



General Risk Assessment

Management Unit:	School of Engineering	Location: (Site/ Building/ Room)	Mechanical Workshop Areas, Rms.201,301, Rankine Building
Assessment Date:	13/05/16	Review Date:	12/05/17
Assessors Name:	Denis Kearns	Job Title:	Workshop Unit Manager
Task / Activity: Carrying out a number of physical engineering tasks within the Mechanical Workshop areas such as drilling, fitting, welding, manual handling, guillotine, surface grinding, bandsaw, chop saw			

What are the hazards? (See list of sample hazards)	What are the risks?	Who might be harmed? (eg Staff, students, visitors)	What control measures are required to eliminate or reduce the risks?	Risk Evaluation			Risk Rating Low, Medium or High
				Consequence (1 – 3)	Likelihood (1 – 3)	Overall risk (C x L)	
Using general mechanical workshop machinery including lathes, mills, grinders, guillotines, welding plant, Band saws	abrasions, cuts, burns, eye injury, entanglement in moving machinery, severance of limbs, crush injury	Technicians	<ul style="list-style-type: none"> Appropriate PPE <u>must</u> be worn Access to the workshop machining areas are strictly restricted to authorised personnel only. No one may operate workshop equipment unless they have received a sufficient training and permission from the management. Specific risk assessments for machinery and the generic risk assessment for power hand tools have been completed and safe systems of work issued to operatives. Guards on the machines <u>must</u> be used. All workshop equipment is regularly maintained and serviced. Long hair <u>must</u> be completely covered and suitable eye protection worn 	3	1	3	M

			<ul style="list-style-type: none"> Weld curtains and anti-flash guards are used when deemed appropriate 				
Using power hand tools and associated electrical equipment for use on machine tools.	Electric shocks or burns from using faulty electrical equipment with possible electric seizure or fatality. Abrasions and eye injury.	Technicians, Logistics personnel	<ul style="list-style-type: none"> Appropriate PPE <u>must</u> be worn Access to the workshops portable electrical equipment is restricted to certified personnel only. There is a validated PAT testing for electrical safety on each portable appliance. Electrical cables and plugs should be regularly visually inspected by the user for damage. Any defective equipment will be reported to the technician-in-charge and taken out of use until the repair has been effected. Electrical equipment is always operated in accordance with manufacturers' instructions. 	3	1	3	M
Manual handling of heavy/bulky objects	Back injury, crush injury, Entrapment, damage to goods being lifted or transported	Staff, Students, Visitors	<ul style="list-style-type: none"> A risk assessment <u>must</u> be completed for lifting heavy and bulky loads that present a risk of injury. Training in lifting techniques will be provided for workshop staff who undertake the lifting of heavy loads. Appropriate PPE for lifting operations must be worn. Appropriate lifting tackle used for specific job. Lifting equipment will be registered with the University's Engineering Insurers and annual inspections carried out. Records of the inspections must be kept in the safety file. 	3	1	3	M
Use of Hazardous Substances such as solvents, coolants and	irritating or hazardous vapours, skin sensitisation, dermatitis, burns, asphyxiation	Staff, Students, visitors	<ul style="list-style-type: none"> A COSHH risk assessment will be completed for using substances that may present a hazard to health. A Material Safety Data Sheet (MSDS) must be kept together 	2	1	2	L

chemicals			<p>with a risk assessment in the Workshop Safety File for future reference.</p> <ul style="list-style-type: none"> All containers used for storage of hazardous and non-hazardous substances must be suitably labelled indicating their contents 				
Slips and trips	Strains, bruising, limb breakages, concussion, laceration	Staff, Students, Visitors	<ul style="list-style-type: none"> Workshop working areas must be kept clear of obstructions and the floor must be kept free from oil and swarf. Any spillages should be cleaned up immediately. Any hazards such as trailing cables, defects to floor coverings and faulty lighting etc. should be reported immediately to the technician-in-charge. All areas well lit. 	2	1	2	L
Fire	Burns, asphyxiation, death	Staff, Students, Visitors	<ul style="list-style-type: none"> Equipment will be switched off when not in use for long periods. All portable electrical equipment will be tested for electrical safety at correct intervals and labelled with the date of the test. Flammable substances <u>must</u> be kept away from naked flames and ignition sources. Flammable substances are kept in an appropriate fire resistant metal cabinet. The fire alarm system is installed, maintained and tested. Workshop users must be acquainted with the Fire Routine Procedure for the building. Fire Stewards are appointed to cover the workshop area. 	3	1	3	M

Working at height (fall from a stepladder)	Strains, bruising, limb breakages, concussion, lacerations	Technicians, E&B Staff, Contractors	<ul style="list-style-type: none"> Users <u>must</u> be familiar with the risk assessment and safe system of work for using stepladders. Users <u>must</u> be familiar with the University Guidance on the Use of Stepladders at: http://www.gla.ac.uk/services/seps/az%20index/laddersandstepladders/ A stepladder will have a visual inspection by the user prior to use for damage. Stepladders are individually identified and formal inspections is carried out and records of inspection kept. Any defective stepladder will be clearly labelled and immediately taken out of use. 	3	1	3	M
Excessive Noise	<ul style="list-style-type: none"> Damage to hearing. 	Staff, Students, Visitors	<ul style="list-style-type: none"> If necessary the noise risk assessment should be carried out and suitable hearing protection supplied. 	2	1	2	L
Lone / Out of Hours (LOOH) Working	<ul style="list-style-type: none"> Non discovery of injured party when seriously injured. 	Technicians, Students	<ul style="list-style-type: none"> Lone working in the workshop are strictly prohibited. A system to avoid lone working may be allowed that requires an extra person (buddy) to be present during certain machining processes. Permission <u>must</u> be granted by management. Modern apprentice and non-experienced personnel <u>must</u> not be left unsupervised in workshop areas while machining work is in progress. 	2	1	2	L
Gas Cylinder Usage and Storage	Crush injury, Explosion of gas, asphyxiation	Technicians, Students	<ul style="list-style-type: none"> Appropriate storage of gas bottle cylinders by use of rack or cradle system. Handing and moving cylinders with correct bottle carrier. Equipment such as regulators, hosing, piping checked at 	2	1	2	L

			<p>regular intervals and replaced if required.</p> <ul style="list-style-type: none">• Required H&S knowledge and safe working practice of equipment being used.				
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GUIDANCE ON COMPLETION OF RISK ASSESSMENT

1. EXAMPLE HAZARDS THAT MAY BE APPLICABLE TO THE JOB or WORK ACTIVITY			
Working at Height	Noise	Hand tools	Vibration
Falling objects	Extreme Heat / cold	Confined spaces	Repetitive hand/ arm movement
Slippery/ uneven/ worn floors	Radiation	Poor housekeeping / cleaning	Machine operation
Obstructions/ projections	Lighting	Vehicle movement	Electro Magnet
Manual handling	Compressed air	Fire / explosion	Pressurised systems
Mechanical Lifting	Substances / materials	Electricity	Other (<i>specify on assessment</i>)

2. RISK MATRIX		Potential consequence of harm		
		1 – Minor Injury (e.g. hazard can cause illness, injury or equipment damage but the results would not be expected to be serious)	2 – Significant Injury (e.g. hazard can result in serious injury and/or illness, over 3 day absence)	3 – Major Injury (e.g. hazard capable of causing death or serious and life threatening injuries)
Likelihood of harm	1 – Unlikely (injury rare, though possible)	1 – Low	2 – Low	3 – Medium
	2 – Possible (injury could occur occasionally)	2 – Low	4 – Medium	6 – High
	3 – Probable (injury likely to occur, can be expected)	3 – Medium	6 – High	9 – Extreme

3. RISK EVALUATION

This is calculated by multiplying the likelihood against the consequence e.g. taking a likelihood of 1, which is classified as Unlikely and multiplying this against a Potential Consequence of 2, which is classified as Significant Injury, would give you an overall Risk Rating of 2, which would result in an overall evaluation as a low risk.

1 to 2 = Low risk

Low risks are largely acceptable, monitor periodically to determine situation changes which may affect the risk, or after significant changes

3 to 4 = Medium risk

Medium risks should only be tolerated for the short-term and then only whilst further control measures to mitigate the risk are being planned and introduced, within a defined time period.

6 = High risk

High risks activities should cease immediately until further control measures to mitigate the risk are introduced. The continued effectiveness of control measures must be monitored periodically.

9 = Extreme Risk

Work should not be started or continued until the risk has been mitigated. Immediate action is required to reduce exposure. A detailed mitigation plan must be developed, implemented and monitored by senior management to reduce the risk before work is allowed to commence



General Risk Assessment

Management Unit:	School of Engineering	Location: (Site/ Building/ Room)	Mechanical Workshop Areas, Rm201,301, Rankine bld.
Assessment Date:	24/02/16	Review Date:	24/02/17
Assessors Name:	Denis Kearns	Job Title:	Workshop Unit Manager
Task / Activity: Operation of Workshop Mills			

What are the hazards? (See list of sample hazards)	What are the risks?	Who might be harmed? (eg Staff, students, visitors)	What control measures are required to eliminate or reduce the risks?	Risk Evaluation			Risk Rating
				Consequence (1 – 3)	Likelihood (1 – 3)	Overall risk (C x L)	Low, Medium or High
Ejection of tool from holder/spindle	<ul style="list-style-type: none"> Eye injury Head injury (concussion) Puncture wound 	<ul style="list-style-type: none"> Operator/ technician. Other technicians /labourers 	<ul style="list-style-type: none"> Correct PPE must be worn at all times. Tooling must be secured before use with correct speeds/feeds selected. Use coolant to prolong tool life, lubricate and prevent overheating of job. Worn tooling should be discarded or sharpened. All safety guards must be in place when machine is in operation. 	3	1	3	M
Ejection of job from table/Mount	<ul style="list-style-type: none"> Body injuries such as crushing, bone breakage 	<ul style="list-style-type: none"> Operator/ technician. Other technicians /labourers 	<ul style="list-style-type: none"> Jobs/fixtures securely fastened with correct clamping systems. Correct feeds and speeds selected. All safety guards must be in place when machine is in operation. 	3	1	3	M

Machine entanglement while in motion fast traverse	<ul style="list-style-type: none"> • Body injuries such as crushing, bone breakage • lacerations 	<ul style="list-style-type: none"> • Operator/ technician. 	<ul style="list-style-type: none"> • Loose clothing/jewellery should be secured or not worn. • Long hair tied back or netted. • Awareness of emergency stop button location/activation. 	3	1	3	M
Injury when loading material on/off machine.	<ul style="list-style-type: none"> • Back strain. • Body injuries such as crushing, bone breakage. • Injury to assisting personnel. 	<ul style="list-style-type: none"> • Operator/ technician. • Other technicians /labourers 	<ul style="list-style-type: none"> • Awareness of manual handling obtained from safety course. • Ask for assistance if needed. • Use mechanical handling devices (forklift, hoists) for safe handling. • Never overstretch/reach when manoeuvring work pieces. 	3	1	3	M
Damaged machine safety equipment such as guards, limit/micro safety switches	<ul style="list-style-type: none"> • Body injury to operator. • Injury to persons in near vicinity. 	<ul style="list-style-type: none"> • Operator/ technician. 	<ul style="list-style-type: none"> • All guards are in place and in good working order. • All micro switches, limit switches operational and without faults. 	2	1	2	L
Excessive Noise	<ul style="list-style-type: none"> • Damage to hearing. 	<ul style="list-style-type: none"> • Operator/ technician. • Other technicians /labourers • Students, staff and visitors 	<ul style="list-style-type: none"> • Ear defenders to be worn when excessive noise generated. 	2	1	2	L
Airborne Dust Particles	<ul style="list-style-type: none"> • Respiratory damage to operator. • Respiratory damage to persons in the near vicinity. • Skin/eye irritation. 	<ul style="list-style-type: none"> • Operator/ technician. • Other technicians /labourers • Students, staff and visitors 	<ul style="list-style-type: none"> • If dust is produced while using material such as modelling foam, GRP, carbon fibre, a dust mask and extractor must be used. 	2	1	2	L
Skin contamination from coolant/oil	<ul style="list-style-type: none"> • Skin irritation/damage. 	<ul style="list-style-type: none"> • Operator. • Labourer 	<ul style="list-style-type: none"> • Disposable gloves should be worn if suffering from skin allergies or using irritant material. 	2	1	2	L

			<ul style="list-style-type: none"> Barrier creams are supplied and should be used. 				
Spills and other floor hazards.	<ul style="list-style-type: none"> Strains/bruising. Broken bones. 	<ul style="list-style-type: none"> Operator/technician. Other technicians/labourers Students, staff and visitors 	<ul style="list-style-type: none"> Spills must be mopped/wiped when occurrence noted. Any trip hazards such as trailing leads should be removed immediately. 	2	1	2	L

GUIDANCE ON COMPLETION OF RISK ASSESSMENT

1. EXAMPLE HAZARDS THAT MAY BE APPLICABLE TO THE JOB or WORK ACTIVITY			
Working at Height	Noise	Hand tools	Vibration
Falling objects	Extreme Heat / cold	Confined spaces	Repetitive hand/ arm movement
Slippery/ uneven/ worn floors	Radiation	Poor housekeeping / cleaning	Machine operation
Obstructions/ projections	Lighting	Vehicle movement	Electro Magnet
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Mechanical Lifting	Substances / materials	Electricity	Other (<i>specify on assessment</i>)

2. RISK MATRIX		Potential consequence of harm		
		1 – Minor Injury (e.g. hazard can cause illness, injury or equipment damage but the results would not be expected to be serious)	2 – Significant Injury (e.g. hazard can result in serious injury and/or illness, over 3 day absence)	3 – Major Injury (e.g. hazard capable of causing death or serious and life threatening injuries)
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3. RISK EVALUATION

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General Risk Assessment

Management Unit:	School of Engineering	Location: (Site/ Building/ Room)	James Watt Bld.
Assessment Date:	29/02/16	Review Date:	28/02/17
Assessors Name:	Denis Kearns	Job Title:	Workshop Unit Manger
Task / Activity: Operating Lathes			

What are the hazards? (See list of sample hazards)	What are the risks?	Who might be harmed? (eg Staff, students, visitors)	What control measures are required to eliminate or reduce the risks?	Risk Evaluation			Risk Rating
				Consequence (1 – 3)	Likelihood (1 – 3)	Overall risk (C x L)	Low, Medium or High
ENTANGLEMENT WITH MOVING PARTS	LACERATION, ABRASION, BRUISING AND BREAKING OF BONES	TECHNICIAN OPERATOR	<ul style="list-style-type: none"> Correct PPE (safety glasses, boots, overalls etc.) must be worn at all times. The chuck must be adequately guarded to prevent contact whilst in motion. Operators must be made aware that the lead screw or feed shaft rotate in use and may be unguarded with a danger of clothing being drawn in when in use. Materials should not project beyond the headstock gearing cover through the hollow spindle. 	3	1	3	M
EJECTION OF WORK PIECE, TOOLS, CHUCK KEY AND SWARF	LACERATION, ABRASION, BRUISING AND EYE INJURY	TECHNICIAN OPERATOR, WORKSHOP STAFF, STUDENTS, ACADEMICS	<ul style="list-style-type: none"> The work-piece should be firmly held by a substantial amount of material in the chuck. Work mounted on a faceplate should be securely bolted to it and counter balanced to prevent excessive vibration. Chuck keys should never be left in the chuck and should be 	3	1	3	M

			<p>spring-loaded where possible to prevent this.</p> <ul style="list-style-type: none"> Cutting tools must be securely held in the tool post and excessive overhang of the tool should be avoided to reduce the possibility of breakage. 				
SWARF AND OTHER WASTE MATERIALS	LACERATION, BURNS AND EYE INJURY	TECHNICIAN OPERATOR	<ul style="list-style-type: none"> No attempt should ever be made to remove swarf whilst the machine is in motion, as it can draw hands and clothing into the machine. Swarf can also be extremely hot and burns can occur. 	2	1	2	L
SLIPPING ON SPILLAGES OF CUTTING FLUIDS/ SUDS	ALLERGIES AND SKIN INFECTIONS FROM CONTACT WITH OIL; BRUISING AND CUTS	TECHNICIAN OPERATOR, WORKSHOP STAFF, STUDENTS, ACADEMICS, CLEANERS	<ul style="list-style-type: none"> Suds oils that have been sprayed from the work-piece onto the floor should be soaked up immediately with an absorbent material and cleared away. 	2	1	2	L
MANUAL HANDLING OF CHUCKS AND FACE PLATES	BACK INJURY, TRAPPING OF HANDS, FINGERS AND FEET	TECHNICIAN OPERATOR, WORKSHOP STAFF	<ul style="list-style-type: none"> Chucks and face-plates can be excessively heavy and might require the assistance of another person or the use of a hoist to facilitate two person Lifting .This hoist should also prevent the danger of chucks rolling off the bed onto the hands and feet of the operator. 	3	1	3	M
FINISHING IN THE LATHE	LACERATION, ABRASION, BRUISING AND BREAKING OF BONES	TECHNICIAN OPERATOR, WORKSHOP STAFF, STUDENTS, ACADEMICS	<ul style="list-style-type: none"> The use of files and abrasives such as emery cloth, to finish work in the lathe is potentially hazardous and should not be encouraged. Be alert at all times with no distractions if having to use this method. 	3	1	3	M
POOR LIGHTING AND VISIBILITY	VARIOUS INJURIES MENTIONED ABOVE	TECHNICIAN OPERATOR	<ul style="list-style-type: none"> Work pieces should always have good local lighting from the lathe and area workshop lighting to allow for safe work. 	2	1	2	L

GUIDANCE ON COMPLETION OF RISK ASSESSMENT

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2. RISK MATRIX		Potential consequence of harm		
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Management Unit:	School of Engineering	Location: (Site/ Building/ Room)	Rm 256 (level 2)
Assessment Date:		Review Date:	
Assessors Name:	Denis Kearns	Job Title:	Workshop Unit Manager
Task / Activity: Operation of Surface Grinder			

What are the hazards? (See list of sample hazards)	What are the risks?	Who might be harmed? (eg Staff, students, visitors)	What control measures are required to eliminate or reduce the risks?	Risk Evaluation			Risk Rating
				Consequence (1 – 3)	Likelihood (1 – 3)	Overall risk (C x L)	Low, Medium or High
Eye Injuries	High speed particles injuring eye	Technical Staff, Logistic Staff, Maintenance personnel	<ul style="list-style-type: none"> Machine guards are in place. Correct PPE must be worn (Safety glasses, overalls, safety shoes) 	3	1	3	M
Wheel Explosion	Shattered stone wheel causing body injury	“	<ul style="list-style-type: none"> Machine guards are in place. Only abrasive wheel certificated personnel allowed to dress, balance or remove wheel. Correct clamping procedures used. 	3	1	3	M
Noise	Damage to eardrum	“	<ul style="list-style-type: none"> Wear appropriate ear defenders 	2	1	2	L
Sparks	Eye injury	“	<ul style="list-style-type: none"> Safety glasses Use correct stone for material 	2	1	2	L
Object flying of magnetic chuck	Injury to body in near vicinity to machine	“	<ul style="list-style-type: none"> Insure appropriate clamping procedures used. Magnetic base deployed. 	3	3	1	M

GUIDANCE ON COMPLETION OF RISK ASSESSMENT

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Obstructions/ projections	Lighting	Vehicle movement	Electro Magnet
Manual handling	Compressed air	Fire / explosion	Pressurised systems
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General Risk Assessment

Management Unit:	Mechanical Workshop Area	Location: (Site/ Building/ Room)	James Watt Bld.
Assessment Date:	27/02/15	Review Date:	27/02/16
Assessors Name:	Denis Kearns	Job Title:	Workshop Unit Manager
Task / Activity: Bandsaw / Bomar saw			

What are the hazards? (See list of sample hazards)	What are the risks?	Who might be harmed? (eg Staff, students, visitors)	What control measures are required to eliminate or reduce the risks?	Risk Evaluation			Risk Rating
				Consequence (1 – 3)	Likelihood (1 – 3)	Overall risk (C x L)	Low, Medium or High
Entanglement	Body contact with blade resulting in severe lacerations or severance of digits.	Technician /operator (T/O), logistic person	<ul style="list-style-type: none"> • Correct guard and emergency stop buttons installed. • Push sticks to be used (on bandsaw) when hands are close to blade. • Machine to be used only by experienced personnel after training on safe operation of saws. • No loose clothing or jewellery to be worn. • Long hair to be tied back. • Make sure working area is clear of obstructions. 	3	1	3	M
Manual Handling	Crush injuries with heavy items. Oversized items being unstable when handling.	T/O, logistic person	<ul style="list-style-type: none"> • Heavy items to be lifted and supported by lifting equipment or trestles. • Manual handling risk assessment made by certificated and competent personnel. 	3	1	2	M
Sharp Objects/Material	Puncture wounds, Eye damage	T/O, logistic person	<ul style="list-style-type: none"> • All PPE provided including gloves, dustcoats and eye protection must be used correctly. 	2	1	2	L

Noise	Damaged hearing.	T/O, any person working within area rm.256	<ul style="list-style-type: none"> • Ear defenders to be worn in area if excessive noise operations in progress 	2	1	2	L
Substance released into air	Breathing difficulties from dust. Eye irritation.	T/O, any person working within area rm.256	<ul style="list-style-type: none"> • Liquid lubrication or LEV to be used if performing excessive cutting operation. • Dust masks must be used. 	2	1	2	L
Trips	Body injury resulting in bruising, broken bones or concussion.	Any person working within area rm.256	<ul style="list-style-type: none"> • Area must be kept free from trailing cables, loose items and any other obstructions. • Any liquid spillage or materials debris need to be cleaned up immediately. • Make sure working area is clear of obstructions. 	2	1	2	L
Correct blade speeds and tooth selection for specific materials	Blade shearing leading to lacerations. Excessive heat causing burns	T/O	<ul style="list-style-type: none"> • Blade speed and TPI suit specific material being cut. • Do not apply excessive blade pressure on material being cut. Use lubricants when required. 	2	1	2	L

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Medium risks should only be tolerated for the short-term and then only whilst further control measures to mitigate the risk are being planned and introduced, within a defined time period.

6 = High risk

High risks activities should cease immediately until further control measures to mitigate the risk are introduced. The continued effectiveness of control measures must be monitored periodically.

9 = Extreme Risk

Work should not be started or continued until the risk has been mitigated. Immediate action is required to reduce exposure. A detailed mitigation plan must be developed, implemented and monitored by senior management to reduce the risk before work is allowed to commence