





REPORT | INDUSTRY ASSISTANCE PROGRAM

Roof bolting workshops

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Contents

Introduction	1
Workshop aims	1
Workshop format and participation	2
Key discussion points	2
Feedback	3
Perform risk assessments	4
Conclusion and future direction	4
Attachment A: PErforM risk assessments	5

Introduction

In the wake of a death of a mine worker from a roof bolting incident, Centennial Coal, Sandvik and the Department of Industry engaged in a workplace agreed undertaking to increase industry awareness of underground mobile machine mounted bolting equipment hazards and to improve bolting practices.

The agreed undertaking report (May 2014) provided guidance information for industry for a step-change approach focusing on worker safety and wellbeing when roof bolting. The report recommended that industry, manufacturers and government bodies accelerate the application of technology and innovation to improve health and safety aspects of bolting activities.

The report outlined the key themes of risk and injury to roof bolters. It highlighted the need to focus on activities that provide opportunities for improvement within the sector. The key themes included:

- inadvertent operation
- selection errors
- musculoskeletal disorders
- direction errors
- operation while in a hazardous position
- being struck by an object
- fluid injection
- manoeuvring of drill steels.

To build on the work already completed, the department agreed to undertake further work on roof bolting. Roof bolting is identified by the industry as being one of the most hazardous and strenuous tasks performed by an underground miner. As the project will require consultation between original equipment manufacturers (OEMs) and end users to consider equipment design, the project is being undertaken via a step-change approach with three distinct phases. The three phases include:

- phase one review of report, data and development of report and action plan
- phase two end user regional workshops
- phase three industry roof bolting roundtable focusing on the application of technology and innovation to improve the health and safety aspects of roof bolting.

Workshop aims

Three workshops were held in the key regional locations of Rutherford, Lithgow and Wollongong in March 2016. The aim of the workshops was to gain direct access to the mine operators and their workers to:

- communicate the outcomes of the agreed undertaking report and the recently completed roof bolting report
- understand the key issues of roof bolting in underground coal mines from the mine operator and end user's perspective
- discuss the issues of legacy plant and fit-for-purpose equipment and what mine operators should be doing in the short term
- complete a group PErforM risk assessment to receive feedback from end users on the way to
 effectively control roof bolting risks.

Workshop format and participation

The workshops were facilitated by Chris Gearing (Mechanical Engineer, Gearing Engineering & Associates) and Kylie Newton (Practice Leader Health and Human Factors, Mine Safety).

One hundred and four people from varied backgrounds including OEMs, engineers, mine operators, unions, mine workers, and health professionals attended workshops across three regions.

The workshop format included the following key agenda items:

- agreed undertaking report
- roof bolting report
- safety bulletin
- fit-for-purpose equipment
- risk assessment tools
- completion of a PErforM risk assessment tool activity.

Key discussion points

There were a number of common discussion points across the three different workshops. Common themes identified at the workshop included:

- forecast demands on both primary and secondary bolting will be significantly greater in the future due to production requirements and difficult strata. As a result, the problems associated with injuries related to roof bolting may increase and become a more pressing issue for the coal mining industry
- provision of regular information from the department with regards to roof bolting injuries. This should include the delivery of regular updates and information and data on roof bolting injuries
- sharing of information between coal mines and OEMs on existing technologies and initiatives
- information on the financial impacts of new equipment and technology compared with current costs of roof bolting, including injuries
- bonus arrangements and the competitive nature of work, including use of contractors, may contribute to a lack of recognition of problems associated with the bolting process. It was highlighted that the industry generally concedes to 'getting the job done' without recognising the problems associated with manual handling and roof bolting installation
- mines generally believed they had a bolting rig procedure in place but that they may not adequately
 cover the circumstances in which rig operators were being injured. It was noted that injuries typically
 occurred when the workers encountered something 'out of the usual'. Operators could see benefits in
 focusing attention on decision making and problem solving and that this should also be considered in
 the mine's training arrangements. It was further suggested that a forum be held for operators to
 specifically deal with bolting procedures including the equipment some mines use and both primary
 and secondary support
- specific hazardous manual task risk assessments had not been undertaken. It was recognised that, with such a high degree of manual handling in the bolting process, hazardous manual task risk assessment should be undertaken.

Feedback

At the completion of the workshops participants were asked 'where to from here'? The following lists are a collation of the responses to that question at each of the workshops.

Rutherford

- Would like to be provided with regular data updates with regards to roof bolting injuries
- Improvement in incident notification process to ensure the right information is being captured
- Would like to see a procurement standard for roof bolting including expectations of designers
- Update MDG 17 and MDG 35.1
- An indicative cost-benefit analysis for safety and production benefits for investing in roof bolting
- Provision of a risk assessment tool when focusing on hazardous manual tasks
- Provision of a report for the NSW Mine Safety Advisory Council on the roof bolting workshops.

Lithgow

- A workshop facilitated by the department breaking down the task of roof bolting into steps
- Controls for roof bolting should be shared, best practice initiatives and constraints should be documented
- Review MDG 35.1
- · Provision of a cost-benefit analysis on self-drilling bolts versus standard bolts
- Research on self-drilling bolts
- Provision of a specific training and mentoring program for operators starting out in the job of roof bolting
- OEMs design risk assessment to include end users
- Compliance versus innovation.

Wollongong

- Need to demonstrate cost benefit
- Department to develop best practice examples within industry so this can be shared
- Breakdown of incidents and why they are occurring
- Look at the lobsters (feeds the cable bolt into and out of the pre-drilled hole in the strata) and provide this in cost-benefit analysis and best practice example
- Provision of a clear scope of work for mines and OEMs, including risk assessment
- Research light weight bolt and or flexible options
- Clear communication and collaboration between coal mines
- Design for future
- Workshop with OEMs and engineers on the design of roof bolting
- Investigate roof bolt length there are complaints they are getting too long
- Manual tensioning needs elimination
- Mesh handling needs to be eliminated
- Proforma for roof bolting incidents
- Review MDG 35.1

- Mine mangers should participate in roof bolting for at least one shift
- Need ideas to engage senior people or decision makers
- Need to encourage innovation
- Force application information to be provided.

Perform risk assessments

Like all hazards, musculoskeletal disorder management requires a risk management approach. It became apparent during the workshops that even though a risk management process is being undertaken for the activity of roof bolting, attendees indicated that this does not include a specific hazardous manual task risk assessment.

There are tools available to assist in risk assessing hazardous manual tasks. As part of the workshop the participants completed a PErforM risk assessment for the task of roof bolting. As part of the participatory ergonomics process the participants were also asked to identify short and long-term controls for the task.

A copy of the completed risk assessments for each of the workshops is at attachment A.

For more information on the PErforM risk assessment process please click on the following link. https://www.worksafe.qld.gov.au/injury-prevention-safety/hazardous-manual-tasks/participative-ergonomics-for-manual-tasks-perform

Conclusion and future direction

Participant feedback indicated that they enjoyed the opportunity to share information and collaborate with other coal mines, and the opportunity to use the PErforM hazardous manual task risk assessment.

Consistent themes identified included an update of MDG 35.1, provision of a cost-benefit analysis for roof bolting versus injury and the need for the industry to provide relevant and accurate information with regards to injuries associated with roof bolting. There was also general consensus of the need to move towards adapting future technology with a preference for automation.

The department will look to implement phase three of the roof bolting project and facilitate an industry roundtable during the first half of 2017. The aim of the roundtable is to bring together key decision makers and industry experts to discuss the current risks and the feasibility, benefits and limitations to future technology including automation in the underground coal mining sector.

In addition the key discussion points the roundtable will draw from feedback received from the three workshops in March 2016. As such the roundtable will include discussion on:

- · cost-benefit analysis for roof bolting with a focus on safety and production benefits
- procurement expectation for roof bolting and expectations on OEMs
- sharing of information among mines on best practice initiatives and innovations
- provision of a specific training and mentoring program for the safety critical task of roof bolting
- OEM design risk assessments and end user involvement.

In the meantime the department will undertake roof bolting project work to build a foundation for the roof bolting roundtable. This work will include reviewing cost data on roof bolting injuries, targeted evaluation on the safety critical task of roof bolting and undertake a detailed human and organisational assessment of roof bolting incidents. Information will be updated on the NSW Mine Safety webpage with regards to the roof bolting round table.

Attachment A : Perform Risk Assessements

Worksheet 1—PErforM Risk Assessment Tool

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Workplace	
Date: 16-3 2016 Workplace: icuinwas Minder #5.	_
Risk assessors	
Work unit/team: A/S ACREN	
Positions: ROOF BOLT OPERATOR.	
Names: CHRIS GEARING, STEVE BANCHOFT JEREMY WEREN.	
Task description	
Name of task: Operation of roof botting rig.	_
Why was this task selected: Known injury history, statistically p	000
Location where task occurs: On continuous miner	_
Who performs the task:	
General description: Manually move drill steel to nig (in & ou	1)
· Manually insert & remove dally.	
· Manually nove bott, butterfly plate, washer.	
Postures: Reach. Twist.	_
Forceful/muscular exertions:	
Repetition and duration: Repritition : - 20mms.	
Duration: - >2HRS.	_
Tools or equipment used: Batting Rig, Consumables, Hand tools	
Work/task organisation and environment:	i pro

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.

Exertion -How	much force is the pe	rson using? – think a	about starting or stop	ping quickly	Body part	
1 No effort	2	3 Moderate force & speed	4	5 Maximum force or speed	•	
Awkward po	sture - How awk	ward is the person's	posture?			
1 All postures neutral	2	3 Moderately unconfortable	4	5 Very uncomfortable		
Vibration-	How much are the v	hole body or hand(s) being vibrated?		shoulder	
1	2	3	4	5	elbow	
Duration -	None Moderate Extreme Duration - How long is the action performed for? How long is the action performed for?					
1 < 10 minutes	2 10-30 min	3 30 min – 1 hr	4 1-2 hrs	> 2 hrs	low leg	
Repetition- How often are similar actions done?						
1 No repetition	2	3 cycle time < 30 s	4	5 cycle time < 10 s		

Risk controls

Design control options:				
(eliminate, substitute, engineer)	Rotation of	pestone pers	onnel -	Reduce der.
Relocate consumables	with easy	peach.		
Set markers to position.	Put marker	on Floor	to sta	nd close to

Administrative control options:

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NSW Department of Industry, Resources Regulator, Mine Safety 6

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Workplace	
Date: Workpla	ice:
Risk assessors	
Work unit/team:	
Positions:	
Names:	
Task description	
Name of task: Install	roof bolt into hole
Why was this task selected:	epetice / hard work
Location where task occurs:	H face on CM
Who performs the task: Opso	itor
General description: Just all	Chemical, then noet bolt
Postures: donormal,	reach, streching & Istring
Forceful/muscular exertions:	o reach & stretch gliff & two
Repetition and duration:	
Tools or equipment used:	nd form
Work/task organisation and enviro	nment: Wer, sl-pper/

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.

Exertion -Ho	w much force is the p	erson using? - think a	about starting or sto	oping quickly	Body part
1 No effort	2	3 Moderate force & speed	4	5 Maximum force or speed	•
Awkward po	osture - How aw	kward is the person's	posture?		
1 All postures neutral	2	3 Moderately uncomfortable	4	5 Very uncomfortable	ter and
Vibration-	How much are the	whole body or hand(s) being vibrated?		shoulder
1	2	3	4	5	elbow back
None		Moderate		Extreme	wrist/
Duration -	How long is the	action performed for?			Windian The Main of
1	2	3	4	5))\\
< 10 minutes	10-30 min	30 min – 1 hr	1 – 2 hrs	> 2 hrs	iow leg
Repetition-	How often are s	similar actions done?	-		Back
1 No repetition	2	3 cycle time < 30 s	4	5 cycle time < 10 s	

Risk controls

Design control options: Single pass Self drilling in atuari Strata Control Neosures bolh. (eliminate, substitute, engineer)

Administrative control options:

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Workplace	
Date: 16/3/16 Work	(place:
Risk assessors	
Work unit/team:	
Positions:	100
Names:	
Task description	
Name of task: Ker	of Bolti - Rei menterlan C
Why was this task selected:	As per workshap
Location where task occurs:	
ho perf ms the task:	Local Doctesp
General description:	g from 12 cm 30 - twin boom
Postures: <u>Back</u> -	bend I to ist D- Dups washing
Forceful/muscular exertions: -	- accerning roof boths \$
Repetition and duration:	eaching up acolon
Tools or equipment used:	In board belting fig

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.

1		1.2	1	IF /	
No effort	2	Soderate for	¢.4	Maximum force or speed	•
Awkward po	osture - Howa	awkward is the persor	n's posture?	/ /	
1	2	3	4	5	
All postures		Moderately	200	Very	$\widehat{\mathbf{D}}$
nound			1	The loss	neck
Vibration-	How much are t	ne whole body or han	d(s being vibrate	ed?	A uploke A
1	2	-3	4	5	eibowy back
None		Moderate	1/	Extreme	
Dentin				///	An martight
Duration -	How long is the	ne action performed for	pr?		knee
1 < 10 minutes	2	3	4	the state	
	10-30 min	30 min – 1 hr	1 - 2 hrs	>2hrs	low leg Hankle
Repetition-	How often ar	e similar actions done			Back
1 No repetition	2	Corcle time	4	5 cycle time	
	1 AN	< 30 s	-	< 10 \$	
Risk o	ontrols				
Design contr	ol options:				
(eliminate si	ubstitute engi	neer)		0.	
st Tern	OPers	todias at	Tot	2 9 DA1-6	ortright.
11 1010	200	how m	osh co	antion that	Dad de
	Son		Fland	and Ball	1 and als
7 lesm	at 1. O	andVIK	Elette	we Dourin	SKIGA
Tan	- 6)11	son not	1dul	ling hoft	
1 reim		Tipe	1 bac	Mali	is some
on i	an +	Innel	DOM	2 TIMENING	æ
Administrativ	e control option	ons:			
and the second					

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Workplace Health and Safety Queensland, Department of Justice and Attorney-General PErforM Worksheet 1 and Worksheet 2 PN10865 Version 2 Last updated April 2011

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Workplace	
Date:	Workplace:
Risk assessors	
Work unit/team:	
Positions:	
Names:	·
Task description	
Name of task:	
Why was this task select	ed:
Location where task occu	Jrs:
Who performs the task:	
General description:	
مار المراجع الم	
Postures:	
Forceful/muscular exertic	ons:
Repetition and duration:	
Tools or equipment used	
Work/task organisation a	nd environment:

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.

Exertion -How	much force is the pe	son using? - think a	bout starting or stop	ping quickly	Body part
1 N⊯⊀. No effort	2 w	Moderate force & speed	4 54641502	5 Maximum force or speed	
Awkward pos	sture - How awak	ward is the person's	posture		
1 All postures neutral	2	3 Moderately uncomfortable	4	5 Very uncomfortable	
Vibration-	How much are the v	vhole body or hand(S) being vibrated?		Shoulder
1		3	4	5	elbow/ back
None Duration -	How long is the a	tion performed for?		Extreme	hipmign
1 < 10 minutes ·	2 10-3 <u>0</u> min	3 30 min – 1 hr	4 1-2 hrs	2 hrs	low leg
Repetition-	How often are si	milar actions done?	\square		Back
1 No repetition	2	cycle time < 30 s	4	5 cycle time < 10 s	

Risk controls

Design control options		
(eliminate, substitute,	engineer)	PERSONNEL
FULLY AUTOM	ATED BOUTING	System.
SELF DRULING	Bouts	
Re FORMARS	FACING BIGS	

Administrative control options:

RETATE PERSONNEL

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Workplace
Date: 15 2 2016 Workplace: BRORDED
Risk assessors
Work unit/team: B Team PWS.
Positions:
Names: Durcan, Bill, Trever, Gary,
Task description
Name of task: Real Botton and Stand
Why was this task selected:
Location where task occurs: Development Parel
Who performs the task:
Operators
General description
- concurrently with cutting
Postures: Exclansion of ans with twistmic
of tonk.
Forceful/muscular exertions:
Madevate-pulling bots out a carselfe
Repetition and duration:
shortening, buging repented
Tools or equipment used: Drill steels, dalles, betts
anchors, washers, Mesh sheets
Work/task organisation and environment: Dark, dustur
derty, hasadous 11
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- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.

Exertion -How	much force is the pe	rson using? – think a	about starting or stop	ping quickly	Body part
1 No effort	2	3 Modecate & speed	4	5 Maximum force or speed	•
Awkward po	sture - How awk	ward is the person's	posture?		
1 All postures neutral	2	3 Molecately upcomfortable		5 Very uncomfortable	
Vibration-	How much are the y	hole body or hand(s	being vibrated?		(upper)
1 None	2	3 Moderate	4	5 Extreme	elbow back low wrist
Duration -	How long is the a	ction performed for?	A		
1 < 10 minutes	2 10-30 min	3 30 min – 1 hr	4 1-2 hrs		low leg
Repetition-	How often are si	milar actions done?	/		Back
1 No repetition	2	3 cycle time < 30 s	4	5 cycle time < 10 s	

Risk controls

Design control options: (eliminate, substitute, engineer 055 (00) spei ay ou ONG Administrative control options:

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Workpla	ce
Date:	Workplace:
Risk assessors	
Work unit/team:	Mh Crew
Positions: Mat	lerrals E
Names:	
Task description	a stocking bolting supplies on to MBG50 Miner
Why was this task	selected: Onerus manual task
Location where tas	skoccurs: Derelopment panels
Who performs the	task: All crew members
General descriptio	n: Supplies are noved to the read of Miner A daisy chain of people then transfer into stange areas on Miner
Postures: Finis (two.bolts)	the boass load Reaching out with 14kg
Forceful/muscular	exertions: Ams shoulders back noring 14 kg.
Repetition and dur	ration: 100 reps / 20 min
Tools or equipmen	t used: Alane.
Work/task organise	ation and environment: Unever mudy Alvor conditions on 3 step staircase

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.

Exertion -How	much force is the	e person using? - think	about starting or st	opping quickly	Body part
1 No effort	2	3 Moderate fo ce & speed	4	5 Maximum force or speed	•
Awkward po	sture - How	awkward is the person's	posture?		
1 All postures neutral		3 Moderately uncomfortable	4	5 Very uncomfortable	Ren merek
Vibration-	How much are t	he whole body or hand(s) being vibrated?		shoulder
1 None	2	3 Moderate	4	5 Extreme	elbow back
Duration -	How long is the	he action performed for	,		Diputing I hand
1 < 10 minutes	2 10.30 min	3	4	5	low leg
Repetition-	How often an	e similar actions done?	1-2113	1 ~ 2 1115	Back
1 No repetition	2	3 cycle time < 30 s	4	E Cycle time	

Design control options: chain either break into 2 groups or change location with chein on term - cossette which can provide bulk change over of materials using machine (LHD). (eliminate, substitute, engineer) Sharttern - rotate long

Administrative control options:

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Workplace	
Date:	Workplace:
Risk assessors	
Work unit/team:	
Positions:	
Names:	
Task description	
Name of task:	
Why was this task select	ed:
Location where task occu	Jrs:
Who performs the task:	
General description:	
Postures:	
Forceful/muscular exertic	ons:
Repetition and duration:	
Tools or equipment used	
Work/task organisation a	nd environment:

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.

Exertion -Ho	INSTALL w much force is the	person using? - think	MCAL Second starting or s	topping quickly	Body part
1 No effort	2	3 Moderate force & speed	4	5 Maximum force or speed	•
Awkward po	osture - How a	wkward is the person's	s posture?		
1 All postures neutral	2	3 Moderately uncomfortable	4	5 Very uncomfortable	y y
Vibration-	How much are th	e whole body or hand	(s) being vibrated?		(upplie)
1	2	3	4	5	elbow back
None		Moderate		Extreme	1 (🖛 🖞 wrist/
Duration -	How long is th	e action performed for	7		knee
< 10 ninutes	10-30 min	30 min – 1 hr	1 – 2 hrs	2 hrs	low leg
Repetition-	How often are	e similar actions done?			Back
1 No repetition	2	3 cycle time < 30 s	4	5 cycle time < 10 s	· ·
_Risk c	ontrols				
Design contr	ol options:	8			
(eliminate, sι	ubstitute, engir	neer) Koran	e opvera	TOX-S UN JOH	58.
hoore A	T OPTION	S OF WH	the Dr	ILL STEELS	AND SORTS
HRE Por	SCT RONGED	, trong t	TO INSTA	clATION,	ann a mar aite air ann an an an an an air air a' bhail a' Mhair ann air an air an an Ann
POSITION	of o	PRRATOR			
in fur	LY AUTO	MATED	ROLTING	SUSTEM.	
ONE 5	TEP BOL	J Deilen	$\neg a - c$	TEMICAL.	
BETTE	R POD	LOADING -	MACHINI	Z + POD.	
	a control outin				
Administrativ	e control optic	ons.			

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and the second second second second second second

Lowe.

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Workplace
Date: Workplace: Woof Belfer.
Risk assessors
Work unit/team: Jerenny Ubran Stepher Beauraft Chris Georg
Positions:
Names:
Task description
Name of task: Roof boltary operator.
Why was this task selected: Statiscally carry highest injury vates
Location where task occurs: Face
Who performs the task:
General description: Abland drill for drill, comment drill, most delly most chemical metal balt, who ahure, metall both
Postures: Twisting
Forceful/muscular exertions: High fraces ragd.
Repetition and duration: come toot cycle - I mon.
Tools or equipment used:
Work/task organisation and environment: Drotz korany confined, darh.
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- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.

Exertion -Hov	v much force is the	person using2-think	about starting	or stopping quickly	Body part
1 No effort	2	3 Moderate force & speed	4	5 Maximum force or speed	
Awkward po	sture - How a	wkward is the person'	s posture?		
1 All postures neutral	2	3 Molerately uncomfortable	4	5 Very uncomfortable	P neck /
Vibration-	How much are th	e whole body or hand	(s) being vibrat	ed?	affoulder
1	2	3	4	5	elbow Thek
None		Moderate		Extreme	Wist/
Duration -	How long is th	e action performed for	?		
1	2	3	4	5	
< 10 minutes	10-30 min	30 min – 1 hr	1 2 hrs	> 2 hrs	low leg Hankle/loot
Repetition-	How often are	e similar actions done	2		Back
1 No repetition	2 5	3 cycle time < 30 s	4	5 cycle time < 10 s	
Risk c	ontrols			- · · · ·	1

Design control options:

(eliminate, substitute, engineer)

Administrative control options: kmon h dler ho

felocate consumette: Rotation at open

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date a	nd Workplac	æ							
Date:	16/3/16	M	Vorkplace:	F	Brudfe	rd Hot	el.		
Risk as	ssessors								
Work u	init/team:								
Positio	ns:								
Names									
Task d	escription								
Name	of task: 📿	ochol	iting						
Why w	as this task	selected:	po	tentio	d for b	ade (si	waldee	injury	•
Locatio	n where tas	k occure	. Míz.		. [1	ines		
Who p	erforms the	ask: N	Aine worke	0~ C	contin	DUS M			
Who p	erforms the f	task: N	le up bo	on c 213 DUL Fr Vernica	vom bad	to of p	rod		
Who p	erforms the a	task: N 1: · Pre · Pre · Ins · Ins	le up bo le up ch le up ch iert cher ert bolt	on c 213 DUt fr micel - inte	vom bad J- o hole	k of p	od . use b	ollerc	ontrol f
Who p Genera Posture	erforms the al description es: 1.C+ 1- Sfretc	iask: N 1: , Pic · pic · ins · ins · ins · ins · ins · ins · withing within	le up be le up be le up ch sert chev sert bolt isting ith orm	on c 213 24 fr remice micel - inte	vom bad 1- o hole re head	LOC P	rod . use b	ollerc	ontrol f
Who p Genera Posture Forcefu	erforms the al description es: lift: sfretc ul/muscular	iask: h i: Pic Pic Pic Ins Ins y # tw hnig wi exertions ile.	le up bo le up bo le up ch sert chev sert bolt it orm i: · lift. • inse	on c 23 24 25 24 25 20 4 5 20 4 5 20 4 5 20 4 5 20 4 5 20 21 3 20 21 3 21 3 21 3 21 3 21 3 21	vom bad d- o hole re head out solf and	L OF P - Skg.	rod . use b p	oller c Irft	antrol f
Posture Forceful Ishnig b Repetil	erforms the al description es: 1.ft :- sfretc ul/muscular >U micon tion and dura	task: h i: Pic Pic Pic ins ins y # tw hrig wi exertions ile. ation:	le up bo le up bo le up ch sert chev ert bolt isting ith arm i lift inse l overy	on c 23 24 fr emice micel - int abov ing ba ut ng k 2 min	vom bad d- o hole ie had obt zolf oud miles.	L OF P - - - - - - -	rod . use b r t arm	oller c	antrol f
Who p Genera Posture Shring b Repetit	erforms the al description es: 1.64	task: N i: Pic Pic Pic ins ins tused: used:	 MIG Aine worke Aine	on c 213 24 fr micel abor ing ba strong he 2 min roof	vom bad d- o hole ie head obt obt whee. bolt -	2 of p	rod . use b p	oller c	ontrol t

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.

Exertion -Ho	w much force is the	person using? - think	about starting or s	topping quickly	Body part
1 No effort	2	3 X Moderate force & speed	4	5 Maximum force or speed	•
Awkward po	osture - How a	wkward is the person's	posture?		
1 All postures neutral	2	3 Moderately upcomfortable	4	5 Very uncomfortable	
Vibration-	How much are the	e whole body or hand(s	s) being vibrated?		shoulder
1	2	3	4	5	elbow back
None	×	Moderate		Extreme	wrist/
Duration -	How long is the	e action performed for?	,		To nipenign
1	2	3	4	5	
< 10 minutes	10-30 min	30 min – 1 hr	1-2 hrs	> 2 hrs	low leg ankle/foot
Repetition-	How often are	similar actions done?			Back
1 No repetition	2	3 cycle time < 30 s	4	5 cycle time < 10 s	

Risk controls

Design control options:	
(eliminate, substitute, engineer)	Confirm use of chemical insert. too)
	Standard location of Consummables.
	housekeeping.

Longterm - one step drill & bolt.

Administrative control options:

	Worksheet 1—PErforM Risk Assessment Tool
	PErforM - Participative Ergonomics for Manual Tasks
	Manual tasks risk assessment form
	Date and Workplace
	Date: 10-3-16 Workplace: Roof Bolting.
	Risk assessors
	Work unit/team:
	Positions: MUTING ROOF BOLLING.
	Names: Roy Dorok Dorle Dreval Barry Trens.
	Task description
	Name of task: install, a. Gm, Cable Bolt
-	Why was this task selected: High Mich. Manual banding Took.
-	Location where task occurs: Undersound, Multi Bolte.
	Who performs the task: Bolter operators.
2.3.5.	Dres, the cablebotts to better grover - som artige. Bott weights gives. Roky (4) place chemical in hole 1.2m tubes install the cablebott into doit hole, manual feed.
	Postures: Standing, bending & force pushing cuble.
	Forceful/muscular exertions: Is Starg, pushing, shoulder pushing.
	Repetition and duration:
	20 cable bolls por Shift. She Shift. porposon).
	Tools or equipment used: LHD. for transport, the mesh & balts
-	Multipolter, maching,
C	Work/task organisation and environment: Un derground wet Modoy, Levelogment, Work, humsd. Echod,
	© The State of Queensland (Department of Employment and Industrial Relations) October 2007, University of Queensland, Curtin University of Technology
5	is is a place change. Mining Method.
C	21 average 500 bolts per da.
	Workplace HealtHand Safety Queensland, Department of Justice and Attorney-General PErforM Worksheet 1 and Worksheet 2 PN10865 Version 2 Last undated April 2011

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.

1 No effort	2	3 Moderate force & speed	4	5 Maximum force or speed	•
Awkward p	osture - How av	wkward is the person's	posture?	7	
1 All postures neutral	2	3 Moderately uncomfortable	4	5 Very uncomfortable	
Vibration-	How much are the	whole body or hand(s) being vibrated?		sh
1	2	3	4	5	elbow back
None		Moderate		Extreme	ZAS
Duration -	How long is the	action performed for?			Contright -
1	2	3	4	5	kne
< 10 minutes	10-30 min	30 min – 1 hr	1-2 hrs	> 2 hrs	iow leg
Repetition-	How often are	similar actions done?	4	5	Back
No repetition		cýcle time		cycle time	1.)
Risk of Design control (eliminate, su Made Tf	controls ol options: ubstitute, engin mads avaitab	eer) person closert	o the	mochine	Third-1
Rig Revi Administrativ	DIRECTIO	no From ree Back	Syster	T = N/S	> *

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Workplace
Date: 1636 Workplace: MG20
Risk assessors
Work unit/team: DEVELOPMENT
Positions: BOLTER
Names: A HEALD
Task description
Name of task: ROOFBOLTING
Why was this task selected: WORKSHOP
Location where task occurs: MG20 DeV
Who performs the task: ROOFBOUERS
General description: LOADING BOLT POOS DRILLING BOLTING MESH TO POSITION
Postures: BENDING & STRETCHING
Forceful/muscular exertions: CHUCK IN DUT. LIFTING BOUTS
Repetition and duration: CONSTANTLY HETING TURNING STRETCHING
Tools or equipment used: BOLTS CHUCKS DRILL STECLS
Work/task organisation and environment: TRAINING, CONFINCED HOT/HUMID RUSHEP
@ The State of Owenedge d (Department of Employment on d in directical Deletion a) Ortober 2007

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
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Exertion -How	much force is the pe	rson using? think a	about starting or stop	ping quickly	Body part
1 No effort	2	3 Moderate force & speed	4	5 Maximum force or speed	•
Awkward po	sture - How awk	ward is the person's	posture?		
1 All postures neutral	2	3 Moderately uncomfortable	4	5 Very uncomfortable	neck
Vibration-	How much are the v	hole body or hand(s) being vibrated?		(upper)
	2	3	4	5	elbow 7 back
None		Moderate		Extreme	wrist/
Duration -	How long is the a	ction performed for?			
1 < 10 minutes	2	3	4	5	
< 10 minutes	10-30 min	30 min – 1 hr	1 – 2 hrs	> 2 hrs	low leg
Repetition-	How often are si	milar actions done?			Back
1 No repetition	2	3 cycle time < 30 s	4	5 cycle time 🗶 < 10 s	

Risk controls

Design control options:

(eliminate, substitute, engineer) Engineer Twisting 1. Rotal Reduci

Administrative control options:

Worksheet 1—PErforM Risk Assessment Tool
PErforM - Participative Ergonomics for Manual Tasks
Manual tasks risk assessment form
Date and Workplace
Date: 82-3-16 Workplace: Clarence Airly
Risk assessors
Work unit/team:
Positions:
Names: JAC, Pete, MATT, MICK
Task description
Name of task: ROOF both installation
Why was this task selected: topical - relevent to all inderground (coal)
Location where task occurs: Cool face 1 Development face.
Who performs the task: trained coercitors
General description: insert divill steal into chock, Clrill, remove clrill insert dolly into divilling, add bolt, plate, chemical spin to roof, wait for set time, tighten bott. - come low roof requiring dist se 2 steel installation
Postures: standing, reaching, the twisting, stepping up low
Forceful/muscular exertions: poshing steels, reaching into poch. lifting mesh, steels, plates, posh chemial operato roof
Repetition and duration: Shr shift on bolting, 4 rigs = 2 openations constantly bolting
Tools or equipment used: mobile botter, drill steels, abligs mesh, bolts, chemicals plates.
Work/task organisation and environment: roof support following
Support rule & TARPS in dark, wet, slorrey drill tailing
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Maskulaas Haalib and Balabi Orisonaland, Decement of Scatter and Attended Occurs

NSW Department of Industry, Resources Regulator, Mine Safety 27

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
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Exertion -Hor	w much force is the	person using? - think	about starting or st	opping quickly	Body part
1 No effort	2	3 Moderate force & speed	4	5 Maximum force or speed	•
Awkward po	osture - How av	wkward is the person	posture?		
1 All postures neutral	2	3 Moderately uncomfortable		5 Very uncomfortable	
Vibration-	How much are the	whole body or hand	(s) being vibrated?		shoulder
1	2		4	5	elbow back
None Duration -	How long is the	action performed for	2	Extreme	in nipotriar with hand
1 < 10 minutes	2 10-30 min	3 30 min – 1 hr	4 1 – 2 hrs	hrs	low leg
Repetition-	How often are	similar actions done?	/		Back
1 No repetition	2	3 cycle time < 30 s	A	5 cycle time < 10 s	

Risk controls

Design control options:

(eliminate, substitute, engineer) Thotake workforce failed on additionali person to assist with last management. rea on bolter. - create a larger work a change levers-spacing & acce ergonomics - improve - self drilling roof bolts. plastic root wesh (10 Full automation Administrative control options:

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Workplace Health and Safety Queensland, Department of Justice and Attorney-General

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Work	place
Date:	Workplace:
Risk assessors	
Work unit/team	:
Positions:	G
Names:	
Task descriptio	n
Name of task:	ROOF BOLT INSTRUCTION
Why was this ta	ask selected: Common THER FOR ROOF BOLT
Location where	task occurs: UB FACE AROA
Who perfo rm s t	the task: BOLTION OPERATORS
General descrip	otion: Derettile & BOLT INSA ARATON
	All and a second a
Postures: 00	ER REACHING, TWISTING
Forceful/muscu	ar exertions: LIFTING BOLT FROM POD, LIFING A
Repetition and	duration: DRILL on BOLT HANDLONG, STAND WI ON
Tools or equipm	HANDLOS, MULTI + BOLTAL
Work/task orga 2	TASK, NOISE, VIBRATON, WET, DATRIC
C The State of O	ueensland (Department of Employment and Industrial Relations) October 2007

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- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
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1	2	3	4	5	
No effort		Moderate force		Maximum force	
		& speed		or speed	
Awkward po	sture - How a	wkward is the persons	posture?		
1	2	3	4	5	
All postures		Moderately		Very	0
neutral		uncomfortable		uncomfortable	neck
Vibration-	How much are th	e whole body or hand(s) being vibrated?		shoulder
1	2	3	4	5	elbow hack
None		Noderate		Extreme	I wrist/
Duration -	How long is th	e action performed for			hip/migh
1 < 10 minutes	2	3	4		
	10-30 min	30 min – 1 hr	1 – 2 hrs	>2 hrs	low leg Hankle/foot
< to minutes	10 00 1111				
Repetition-	How often are	similar actions done?	/		Back
Repetition-	How often are	similar actions done?	4	5	Back

(eliminate, substitute, engineer)

Administrative control options:

TA3K

ROTATION, STRETCHANCE, HAZARD INDENTIFICATION.

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Markalace Health and Safety Oueensland Department of Justice and Attorney General

STORAGE DESIGN, AUTO BEELT INSTAULATON

li

Worksheet 1—PErforM Risk Assessment Tool

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form
Date and Workplace
Date: 22/3/16 Workplace: Springent
Risk assessors
Work unit/team: G Cant J. Cleeson A West 1) Unit A. Nert
Positions: Operatory/Hister.
Names:
Task description
Name of task: pland Bolton
Why was this task selected: Manual Handling Issuess
Location where task occurs: SPRENCURVE - MERE GENERAL.
Who performs the task: Z Man Crew.
General description: Sartalling &n Caste Solts using a hand held Solter - Ssim hole 4x1.5 Zx1m length drall steels.
Postures: Standing, Scuding, reaching, lifting
Forceful/muscular exertions: Prohing, Lifting pulling. dragging. Repetition and duration: Shars por 8h- shift
Tools or equipment used: Rambor hand held air operated botter.
Work/task organisation and environment: 13 per shift, uneven Noon, Wet bad voot, ribs, close proximally to conveyor.
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- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
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- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.

1 No effort	2	3 Moderate force & speed	4	5 Maximum force or speed	
Awkward p	osture - How	awkward is the persons	posture?		
1 All postures neutral	2	3 Moderately uncomfortable	4	5 Very uncomfortable	neck
Vibration-	How much are t	the whole body or hand(s) being vibrated?		should
1	2	3	4	5 etbo	Dack the
None	1	Moderate	~	Extreme	141
Duration -	How long is	the action performed for?		1	hipshigh
1	2	3	4	5	knee
< 10 millutes	10-30 min	30 min – 1 hr	1-2 hrs	> 2 bre	wieg
Repetition- 1 No repetition	How often a	e similar actions done? cycle time < 30 s	4	5 cycle time < 10 s	Back
Risk	controls				
Desian cont	rol options:				
(eliminate, s ティンマム dr、リン・ハ	substitute, eng	ineer) hand he	12 50	liter for a	
	, J				
Josign on	chis can	not read in	to install	(centre Solts)	
	ve control opti	ions:			
Administrati					
Administrati	rodution	· v.16 0-	the er	playees.	

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There 1e'

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
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Exertion -Hov	w much force is the p	erson using? – think	about starting or stop	ping quickly	Body part
1 No effort	2	3 Moderate force & speed	4	5 Maximum force or speed	•
Awkward po	sture - How awa	ward is the person's	posture?		
1 All postures neutral	2	3 Moderately uncomfortable	4	5 Very uncomfortable	E.
Vibration-	How much are the	whole body or hand(s	s) being vibrated?		shoulder
1 None		3 Moderate	4	5 Extreme	elbow back low back back wrist/
Duration -	How long is the a	action performed for?	,		hipthigh hand
1 < 10 minutes	10-00 min	3 30 min – 1 hr	4 1 – 2 hrs	5	low leg
Repetition-	How often are s	imilar actions done?		1	Back
1 No repetition	2	3 cycle time < 30 s	4	5 cycle time < 10 s	

Risk controls

Design control options:

(eliminate, substitute, engineer)

LIGHTER MEST MESH HANDLER MESH SUPPORT ARMS.

Administrative control options:

CAPITAL & MANUAL HANDLING (RAININC. EDURE

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Workplace
Date: 23.3.16 Workplace: UNDER GRAIND,
Risk assessors
Work unit/team: MICK PUTUR DENNIS
Positions:
Names:
Task description
Name of task: MSBRATING CABLIS POLT MATO ROOF (LONG-TONDON CABLE
Why was this task selected: - KUGALLY MANUALLY INTONSWIS - DALLY TASK / REPUTITIVES
Location where task occurs: UNDER GRAIND (GENSRAL)
Who performs the task: OPERATORS (of BOLTIONS SRWY)
General description: POSITION CABLIS AT HOUB LACATION MAMAILY LINE UP CABLE GND WITH DRILL HOLIS · GRIPPING CABLE FORCE-FLED CABLE INTO HOLIS UNTIL REACHES DEPTH (6-10m.)
Postures: REACHING OUT THON WIFTING TO ABOUT SHOULDERS, BENT OVER
- RAGING CABLE, PUSCING
Repetition and duration: 8-20 TIMDS PLAN \$6 HOUR UPTIME / SHUET
Tools or equipment used: AADS (GLAIS) TOSAM LIFT (2 persons)
Work/task organisation and environment: UNGUSN GRAND, WET/MUD DARK, NOAR BETTED.
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- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
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No effort	2	3 Moderate force & speed	4	5 Maximum force or speed	- NOCK BACK
Awkward p	osture - How a	wward is the person's	s posture?		- SHOULDBRS
1 All postures neutral	2	3 Moderately uncomfortable	4	5 Very uncomfortable	R neck
Vibration-	How much are the	whole body or hand(s) being vibrated?		Shoulder
1		3	4	5	elbow back low
None		Moderate		Extreme	hip hip high
Duration -	How long is the	e action performed for	1		knee
1 < 10 minutes	2	3	4	5	iow leg
de.	10-30 min	30 min – 1 hr	1 – 2 hrs	2 hrs	ankle/foot
Repetition-	How often are	similar actions done?	11		Back
1 No repetition	2	3 cycle time	4	5 cycle time	 Kyleijs
		< 30 s	1	< 10 s	
Risk	controls	< 30 s	1	< 10 s	
Risk Design cont	controls rol options:	< 30 s	1	< 10 s	
Risk Design cont (eliminate, s	controls rol options: substitute, engin	< 30 s	1 	<10 s	and anot il-
Risk Design cont (eliminate, s - <i>CABL</i> &	controls rol options: substitute, engin	< 30 s	J JT (Re	<10s RUIRES REDUC	Trood on MAST HATC
Risk Design cont (eliminate, s - <i>CABL</i> - SELF	controls rol options: substitute, engin FBAD A - DRUU	< 30 s	J JT (Re	<10s RUIRES REDUC	Trood in Mast Hard
Risk Design cont (eliminate, s - <i>CABL3</i> - <i>S</i> &2, f - <i>FROCC</i>	controls rol options: substitute, engin - DRUU - DRUU &S DESIGN	< 30 sol	ST (Re	<10s RUIRES REDUC Supplies	and - Mast Hard
Risk Design cont (eliminate, s - CABLS - CABLS - SELF - PROUS - ROUS	controls rol options: substitute, engin fisted A - DRILLI es DESIGN TS. (Autor	< 30 s	ST (Re	<10s RUIRES REDUC Supplies	Trad - MAST HAR
Risk Design cont (eliminate, s - CABL3 - SELF - ROCO - ROCO K R331	controls rol options: substitute, engin - DRUU - DRUU - DRUU - DRUU - DRUU - DRUU - DRUU - DRUU - DRUU - DRUU	< 30 sold and a sold a	ST (Re 117 of (PR3)	<10s RUIRES REDUC SUPPLICES REDUCE SETO	Trool - MAST Hote
Risk Design cont (eliminate, s - CABL& - SE2F - PROCO - ROCO K- R331 Administrati	controls rol options: substitute, engin - DRILLI - DRILLI	< 30 s	J JT (Re 1173 A (M2)	<10s RUHRES REDUC SUPPLIES REDUCE SETO	Trool - MAST Here Marky Supp Roa's
Risk Design cont (eliminate, s - CABLS - SELF - PROUS - ROUS - ROUS Administrati	controls rol options: substitute, engin <i>FBB A</i> - DRILLI SS DESIGN SS DESIGN VE CONTROLOGIE Ve control optio	< 30 s	ST (Res MITY of (ARS)	<10s RUIRES REDUC Supplies REDUCE Sete	Trad - MAST HAR
Risk Design cont (eliminate, s - CABL3 - SEZF - PROUS - ROUS - ROUS Administrati TASK MIN Z	controls rol options: substitute, engin - DRULI - DRUL	< 30 s	ST (Re 1103 of (PR3)	<10s RUIRES REDUC SUPPLIES REDUCE SET	Trool - MAST Hora

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

ate: 22/03/2016W	lorkplace: BolTING WORKSHER.
lisk assessors	
Vork unit/team:	
ositions:	
vames:	
Task description	
Name of task: Kee	F-BOLTIME DRILLIM 27mm
Why was this task selected:	BOLTING WORKSHOP.
ocation where task occurs:	14.
Who performs the task:	CM OPERATER.
	and the second
General description:	a of DRILL STEEL FROM HOLDER
LOWER DRILL	PODS, INSERT PRICE STEER, HOLD
SJEEL AND RAICO	A TO ROOF, ENGAGED AUTO DAY
	STEEL
COMPLE DRICL	
Postures: Twics ring	Aens SotenDINZ GRIFFING OF
Postures: Twicsfing	Aris & FENDING GRIFFING OF.
Postures: Twics rung CC + HAND OVER Forceful/muscular exertions:	Arns & TENDING GRIFFING OF ATION ON DRICC FUNCTION. LIFTING & AKIFFING & TUTSTION
Postures: Thirs FLING ECC, HAND OVER Forceful/muscular exertions: RILL STECL	APIEN ON DELLA FUNCTIONS
Postures: This contract Postures: This contract Porceful/muscular exertions: CILL STEEL Repetition and duration: >	Arns Extending Griffing of Ation on Ducco Functions. LIFTING & AKIPPING & TUTISTICAL
Postures: T_{M} or E_{L} Forceful/muscular exertions: R_{LL} STEGL Repetition and duration: $>$ T_{T} T_{CT} T_{CT} T_{CT}	Arns & Tendinz Guirring of ATION ON DUCCE FUNCTIONS LIFTING & AKIERING & TUTISTICA 24 CENETITION: 10 to 20 Sec
Postures: T_{M} or F_{L} $T_{C} \leftarrow HAND$ or F_{C} Forceful/muscular exertions: R_{LL} SUCCL Repetition and duration: $>$ $T_{C} = \frac{1}{2} + 1$	Arns SotenDINZ GRIFFING OF ATION ON DUCCO FUNCTIONS. LIFTING & ALIFFING & TUTISTICA 24. CENETITION: 10 to 20 Sec. Roof Balter
Postures: T_{M} or E_{L} $T_{C} \leftarrow H_{M} \land Or E_{L}$ Forceful/muscular exertions: $R_{LL} \land OT \in C$ Repetition and duration: $>$ $T_{C} \land T_{C} \land C \land C$ Fools or equipment used:	Ans Sotendine Guirring of Ation on Ducco Functions. LIETINE & AKIERING & TUTISTICA 24. CENETITION: 10 to 20 Sec. Roof Solter,
Postures: T_{M} or E_{L} Forceful/muscular exertions: R_{LL} STEEL Repetition and duration: $>$ Tools or equipment used: Work/task organisation and	Arns SotenDINZ GRIFFING OF ATION ON DRILLE FUNCTIONS. LIFTING & ALIFFING & TUTISTICA 24. CENETITION: 10 to 20 Sec. Reaf Solter. environment: ST SUPPERS WORKING ON

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.

Exertion -Ho	w much force is the p	erson using? – think	about starting or st	opping quickly	Body part
1 No effort	2	3 Moderate force & speed	4	5 Maximum force or speed	•
Awkward po	osture - How aw	kward is the person's	posture?		
1 All postures neutral	2	3 Moderately uncomfortable	4	5 Very uncomfortable	E.
Vibration-	How much are the	whole body or hand(s) being vibrated?		shoulder
1	2	3	4	5	elbow back
None		Moderate		Extreme	back wrist/
Duration -	How long is the	action performed for			In nigothigh
1 < 10 minuton	2	3	4	5	
< 10 minutes	10-30 min	30 min – 1 hr	1 – 2 hrs	>2 hrs	low leg Hanklefloot
Repetition-	How often are	similar actions done?			Back
1 No repetition	2	3 cycle time < 30 s	4	5 cycle time < 10 s	

Risk controls

Design control options:

(eliminate, substitute, engineer)

1. -> REPOSITION DRUL STEEL HOLDER 2 -> INSTALL DRUL HOLDER 3-> INVESTIGATE SELF DRILLING BOLTS, 4- CONSIDER TO USE DIFFERNT BIT SIZE TO REDUCE DRILLING TIME.

Administrative control options:

-> 1. ROTATE ORERATORS, 2-> TRAINED & COMMUNICATE OAELATOR. 3. UP DATE / LEVIEW ROLEDURES,

Erfort anual ate ar ate: isk as /ork u ositior ames ask de ame o	M - Participative Ergonomics for Manual Tasks I tasks risk assessment form nd Workplace 22-3-16 Workplace: CLARENCE ssessors mit/team: G. C.BO DAMD EPTO ns: Witton DEPLOP. ENG OP. : escription	
lanual ate ar ate: isk as /ork u ositior ames ask de ame c	I tasks risk assessment form nd Workplace D2-3-16 Workplace: CLARENCE ssessors mit/team: G.C.BO DAMD EPTO ns: Vistor DEPLOP. ENG OP. : escription	
ate ar ate: isk as /ork u ositior ames ask de ame c	nd Workplace 22-3-16 Workplace: <u>CLARENCE</u> ssessors init/team: <u>G. C. BO</u> DAMO EPTO ns: <u>Vistor</u> <u>DEPOP</u> . <u>ENG</u> OP. : escription	
ate: isk as /ork u ositior ames ask de ame c	22-3-16 Workplace: CLARENCE ssessors mit/team: <u>G. C. BO</u> DAMO EPTO ns: <u>Visitor</u> <u>DEPOP</u> . ENG OP. : escription	
isk as /ork u ositior ames ask de ame c	ns: Victor DEPLOP. ENG OP.	
/ork u ositior ames ask de ame c	ns: Vistor DEPOP. ENG OP.	
ositior ames ask de ame c	ns: Visitor DEPOP. ENG OP.	
ames ask de ame o	escription	
ask de ame o	escription	
ame o		
	of task: INSTALL SHEET OF MESH OF MULT	Ro
/hy wa	as this task selected:	
ocatio	on where task occurs: UNDER GROUND, FACE.	
/ho pe	erforms the task: OPERATORS.	
enera	al description: GET WESTI FROM POD AT REAR OF V	n
	LIGT MESTI ONTO M/C.	
	PLACE ONTO RICH. TRS.	
	A HULL REDUCTORING TO THE MELTING	
osture	DUE TO LIFTING. & TWISTING.	
orcefu	ul/muscular exertions: PULLING, LIETING, ABOVE SHOP	৩ঢ়
epetit	tion and duration: 2 HOURS . PER-GHIET.	
ools o	or equipment used: ROSE BOLTER POD - ELMCO	
Vork/ta	ask organisation and environment: DARK RESTRICTED.	
	WET MUNNY, LOOGE LOAL	
© The Univer	State of Queensland (Department of Employment and Industrial Relations) October 2007, rsity of Queensland, Curtin University of Technology	

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.

Exertion -How much force is the person using? - think about starting or stopping quickly					Body part
1 No offert	2	3 Mederate force	4	5 Maximum force	
No emort		& speed		or speed	
Awkward po	sture - How awk	ward is the person's	posture?		
1	2	3	4	5	
All postures neutral		Moderately uncomfortable		Very uncomfortable	neck
Vibration-	How much are the v	whole body or hand(s) being vibrated?		shoulder
1	2	3	4	5	elbow 7 back
None		Moderate		Extreme	back wrist/
Duration -	How long is the a	ction performed for?			(i) hipmist
1	2	3	4	5	
< 10 minutes	10-30 min	30 min – 1 hr	1 – 2 hrs	> 2 hrs	low leg
Repetition-	How often are si	milar actions done?			Back
1 No repetition	2	3 cycle time < 30 s	4	5 cycle time < 10 s	

Risk controls

Design control options:

(eliminate, substitute, engineer)

Administrative control options:

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Workplace	
Date: <u>23-3-16</u> . Workplace:	Underground Coal Mines - various si
Risk assessors	
Nork unit/team: Clinton Smith	
Positions: H	1
ames:	
Task description	- roof botter on most mounted Rig
Why was this task selected: Know	urs and upper body.
Nho performs the task:	tors (nnin, ng" technicians)
General description: Obtain de insert drill steel into pool, Drill hole chuck, place to	cill steel from pad reach out and drill pod of Church of drill dapth remove from selve into drill/bolt pad.
Postures: (eaching, the	sting, bending.
Forceful/muscular exertions: push chuck and removi	ing /pulling steel into drill ing form church, foristing hand act
Repetition and duration: repitition	were to be peried.
fools or equipment used:	stel. and drill rigs
Nork/task organisation and environm confined space.	ent: wet, dark, slippery,

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.



PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Workplace DEVELOPMENT Date: 23 Workplace: 11 **Risk assessors** Work unit/team: 🖊 Positions: Tirk-Names: 2885 ner 300 Task description Boltin continuous Name of task: Koof Miner 12CM3C Why was this task selected: Topicer bate Looption where task occurs: ma Who performs the task: an e General description ゴー Installet. IN Cer the hold Postures: -1 Forceful/muscular exertions: esh 10 Cla Repetition and duration vale clok Clemice Tools or equipment used: bo the chen 50 1H Cerrip 100 Roll Work/task organisation and environment: p restricted poor Scale UIS ite © The State of Queensland (Department of Employment and Industrial Relations) October 2007, 101 University of Queensland, Curtin University of Technology E la 120 shift

Workplace Health and Safety Queensland, Department of Justice and Attorney-General PErforM Worksheet 1 and Worksheet 2 PN10865 Version 2 Last updated April 2011

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.

Exertion -Ho	w much force is the	person using? - think a	about starting or st	opping quickly	Body part
1 No effort		3 Moderate force & speed	4	5 Maximum force or speed	•
Awkward po	osture - How a	wkw.rd is the person's	posture?	/	
1 All postures neutral	2	Moderately uncomfortable	4	5 Very uncomfortable	
Vibration-	How much are th	e whole body or hand(s	being vibrated?		choulder
1	2	3	4	5	elbox back
None		Moderate		Extreme	wrist/
Duration -	How long is th	e action performed for?			Windign T
1 < 10 minutos	200	3	4		
	10-30 min	30 min – 1 hr	1-2 hrs	> 2 hrs	low leg
Repetition-	How often are	similar actions done?	1		Back
1 No repetition	24-	3 cycle time < 30 s	4	5 cycle time < 10 s	

Risk controls

Design control options	5:			
(eliminate, substitute,	engineer) Lobsky	- Cable	inster the	e; dedicated
Co-sumable	Sterrage cree	5 hyo	taule	forecome-
hftas gra	noth	South	nig	amententin

Administrative control options: growthand (proceedure, training le antage No the

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Westerland three and before because of the second states of the

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Workplace
Date: 23.3.16 Workplace: Clorence
Risk assessors
Work unit/team: Joy Centennia
Positions:
Names: Grant Sullivan, Daniel Chan, Jomes Streeter, Andrew Thomas
Task description
Name of task: Marh Handling
Why was this task selected: Awklowed, sheatler, neek
Location where task occurs: Underground Der roudierays.
Who performs the task: Balter Offerator
General description: Manufort mesh from veer of machine to the top of the TRS-
Postures: Handy above head
Forceful/muscular exertions: Shoulders, back museles, neck, arms.
Repetition and duration: I minute cycle - 30 records. 7 cycles per hoer.
Tools or equipment used: hands PPE
Work/task organisation and environment: Underson and minister of minister week, coal offillage. Anoven floor

University of Queensland, Curtin University of Technology

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.

Exertion -How	v much force is the p	person using? - think	about starting or st	opping quickly	Body part
1 No effort	2	3 Moderate force & speed	4	5 Maximum force or speed	•
Awkward po	sture - How aw	/kward is the person's	posture?		
1 All postures neutral	2	3 Moderately uncomfortable	4	5 Very uncomfortable	R met
Vibration-	How much are the	whole body or hand(s	s) being vibrated?		shoulder
1	2	3	4	5	elbow back
None		Moderate		Extreme	back wrist/
Duration -	How long is the	action performed for?	2		niphigh F knoe
1 < 10 minutos	2	3 🍙	4	5	
< to minutes	10-30 min	30 min – 1 hr	1 – 2 hrs	> 2 hrs	low leg ankie/loot
Repetition-	How often are	similar actions done?			Back
1 No repetition	2	3 cycle time ∦y < 30 s	4	5 cycle time < 10 s	

Risk controls

Design control options: (eliminate, substitute, engineer) Engineer a solution Have a rack mounted at the front of the moultibolter. The rack can have a hydraulic cylinder to raise it to the pharators can use a hook to shoe of ATRS on.

Administrative control options:

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Workplace
Date: 23-3-16 Workplace: METRO
Risk assessors
Work unit/team: WALLY, GORDON, PAUL SHANE, CRAIG
Positions: IME, CHECKY, GEO OPERATOR
Names:
Task description
Name of task: GETTING MEGABOIL FROM POD > LOB
Why was this task selected: Knowp SAFET/ 1390E
Location where task occurs: OUTBYE, SECONDARY SUPPORT
Who performs the task: CONTRACTORS X2 OPS
General description: UNIODDIDG, DRAGGIDG & INSERTING MEGABOITS AS PER SUPPORT PLAN
Postures: AWKWORD LIFTING, TWISTING, ECEPTION
Forceful/muscular exertions: DRACGING MEGABOH & POSHINGL
Repetition and duration: 20 TIMES PER SHIFT
Tools or equipment used: ELECTRIC, Hydrachic Drill Rich
Work/task organisation and environment: UNEVER GROUPS, WET MUDDY ROADWAY

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.



Risk controls

Design control options:

(eliminate, substitute, engineer) OBSTER CARLE BOH PUSHER, HOUSEKEEDISC

Administrative control options:		
ROTATE EXERSION	EFTS	RIGHT, FRONT & BACK
BETWEEN OPS		

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Workplace
Date: 23/3/16 Workplace: V~Derceo-ND
Risk assessors
Work unit/team: Teveropment
Positions:
Names: DARREN, ODE, NOY DANNY, JAMES, MATT
Task description
Name of task: INSTALLING 8M CABLE BOLT (PRIMARY SUPPORT)
Why was this task selected: PRIMARY ROOP SUPPORT AD
Location where task occurs: ALL GATE COADT
Who performs the task: OPENTING
General description: INSTALL &M SUMO BOLT EVERY 2M (2x2 PATTERN), MANUAL HANDLING REGULAD TO INITUL BOLT IN TO HOLF
Postures: POOR. UMITED ROOM TO MOVE BENT OFER & TWIST TO LIFT A POVE HEAD.
Forceful/muscular exertions: YET, APPAPY 24 kg FOR A 8M CABLE, NEED TO PUSH INTO HOLE ABOVE
Repetition and duration: APROX 2 PER HOUR HIS KEAD
Tools or equipment used: ALC MANUAL HANDLING TO PLON INTO HOLE
Work/task organisation and environment: DEVELOPMENT PAJEL
PADWAY CABLE BOLT WETHERATION OFF
© The State of Queensland (Department of Employment and Industrial Relations) October 2007, University of Queensland, Curtin University of Technology
MOT & HUMID NOREFLACE, MINER.
12 HR SMIFTS.
WET ENVIRONMENT

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.

1	2	3	4	5	
No effort		Moderate force	0	Maximum force	
	1	a speed		or speed	
Awkward po	sture - How av	wkward is the person's	posture?		
1	2	3	4	5	
All postures neutral		Moderately uncomfortable		Very Sontable	
Vibration					shoulder
vibration-	How much are the	e whole body or hand(s	being vibrated?	5	elbow back
(1)	2	5	-	5	9 00 8
None		Moderate		Extreme	the state of the s
Duration -	How long is the	e action performed for?			mindian -
1	2	3	4	5	knee
< 10 mi	10-30 min	30 min – 1 hr	1-2 hrs	> 2 hrs	low leg
/	1.0.00			2 113	ankle/foo
Repetition-	How often are	similar actions done?			Back
1 No repetition	2	3 cycle timo	4	5 ovcle time	
NO repetition	0	< 30 s		< 10 s	
Risk c	ontrols				
Design contro	ol options:				
(eliminate, su	ibstitute, engin	eer)			
31012	T TEAM	- 3-1-	200	Joe Joe T	Piores a
	CABLE	HANDLER	OPT ON:	(coster)	CHA-GOOT
	to (ARLE BOLT	MATOCI	LC C PATTER	and S
Lovo	TERM	- AVTO	MATED	BOLTING CY	LE /MACHIN
0.0.00	BETTE	R DEDIGN	OF PLA	TFORM	
	ette		-		
Administrativ	e control optio	ns:			
2 P	ELSON J	os, Job	POTADA	J	

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Workplace
Date: 23 3/16 Workplace: DEV RANEL
Risk assessors
Work unit/team: AL (TAYF, PATE SON, EDD 1, PETCA + BILL PAEW
Positions: OPENATION.
Names: A TEAM.
Task description
Name of task: CUT + BOLT
Why was this task selected: Hild FAEDUENIM OF MUDENT.
Location where task occurs: FALE
Who performs the task:
General description: CUT OUT & BOLT MOOF + RIBS.
Postures: BENDINE, MINUTL HANDLINE, EXENTION - STREALHING
Forceful/muscular exertions: INSENTIONS DE BULTE - TWISTING / BENDINA,
Repetition and duration: VENT REPETITIVA - 6 REPETITIONS / HA-
Tools or equipment used: HONAVLIL RIGG. DAILL STEELS.
Work/task organisation and environment: SWP'S - BOLTING, TRAINING
GOPERVISION, PPE - HOT, HUMID, VANIABLE ROOF 7 RIB (DVD ITTO.
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- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
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1	2	3	1	5	
No effort	2	Mode ate force & speed	1	Maximum force or speed	•
Awkward po	osture - How a	wkward is the person's	posture?		
1 All postures neutral	2	3 Modestely uncomfortable	4	5 Very uncomfortable	
Vibration-	How much are th	e whole body or hand(s	being vibrated?		shoulder
1	2	3	4	5	elbow back
None		Moderate		Extreme	back wrist
Duration -	How long is th	e action performed for?			
1 < 10 minutes	2	3	4	5	P P
	10-30 min	30 min – 1 hr	1 – 2 hrs	> 2 hrs	low leg
Repetition-	How often are	similar actions done?			Back
1 No repetition	2	3 cycle time < 30 s	4	5 cycle time 1 < 10 s	
Risk c	ontrols				
Design contro	ol options:	The second second	T. D. C. T.		
eliminate su	hstitute engr	eer 51-/0	STRIAL - 1	FAERURAT TON	S ROTATION.
		- 37-7	naut Art.	1 Augan ATRI	REERENHEN
		01-1	the line	1 Hour low Pat	1.001001164
- 1	FE I Times	NE HOT	T. V. IL	5- C	
TO	10211100	or ortan	Int Or	strock.	
		1			

Administrative control options:

STASDONNE-

+ QUALITY EQUIPMENT LOWTHEL PRU2En mont SWP'S. REULEM + IMPROVE

SELF

DRILLINE

BALT

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Workplace Health and Safety Queensland, Department of Justice and Attorney-General PErforM Worksheet 1 and Worksheet 2 PN10865 Version 2 Last updated April 2011

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form Date and Workplace Workplace: TAHMOOR Date: 23 316 Risk assessors Work unit/team: J. VANHEERDEN, J. LOUGARD, G. FOODEY, P. PRIESI, C. DOMER L. DAVIES Positions: ENGINEERS, EPERATIONS Names: Task description Name of task: PUTTING DRILY, STEEL IN DRILL POT. Why was this task selected: THIS IS A SIGNIFICANT & REPETITUE PART OF THE BOLTING CYCLE Location where task occurs: DRODUCTON FACE Who performs the task: ODERATOR TRADES TRAINED AND AUTHORISED. General description: JOY CAPA 12CM20, NORTH-SOUTH FACING RIGS HERZLO BOLTIN POD POSITIONED 1-2M BEHIND BOLTING STATION, NO PLATFORMS, NO TRS, NO RIB Postures: AKKER BORNER, AWKWARD GETTING BOUT STEEL OUT OF POD Forceful/muscular exertions: REACHING BACK TO GRAB STEEL OUT OF POD HOAM, OVER REACHING ; TWISTING Repetition and duration: YES, REPETITIVE 6x DER M, 10M PER SHIFT. Tools or equipment used: N(A-70 UPT 3 Prove STEEL Work/task organisation and environment: DARK, DUSTY, HOT, 9-12hr lengths Shill

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
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Exertion -Ho	w much force is the	person using? – think	about starting or	stopping quickly	Body part
1 No effort	2	3 Moderate force & speed	4	5 Maximum force or speed	•
Awkward po	osture - How a	wkward is the person's	posture?		
1 All postures neutral	2	3 Moderately uncomfortable	4	5 Very uncomfortable	1 V/ neck
Vibration-	How much are th	e whole body or hand(s) being vibrated?	,	allino
1	2	3	4	5	elbow back
None		Moderate		Extreme	back wrist/
Duration -	How long is th	e action performed for	?		
1	2	3	4	5	
S to minutes	10-30 min	30 min – 1 hr	1 – 2 hrs	> 2 hrs	low leg
Repetition-	How often are	similar actions done?			Back
1 No repetition	2	3 cycle time < 30 s	4	Cycle time	

Risk controls

1

Design control options:
(eliminate, substitute, engineer)
ELIMINATE: AUTOMATION®
SUBSTITUTE: WITH SELF DRILLING BOUTSO
ENGINEER: RE. POSITION STREL PODO.
: LIGHTEN DRILL SPEEL 2

Administrative control options:

- PROCEDURE: WALK BACK TO POD RATHER THAN REACH POD.

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Workplace Health and Safety Queensland, Department of Justice and Attorney-General PErforM Worksheet 1 and Worksheet 2 PN10865 Version 2 Last updated April 2011 Long TERM: (2)

PErforM - Participative Ergonomics for Manual Tasks

Manual tasks risk assessment form

Date and Workplace
Date: 23/3/16 Workplace:
Risk assessors
Work unit/team:
Positions:
Names:
Task description
Name of task: IRILL ROOF HOLE W ROOFBATTER
Why was this task selected: HIGEST RISK OF PERSONAL INJURY
Location where task occurs: DEN PANEC.
Who performs the task:
General description: - OBTAIN DRILL STEEL FROM POP. · MSSRT PRILL STEEL, DRILL HOLE TO DEPTM, REMOVE DRILL STEEL.
Postures: REACHING, TWISTING, PULLING & PUSHING.
Porceful/muscular exertions: Tubunder & Pourne Steer in To DRUE MOTOR.
Repetition and duration: 20min Por HR. OVER GHR PORIOD. REPETITION 1- EVERY 60-70 SEC.
Tools or equipment used: Deve Stores, Rus Deve Ric.
Work/task organisation and environment: War Support PARK Con FINED

- 1. Indicate on the body chart which area(s) of the body you feel are affected by the task.
- 2. If more than one body part is affected, you may shade the different body parts in different colours. If so, use the matching colour when scoring the risk factors (e.g. red for arms on the body and score sheet, blue for low back on the body and score sheet).
- 3. Give each risk factor a score out of five. One (1) is when the risk factor is not present and five (5) is when the risk factor is the most severe level they have experienced.

1	2	3	4 -2	15	
No effort		Moderate force & speed	Ţ	Maximum force or speed	•
Awkward po	osture - How a	wkward is the person's	s posture?		
1 All postures neutral	2	3 Moderately uncomfortable	4	5 Very uncomfortable	and 2
Vibration-	How much are th	e whole body or hand	s) being vibrated?		shoulder
1	2	3	4	5	elbow back
None		Moderate		Extreme	back wrist
Duration -	How long is th	e action performed for	?		inight knee
1	2 🗳 🖌	3	4	5	
< 10 minutes	10-30 min	30 min – 1 hr	1 – 2 hrs	> 2 hrs	low leg Hankleffoot
Repetition-	How often are	e similar actions done?			Back
1 No repetition	2	3 cycle time < 30 s	4	5 cycle time < 10 s	

Risk controls

Design control options:

(eliminate, substitute, engineer) REPOSITION STEELS, SEVIEW Access

TO DRILL MOTORS

SHOET FORM: SUBTITUTE W/ SDRB, TO REDUCE MOVEMENTS BY LONG FORM: AUTOMATION.

Administrative control options:

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Markalaas Haalth and Pafaty Oyaanaland, Department of Justice and Attorney Caneral

50%