

**AXIS**

**REHABILITATION**

*at work*

# TASK ANALYSIS REPORT

**Organisation: PUMA Energy**

**Work Area: Mackay**

**Job Title: Terminal Operator**

**General Description: The Terminal Operator is responsible for the functioning of the Mackay terminal in ensuring safe receipt, storage and distribution of fuel. The Operator is also responsible for the safe receipt of fuel from tankers at the Mackay Multi-user Terminal, into the PUMA Mackay Terminal.**

Work activities/sub-tasks may include (see pg 3):

- Valve operation
- Tank sampling
- Administrative tasks
- Mobile pump relocation and operation
- Forklift, firetruck and utility vehicle driving
- "Pig" use
- Fire-fighting pump deployment and collection
- Set-up of spools

<b>Employees:</b>	2 full-time operators, 0600-1400 or 1000-1800 shift.
<b>Working Hours:</b>	0600-1400 or 1000-1800 shift
<b>Work Environment:</b>	Variable dependant on day's tasks, usually 50% indoor climate controlled, 50% outdoor direct sunlight exposure.
<b>PPE:</b>	Long pants, long-sleeve shirt (hi-visibility), safety boots, hard hat, tinted safety glasses, gloves, sunscreen.
<b>Adaptive devices:</b>	Forklift

The following keys were used to undertake this task analysis. **Physical Demands:**

Term	Definition-Strength rating represents the strength requirements which are considered to be important for average, successful work performance
<b>Sedentary work</b>	Manual handling <4.5kg of force occasionally and/or <1kg frequently to lift, carry, push, pull, or otherwise move objects, including the human body. Sedentary work involves sitting most of the time, but may involve walking or standing for brief periods of time, occasionally.
<b>Light work</b>	Manual handling <9kg of force occasionally, and/or <4.5kg frequently, and/or <1kg constantly to move objects. Physical demand requirements are in excess of those for Sedentary Work. Even though the weight lifted may be only a negligible amount, a job should be rated Light Work: (1) when it requires walking or standing to a significant degree; or (2) when it requires sitting most of the time but entails pushing and/or pulling of arm or leg controls; and/or (3) when the job requires working at a production rate pace entailing the constant pushing and/or pulling of materials even though the weight of those materials is negligible.
<b>Medium work</b>	Manual handling 9-22kg of force occasionally, and/or 4.5-9kg frequently, and/or >4.5kg constantly to move objects. Physical Demand requirements are in excess of those for Light Work.
<b>Heavy work</b>	Manual handling 22-44kg of force occasionally, and/or 9-22kg of force frequently, and/or 4.5-9kg constantly to move objects. Physical Demand requirements are in excess of those for Medium Work.
<b>Very Heavy work</b>	Exerting >44kg of force occasionally, and/or >22kg of force frequently, and/or >9kg of force constantly to move objects. Physical Demand requirements are in excess of those for Heavy Work.

**Frequency Classifications:**





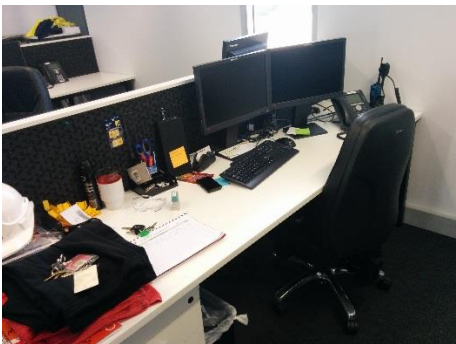
	Occasional	Frequent	Constant	Definitions #
% time	1-33	34-66	67-100	Sustained > 30 secs at a time
Reps per day	1-100	101-500	500+	Long duration > 30 mins at a time or >2hrs in shift
Reps per hour	0-12	12-63	>63	Repetition > 2 per minute
Reps per minute	1 every 5-15	1 every 1-5	1 or more	Exposure – time spent completing task over whole shift





**Summary:**

	Sedentary	Sedentary - Light	Light	Light - Medium	Medium	Medium - Heavy	Heavy	Very Heavy
Occasional (1-33%)	4.5kgs	7kgs	9kgs	16kgs	23kgs	34kgs	45.5kgs	Over 45.5kgs
Frequent (34-66%)	Negligible	3.5kgs	4.5kgs	7kgs	11.5kgs	16kgs	23kgs	Over 23kgs
Constant (67-100%)	-	-	Neg	2kgs	4.5kgs	7kgs	9kgs	Over 9kgs
	Sit	Sit/stand	Stand/walk	Stand/walk	Stand/walk	Stand/walk	Stand/walk	Stand/walk

References: U.S Department of Labour (1991) Dictionary of Occupational Titles, Fourth Edition  
# Hazardous Manual Task Code of Practice, WH&S Qld 2011

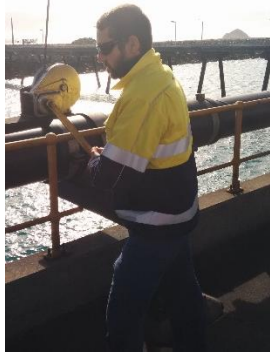
Physical demands of job and % of work time allocated	Never 0%	Occasional 1- 33%	Frequent 34- 66%	Constant 67-100%	Comments
<b>Whole body movement</b>					
Sitting				✓	Proportion of sitting/standing/walking variable depending on day – usually 50/50 split between standing/walking
Standing				✓	
Walking				✓	
Kneel/squatting		✓			Accessing some valves, some tank sampling activities
<b>Lower back movement</b>					
Bending forwards			✓		Accessing valves, moving rigid pipe on trolleys, tightening end-plates
Bending backwards	✓				
Twisting		✓			Valves
Stooping		✓			Valves
<b>Neck movement</b>					
Flexion - looking down		✓			Traversing stairs/ladder
Extension - looking up		✓			Traversing stairs/ladder
Rotation		✓			Forklift/vehicle driving
<b>Upper Limb Movement</b>					
Finger/thumb Manipulation			✓		Administration tasks
Gripping			✓		Valves, tools use to tighten end-plates/pipe connections
Forward Reach		✓			Valves
Overhead Reach		✓			Valves
Side reach		✓			Some valves
Wrist side bend	✓				
Wrist extension		✓			Administration tasks
<b>Other demands</b>					
Steps/stairs			✓		Accessing tanks, ascending to top of tank
Uneven ground		✓			At multi-user terminal
Balancing		✓			Reaching for difficult access valves
Vibration – WB or UL		✓			Forklift operation
<b>Weights and forces</b>					
Floor (kg)		20-35kg			Mobile pump, “pig”
30cm (kg)		20-35kg			Mobile pump, “pig”
Waist (kg)		20-35kg			Mobile pump, “pig”
Shoulder (kg)	✓				
Above shoulder (kg)	✓				
Carrying		35kg			
Pushing (kg force)		25-45kg			Sustained push rigid pipe-Initial push of rigid pipe on trolleys, valves at waist to shoulder height
Pulling (kg force)		45kg			Initial pull of trolleys

Job Title: Terminal Operator (Mackay)	
<b>Task 1: Valve operation</b> <b>Total time/shift: up to 2hrs</b> <b>Task duration: 10mins at a time</b>	<b>Physical demand level – Light to medium work</b>
	<ul style="list-style-type: none"> <li>• Turning of valves at various heights and locations around terminal.</li> <li>• May require kneeling or squatting.</li> <li>• Some valves in position whereby operator has arms outstretched above head or leaning over safety rail.</li> <li>• Valves well maintained by operators to ensure minimal effort in initial turn force.</li> <li>• Tools available to increase mechanical advantage if stiff valve is encountered.</li> </ul>
	 
<b>Task 2: Tank sampling</b> <b>Total time/shift: up to 1hr</b> <b>Task duration: 5mins at a time</b>	<b>Physical demand level – Light work</b>
	<ul style="list-style-type: none"> <li>• Tanks sampled regularly from ground level access.</li> <li>• Once per week tanks required to be dipped from on top of tank – requires traversing of seven flights of stairs for access.</li> <li>• Small sample bag required to be carried during this process.</li> </ul>
<b>Task 3: Administrative Tasks</b> <b>Total time/shift: up to 4hr</b> <b>Task duration: 1hr at a time</b>	<b>Physical demand level – Sedentary work</b>
	<ul style="list-style-type: none"> <li>• Planning and administrative tasks on computer.</li> <li>• 5pt base, adjustable chairs and standard keyboard and mice used.</li> <li>• Responsibility of Operator to ensure adequate standing when tasked with high amounts of administrative responsibility for shift.</li> </ul>

<p><b>Task 4: Mobile pump and hose relocation and operation</b> Total time/shift: up to 2hrs Task duration: 30mins at a time</p>	<p><b>Physical demand level – Heavy work</b></p>
 	<ul style="list-style-type: none"> <li>• Lift mobile pump (approx. weight 20kg) and hose and carry to location required.</li> <li>• May use forklift to lift – though pump isn't designed to be lifted in this way.</li> <li>• Even though forklift may be used to traverse most of distance, pump likely required to be manually lifted to final destination as may be required to be used in tighter spaces where forklift cannot access.</li> </ul>
<p><b>Task 5: Forklift and vehicle operation</b> Total time/shift: up to 3hrs Task duration: 30mins at a time</p>	<p><b>Physical demand level – Light work</b></p>
	<ul style="list-style-type: none"> <li>• Use of forklift for various operational requirements – lifting of pipes, mobile pump, pig, etc.</li> <li>• Driving of firetruck and utility vehicle to locations around tank farm and</li> <li>• Requires adequate neck/upper back rotation to ensure safety in shoulder checking.</li> <li>• Requires sitting tolerance of greater than 10 minutes.</li> </ul>
<p><b>Task 8: "Pig" use</b> Total time/shift: max 5 /shift Task duration: 30 seconds</p>	<p><b>Physical demand level – Heavy work</b></p>
	<ul style="list-style-type: none"> <li>• Lift pig from ground level to pipe height – usually at waist to chest height.</li> <li>• Used to push product.</li> <li>• Weight of pig = 35kg lift from ground to waist/chest height.</li> </ul>

**Task 6: Firefighting pump deployment and collection**  
Total time/shift: up to 4hrs  
Task duration: up to 1hr at a time

**Physical demand level – Very heavy work**



- Wharf activity – performed on average every four weeks.
- Firefighting vehicle is backed up to edge of wharf.
- Pump is pushed out back of truck, over ramp and descended into water via winch.
- After wharf activities concluded, pump is manually winched back up from water level to platform level – winch may take 10 minutes of continuous winding to use. Above shoulder head range of motion is required to use winch.
- Pump is bulky and not designed to be lifted over an edge – difficult to manoeuvre due to attachment points, may need to be physically pushed to bring back over lip of pipe. This task usually requires 2-3 people to achieve.
- Hose is also required to be lifted back up by hand – may take 10 minutes of continuous lifting.

**Task 7: Spool setup**  
Total time/shift: up to 4 hrs  
Task duration: up to 30 mins at a time

**Physical demand level – Heavy work**



- Wharf activity – performed on average every four weeks.
- Push rigid pipe in trolleys – requires 45kg initial push to align wheels, then 15kg ongoing push. Task is in a moderately forward flexed position.
- Will use forklift to lift trolleys over uneven edge at multi-user terminal.
- Lift end of rigid pipe and line up onto fixed pipe with forklift.
- Secure connection of pipes with bolts to high torque – adequate tool available.
- End-plates on spools are lighter versions that weight approximately 5kg.
- End-plates required to be used on fixed pipe weigh up to 20kg.

---

This task analysis was prepared for PUMA Energy on 28.07.2015. This data may vary depending on production rates, changes in design or work organisation and staffing levels. This document was prepared by Samuel Hutchins of Axis Rehabilitation *at work* and reviewed by Jennifer Barnett prior to publication.

---

U.S Department of Labour (1991) Dictionary of Occupational Titles, Fourth Edition Appendix C, Components of the definition trailer, section IV. Physical Demands – Strength Rating.