Summary of Changes

<table>
<thead>
<tr>
<th>Rev No.</th>
<th>Section Changed</th>
<th>Revisions Made</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>All</td>
<td>Transferred to current template. Assigned revision number 1 as no previous revision number assigned.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Complete rewrite. Request previous version for comparison.</td>
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<tr>
<td>2</td>
<td></td>
<td>Included guidance for working with 3M Endothermic Mat in Sections 1, 2 and 4.</td>
</tr>
</tbody>
</table>

Scope

This standard applies to all Suncor Energy Inc. Wood Buffalo Region employees, contractors, vendors and visitors and is part of the Wood Buffalo Region EHS management system.

Purpose

To ensure the safe and efficient handling of refractory ceramic fibre (RCF) insulation to comply with all related Government Regulations and Suncor Energy Standards.

Compliance

The recognition, evaluation and control to mitigate potential effects from RCF exposure must be communicated before commencing activities where RCF is or may be present or handled. Handling, storage and disposal of RCF waste shall be performed in compliance with applicable regulations and in a manner that minimizes any impact to the environment.

Roles and Responsibilities

The following individuals and groups have the following roles and responsibilities:

**Document Owner**
- Ensures this document is reviewed according to the required revision cycle.
- Ensures the document is updated to accommodate changes to Suncor, provincial, and federal regulation.
- Ensures the document is updated to mitigate risks found as the result of an incident.

**Document Approver**
- Ensures this procedure is necessary and that it aligns with management and company direction.

**Manager, Industrial Hygiene**
- Accountable for the evaluation, maintenance and revision of this standard every three years.
Continued

Line Management
• Ensures implementation and adherence to these procedures and ensures all concerned parties are aware of the requirements for the handling of RCF for the project by reviewing this procedure.

Area Permit Centre
• Contractor Supervisor is aware of the hazards of RCF and of the personal protective equipment requirements in the area.
• Contractor Supervisor is advised of concerns pertaining to the area’s machinery and the shutting down of mechanical ventilation and power.
• Issues specific work permits and/or authorizations to the Removal Supervisor as required.

Contractor Supervisor
• Ensures this procedure, related site standards and legislated requirements are understood and adhered to.
• Ensures workers with potential for exposure have been alerted to possible hazards and instructed on proper handling procedures.
• Ensures Safety Data Sheet (SDS) for RCF materials being used are reviewed with employees to outline hazards and health warnings of the materials they are expected to handle.
• Ensures RCF workers have been fit tested for the appropriate respiratory protection.
• Ensures appropriate Suncor Energy work permit and/or authorization are obtained and workers are advised of the requirements.
• Ensures required personal protective equipment for the job is supplied.
• Ensures all equipment necessary to complete work is supplied.
• Ensures Foreman is appointed to manage and be responsible for the entire job.
• Ensures Foreman is aware of the scope of work and this procedure.

Foreman
• Ensures appropriate Suncor Energy Inc. safe work permit/authorizations are obtained, and workers involved are informed of and adhere to the requirements of the permit.
• Ensures workers are wearing appropriate PPE and that workers perform a seal check with their respiratory protection.
• Ensures restricted work area is designated and banner-guard and warning signs are placed at entrance of all access points into restricted work area.
• Designates a location within the restricted work area as a staging zone for bagged waste and ensures concerned parties are aware of the location.
• Ensures this procedure and area specific procedures are reviewed with the worker before starting work.
Responsibilities  

Foreman (cont'd)  
• When requested, provides a copy of this procedure and the Occupational Health & Safety Act, Regulations and Codes to all personnel entering the restricted work area.
• Ensures workers have access to a SDS on RCF insulation.
• Obtain authority and instructions from Area Permit Centre before sealing, removing or shutting down ventilation system, electrical system, or similar system within the restricted work area.
• Ensures all electrical equipment brought on to the site is intrinsically safe and grounded.
• Arranges for transportation and disposal of bagged RCF waste to the Suncor Landfill site.

Removal Workers or Persons Entering a Restricted Work Area  
• Reviews this procedure and applicable area specific procedures before starting work.
• Wears personal protective equipment.
• Performs respirator seal check to assure the fit of the respirator before entering a restricted work area.
• Leaves the restricted work area immediately if problems develop with the respirator or there is an emergency.

References & Terms, Definitions and Acronyms  

• LMS0052A Respiratory Protection Standard
• Standard for Fireproofing of Structures and Equipment 1003

The following terms, definitions and acronyms are used in this procedure:

- **HEPA Filter**  
  A type of air filter that removes >99.97% of particles 0.3 um or larger at a specified flow rate.

- **MMMF**  
  Man-made mineral fibres

- **Partial Enclosure**  
  Having four walls and floor lined with 6 mil polyethylene sheets, turn-up of 30 cm where floor joins the walls. This structure is not airtight as HEPA negative air units are not used.

- **Refractory Ceramic Fibre (RCF)**  
  A material composed of alumino-silicate fibres and is highly resistant to heat. RCF is a special category of synthetic vitreous fibers (SVFs) or more commonly known as man-made mineral fibers (MMMFs) and can be in the form of blanket, modules or cement.

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**Restricted Area**
An area of the work site which extends to at least 3 meters in every direction. The area must be demarcated by red banner tape with "Danger Do Not Enter".

**SVF**
Synthetic vitreous fibres

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**Procedure**

1. **Pre-Job Planning**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Installation / Repair of RCF Insulation</strong></td>
<td><strong>1.1</strong> Ensure the use of RCF is limited to those applications where substitution of an alternative material, (i.e., glass fibre, mineral wool, Isofrax or equivalent) is not feasible. Where more than 1 m² of RCF is being handled, a restricted work area must be established.</td>
</tr>
<tr>
<td></td>
<td><strong>1.2</strong> Suncor’s Standard for Fireproofing of Structures and Equipment (Standard 1003) requires the use or the 3M RCF Endothermic Mat (Emat) as fire barrier material for structural steel applications. The 3M RCF Endothermic Mat is flexible with thickness of 0.4 inches capable of layering. In the installed configuration, pieces of these mats are abutted to one another. Aluminum foil tape is applied over top of the butted seam circumferentially and also along the longitudinal seam where the Emat overlaps onto itself as an environmental barrier to prevent water ingress. Restricted areas around 3M Endothermic Mat cutting and installation should still be used to prevent other workers from entering into cutting and installation areas without PPE protection. However, the size of restricted area can be reduced to accommodate other trade works at the same areas.</td>
</tr>
<tr>
<td></td>
<td>• A 6 mil plastic drop sheet should be placed under cutting and installation areas to collect any released fibers or falling RCF material.</td>
</tr>
<tr>
<td><strong>Removal of RCF Insulation</strong></td>
<td><strong>1.2</strong> • Consult with Suncor Insulator Coordinator or review the SDS of material handled to determine if RCF material is present.</td>
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<tr>
<td></td>
<td>• If possible, determine and confirm that the material being handled is RCF. <strong>Note:</strong> This may be harder to identify/confirm with some of the existing insulation installed in older furnaces.</td>
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<tr>
<td></td>
<td>• If confirmation cannot be made as to whether the insulation is RCF or man-made vitreous fibres, assume the material to be RCF and follow these procedures.</td>
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<tr>
<td></td>
<td>• A restricted work area must be established.</td>
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</tbody>
</table>
2. Personal Protective Equipment (PPE)

Step | Action
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2.1 | The following PPE is required:
• At least a half face air purifying respirator with P100 (HEPA) filters
• Long sleeve coveralls with an outer layer of disposable coveralls such as white Tyvek coveralls. Disposable coveralls are not required when working with the 3M Endothermic Mat material.
• Monogoggles or tight fitting safety glasses
• Gloves
• Rubber boots or disposable boot covers
• All other personal protective equipment normally required in the work area.

If rubber boots or disposable boot covers cannot be used for safety reasons, Suncor approved work boots may be worn and properly decontaminated as per section 4.

3. Site Preparation

Step | Action
--- | ---
3.1 | The boundary of the work area shall be physically restricted by the use of one strand of red banner guard tape with appropriate tagging at waist level, approximately 3 meters from the work area.
3.2 | The strand shall read “Danger Do Not Enter” and must be in place before work begins.
3.3 | Banner-guard tape must be placed at the entrance of all access points entering into or beneath the restricted work area.
3.4 | The size of the restricted area may be adjusted based on results of airborne fiber concentration around the work area or wind direction.
3.5 | If the restricted area is inside a confined space the confined space “Do Not Enter” sign is a sufficient boundary.
3.6 | Where practical, construct a partial enclosure (as the floor with 6 mil poly and four walls) at the entry/exit point of restrict areas.
   If partial enclosure is not practical, 6 mil poly floor and windbreak should be set up at the entry/exit point of restrict areas.
   • Inside the partial enclosure or at the exit point of restriction areas, PPE disposal bin and damp cloth should be available to clean gross contamination from exterior of PPE and to dispose the used PPE.
   • Used damp cloth can be disposed into PPE disposal bin.

*Continued on next page*
**Step** | **Action**  
---|---  
3.7 | The stage zone for bagged RCF material or waste should be set up in the restricted area.  
• Any workers inside the restricted area where refractory ceramic fiber waste is being placed shall wear PPE in accordance with Section 2.  
3.8 | RCF is to be transported to and from the job site in a closed or sealed container or box, with the contents clearly marked on the outside or in packaging supplied by the manufacturer or the supplier, in compliance with WHMIS 2015 requirements.  
3.9 | Where appropriate, a 6 mil plastic drop sheet should be placed under the work area to collect any released fibres or falling RCF material.  

### 4. Decontamination:  

**Note:** Depending on the scope of RCF/refractory removal, a donning and doffing hoarding may be required to ensure workers are provided with an area for decontamination.  

**Step** | **Action**  
---|---  
4.1 | Construct an enclosure at the entry of RCF restricted areas with clean room and dirty room. Prior to leaving the enclosure, while in the dirty room, use a damp cloth to remove all visible dust and debris from the exterior of disposable coveralls, boots, respirator and hard hat. Disposable coveralls and boots will be removed and placed inside a waste bag for disposal; In the clean room, the respirator filter is disposed in the waste bag and clean respirator is removed.  
4.2 | When working with the 3M Endothermic Mat, prior to leaving the restricted area, use a damp cloth to remove all visible dust and debris from the exterior of the coveralls, boots, respirator and hard hat. Remove the respirator with filters outside the restricted area and wash hands and face before eating, drinking or smoking.  

### 5. Air Monitoring  

**Step** | **Action**  
---|---  
5.1 | Air monitoring will be conducted at the discretion of the Industrial Hygiene Department. Industrial Hygiene shall arrange for monitoring to be conducted as per NIOSH 7400.  

### 6. Installation/Repair of RCF Insulation  

**Step** | **Action**  
---|---  
6.1 | All personnel entering the restricted work area are required to wear personal protective equipment to minimize exposure.
6.2 During installation of RCF insulation, airborne fiber levels must be minimized by covering the RCF insulation as soon as it is installed and leaving excess material in its packaging.

6.3 Workers in close proximity to RCF material must ensure they limit physical/mechanical contact with the material to minimize personal contact and fibre release.

6.4 Installed RCF in the immediate work area is to be covered or protected by a fire blanket or similar item to reduce contact or disturbance by workers during equipment repairs.

6.5 Any waste material, such as the 6 mil drop sheet and grossly contaminated personal protective equipment shall be bagged and removed to the Suncor landfill. RCF does not require a permit for dumping at the Suncor landfill.

7. Removal of RCF Insulation

7.1 All personnel entering the restricted work area are required to wear personal protective equipment to minimize exposure.

7.2 Carefully remove the RCF ensuring that dust levels are minimized.

• Where practical, place the RCF material into a 6 mil plastic bag.

• Seal the 6 mil plastic bag with duct tape when approaching the bag's volume capacity or weight capacity.

• Contaminated equipment that is too large to be disposed of in 6 mil plastic bags shall be wrapped in a layer of 6 mil plastic sheeting or tarp and sealed with 50 mm fibre duct tape.

7.3 Clean exposed equipment surfaces ensuring removal of all visible RCF using one or more of the following: a damp cloth, a buff pad, a wire brush, a scraper or a 2 stage HEPA vacuum.

• Dust levels are to be minimized by use of an airless sprayer or a HEPA vacuum during removal work with these tools.

7.4 Move the sealed 6 mil plastic bags to a prearranged staging zone within the restricted area for removal and wipe the bags clean with a damp cloth.

7.5 Dispose of RCF waste by removal to the landfill. RCF does not require a permit for dumping at the landfill.
8. Entering a Confined Space with RCF Present

Step Action
8.1 When entering a confined space with RCF, even when workers are not expected to disturb the RCF, the control measures in section 2 shall apply unless Industrial Hygiene conducts air sampling and the results indicate control measures can be decreased.

9. Storing RCF Material

Step Action
9.1 When storing RCF, it shall be stored as per manufacturer's instructions and in a manner that minimizes worker exposure. The restricted area can be for installation/repair or removal or specifically set up for RCF storage. In some cases where RCF application is in process, unsealed materials may be stored in a hoarding built for installation/material staging purposes.

9.2 The boundary of the staging area shall be physically restricted by the use of one strand of red banner guard tape with appropriate tagging at waist level, approximately 3 meters from the area.

The strand shall read “Danger Do Not Enter” and must be in place before work begins.

9.3 Banner-guard tape must be placed at the entrance of all access points entering into or beneath the restricted work area.

9.4 If the restricted area is inside a confined space the confined space “Do Not Enter” sign is a sufficient boundary.

Note: Alternatively, RCF material can be staged inside of a hoarding specifically designated for RCF which is labelled as containing RCF material.

9.5 When being staged, the RCF material shall be wrapped in 6 mil poly sheeting and unsealed materials should be covered by 6 mil poly sheeting. A 6 mil plastic drop sheet should be placed under the work area to collect any released fibres or falling RCF material.

End of Procedure
The following individuals have approved and signed this document.

UserName: Sheila Chernys (schernys)
Title: Dir OS Enviro & Reg
Date: Monday, 20 March 2017, 08:52 PM Mountain Time
Meaning: Approver 1 Signed

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