

Ergonomics Program	Document No.: RSW-SAF-050-DT	Approval Date: 08/12/20	Page 1 of 12
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1.0 PURPOSE

- 1.1 The program exists to ensure that ergonomic risks are anticipated, identified, evaluated and controlled to reduce the potential of work-related musculoskeletal disorders (WMSD).
- 1.2 Program Objectives:
- 1.2.1 Reduce ergonomic risk factors in existing job tasks, tools, and equipment to meet the capabilities and limitations of all employees.
 - 1.2.2 Prevent the introduction of new ergonomic risk factors in future job tasks, tools, and equipment through engineering design.
 - 1.2.3 Increase ergonomic awareness.
 - 1.2.4 Promote and support the safety and health of all employees.

2.0 SCOPE

- 2.1 This program applies to all routine, turnaround & shutdown, work performed by employees in any area or office located on Marathon Petroleum Company's Detroit Refinery owned or leased properties.
- 2.2 This program applies to all Marathon Petroleum Company Detroit Refinery employees and directly-supervised employees.

3.0 PROGRAM

3.1 PLAN ADMINISTRATION & RESPONSIBILITIES

Program Administrator

- 3.1.1 The ergonomics subject matter expert shall act as the ergonomics program administrator and is responsible for the program's implementation.
- 3.1.2 The program administrator will facilitate the creation, maintenance, and organization of all needed documentation, administrative tools, and equipment for the ergonomics program.
- 3.1.3 The program administrator shall develop in-house expertise for dealing with ergonomic issues to include the assessment or survey of ergonomic hazards, prioritization of the hazards, implementation of solutions, and reevaluation of the implementations.

Refinery Leadership Team (RLT):

- 3.1.4 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.
- 3.1.5 The RLT shall also support the program through ensuring the ergonomics program administrator, is provided with the necessary training, information, and authority to carry out their responsibilities.

Area Teams or Other Departmental Leadership:

- 3.1.6 Area Teams or other department's management will work with the program administrator, the area team safety representative to properly address ergonomic hazards and implement solutions to existing risks where feasible.

3.2 SUPPORT TEAM STRUCTURE

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

3.3 EMPLOYEE INVOLVEMENT

- 3.3.1 Employee participation and involvement will be accomplished through the following means:
- 3.3.1.1 Provide all employees basic ergonomic hazard awareness training.
 - 3.3.1.2 Identify a system that encourages all employees to report ergonomic concerns and suggestions for improvements. Seek suggestions and comments from employees of ways to improve current conditions or potential problems.
 - 3.3.1.3 Involve employees in the investigation of reported work related ergonomic injuries or illnesses along with the supervisor, safety or ergonomic team to help determine the nature and causes and, where appropriate, to implement control measures.
 - 3.3.1.4 Train Circle of Safety observers to identify ergonomic risks as they conduct workplace observations and work with the safety or ergonomics team to make improvements.
 - 3.3.1.5 Encourage employees, contractors, and visitors to participate in non-mandatory daily stretches that may aid in injury reduction.
 - 3.3.1.6 Recruit employees, in cross-functional capacities to be trained in applied ergonomics and to participate on safety, ergonomic or other continuous improvement teams.

3.4 ERGONOMIC TOOLS AND CRITERIA

- 3.4.1 To identify ergonomic hazards in the work place, "active" and "proactive" approaches are encouraged. Outside consultants may be used for initial screening of problematic jobs and more detailed hazard analyses.
- 3.4.2 A worksite analysis shall be conducted in order to recognize, identify, and correct ergonomic risk factors. The worksite analysis can act as a baseline for evaluating the effectiveness of this program and will include:
- 3.4.2.1 Analysis of injury records, incident investigations, incident rates, Circle of Safety data and worker's compensation costs.
 - 3.4.2.2 Analysis of WMSD trends.
 - 3.4.2.3 Employee feedback including but not limited to information from Safety Opportunity to Share Forms, Sequential Safety Meeting Pass-Up concerns, safety meetings, and other informal feedback.
 - 3.4.2.4 Performing ergonomic risk assessments to measure the risk.

3.5 RISK ASSESSMENTS, PRIORITIZATION, IMPLEMENTATION & EVALUATION

- 3.5.1 When conducting a risk assessment, a variety of sources of information on the job/task should be used including:
- 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.
- 3.5.2 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 in addition to witnessing and documenting if possible the operator perform the job or task.
- 3.5.3 The following tools may be utilized to conduct ergonomic risk assessments:
- BRIEF™ Survey
 - NIOSH Lifting Equation
 - Snook Push/Pull/Carry Tables
 - Basic and Detailed Data Collection forms
 - Employee Surveys
- 3.5.4 The collective information including the reviewing of data shall be assessed and the results placed in a risk model to establish the impact to various parts of the body. Risk levels will be scored as high, moderate or low concern.
- 3.5.5 The results of the survey 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.
- 3.5.6 Prioritization of potential ergonomically at-risk jobs/tasks shall be based on risk factors. Prioritization will utilize the following tools or information:
- BEST™ assessments
 - Injury data
 - Cost and ease of implementation
 - Employee feedback
 - Recommendations for improvements
- 3.5.7 The program administrator should develop an action plan to address the prioritized potentially at-risk jobs and tasks.
- 3.5.8 The program administrator or area team safety representative will assist Area Teams or corresponding department management with implementing ergonomic job improvements.
- 3.5.9 Improvements to reduce or control hazards should be considered in the following order:
- 3.5.9.1 Risk elimination if the job or task can be performed in a safer method
- 3.5.9.2 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

3.5.9.3 Work practice controls to review 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 and 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

3.5.9.4 Personal protective equipment to help to reduce extreme postures and/or excessive forces. Examples include but are not limited to:

- cushioned, anti-vibration or insulate 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 the plant nurse.

3.5.10 All proposed changes must be approved by the program administrator/ area team safety representative or other appropriate area team leaders or department management prior to implementation.

3.5.11 The Cost Justification Worksheet may be used as necessary to justify improvements when necessary. If needed, the ergonomics team teamed with other appropriate internal personnel shall present the RLT with Decision Support Packages (DSPs) to further justify improvements.

3.5.12 Implementations shall 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.

3.5.13 Post-implementation surveys and evaluation tools and processes will mirror the tools and processes used in the initial surveys and evaluation process.

3.5.14 If the improvement is effective, the improvement will be considered for permeation and incorporated into design standards.

- 3.5.15 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 must continue until a reasonable solution is implemented.

3.6 ERGONOMIC EDUCATION AND TRAINING

- 3.6.1 Ergonomics training will be tailored to provide each work group with the skills and information needed to recognize ergonomic hazards, signs and symptoms of work related overexertion injuries, cumulative trauma or other musculoskeletal disorders, how to report them and the means to help correct or avoid them.

- 3.6.2 These tailored training levels include the following:

3.6.2.1 Basic Ergonomics - directed to all employees and will consist of ergonomic hazard awareness, identifying signs and symptoms, reporting procedures and measures that can be taken to modify or adjust workstation to reduce ergonomic stresses and the process for assessing and responding to the ergonomic hazards.

3.6.2.2 Applied Ergonomics - directed to site ergonomic team members and will focus on identifying and evaluating ergonomic risks, conducting assessments, and developing and implementing solutions.

3.6.2.3 Advanced Ergonomics - directed to project engineers and designers and will focus on engineering out ergonomic hazards through the use of build and design specifications in the development and installation stage.

- 3.6.3 All employees shall receive the basic ergonomic training and refresher training periodically thereafter as deficiencies are identified.

- 3.6.4 Applied and Advanced ergonomics training will be conducted initially and refreshers will be offered periodically as deficiencies are identified to establish and maintain ongoing ergonomic team or engineering competencies and skills in those functions.

- 3.6.5 Circle of Safety Observers should receive an adapted Basic Ergonomics training initially and additional refresher training as needed to identify at-risk and safe ergonomic behaviors and conditions.

- 3.6.6 Computer-Based Training (CBT) can be used to supplement any training described above.

3.7 ERGONOMIC HAZARD PREVENTION AND CONTROL

- 3.7.1 New equipment designs should be designed or evaluated and approved by Marathon Project Engineers who have attended the Advanced Ergonomics course. All new equipment intended for use by employees, contractors, or visitors should be designed applying the principles learned in the Advanced Ergonomics training class.

- 3.7.2 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.

3.8 RECORDKEEPING

- 3.8.1 Injuries and illnesses will be reported in accordance with Marathon Petroleum Company's programs for incident investigation and reporting requirements.
- 3.8.2 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.
- 3.8.3 Employee reports of ergonomic concerns, responses to these reports, ergonomic team minutes, risk assessments, ergonomic implementation records, ergonomic capital improvements and ergonomic auditing reports shall be maintained as required by the ergonomics team charter.
- 3.8.4 All training records shall be maintained by the Training Department.

3.9 PERIODIC PROGRAM REVIEW

- 3.9.1 This written program shall be reevaluated every five years or more often as needed.
- 3.9.2 The program's effectiveness should be assessed using performance metrics. Examples of potential metrics include, but are not limited to:
 - 3.9.2.1 Circle of Safety – the Circle of Safety accumulates observations and generates CBI Analysis data reports for both at-risk and safe behaviors and conditions. Body Mechanics data from the CBI Analysis will be trended to show signs of improvement or decline.
 - 3.9.2.2 Number of pro-active investigative or compliant driven assessments conducted.
 - 3.9.2.3 Number/percent of investigated assessments with solutions identified and executed
 - 3.9.2.4 Quantitative measurement of risk reduction.
 - 3.9.2.5 Injury/Illness Performance – Injury and illness statistics will include alleged work-related strain/overexertion, cumulative trauma or other musculoskeletal disorders. The number of ergonomically-related injuries/illnesses will be used to establish a separate incident rate that will be measured and tracked against total incident rates.
 - 3.9.2.6 Annual budgeted appropriations dedicated to ergonomic risks.
 - 3.9.2.7 Ergonomics performance measurements and baselines to determine the effectiveness of the facility's efforts and activities in reducing injuries/illnesses, costs, and risk factors.
 - 3.9.2.8 Written ergonomic activity reports, team projects, meeting minutes, and similar documentation.

4.0 **DEFINITIONS**

- 4.1 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 B](#) for an example of the BEST.

- 4.2 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 A](#) for an example of the BRIEF.
- 4.3 Ergonomic Expertise – the result of extensive experience, training, or formal education in ergonomics, human factors, or other anthropometry-related studies.
- 4.4 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.
- 4.5 Ergonomic Risk Assessment – An objective and comprehensive examination of a job task performed by an observer trained in identifying ergonomic risk factors.
- 4.6 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 C](#) for an example of this spreadsheet.
- 4.7 Work-Related Musculoskeletal Disorder (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.

Examples may include the following:

- muscle strains and tears
- ligament sprains
- joint and tendon inflammation
- pinched nerves
- spinal disc degeneration
- low back pain
- tension neck syndrome
- carpal tunnel syndrome
- rotator cuff syndrome
- DeQuervain's syndrome
- trigger finger
- tarsal tunnel syndrome
- sciatica
- epicondylitis
- tendonitis
- Reynaud's phenomenon
- hand-arm vibration syndrome
- carpet layer's knee
- and herniated spinal disc

Not included are injuries caused by slips, trips, falls, vehicle accidents, or similar accidents.

- 4.8 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.

5.0 REFERENCES

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5.1 [Ergonomic Stress Exposure Control HLT-2006](#)

6.0 ATTACHMENTS

- 6.1 [Attachment A: The BRIEF™ Survey](#)
- 6.2 [Attachment B: The BEST™ Form](#)
- 6.3 [Attachment C: NIOSH Lifting Guidelines](#)

7.0 REVISION HISTORY

Revision number	Description of change	Written by	Approved by	Effective date
0	Original Document	E. Burnett	Safety Steering Committee	08-01-2009
1	Updated Document Number	E. Dvorak	L. Mazur	01-05-10
2	Scheduled Review No Updates	A Tys	L. Mazur	08-08-12
3	Scheduled review. Modified to meet requirements of HLT-2006 and remove requirements from a previous draft RSP. (draft requirements kept as recommendations". Updated header per RGD 1051 DT	A Tys	J. Rabideau	08-11-15
4	Updated document to reflect current Ergonomic Team. Removed out dated information on past "Valve Survey" that was completed.	A. Hetu	J. Rabideau	03-21-16
5	Updated documents to remove Ergonomics Team Requirement, updated to reflect change of terminology from DLT to RLT.	A. Hetu	A. Morales	08/12/20

BRIEF™ Survey — BASELINE RISK IDENTIFICATION OF ERGONOMIC FACTORS

Version 3.0

Step 1

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

Complete Job Information

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.

	Hands and Wrists		Elbows		Shoulders		Neck		Back		Legs
	Left	Right	Left	Right	Left	Right	Left	Right	Twisted	Unsupported	Unsupported
Posture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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)	≥ 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)
Duration	≥ 10 sec.	≥ 10 sec.	≥ 10 sec.	≥ 10 sec.	≥ 10 sec.	≥ 10 sec.	≥ 10 sec.		≥ 10 sec.		$\geq 30\%$ 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	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	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.



ATTACHMENT B: The BEST™ Form

BEST™ — BRIEF™ EXPOSURE SCORING TECHNIQUE

Version 1.0

Step 1	Job Name: _____ Site: _____ Station: _____
Complete Job Information	Date: _____ Dept: _____ Shift: _____ Product: _____

Step 2	Transfer BRIEF Scores																								
Transfer scores (0-4) from a completed BRIEF Survey.																									
	<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr> <th colspan="2">Hands and Wrists</th> <th colspan="2">Elbows</th> <th colspan="2">Shoulders</th> <th rowspan="2">Neck</th> <th rowspan="2">Back</th> <th rowspan="2">Legs</th> </tr> <tr> <th>Left</th> <th>Right</th> <th>Left</th> <th>Right</th> <th>Left</th> <th>Right</th> </tr> <tr> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table>	Hands and Wrists		Elbows		Shoulders		Neck	Back	Legs	Left	Right	Left	Right	Left	Right	0	0	0	0	0	0	0	0	0
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

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 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.											
	<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr> <th style="font-size: x-small;">Vibration</th> <th style="font-size: x-small;">Low Temperatures</th> <th style="font-size: x-small;">Soft Tissue Compression</th> <th style="font-size: x-small;">Impact Stress</th> <th style="font-size: x-small;">Glove Issues</th> </tr> <tr> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table>	Vibration	Low Temperatures	Soft Tissue Compression	Impact Stress	Glove Issues	0	0	0	0	0
Vibration	Low Temperatures	Soft Tissue Compression	Impact Stress	Glove Issues							
0	0	0	0	0							

Comments:

Step 4	Add Conversion Factors	0
--------	-------------------------------	---

Step 6	Add Physical Stressor Scores	0
--------	-------------------------------------	---

Step 7	Calculate Job Risk Factor Score	0
	(Conversion Factors + Physical Stressor Scores)	

Step 8	Determine Time Exposure Multiplier	0
	Use the table at left to determine the appropriate multiplier.	

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 9	Calculate Job Hazard Score	0.00
	(Job Risk Factor Score x Time Exposure Multiplier)	

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

ATTACHMENT C: NIOSH Lifting Guidelines

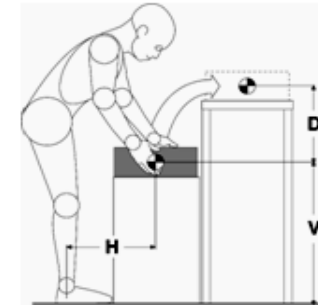
Humantech®

CLEAR WORKSHEET

NIOSH Lifting Guidelines

DESCRIPTION

Job Title			
Model Inputs:	Enter Data	Multipliers:	Model Outputs:
Horizontal Location (H) (min 10", max 25")	<input type="text" value="in"/> (10" is best)	HM =	Recommended Weight Limit (RWL):
Vertical Location (V) (min 0", max 70")	<input type="text" value="in"/> (30" is best)	VM =	<input type="text" value=""/> lb.
Travel Distance (D) (min 10", max 70")	<input type="text" value="in"/> (10" is best)	DM =	Lifting Index (LI = Load/RWL):
Angle of Asymmetry (A) (min 0°, max 135°)	<input type="text" value="deg"/> (0 is best)	AM =	<input type="text" value="0.00"/>
Coupling (1=good, 2=fair, 3=poor)	<input type="text" value=""/> (1 is best)	CM =	Frequency Independent RWL:
Duration (Enter 1, 2 or 8 hrs. only)	<input type="text" value="hr(s)"/> (1 is best)	Dur =	<input type="text" value=""/> lb.
Frequency (min 0.2, max 15 lifts/min)	<input type="text" value="l/m"/> (0.2 is best)	FM =	Frequency Independent LI:
Average Load Weight	<input type="text" value="lb"/>		<input type="text" value="0.00"/>
Maximum Load Weight	<input type="text" value="lb"/>		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).

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