Person: Butler, Jessie (jbutler@jlab.org)
Org: PHALLA

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Jefferson Lab
Thomas Jefferson National Accelerator Facility

Operational Safety Procedure Review and Approval Form # 137184
(See ES&H Manual Chapter 3310 Appendix T1 Operational Safety Procedure (OSP) and Temporary OSP Procedure for Instructions)

Type:	***OSP*** Click for OSP/TOSP Procedure Form Click for LOSP Procedure Form Click for LOTO-COMPLEX Information Click for LOTO-GROUP Information		
Serial Number:	***ENP-22-137184-OSP***		
Issue Date:	***7/19/2022***		
Expiration Date:	***7/19/2025***		
Title:	***Milling Machines***		
Location: (where work is being performed) Building Floor Plans	***101 - Experimental Hall A*** ***72 - Physics Storage*** ***98 - Physics Fabrication - 1***	Location Detail: (specifics about where in the selected location(s) the work is being performed)	***Various Physics Division Location***
Risk Classification: (See ES&H Manual Chapter 3210 Appendix T3 Risk Code Assignment)	Without mitigation measures (3 or 4): With mitigation measures in place (N, 1, or 2):		***3*** ***1***
Reason:	This document is written to mitigate hazard issues that are : ***Determined to have an unmitigated Risk code of 3 or 4***		
Owning Organization:	***PHALLA***		
Document Owner(s):	***Butler, Jessie (jbutler@jlab.org)*** Primary		

Supplemental Technical Validations

High Noise (Dainnya Busbin, Imani Burton, Jennifer Williams)
Machine Tools (Bert Manzlak, Bill Rainey)
Pinch Points (Bert Manzlak, Bill Rainey)
Sharp Edges (Bert Manzlak, Bill Rainey)
ESH&Q Liasion (Bert Manzlak)

Document History

Revision	Reason for revision or update	Serial number of superseded document
	Previous OSP expired.	

Lessons Learned	Lessons Learned relating to the hazard issues noted above have been reviewed.

Comments for reviewers/approvers:	

Attachments
Procedure: ***Milling Machines OSP.pdf***
THA: ***Milling Machines THA.pdf***
Additional Files:

Review Signatures	
Subject Matter Expert : High Noise	**Signed** on 7/18/2022 4:33:47 PM by Jennifer Williams (jennifer@jlab.org)
Subject Matter Expert : Machine Tools	**Signed** on 7/17/2022 8:57:39 PM by Bert Manzlak (manzlak@jlab.org)
Subject Matter Expert : Pinch Points	**Signed** on 7/17/2022 8:57:47 PM by Bert Manzlak (manzlak@jlab.org)
Subject Matter Expert : Sharp Edges	**Signed** on 7/17/2022 8:57:55 PM by Bert Manzlak (manzlak@jlab.org)

Approval Signatures	
Division Safety Officer : PHALLA	**Signed** on 7/18/2022 4:34:36 PM by Ed Folts (folts@jlab.org)
ESH&Q Division Liasion : PHALLA	**Signed** on 7/19/2022 8:38:00 AM by Bert Manzlak (manzlak@jlab.org)
Org Manager : PHALLA	**Signed** on 7/18/2022 4:40:52 PM by Mark Jones (jones@jlab.org)

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Jefferson Lab
Thomas Jefferson National Accelerator Facility

Operational Safety Procedure Form

(See ES&H Manual Chapter 3310 Appendix T1 Operational Safety Procedure (OSP) and Temporary OSP Procedure for instructions.)

Click For Word Doc

Title:	Milling Machines		
Location:	Hall A and Other Physics Division Work Areas	**Type:**	☒ OSP ☐ TOSP
Risk Classification (per Task Hazard Analysis attached) (See *ES&H Manual Chapter 3210 Appendix T3 Risk Code Assignment*.)		**Highest Risk Code Before Mitigation**	3
		Highest Risk Code after Mitigation (N, 1, or 2):	1
Owning Organization:	Physics / Hall A	**Date:**	15 July 2022
Document Owner(s):	Jessie Butler (JButler)		

DEFINE THE SCOPE OF WORK

1. Purpose of the Procedure – Describe in detail the reason for the procedure (what is being done and why).

Jefferson Lab has determined that the use of milling machines are inherently risky and carries an unmitigated Risk Code of 3 or higher. This OSP is used to ensure hazards are communicated and training is appropriate prior to use of these pieces of equipment.

2. Scope – include all operations, people, and/or areas that the procedure will affect.

This OSP covers all milling machines used in Physics Division.

3. Description of the Facility – include building, floor plans and layout of the experiment or operation.

Milling machines are used for the shaping or polishing of metal and other solid materials. This involves movement of an abrasive surface against a work piece.

ANALYZE THE HAZARDS and IMPLEMENT CONTROLS

4. Hazards identified on written Task Hazard Analysis

See attached Task Hazard Analysis (THA)

5. Authority and Responsibility:

5.1 Who has authority to implement/terminate

Hall A Work Coordinator

5.2 Who is responsible for key tasks

Hall A Tech Staff or properly trained personnel by the owner of this document.

5.3 Who analyzes the special or unusual hazards including elevated work, chemicals, gases, fire or sparks (See ES&H Manual Chapter 3210 Appendix T1 Work Planning, Control, and Authorization Procedure)

6. Personal and Environmental Hazard Controls Including:

6.1 Shielding

As required per equipment manual or deemed necessary for the task being performed.

6.2 Barriers (magnetic, hearing, elevated or crane work, etc.)

As required per equipment manual or deemed necessary for the task being performed.

6.3 Interlocks

As required per equipment manual or deemed necessary for the task being performed.

6.4 Monitoring systems

As required per equipment manual or deemed necessary for the task being performed.

6.5 Ventilation

As required per equipment manual or deemed necessary for the task being performed.

6.6 Other (Electrical, ODH, Trip, Ladder) (Attach related Temporary Work Permits or Safety Reviews as appropriate.)

As required per equipment manual or deemed necessary for the task being performed.

7. List of Safety Equipment:

7.1 List of Safety Equipment:

Since this OSP covers several different pieces of equipment, operator must wear proper safety equipment as outlined in the operation manual of the equipment used in performing the task.

7.2 Special Tools:

As required per equipment manual or deemed necessary for the task being performed.

8. Associated Administrative Controls

This OSP, THA and the machine's operation manual.
On the job training and demonstrated proficiency.

9. Training

9.1 What are the Training Requirements (See List of Training Skills)

- Read operation manual
- Read and sign this OSP
- Read chapter 6121 Appendix T1 Safe operation of machine tools
- Receive Supervisor's authorization
- Operational checkout and familiarization by equipment

DEVELOP THE PROCEDURE

10. Operating Guidelines

- Ensure that all operator selector switches and buttons are clearly identified and that you know the function of every key, button, knob, or handle.
- Ensure that the power is off before adjusting work pieces.
- Ensure that the chuck key has been removed from the spindle before starting the machine.
- Use the milling machine spindle brake to stop the spindle after the power has been turned off.
- Ensure that the power is off before adjusting tools, work pieces, or coolant hoses.

- Ensure that the spindle has stopped completely before taking any measurements.
- Ensure that the spindle has stopped completely before loading or unloading a work piece.
- Ensure that hands and arms are kept clear of the spindle start switch when changing tools.
- Inspect cutter and machine and ensure they are in good condition prior to use.
- Ensure that the proper size and type of tool are being used for the job.
- Ensure that cutting tools have been removed prior to cleaning the machine.
- Use a hook or similar device to remove chips.
- Ensure that compressed air is only used to remove chips if the air hose is equipped with a pressure-reducing nozzle. Air must not be used if chips contain hazardous material, such as Radiation. Do not use compressed air to blow chips from personnel.
- Ensure that power drawbars and power-cutter adapter retention mechanisms do not release during power spindle rotation or as a result of power loss.
- Ensure that you are clear of pinch points created by moving guards before starting the machine.
- Ensure that work is done in a well-lit area.
- Ensure that the belt or wheel has stopped completely before moving guards or covers.
- Do not reach around a guard.

11. Notification of Affected Personnel (who, how, and when include building manager, safety warden, and area coordinator)

Notify equipment owner by phone or email in case of incident or equipment malfunction.

12. List the Steps Required to Execute the Procedure: from start to finish.

- Provide clearance between machines so that movement of one operator or helper will not interfere with the work of others.
- Provide ample room for handling of material, work pieces, and chips.
- Provide safe storage and handling of tooling and parts that could dislodge and fall or roll.
- Keep floor area around machine free of obstructions and maintained in safe condition.
- Use attached guard or shield to prevent chips from being thrown, except in areas not assigned as work areas or stations.
- Ensure spindle has stopped completely before moving safeguards or covers.
- Do not reach around a safeguard and ensure that all guards:
  1. Prevent body parts from entering the area being guarded.
  2. Do not create pinch points between the guards and other stationary or moving parts of the machine or tooling.
- Ensure that fixed guards are securely attached to the machine forms, components, or fixtures and, where possible, utilize fasteners removable by tools not normally at the disposal of the operator.
- Ensure that any loose parts on the machine are removed before operating the machine.
- Ensure that the bit/cutter is not in contact with the work piece before the machine is started.
- Ensure that the spindle rotates in the correct direction for the tool being used before cutting material.
- Ensure that rotating cranks and hand wheels are well lubricated and maintained.
- Hand wheels are located on retractable crank to ensure that crank is not protruding while the machine is operation.
- Ensure that work is secured and located. Use stop-blocks where necessary. Keep clamps clear of cutter path.

- Ensure that the correct table feed and spindle speed for the job is used. Reduce feed and speed if any unusual noise or vibration is noticed.
- Only operate the machine in a well-lit area.
- Always stay at the machine while it is running.

13. Back Out Procedure(s) i.e. steps necessary to restore the equipment/area to a safe level.

Stop and contact area Work Coordinator or Supervisor

14. Special environmental control requirements:

14.1 List materials, chemicals, gasses that could impact the environment (ensure these are considered when choosing Subject Mater Experts) and explore EMP-04 Project/Activity/Experiment Environmental Review below

Any coolant used must have a MDS on hand and be approved by the Environmental group

14.2 Environmental impacts (See EMP-04 Project/Activity/Experiment Environmental Review)

N/A

14.3 Abatement steps (secondary containment or special packaging requirements)

N/A

15. Unusual/Emergency Procedures (e.g., loss of power, spills, injury, fire, etc.)

In the event of injury, or an immediate emergency exists, call **911** and also notify: area Work Coordinator and Supervisor

- Guards (**x5822**)
- Occupational Medicine (**x7539**)
- Crew Chief (**x7045**) (if inside the fence)

In case of an injury follow standard JLAB procedures. Initial response cards are located with each phone for appropriate emergency phone numbers. Additional information can be found at https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-24400/*.pdf.

16. Instrument Calibration Requirements (e.g., safety system/device recertification, RF probe calibration)

As required by operator's manual.

17. Inspection Schedules

Operators should conduct a pre-use inspections and as required by operator's manual

18. References/Associated/Relevant Documentation

- User's Manual, Location: In Hall A tech area
- EH&S Manual chapter 6121 Appendix T1 Safe operation of machine tools
- OSHA Standard 29 CFR 1910.212 Machinery and Machine Guarding

19. List of Records Generated (Include Location / Review and Approved procedure)

This OSP and associated THA

Submit Procedure for Review and Approval (See ES&H Manual Chapter 3310 Appendix T1 OSP & TOSP Instructions – Section 4.2 Submit Draft Procedure for Initial Review):

- Convert this document to .pdf
- Open electronic cover sheet: https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-24048/3310T1Form.doc
- Complete the form

- Upload the pdf document and associated Task Hazard Analysis (also in .pdf format)

Distribution: Copies to Affected Area, Authors, Division Safety Officer
Expiration: Forward to ES&H Document Control

Form Revision Summary

Revision 1.7 – 02/25/2021 – Corrected link to Word doc; updated 'ESH&Q' to "ES&H'; other minor edits. No approval required.
Revision 1.6 – 06/23/2020 – Update section 15 to reflect guard number, what to do in an emergency, crew chief numbers, etc. approved by H. Fanning
Revision 1.5 – 04/11/18 – Training section moved from section 5 Authority and Responsibility to section 9 Training
Revision 1.4 – 06/20/16 – Repositioned "Scope of Work" to clarify processes
Qualifying Periodic Review – 02/19/14 – No substantive changes required
Revision 1.3 – 11/27/13 – Added "Owning Organization" to more accurately reflect laboratory operations.
Revision 1.2 – 09/15/12 – Update form to conform to electronic review.
Revision 1.1 – 04/03/12 – Risk Code 0 switched to N to be consistent with 3210 T3 Risk Code Assignment.
Revision 1.0 – 12/01/11 – Added reasoning for OSP to aid in appropriate review determination.
Revision 0.0 – 10/05/09 – Updated to reflect current laboratory operations

ISSUING AUTHORITY	FORM TECHNICAL POINT-OF-CONTACT	APPROVAL DATE	REVIEW DATE	REV.
ES&H Division	Harry Fanning	04/11/18	02/25/24	1.6

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Jefferson Lab
Thomas Jefferson National Accelerator Facility

Task Hazard Analysis (THA) Worksheet

(See ES&H Manual Chapter 3210 Appendix T1
Work Planning, Control, and Authorization Procedure)

Click For Word

Author:	Butler, Jessie (JButler)	**Date:**	15 July 2022	**Task #:** If applicable	N/A

Complete all information. Use as many sheets as necessary

Task Title:	Milling Machines			**Task Location:**	Hall A and Physics Division work spaces
Division:	Physics	**Department:**	Hall A	**Frequency of use:**	As needed
Lead Worker:	Hall A Work Coordinator				
Mitigation already in place: Standard Protecting Measures Work Control Documents	Specific to manufacturer so users of the equipment must read and understand equipment operating manual.				

Sequence of Task Steps	Task Steps/Potential Hazards	Consequence Level	Probability Level	Risk Code (before mitigation)	Proposed Mitigation (Required for Risk Code >2)	Safety Procedures/ Practices/Controls/Training	Risk Code (after mitigation
1	Machine Tools – (e.g., rotating parts, cuts, pinch points, sharp edges, abrasions)	High	Low	3	1. Wear safety glasses 2. Wear gloves	1. Use machine guards 2. Wear proper work attire 3. Read & sign equipment OSP 4. Read and understand equipment Operation Manual	1
2	High Noise Level	Medium	Medium	3	1. Wear hearing protection	1. Properly wear ear plugs or ear muffs when required.	1
3	Dust – (hazardous or nuisance)	Medium	Low	2	1. Wear safety glasses 2. Wear dust mask / respirator is necessary and trained	1. SAF 200: Respirator training	N

Highest Risk Code before Mitigation:	3	**Highest Risk Code after Mitigation:**	1

Task Hazard Analysis (THA) Worksheet

(See ES&H Manual Chapter 3210 Appendix T1
Work Planning, Control, and Authorization Procedure)

When completed, if the analysis indicates that the Risk Code before mitigation for any steps is "medium" or higher (RC≥3), then a formal Work Control Document (WCD) is developed for the task. Attach this completed Task Hazard Analysis Worksheet. Have the package reviewed and approved prior to beginning work. (See ES&H Manual Chapter 3310 Operational Safety Procedure Program.)

Form Revision Summary

Revision 0.2 – 07/26/21 – Periodic Review; updated header and footer
Periodic Review – 08/29/18 – No changes per TPOC
Periodic Review – 08/13/15 – No changes per TPOC
Revision 0.1 – 06/19/12 - Triennial Review. Update to format.
Revision 0.0 – 10/05/09 – Written to document current laboratory operational procedure.

ISSUING AUTHORITY	TECHNICAL POINT-OF-CONTACT	APPROVAL DATE	REVIEW DATE	REV.
ES&H Division	Harry Fanning	08/29/18	07/26/24	0.2

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By signing this page, you testify that you have read, understand, and agree to abide by the procedure specified in the above referenced work control document:

Serial Number: ENP-22-137184-OSP

Title: Milling Machines

Name	Signature	Date