Hantavirus Hazards and Control Practices

Safe Work Practice SWPRA-1

1.0 Purpose

Hantavirus is a virus that exists in a variety of rodents although it is primarily limited to the deer mouse in North America.

The purpose of the Hantavirus Hazards and Controls Practice is to:

a) Describe the risks of hantavirus and specify control measures,
b) Comply the legislation, and
c) Provide the operational framework for the identification, assessment, and control of hantavirus exposure on Advanced Electrical Services work sites.

This practice in part responds to Advanced Electrical Services (AES) Health Safety and Management Program. The Alberta, British Columbia, Manitoba and Saskatchewan regulatory requirements are found in Appendix A.

2.0 Scope

The Hantavirus Hazards and Controls and Practices applies to all AES worksites and encompasses contracted work activities where Hantavirus hazards may be present. This practice sets the minimum standard and expectations regarding protecting worker's heath and safety from hantavirus hazards.

3.0 Hantavirus Hazards and Controls Process

3.1 What is Hantavirus Infection?

Hantavirus exists in a rodent's body (i.e., deer mouse), saliva, urine and feces. Hantavirus infection (the virus) can occur via contact with live and dead rodents, rodent bites, contact with eyes, and contact with broken skin, or open wounds, eating or drinking contaminated food, and inhalation or ingestion of contaminated materials or dust from dried mouse droppings, urine, and saliva from infected rodents. The most predominant hazard is inhalation where aerosols containing the virus are deposited into an individual's lungs.

There is no evidence that household pets or infected humans can transmit the disease.

3.2 Exposure

Exposure to hantavirus should be maintained as low as reasonably possible. Exposure may occur anywhere where workers could have contact with rodents, their saliva, urine, feces, or material that have become contaminated with the above. Certain areas are more likely to harbor rodents than others such as attics, crawlspaces, field buildings, insulated pipe, switchgear, etc. As a result, some workers may be more likely to encounter hantavirus than others. Those who may be exposed include:

a) Anyone working or living (workers, farmers, hikers, and campers) in rodent contaminated sites or buildings (e.g. control rooms, camps);
b) Personnel who enter field buildings (outbuildings, e-houses);
c) Personnel involved in mouse cleanup;
d) Personnel who are required to access ceiling, wall, floor, or subfloor spaces such as electricians and insulators; and
e) Personnel handling and receiving records and files stored or once stored at a field site (outbuilding, e-houses).

3.3 Health Effects

A number of cases of hantavirus infection have been reported in Alberta in the last few years. Deer mice are the main carriers of hantavirus, although it is possible that other rodent species such as field mice, voles and rats may also carry the disease. Hantavirus can cause a serious lung infection, called Hantavirus Pulmonary Syndrome (HPS) with an average fatality rate of 40 to 50%.

It is important to know that symptoms of HPS, since early treatment can significantly improve the chance of survival. Initial symptoms typically occur 4 to 42 days after the first exposure (usually between 10 and 14 days) and consist of the following:

a) Fevers of up to 40 degrees Celsius
b) Headache, nausea, and vomiting
c) Fatigue, weakness, and chills
d) Diarrhea
e) Muscle aches
f) Cough
g) Severe abdominal pain

Although the above symptoms can all be caused by the flu; the HPS, the muscle aches affect mainly the lower back, buttocks, thighs, and other large muscle groups. The abdominal disease, such as appendicitis. The patient usually feels much worse than a medical assessment would suggest. These facts may be useful in differentiating between fly and hantavirus infection.

The second stage starts with shortness of breath. This is due to collection of fluid in the lungs (pulmonary edema) and is the primary symptom of HPS. Later on, a cough may develop. The HPS disease, however, can be confirmed through specific medical tests.

Subsequent symptoms consist of shortness of breath because of pulmonary edema and subsequent death.

3.3 Health Monitoring and Treatment

a) Health monitoring is not required for hantavirus exposure unless it is a requirement of a Hantavirus Exposure Plan; however, if you feel ill and suspect hantavirus may be the cause, seek medical attention immediately.
b) Do not delay if you experience the above symptoms and have had recent contact with rodents or their droppings; make sure the doctor is aware of exposure history.
c) There is no specific cure for HPS. However, treatment aimed at combating the damage caused to the body by the infection (supportive therapy) can be effective in saving lives.

4.0 Hantavirus Hazards and Control Procedures

4.1 Hazard Assessment and Control Measures

All reasonable efforts must be made to eliminate the hantavirus hazard where possible. Working in an area or with materials that may be contaminated would require a hazard assessment. When rodents or rodent contamination is identified, the hazards need to be controlled by means of engineering controls and/or administrative controls.

Note: ***Depending on the severity of infestation, a Rodent Management and Control Plan may be required; see the following section details.***

1. Engineering controls shall consist of the use of dust suppression methods such as the use of disinfectant sprays such as 1 : 5 dilution of household bleach to minimize dust generation. Disin fectant sprays should be applied in a manner that does not create dust. Workers engaging in disinfectant spraying shall adhere to the PPE requirements below. Material Safety Data Sheets (MSDS) shall also be consulted prior to spraying ensuring the proper protection and ventilation.

2. Administrative controls shall consist of procedures and training on controlling hantavirus hazards.

3. Where there controls cannot be used or are not effective, personal protective equipment is the next line of defence:

a) Respiratory protection shall be used when conducting inspections or other work in areas known to be or likely to be contaminated or when conducting mouse cleanups. Respiratory protection shall consist of, at a minimum, a half mask respirator (NIOSH-approved) equipped with P100 filters. Workers shall be fit tests, and mask shall be inspected prior to use.

b)Disposable impervious gloves must be used. If significant body contact is expected or for larger areas of contamination cleanup where more dust may be generated, workers should wear full body disposable suites equipped with hoods.

Important Note: ***All affected workers (i.e., the work crew) must be included in the pre-job hazard assessment and in the control or elimination of those identified hazards. Further, all other workers at the worksite must be informed of the hazards and of the methods used to control or eliminate the hazards.***

4.2 Pre-job Safety Meeting

Prior to starting the cleanup, the Permit Issuer will hold a pre-job safety meeting with all workers or contractors involved in the work where all aspects of the cleanup, additional PPE, and respiratory protective equipment (RPE) will be discussed.

4.3 Safe Work Permit

Depending upon the site location and client requirements, a specific safe work permit may be required for the clean up to begin. AES site supervisors shall contact their site representatives to clarify any specific site requirements. Client environmental services should also be contacted, and made aware of the work prior to starting.

4.4 Trapping and Removing Dead Rodents

4.4.1 Trapping Rodents

Note: ***AES does not have any permit buildings on site locations and generally will not place traps for Rodent Control. Any traps found with dead rodents on site, the supervisor will notify the site representative and/or the company that placed the trap.***

If AES is required by contract to implement a Rodent Control program that includes laying traps,

Traps shall;

1. Placed in buildings with spring-loaded mouse traps. Bait the traps with dried fruit or peanut butter mixed with oats or chees. Be sure the bait is securely attached to the trip pedal, or the trap may not spring when the food is removed. Ensure to read all manufactures documentation on the arming of the trap, and to wear the appropriate PPE with arming and handling the trap.
2. Set traps at right angles to the walls where the rodents are known to travel, with the bait side of the trap towards the wall. Bait the traps without setting them for the first few nights.
3. Document the location of each trap, and the date that if was initial baited.

4.4.2 Removing Dead Rodents

Workers shall:

1. Spray the trap with a disinfectant prior to removing the rodent. Disinfectants such as a 1 : 10 dilution of household bleach, 70% alcohol, or most general purpose house hold disinfectants are effective in killing the hantavirus. Make sure the label indicates the product is a disinfectant, and review the MSDS prior to use.
2. Wearing disposable gloves, transfer the dead rodent to a disinfectant solution and soak before transferring it to a sealable plastic bag. The seal does not have to be air tight, and can be sealed with a twist tie or tie wrap.
3. Dispose of the bagged rodent by placing it in the regular garbage. Disinfect the area (do not reuse the disinfectant solution used to soak the rodent). Wash your hands and exposed skin surfaces thoroughly with soap and water.
4. Dispose of all disinfectant liquid as per MSDS and site environmental requirements.

4.5 Decontamination Procedures

Workers can become contaminated with hantavirus-contaminated materials by having the dust on their clothes, hands, or hair. Workers must be provided with adequate PPE to limit body contamination and must have adequate facilities available to safely remove any contamination.

To clean up small areas of contamination; for example, where small amounts of droppings are present, do the following:

1. Prevent entry of unprotected personnel.
2. Wear a respirator with high-efficiency particulate filter (N-100, R-100 or P-100), googles, and appropriate impervious disposable gloves (nitrile, rubber).

Note: Leather gloves are not to be used.

3. Spray with 1 : 5 dilution of household bleach. Soak the material thoroughly in a manner that does not create dust while spraying (use a fine mist as opposed to a heavier stream).

Cautionary Note: ***In some industrial areas contaminated with oils or other chemicals, chlorine in bleach can react resulting in possible inhalation and/or explosion hazards. If cross contamina tion with other chemicals is suspected, stop all work and consult the site supervisor and/or site representative.***

4. Scoop up material, seal it in a double plastic bag and label the bags. If the material is soaked through with disinfectant, the bags can be disposed of in the regular garbage.
5. Wash down area with disinfectant and detergent. (Ensure that detergent will not react with Bleach)
6. Leave work area and dispose of gloves. Remove respirator.
7. Use the same precautions for picking up dead rodents. Put on disposable impervious gloves and spay the carcass with bleach solution. Disinfect all traps with bleach solution.
8. For larger areas of contamination, where dust will be produced during the cleanup, wear dispos able coveralls with hoods.
9. After the work has been completed, remove coveralls and gloves.
10. While eye protection and respirator are still in place, carefully wipe them over with a paper towel, avoiding contact with skin and eyes. Also, wipe boots down with disinfectant.
11. Remove eyewear and respirator.
12. Disinfect eyewear and respirator. Throw away disposable gloves.

5.0 Training

All employees who may be required to work in areas where rodent contamination may be present must be trained in hantavirus awareness. Training will at a minimum include:

a) Review regulatory requirements of provincial government where the worker is stationed. Alberta, British Columbia, Manitoba and Saskatchewan regulatory requirement are listed in Appendix A.
b) Communication and monitoring for the control of hantavirus.
c) Application of hazard identification and control tools including applicable permits, procedures, worksheets, etc.

Note: ***It is a legal requirement that workers must use the procedures appropriately and apply the train- ing.***

6.0 Roles and Responsibility

6.1 AES Employees

All AES employees and contractors are responsible for reporting signs of rodent infestation to their supervi- sor and depending on the severity of the infestation, stopping the work if necessary according to the agreed upon guidelines.

7.0 Definitions and Acronyms

The following are definitions and acronyms that are specific to hantavirus hazard and control.

Bio Hazardous Material means a pathogenic organism, including a blood borne pathogen, that, because of its known or reasonable believed ability to cause disease in humans, would be classified as Risk Group 2,3,or 4 as defined by the Public Health Agency of Canada or any material contaminated with such as organism.

Expose means to come in harmful contact with an infectious material or organism from inhalation, ingestion, skin or mucous, membrane contact, or percutaneous injury.

Hantavirus Pulmonary Syndrome (HPS) is a serious illness caused by a virus that is often fatal.

Harmful Substance means a substance that, because of its properties, application or presence, creates or could create a danger, including a chemical or biological hazard, to the health and safety of a worker exposed to it.

Hazardous Substance means a controlled product and a chemical, biological, of physical agent that, be reason of property that the agent possesses, is a hazardous to the health or safety of a person exposed to it.

Infection Material or Organism means an infectious material or organism that has been identified in an approved manner as an infectious disease hazard that poses a significantly increased exposure risk to a worker or self-employed person.

Occupational Exposure means a reasonably anticipated, harmful contact with blood or other potentially infectious bio hazardous materials that may results from performance of a staff members duties.

Other Potentially Infectious Materials means human body fluids, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids.

Rodent is a mammal belonging to the order Rodentia characterized by continuously growing incisor teeth. Common rodents include mice, rates, prairie dogs, beavers, etc.

Virus is a microscopic infectious agent that requires a host in order to replicate.

Appendix A

Applicable Legislation

The Hantavirus Hazards and Controls Practice encompasses requirements of the following legislation:

1. Alberta OHS Code

a. Part 2 – Hazard Assessment, Elimination and Control
   - o Section 7 – Hazard Assessment
   - o Section 8 – Worker Participation
   - o Section 9 – Hazard Elimination and Control

b. Part 4 – Chemical Hazards, Biological Hazards, and Harmful Substances
   - o Section 16(3) – Maintaining Exposure as Low as Reasonably Achievable

c. Part 35 – Heath Care and Industries with Biological Hazards
   - o Section 525.1 – Exposure Control
   - o Section 528 – Policies and Procedures
   - o Section 529 – Limited Exposure
   - o Section 530 – Post-Exposure Management

2. Alberta OHS Regulation

a. Part 1 – General
   - o Section 15 (3) to (5) – Training

3. Saskatchewan OH&S Regulation

a. Part III – General Duties
   - o Section 12 a) General Duties of Employers
   - o Section 22 b) OH&S Program

b. Part VI – General Health Requirements
   - o Section 85 – Exposure Control Plan

c. Part XXI – Chemical and Biological Substances
   - o Part XXXI – Additional Protection Heath Care Workers

4. Manitoba Workplace Safety and Health Act

a. Section 4(1) – General duties of employers
b. Section 4(2) – Further duties of employers
c. Section 7.4 (1) – Establishment of workplace safety and health program
d. Section 7.5 (5) – Content of Program
   - o (b) identification of potential dangers…
   - o (f) plan for control of any biological or chemical substance…
   - o (h) plan for training….

5. Manitoba Workplace Safety and Health Regulation

a. Part 2 – General Duties
   - o Section 2.1 - Eliminating or control of risks
   - o Section 2.1.1 – Safe work procedures

b. Part 36 – Chemical and biological substances

- o Section 36.4 – Non-airborne hazards
- o Section 36.6-36.9 – Monitoring and control measures

6. British Columbia Occupational Health and Safety Regulation

a. Part 3 – Rights and Responsibilities
- o Section 3.5 – Workplace inspections
- o Section 3.10 – Reporting unsafe conditions

b. Part 5 – Chemical and Biological Agents
- o Section 5.5 – WHMIS program
- o Section 5.16(1) – Availability of SDS and toxicological data
- o Section 5.53 – Workplace monitoring
- o Section 5.54 – Exposure Plant
- o Section 5.5 – Types of controls
- o Section 5.59 – Investigating symptoms

c. Part 6 – Substance Specific Requirements
- o Section 6.34 – Exposure control plan

d. Part 8 – Personal Protective Equipment
- o Section 8.33 – Selection
- o Section 8.40 – Fit Tests