Work scope details:

Title: Welding Operations for Grade 3 Tasks

Work Scope Summary: The work involves welding, burning, and brazing tasks performed by qualified craft personnel in the North 1 fab shop. This Grade 3 work plan includes the use of various welding processes and requires adherence to safety protocols, including the use of appropriate personal protective equipment (PPE) and obtaining necessary permits.

Key Work Scope Components:

• Welding, burning, and brazing using multiple processes

• Grinding, chipping, and brushing of welds

• Equipment setup and support for other crafts

• Compliance with hot work and other relevant safety permits

Relevant previous events and lessons learned:

Event Title	Event Summary	Lessons Learned	Reference Link
Welding Fume Exposure Incident	A welder experienced respiratory issues due to prolonged exposure to fumes from flux core arc welding without adequate ventilation.	Ensure proper ventilation and fume extraction systems are in place and functioning before starting welding operations.	OSHA Welding Fume Exposure
Hot Work Fire Incident	A fire broke out during hot work due to flammable materials being left in the vicinity.	Maintain a 35-foot radius free of flammable materials during hot work and conduct a thorough area inspection before commencing work.	Fire Safety in Hot Work
Equipment Failure During Welding	A welding machine malfunctioned, causing a sudden power loss and potential electrical shock risk.	Regular maintenance and inspection of welding equipment are essential to prevent failures. Implement a checklist for pre-use equipment checks.	OSHA Electrical Safety
Chemical Spill During Cleaning	An employee spilled acetone while cleaning equipment, leading to a slip hazard and potential fire risk.	Ensure proper handling and storage of chemicals, and provide training on spill response and cleanup procedures.	Chemical Safety
Ergonomic Injury from Manual Handling	An employee suffered a back injury from improper lifting techniques while handling heavy materials.	Implement ergonomic training and use mechanical aids for lifting to minimize the risk of musculoskeletal injuries.	OSHA Ergonomics

Missing Hazards:

Hazard	Missing or Inadequate Mitigation in Current Work Control Document	Recommended Mitigation for Revision	Reference Link	SBMS Link
Electrical Shock	Not addressed	Implement lockout/tagout (LOTO) procedures for electrical equipment during maintenance.	OSHA LOTO	N/A
Confined Space Entry	Not addressed	Conduct a confined space assessment and ensure proper permits and monitoring are in place when working in confined areas.	OSHA Confined Space	N/A
Noise Exposure	Inadequate monitoring	Conduct noise exposure assessments and provide hearing protection as needed. Implement a hearing conservation program.	OSHA Noise	N/A
Chemical Exposure	Inadequate PPE specification	Specify appropriate chemical-resistant gloves and goggles for handling acetone and other chemicals.	OSHA Chemical PPE	N/A
Fire Hazard from Flammable Materials	Not addressed	Establish a designated flammable materials storage area and ensure proper disposal of rags and other waste.	NFPA Fire Safety	N/A
Ergonomic Risks	Inadequate assessment	Conduct ergonomic assessments for manual handling tasks and provide training on proper lifting techniques.	OSHA Ergonomics	N/A
Hot Work Permit Compliance	Inadequate verification	Implement a checklist to verify that all hot work permits are current and that all safety measures are in place before starting work.	OSHA Hot Work	N/A
Inadequate Training	Not addressed	Ensure all personnel receive training on equipment operation, safety protocols, and emergency response procedures.	OSHA Training	N/A

Failure mode analysis:

Current Control	Failure Mode of the Control	Effect of Failure	Cause of Failure	Recommended Action
Hot Work Permit System	Permit not obtained or expired	Increased risk of fire or explosion	Poor communication or oversight	Implement a digital tracking system for permits to ensure timely renewals and approvals.
PPE Requirements	PPE not used or inadequate	Increased risk of injury from sparks or fumes	Lack of enforcement or training	Conduct regular PPE audits and provide refresher training on PPE usage and requirements.
Equipment Maintenance Schedule	Equipment not maintained or inspected	Increased risk of equipment failure and injury	Inadequate scheduling or oversight	Establish a mandatory maintenance log and schedule for all equipment used in welding operations.
Communication Protocols	Miscommunication among team members	Increased risk of accidents or errors	Lack of clear communication channels	Implement daily safety briefings and use standardized communication tools (e.g., radios) during operations.
Emergency Response Procedures	Procedures not followed or understood	Delayed response to incidents	Lack of training or drills	Conduct regular emergency response drills and provide clear, accessible emergency response documentation.

Current Control	Failure Mode of the Control	Effect of Failure	Cause of Failure	Recommended Action
Training and Competency Verification	Inadequate training for personnel	Increased risk of accidents due to lack of knowledge	Insufficient training programs	Develop a comprehensive training program that includes hands-on practice and assessments for all personnel.
Chemical Handling Procedures	Inadequate spill response measures	Increased risk of slips, falls, and fire hazards	Lack of awareness or training	Provide spill kits and training on proper spill response procedures for all chemicals used.
Ergonomic Controls	Manual handling injuries	Increased risk of musculoskeletal disorders	Lack of ergonomic assessments	Implement ergonomic assessments and provide mechanical aids for lifting heavy materials.