## Work scope details:

**Title:** Configuration Change from Focusing Guide to Non-Focusing Guide

**Work Scope Summary:** This work involves the removal of the existing focusing guide and the installation of a non-focusing guide, necessitating the extraction and subsequent reinstallation of the cryostat. The operation requires careful handling of materials and adherence to safety protocols to mitigate potential hazards.

**Key Work Scope Components:**

- Removal of the cryostat
- Removal of shielding for the guide
- Replacement of the focusing guide with a non-focusing guide
- Reinstallation of shielding
- Reinstallation of the cryostat

## Relevant previous events and lessons learned:

| Event Title | Event Summary | Lessons Learned | Reference Link |
|---|---|---|---|
| Cryostat Failure Incident | A cryostat failed during maintenance, leading to a release of cryogenic fluids and necessitating an emergency response. | Ensure regular maintenance checks and training on emergency procedures for handling cryogenic materials. | N/A |
| Equipment Installation Accident | During the installation of a similar guide, a worker was injured due to improper lifting techniques. | Emphasize proper manual handling training and use of lifting aids to prevent injuries. | N/A |
| Shielding Removal Incident | Inadequate shielding during a guide change led to radiation exposure for personnel. | Always verify shielding integrity before and after work, and ensure proper monitoring of radiation levels. | N/A |
| Overhead Work Injury | A worker was injured when equipment fell from above during overhead work due to lack of proper securing. | Implement strict hoisting and rigging protocols, including regular inspections of lifting equipment. | N/A |
| Confined Space Hazard | A maintenance team encountered hazardous conditions in a confined space during equipment removal. | Conduct thorough risk assessments and ensure proper ventilation and monitoring in confined spaces. | N/A |

## Missing Hazards:

| Hazard | Missing or Inadequate Mitigation in Current Work Control Document | Recommended Mitigation for Revision | Reference Link | SBMS Link |
|---|---|---|---|---|
| Manual Material Handling | Not addressed | Implement a lifting plan that includes weight limits and use of mechanical aids. | N/A | N/A |
| Cryogenic Exposure | Not addressed | Provide training on cryogenic hazards and ensure PPE is available and used. | N/A | N/A |
| Radiation Exposure | Not addressed | Conduct a radiation safety assessment and ensure proper monitoring equipment is in place. | N/A | N/A |
| Overhead Work Risks | Inadequate mitigation | Ensure all tools and materials are secured and implement a drop zone policy. | N/A | N/A |
| Confined Space Entry | Not addressed | Conduct a confined space entry assessment and ensure ventilation and monitoring are in place. | N/A | N/A |
| Tool Safety | Inadequate current mitigation | Ensure all tools are inspected before use and that operators are trained in their proper use. | N/A | N/A |
| Environmental Conditions | Not addressed | Assess environmental conditions (temperature, noise) and provide necessary controls. | N/A | N/A |
| Communication Failures | Not addressed | Establish clear communication protocols and conduct pre-job briefings. | N/A | N/A |

## Failure mode analysis:

| Current Control | Failure Mode of the Control | Effect of Failure | Cause of Failure | Recommended Action |
|---|---|---|---|---|
| Permit system | Permit not obtained or expired | Work may proceed without proper authorization, leading to safety violations | Lack of awareness or oversight | Implement a checklist to verify permits before starting work |
| PPE requirements | PPE not used or inadequate | Increased risk of injury or exposure | Lack of enforcement or training | Conduct regular audits of PPE usage and provide refresher training |
| Work instructions | Instructions not followed | Increased risk of accidents due to improper procedures | Poor communication or unclear instructions | Revise work instructions for clarity and conduct pre-job briefings |
| Communication processes | Miscommunication among team members | Increased risk of accidents due to lack of coordination | Distractive environment or time pressures | Establish a communication protocol and use check-in points during work |
| Emergency response procedures | Emergency procedures not known | Delayed response to incidents, increasing severity | Lack of training or drills | Conduct regular emergency response drills and training sessions |
| Tool availability | Tools not available or inadequate | Delays in work and increased risk of using improper tools | Poor inventory management | Implement a tool tracking system to ensure availability and condition |
| Training and competency | Workers not adequately trained | Increased risk of errors and accidents | Lack of training programs | Develop a comprehensive training program and maintain records of training |

| Current Control | Failure Mode of the Control | Effect of Failure | Cause of Failure | Recommended Action |
|---|---|---|---|---|
| Traffic control | Traffic management not enforced | Increased risk of accidents in work area | Lack of visibility or signage | Implement clear traffic control measures and ensure visibility of work zones |