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Org: PHALLA

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Operational Safety Procedure Review and Approval Form # 145956
(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 LO SP Procedure Form Click for LOTO-COMPLEX Information Click for LOTO-GROUP Information |
| Serial Number: | ENP-23-145956-OSP |
| Issue Date: | 1/3/2023 |
| Expiration Date: | 11/3/2025 |
| Title: | Hall A Welding Area |
| Location: (where work is being performed) Building Floor Plans | 101 - Experimental Hall A - A100 Location Detail: (specifics about where in the selected location(s) the work is being performed) Left side of the Hall up against the West wall |
| Risk Classification: (See ES&H Manual Chapter 3210 Appendix T3 Risk Code Assignment) | Without mitigation measures (3 or 4): 3 With mitigation measures in place (N, 1, or 2): 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): | Lumanog, Andrew (andrewl@jlab.org) Primary |

Supplemental Technical Validations

Gas Cylinders (Robert Myles, Tim Minga)
High Noise (Dainnya Busbin, Imani Burton, Jennifer Williams)
Welding, Cutting, Brazing, and Grinding (Jenord Alston, Steve Smith)
Portable Hand Tools (Bert Manzlak, Bill Rainey)
ESH&Q Liasion (Bert Manzlak)

Document History

| Revision <input checked="" type="checkbox"/> | Reason for revision or update <input checked="" type="checkbox"/> | Serial number of superseded document <input checked="" type="checkbox"/> |
|--|---|--|
| 1 | No changes required. | ENP-19-90475-OSP |

| | |
|---|--|
| Lessons Learned | Lessons Learned relating to the hazard issues noted above have been reviewed. |
| Comments for reviewers/approvers: <input type="checkbox"/> | <i>Re-submitted. Added table to section 7.1 of the OSP.</i> |
| Attachments <input type="checkbox"/> | |
| Procedure: <i>Procedure-Hall A Welding Area OSP 2022.pdf</i> THA: <i>THA- Hall Welding 2022.pdf</i> Additional Files: | |
| Review Signatures | |
| Subject Matter Expert : Gas Cylinders | Signed on 12/19/2022 3:21:53 PM by Tim Minga (minga@jlab.org) |
| Subject Matter Expert : High Noise | Signed on 12/19/2022 9:45:59 AM by Jennifer Williams (jennifer@jlab.org) |
| Subject Matter Expert : Hot Work->Welding->Cutting-> Brazing-> and Grinding | Signed on 1/3/2023 10:03:04 AM by Jenord Alston (jalston@jlab.org) |
| Subject Matter Expert : Portable Hand Tools | Signed on 12/30/2022 8:30:52 AM by Bert Manzlak (manzlak@jlab.org) |
| Approval Signatures | |
| Division Safety Officer : PHALLA | Signed on 1/3/2023 10:30:25 AM by Ed Folts (folts@jlab.org) |
| ESH&Q Division Liasion : PHALLA | Signed on 1/3/2023 1:02:02 PM by Bert Manzlak (manzlak@jlab.org) |
| Org Manager : PHALLA | Signed on 1/3/2023 10:10:21 AM by Mark Jones (jones@jlab.org) |

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Operational Safety Procedure Form

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

Click
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| | | | |
|--|---------------------|---|--|
| Title: | Hall A Welding Area | | |
| Location: | Hall A | Type: | <input checked="" type="checkbox"/> OSP <input type="checkbox"/> 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: | December 12, 2022 |
| Document Owner(s): | Andrew Lumanog | | |

DEFINE THE SCOPE OF WORK

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

The purpose of this procedure is to establish a dedicated welding area in Hall A

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

Hall A technical staff will use this area for the fabrication and modification of many different types of material used during installation. The area's primary focus will be welding, cutting, grinding, and soldering; which is done on a regular basis.

1. **Welding:** TIG, MIG, and FCAW
2. **Grinding:** Includes hand tools, 4 and 7 inch hand grinders. Grinding will precede welding and produce sparks; majority will be carbon steel.
3. **Soft Soldering (Brazing):** Includes 600-1500 degrees F; Handy Harmon brazing flux (paste). Copper to stainless steel (silver solder joints)
4. **Hard Soldering (Brazing):** Includes 600-1500 degrees F; Handy Harmon brazing flux (paste). Copper to stainless steel (silver solder joints)

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

The area is located inside Hall A on the Right side (referring to beam direction).

The location will be against the West wall near the sprinklers and well away from the VESDA sensors.

Rear and side walls of the area are protected by metal sheets along their perimeter to contain any sparks that are produced in this area.

Forward wall, separating the work area from the main building, consist of standard welding screens with fire proof material extending from the bottom of the screen to the floor.

Cabinets, shelves, etc... in the area and close vicinity will be made of non-combustible materials.

A fire extinguisher will be kept beside of the welding table and at the entrance/exit point of the area.

These extinguishers will be inspected monthly by the area's Safety Warden.

Any appreciable amount of flammable liquids will be stored in flammable lockers when not in-use.

Refrasil fire-retardant cloths or metal screens will be used to protect any combustible material that can't be moved.

Flammable gases not in-use will be stored outside of area; empties stored separately. Flammables will be stored at a minimum of 20 feet away from oxidizers.

Welding screens will be used to protect other worker, in the area, from sparks, heat, debris, etc... produced during welding and grinding.

ANALYZE THE HAZARDS and IMPLEMENT CONTROLS

4. Hazards identified on written Task Hazard Analysis

- 1- Thermal burns
- 2- UV exposure to eyes and skin
- 3- Fire
- 4- Lacerations
- 5- Eye injury
- 6- Hearing loss

5. Authority and Responsibility:

5.1 Who has authority to implement/terminate

Hall A Work Coordinator / Fire Marshall

5.2 Who is responsible for key tasks

Andrew Lumanog or designee

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](#))

SAF 108
 Welding Qual (If Applicable)

6. Personal and Environmental Hazard Controls Including:

6.1 Shielding

Welding screens and fire blankets will be used as needed.

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

Welding screens

6.3 Interlocks

N/A

6.4 Monitoring systems

N/A

6.5 Ventilation

Standard Hall Ventilation and Shop smoke eaters shall be used as needed for any work causing a smoke or ventilation hazard.

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

1. See 6122 and its appendices for more discussion on hazards.
2. Flammables should be moved a minimum of 35' from hot work. Items which cannot be moved should be protected by a welding curtain and/or a fire retardant cloth.
3. Clean grinders before and after grinding aluminum. Clean up aluminum dust promptly after grinding. Use only grinding wheels approved for aluminum.
4. Ensure that all work is properly grounded, If welding on a metal table be sure that it is connected to a building or earth ground.

7. List of Safety Equipment:

7.1 List of Safety Equipment:

- Welding Shield
- Hearing Protection
- Safety Glasses (clear and tinted)
- Hats
- Gloves
- Face Shield
- Welding Shirt / Jackets
- Fire Extinguisher

Welding controls and PPE:

| Equipment Required? | Welding | Torch Cutting | Brazing | Saw Cutting | Grinding |
|---|--|---------------|---------|-------------|----------|
| Fire extinguisher | Yes | Yes | Yes | Yes | Yes |
| Safety glasses or goggles | No – TIG All other welding safety glasses required under helmet | Yes | Yes | Yes | Yes |
| Faceshield over safety glasses or goggles | No | No | No | Yes | Yes |
| Leather gloves | Yes | Yes | Yes | Yes | Yes |
| Hearing protection | YES: when welding aluminum | No | No | Yes | Yes |
| Welding helmet & screens | Yes | No | No | No | No |

| | | | | | |
|--|----------------------------|-------|-------|----|---|
| Shade lens | Yes** | Yes** | Yes** | No | No |
| Respirator | Yes – FCAW | No | No | No | YES: when grinding aluminum |
| Local exhaust (e.g. smoke eater, elephant trunk) | Yes – FCAW, plasma cutting | No | No | No | YES: grinding aluminum (where feasible) |

****Shade Lens Requirements**

| Welding operation | Protector | Arc Current (amperes) | Typical Filter Lens Shade |
|--------------------------------|--|-----------------------|---------------------------|
| Gas Tungsten Arc Welding (TIG) | Welding Helmet | <50 | 8-10 |
| | | 50-150 | 8-12 |
| | | 150-500 | 10-14 |
| Gas Metal Arc Welding (MIG) | Welding Helmet | < 60 | 7 |
| | | 60-160 | 10-11 |
| | | 160-250 | 10-12 |
| | | 250-550 | 10-14 |
| Torch Brazing and Soldering | Welding Goggle, or Helmet | N/A | 2 to 4 |
| Plasma Cutting | Welding helmet with integrated Power air purifying respirator (PAPR) | <20 | 2-4 |
| | | 20-40 | 5 |
| | | 40-60 | 6 |
| | | 60-80 | 8 |
| | | 80-300 | 8-9 |
| | | 300-400 | 9-12 |
| | | 400-80 | 10-14 |

When performing Tungsten Inert Gas (TIG) welding, safety glasses are not required under the welding helmet.

However, do not flip weld shield up before weld puddle has cooled.

Respiratory protection may be worn under a voluntary basis for TIG and MIG welding, cutting, and grinding. Contact Industrial Hygiene to obtain respiratory protection.

By standers of grinding operations must wear the full required PPE.

7.2 Special Tools:

Welding Machine, Cutters and Grinders

8. Associated Administrative Controls

This OSP and associated THA

9. Training

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

SAF108 (when applicable)
 SAF150 (when applicable)
 MED14 (when applicable)
 SAF150GT (when applicable)
 SAF150FC (when applicable)
 SAF150GM (when applicable)

DEVELOP THE PROCEDURE

10. Operating Guidelines

This OSP and Chapters 6120, 6122 and 6640 Appendix T2 of the EH&S Manual.

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

In the event of fire, injury or any other emergency, all personnel are to follow the JLAB emergency action card attached to the phones, Emergency Response Procedure poster, or in the ES&H manual. Fire and serious injury dial 911 then security at ext. 5822 Non-life threatening medical call Medical Services at ext. 7539 (during normal business hours)

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

1. Clear area of all explosive, flammable and hazardous materials.
2. Assess the need for a fire watch (each job).
3. Inspect fire extinguishers
4. Don proper PPE
5. Ensure local ventilation is available if needed.
6. Check all equipment before use to ensure proper operation.
7. Ensure the following dangers have been eliminated or specifically addressed before proceeding.
 - a- Penetrating a pressurized system.
 - b- Penetrating a container of hazardous material.
 - c- Affecting an item that is potentially radioactive.
 - d- Damaging property.
 - e- Welding of hazardous materials (refer to material SDS). Lead is prohibited.
 - f- Remove paint from surfaces prior to hot work using safe chemical stripper (i.e. Smart Strip) to remove paint 4" from both sides of hot work area.
8. Stop all welding ½ hour prior to end of shift and check for fires and gas leaks.

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

Stop and Re-assess.

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

| |
|--|
| N/A |
| 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.) |
| <p>In the event of injury, or an immediate emergency exists, call 911 and also notify:</p> <ul style="list-style-type: none"> • Guards (x5822) • Occupational Medicine (x7539) • Crew Chief (x7045) (if inside the fence) <p>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.</p> |
| 16. Instrument Calibration Requirements (e.g., safety system/device recertification, RF probe calibration) |
| Welding machine (yearly) |
| 17. Inspection Schedules |
| Person performing the hot work must inspect area, associated equipment and tools prior to and at the end of every shift that this area is used. |
| 18. References/Associated/Relevant Documentation |
| Chapters 6120, 6122 and 6640 Appendix T2 of the EH&S Manual. |
| 19. List of Records Generated (Include Location / Review and Approved procedure) |
| Property owners of welding machines to keep records of inspections/calibrations. |

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 | 1.7 |

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Task Hazard Analysis (THA) Worksheet

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

Click
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| | | | |
|---|---------------------------|---------------------------------|-----------|
| Author: Andrew Lumanog | Date: 12/12/2022 | Task #: If applicable | |
| Complete all information. Use as many sheets as necessary | | | |
| Task Title: Hall A Welding Area | Task Location: | | |
| Division: Physics | Department: Hall A | Frequency of use: | As Needed |
| Lead Worker: | Andrew Lumanog | | |
| Mitigation already in place: Standard Protecting Measures Work Control Documents | Associated OSP | | |

| 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 | Thermal Burns | M | M | 3 | Protective clothing Welder's gloves Fire Blanket First Aid Cabinet | OSP Fire Safety | 1 |
| 2 | UV exposure to eyes and skin | M | M | 3 | Welding screens Welder's gloves Protective eyewear Report burns to OCMED | OSP Fire Safety | 1 |
| 3 | Fire | M | M | 3 | Keep area clear of flammables & combustibles Use fire watch Fire Extinguisher | OSP Fire Safety | 1 |

Task Hazard Analysis (THA) Worksheet

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

| Sequence of Task Steps | Task Steps/Potential Hazards | <u>Consequence Level</u> | <u>Probability Level</u> | <u>Risk Code</u> (before mitigation) | Proposed Mitigation (Required for <u>Risk Code</u> >2) | Safety Procedures/ Practices/Controls/ Training | <u>Risk Code</u> (after mitigation) |
|------------------------|------------------------------|--------------------------|--------------------------|---|---|---|--|
| 4 | Lacerations | L | M | 2 | Protective clothing Gloves Face shield | OSP | 1 |
| 5 | Eye Injury | L | M | 2 | Eye protection | OSP | 1 |
| 6 | Hearing Loss | L | M | 2 | Hearing protection | OSP | 1 |

Highest Risk Code before Mitigation:

3

Highest Risk Code after Mitigation:

1

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](#).)

Task Hazard Analysis (THA) Worksheet

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

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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For questions or comments regarding this form contact the Technical Point-of-Contact [Harry Fanning](#)

