rotation, production rate adjustment, and/or the provision of rest periods. Examples include but are not limited to:
    - worker selection
    - employee training
    - job rotation
    - preventive maintenance
    - added people for specific job tasks
    - rest and stretch breaks

- changes in work methods
- alternative tasks
- adjustment in work pace or cycle times
- worker conditioning

- Personal protective equipment to help to reduce extreme postures and/or excessive forces. Examples include but are not limited to:
  - cushioned, anti-vibration or insulated gloves to protect workers' hands from heat, cold, sharp edges or vibration
  - protective covers to cover sharp corners causing contact stress
  - anti-fatigue mats

  **Note**: Wrist wraps, splints and back belts are not considered protective equipment and shall not be dispensed without the approval of medical.
- All proposed changes must be approved by the program administrator or other appropriate area team leaders or department management prior to implementation.

### 5.4 Evaluation

Implementations can be evaluated as part of the continuous improvement process to determine the effectiveness of reducing the risk while evaluating any new risks the implementation may have caused.

Post-implementation surveys and evaluation tools and processes will mirror the tools and processes used in the initial surveys and evaluation process. If the improvement is effective, the improvement will be considered for permeation and incorporated into design standards.

If further ergonomic hazards are found during the post-implementation evaluation or if the implemented controls are not being utilized effectively, other control methods and the post-implementation evaluation process may continue until a reasonable solution is implemented.

## 6.0 HAZARD PREVENTION AND CONTROL

All new equipment intended for use by employees, contractors, or visitors should be designed applying ergonomic principles. Equipment designs should be reviewed with a member from either the ergonomics team or the safety department to ensure that the process or equipment is designed to match the capabilities of the employees.

## 7.0 RECORDKEEPING

Injuries and illnesses will be reported in accordance with Marathon Petroleum Company's programs for incident investigation and reporting requirements.

Employee injury/illness medical treatment and management records will be maintained in accordance with the Company Records Retention Policy and/or as required by regulations.

Employee reports of ergonomic concerns, responses to these reports, ergonomic risk assessments, ergonomic implementation records, ergonomic capital improvements and ergonomic auditing reports shall be maintained by the program administrator.

All ergonomic training records shall be maintained by the Training Department.

## 8.0 PERIODIC PROGRAM REVIEW

This written program shall be reevaluated every five years or more often as needed.

The program's effectiveness should be assessed using performance metrics. Examples of potential metrics include, but are not limited to:

- Number of pro-active investigative or compliant driven assessments conducted.
- Number/percent of investigated assessments with solutions identified and executed.
- Quantitative measurement of risk reduction.
- Injury/Illness Performance – Injury and illness statistics will include alleged work-related strain/overexertion, cumulative trauma or other musculoskeletal disorders.
- The number of ergonomic-related injuries/illnesses will be used to establish a separate incident rate that will be measured and tracked against total incident rates.

Ergonomics performance measurements and baselines to determine the effectiveness of the facility's efforts and activities in reducing injuries/illnesses, costs, and risk factors.

## 9.0 REVIEW AND REVISION HISTORY

| Revision # | Preparer | Date | Description |
| --- | --- | --- | --- |
| 0 | Kelly Codlin | 9/10/2021 | Original Release to comply with HLT-2006 Ergonomic Stress Exposure Control |
| | | | |
| | | | |
| | | | |

## 10.0 ATTACHMENT 1 – THE BRIEF SURVEY

### BRIEF™ Survey – BASELINE RISK IDENTIFICATION OF ERGONOMIC FACTORS

Version 3.0

**Step 1** Complete Job Information

Job Name: _____ Site: _____ Station: _____

Date: _____ Dept: _____ Shift: _____ Product: _____

**Step 2** Identify Risks

2a. Mark Posture and Force boxes when risk factors are observed.

2b. For body parts with Posture or Force marked, mark Duration and/or Frequency box(es) when limits are exceeded.

| Step 2 | Hands and Wrists | | Elbows | | Shoulders | | Neck | Back | Legs |
|---|---|---|---|---|---|---|---|---|---|
| | Flexed ≥ 45°, Ulnar Deviation, Extended ≥ 45°, Radial Deviation | | Rotated Forearm, Fully Extended ≥135° | | Arm Behind Body, Arm Raised ≥ 45°, Shoulders Shrugged | | Flexed ≥ 30°, Sideways, Extended, Twisted ≥ 20° | Flexed ≥ 20°, Sideways, Extended, Twisted, Unsupported | ≤45° Squat, Kneel, Unsupported |
| | Left | Right | Left | Right | Left | Right | | | |
| 2a. Posture | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Force | Pinch Grip or Finger Press ≥ 2 lb (0.9 kg), or Power Grip ≥ 10 lb (4.5 kg) ☐ | | ≥ 10 lb (4.5 kg) ☐ | ☐ | ≥ 10 lb (4.5 kg) ☐ | ☐ | ≥ 2 lb (0.9 kg) ☐ | ≥ 25 lb (11.3 kg) ☐ | Foot Pedal ≥ 10 lb (4.5 kg) ☐ |
| 2b. Duration | ≥ 10 sec. ■ | ≥ 10 sec. ■ | ≥ 10 sec. ■ | ≥ 10 sec. ■ | ≥ 10 sec. ■ | ≥ 10 sec. ■ | ≥ 10 sec. ■ | ≥ 10 sec. ■ | ≥ 30% of day ■ |
| Frequency | ≥ 30/min. ■ | ≥ 30/min. ■ | ≥ 2/min. ■ | ≥ 2/min. ■ | ≥ 2/min. ■ | ≥ 2/min. ■ | ≥ 2/min. ■ | ≥ 2/min. ■ | ≥ 2/min. ■ |
| Score | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Risk Rating | H M **L** | H M **L** | H M **L** | H M **L** | H M **L** | H M **L** | H M **L** | H M **L** | H M **L** |

**Step 3** Determine Risk Rating

In the Score box, write the number of risk factor categories (0-4) checked for each body part. Using the table at right, circle the corresponding Risk Rating for each body part. ▶

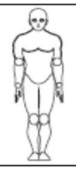
| Score | Risk Rating |
|---|---|
| 3 or 4 | = High (H) |
| 2 | = Medium (M) |
| 0 or 1 | = Low (L) |

**Step 4** Identify Physical Stressors

Mark physical stressors observed:

- ☐ Vibration (V)
- ☐ Low Temperatures (L)
- ☐ Soft Tissue Compression (S)
- ☐ Impact Stress (I)
- ☐ Glove Issues (G)

▶ Use the corresponding letters to show location of stressors. ▶





www.humantech.com ■ Tel. 734.663.6707 Fax 734.663.7747

## 11.0 ATTACHMENT 2 – THE BEST FORM

**BEST™ – BRIEF™ EXPOSURE SCORING TECHNIQUE** Version 1.0

**Step 1** Complete Job Information

Job Name: _____ Site: _____ Station: _____
Date: _____ Dept: _____ Shift: _____ Product: _____

**Step 2** Transfer BRIEF Scores

Transfer scores (0-4) from a completed BRIEF Survey.

| Hands and Wrists | | Elbows | | Shoulders | | Neck | Back | Legs |
|---|---|---|---|---|---|---|---|---|
| Left | Right | Left | Right | Left | Right | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Step 3** Determine Conversion Factors

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Find each BRIEF Score in the table at right and determine the conversion factor for each body part.

| BRIEF Score | Conv. Factor |
|---|---|
| 4 | 10 |
| 3 | 5 |
| 2 | 3 |
| 1 | 1 |
| 0 | 0 |

**Step 4** Add Conversion Factors → 0

**Step 5** Summarize Physical Stressors

Place a 2 in the box for each physical stressor marked on the BRIEF, and a 0 for each physical stressor not marked.

| Vibration | Low Temperatures | Soft Tissue Compression | Impact Stress | Glove Issues |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |

**Step 6** Add Physical Stressor Scores → + 0

**Step 7** Calculate Job Risk Factor Score

(Conversion Factors + Physical Stressor Scores) → = 0

Comments:

| Time on Task Per Week | Multiplier |
|---|---|
| > 40 hours | 1.25 |
| 20 - 40 hours | 1.0 |
| 4 - 19 hours | 0.8 |
| < 4 hours | 0.4 |

**Step 8** Determine Time Exposure Multiplier

Use the table at left to determine the appropriate multiplier. → X 0

| Job Hazard Score | Priority |
|---|---|
| 0 - 9 | Low |
| 10 - 29 | Medium |
| 30 - 49 | High |
| 50+ | Very High |

**Step 9** Calculate Job Hazard Score

(Job Risk Factor Score x Time Exposure Multiplier) → = 0.00



www.humantech.com ■ Tel. 734.663.6707 Fax 734.663.7747

## 12.0 ATTACHMENT 3 – NIOSH LIFING GUIDELINES

Humantech®

CLEAR WORKSHEET

**NIOSH Lifting Guidelines** DESCRIPTION

Job Title

| Model Inputs: | Enter Data | Multipliers: |
|---|---|---|
| Horizontal Location (H) (min 10", max 25") | in (10" is best) | HM = |
| Vertical Location (V) (min 0", max 70") | in (30" is best) | VM = |
| Travel Distance (D) (min 10", max 70") | in (10" is best) | DM = |
| Angle of Asymmetry (A) (min 0°, max 135°) | deg (0 is best) | AM = |
| Coupling (1=good, 2=fair, 3=poor) | (1 is best) | CM = |
| Duration (Enter 1, 2 or 8 hrs. only) | hr(s) (1 is best) | Dur = |
| Frequency (min 0.2, max 15 lifts/min) | l/m (0.2 is best) | FM = |
| Average Load Weight | lb | |
| Maximum Load Weight | lb | |

**Model Outputs:**

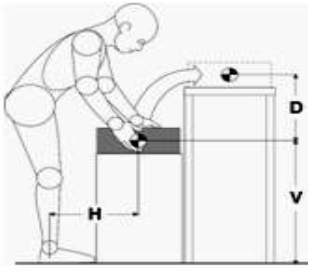
Recommended Weight Limit (RWL): lb.

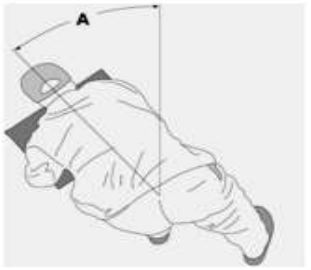
Lifting Index (LI = Load/RWL): 0.00

Frequency Independent RWL: lb.

Frequency Independent LI: 0.00

Recommendations:




**NOTE:** The NIOSH guidelines in this Microsoft Excel Workbook are derived from a paper titled "Revised NIOSH Equation for the Design and Evaluation of Manual Lifting Tasks" published in Ergonomics (Waters, Putz-Anderson, Garg, and Fine, 1993).