

**RAI 21:**

Description of Deficiency: The applicant did not provide specific information regarding accident conditions related to the ventilation systems. In addition, it did not provide safety impacts of system failures or identify contingencies for such occurrences related to the ventilation systems.

Basis for Request: NUREG-1569, Acceptance Criterion 4.1.3(4), states: “The application demonstrates that the effluent control systems will limit exposures under both normal and accident conditions. The application also provides information on the health and safety impacts of system failures and identifies contingencies for such occurrences. In TR Section 4.1.3, the applicant refers to its SHEQMS, Volume VIII, Emergency Manual, for responses to emergency situations that could occur at the site in the event of effluent system failures, but neither provides details on the safety impacts from these failures nor identifies contingencies for such occurrences.

Request for Additional Information: Consistent with NUREG-1569, Acceptance Criterion 4.1.3(4), please provide details on accident conditions related to the ventilation systems. Specifically, please provide information on the health and safety impacts of ventilation system failures and identify contingencies for such occurrences for staff to evaluate NUREG-1569, Acceptance Criterion 4.1.3(4), or indicate where this information can be found in the application.

**RAI Response 21 (9-25-2014)**

Section 4.1.3 of the application has been revised to address Acceptance Criterion 4.1.3(4) by addressing health and safety impacts of ventilation system failure and identifying contingencies for single fan failure and power outages. SOP P.16, Plant Ventilation System Operation, previously submitted under non-disclosure, has been summarized and included in the text.



#### 4.1.3 Response to Emergency Events Associated with Effluent Control Systems

~~Elevated radon levels are the primary health and safety impact of ventilation system failure. Given the redundant fans and Cameco's use of additional PPE and engineering controls, the dose impacts from ventilation system failures are maintained ALARA.~~

~~In response to shutdown of a fan, Cameco immediately begins a process to return the fan to service. In the meantime, Cameco can respond with additional personal protective equipment, fans and by setting up a radon progeny monitors in the vicinity for real time radon progeny levels during the maintenance or repair process.~~

~~Elevated radon levels are the primary health and safety impact of ventilation system failure. Currently Crow Butte adheres to requirements in the SHEQMS Volume VIII, Emergency Manual, Volume VIII (CBR 2010a) and SHEQMS Operating Manual, Volume III, SOP P.16, Plant Ventilation System Operation, when responding to ventilation system failures. The Marsland project will also be subject follow to the same requirements of the manual and SOP.~~

~~SHEQMS Operating Manual, Volume III, SOP P.16, Plant Ventilation System Operation, for the CPF addresses; repair, maintenance and inspection of the ventilation system as summarized below:~~

- ~~• Restart after power bump or power outage~~
- ~~• Alarm response~~
- ~~• Evacuation requirements~~
- ~~• RSO notification~~
- ~~• Use of Prism radon progeny monitors~~
- ~~• System Maintenance/Inspections~~
  - ~~○ Daily Walk-through Inspection~~
  - ~~○ Daily Manometer Readings~~
  - ~~○ Weekly RSO Walk-through~~
  - ~~○ Annual Roof Vent Inspections~~
  - ~~○ Filter Maintenance/Replacement~~

~~Health and safety impact resulting from ventilation system failures are deemed to be minimal, as the engineered and process controls will be similar to those in place at the CPF. Ventilation fans will run continuously and will be inspected daily to minimize unplanned shut downs. In addition, a respiratory protection program will be implemented as regulated by the NRC's Regulatory Guide 8.15, Acceptable Programs for Respiratory Protection.~~

~~In response to the shutdown of either an individual fan or a ventilation system failure, CBR will immediately begin the process of restoring appropriate ventilation. This will be accomplished either through the repair of existing ventilation or through the utilization of portable temporary ventilation. Radon progeny monitoring will be initiated and respiratory protection will be utilized as deemed appropriate by the RSO per 10 CFR §20.1701(a)(3) until the system ventilation has been restored.~~

~~If an emergency situation, such as an extended power failure, where exposure levels are considered unacceptable, the facility will be evacuated in accordance with SHEQMS Emergency~~





~~Manual, Volume VIII. The emergency manual is a guideline.~~ The individuals responsible for responding and managing emergencies must use their best judgment when making decisions related to the emergency. In the event of a failure of an effluent control device or other mishap that could result in exposure of an individual to elevated quantities of radiation present in gases, liquids, or solids, emergency procedures outlined in the emergency manual and other applicable procedural manuals will be implemented. Guidelines ~~in these manuals~~, on which employees receive training, will be implemented to minimize individual exposures. ~~—The E~~emergency ~~M~~manual addresses emergency situations such as medical emergencies, fires, explosions, radiological emergencies, chemical emergencies, transportation emergencies, natural disasters, and security threats. The Crow Butte Chemical Emergency Response Guide, Chapter 11, Appendix A of the SHEQMS Emergency Manual, provides detailed instructions for responding to ~~an~~ emergencies involving bulk, petrochemical, and compressed gases used at the site. If needed, CBR maintains emergency evacuation procedures that all employees, contractors, and visitors are trained to follow.

~~At the CPF and Marsland, all ventilation fans run continuously and will be inspected daily. Fan failures at the CPF have been rare and have been readily observable. Replacement fan motors can be quickly sourced, and failures can be quickly remedied. When a fan fails or is shut down for maintenance, negative pressure remains within the building by virtue of the fans that continue to operate. Failure of the largest single fan (#5 Duct) at the CPF would result in only a 13 percent reduction in total capacity.~~

~~SOP P.16 for the CPF addresses repair and maintenance of current ventilation systems. This SOP will be revised to also address MEA ventilation systems. A copy of the SOP and associated inspection form has been provided to the NRC for information under a request for confidentiality.~~

SOP P.16 addresses:

- ~~• Restart after power bump or power outage~~
- ~~• Alarm response~~
- ~~• Evacuation requirements~~
- ~~• RSO notification~~
- ~~• Use of Prism radon progeny monitors~~
- ~~• System maintenance~~
- ~~○ Biannual roof vent inspections~~
- ~~○ Filter replacement~~
- ~~○ Blower and vent duct washing~~

#### 4.1.34.1.4 ALARA Evaluations of Effluent Control Systems

As with the CPF, CBR will operate the effluent controls so that all airborne effluent releases are maintained ALARA. The recent addition of a hard-piped ventilation system dedicated to the bicarbonate mix tank at the CPF will also be incorporated into the Marsland design to ensure that employee exposures remain ALARA.