Diesel Fumes/Carcinogens (L. Sloan)

Recommendation:

That the March 15, 2006, Corporate Services Department report 2006COM004 be received for information.

Report Summary

This report outlines the air quality situation in the City bus garages and steps that have been taken to address it.

Previous Council/Committee Action

At the January 31, 2006, City Council meeting, Councillor L. Sloan made the following inquiry:

> "The National Institute for Occupational Safety and Health considers diesel exhaust a potential human carcinogen (cancer causing substance). Recently, the Alberta Cancer Board has joined forces with Alberta Human Resources and Employment to create a booklet to inform workers and their employers about carcinogens, controls and risk factors in the workplace. I would like to know the following:
>
> 1. What controls are currently in place to minimize risk of employee exposure to diesel fumes?
> 2. What other substances or processes in Transit are carcinogenic, and what steps have been taken to eliminate or control exposure of employees to these substances/processes based on occupational exposure limits?
> 3. What administrative or engineering controls and additional personal protective equipment is available to employees exposed to any/all of these carcinogens?
> 4. What consideration has been given by the Occupational Health and Safety Committee to this issue?
> 5. What assessment has Administration done on the "additive" effect – whereby exposure to a combination of risk factors (i.e., smoking and diesel fumes) puts workers at greater risk?
> 6. Please provide a summation of Material Safety Data Sheets (MSDS), education and training materials provided to employees (as required by law) on how to deal with diesel exhaust and other carcinogenic substances.
>
> I would like this information to return to Transportation and Public Works Committee."

Report

Responses to Questions

1. *What controls are currently in place to minimize risk of employee exposure to diesel fumes?*

   The major exposure of employees to diesel fumes is in the bus storage areas of Ferrier, Mitchell and Westwood garages during the period when buses are leaving the garages for rush-hour service.

   Employees who are not required to be in the storage areas at that time are assigned work in other parts of the garage which are separated physically from the storage areas. Employees that must be in the storage areas during the periods of heaviest exhaust

contamination are encouraged to wear respirators.

Testing for exposure levels to diesel exhaust components (carbon monoxide, nitrogen dioxide, nitric oxide, formaldehyde, sulphur dioxide, diesel particulates and coal tar pitch volatiles) is carried out biennially. Testing is conducted during the periods of worst air quality, typically on a Monday morning in January or February when garage doors are closed due to outside temperatures. Results have shown that employee exposure levels are consistently below the eight-hour occupational exposure limits (OEL) legislated in the Alberta Occupational Health and Safety Act and Regulations. There is no legislated OEL for diesel particulates, but exposure levels have been found to be below the guideline of the American Council of Government Industrial Hygienists (ACGIH).

Subjectively, fumes are visible in the garages during the periods of heaviest exhaust fumes. Employees complain of sore throats, stinging eyes and lung irritation.

The bus storage areas are equipped with ventilation systems that provide fresh heated air from outside and exhaust the contaminated air from inside. The ventilation systems are regularly serviced and maintained. Exhaust fans are checked daily to ensure all are operating properly.

In mild weather, bus garage doors are left open during periods of high levels of diesel fumes to encourage natural ventilation. Skylights are removed in summer at Ferrier and Mitchell garages to provide natural ventilation. Some windows in Mitchell garage have been replaced with louvered openings that can provide natural ventilation in mild weather.

Bus drivers are reminded to minimize the generation of diesel exhaust fumes inside the garages by not accelerating aggressively or idling buses unnecessarily. Transit supervisors monitor the storage areas monthly in winter to ensure employees conform to this practice.

Ferrier garage is equipped with sensors that open the exit doors while the bus is approaching so it does not have to come to a full stop before exiting.

The older buses are fuelled every second day in Ferrier and Mitchell garages to reduce emissions during the cleaning and recycling process.

The major exhaust fume generators are the older buses with two cycle Detroit Diesel engines. There are 210 of these older buses still in service. These buses are between 24 and 34 years old, and have each driven more than one million kilometres and have had several engine overhauls and tune-ups over their lifetimes. The engines are no longer supported by the manufacturer.

Tune-ups and overhauls help reduce the generation of exhaust fumes but do not eliminate them. The engines smoke particularly heavily when being started up cold after a few days off.

The buses are being replaced at a rate of 35 per year under Capital Project XX-25-4219. In recent years, approximately eight per year of those replaced buses have been refurbished and put back into revenue service to meet demand for increased transit service, making the effective retirement rate 27 per year.

The three bus garages were designed to accommodate a total of 740 buses. They are presently housing 810 buses. This is more than the exhaust systems were designed to handle and the additional load on the ventilation systems is contributing to the fumes problem. A new bus garage is planned for the southwest quadrant of the city, but is not scheduled for completion until 2008 or 2009.

In recent years, Mobile Equipment Services (MES) prepared Capital Priorities Plan (CPP) project requests to update and expand the capacity of the ventilation systems in the garages, but funding was not approved.

A recent study on air quality has been concluded at Westwood Garage. Depending on the results of the study, mitigation measures to be considered would include requiring compulsory respirators for employees working in the main bus barns during the morning rush hour, increasing the program to overhaul and tune-up engines that are the major exhaust fume generators, and improving the ventilation systems in the garages.

2. *What other substances or processes in Transit are carcinogenic, and what steps have been taken to eliminate or control exposure of employees to these substances/processes based on occupational exposure limits?*

   A variety of substances used in bus maintenance contain carcinogens or suspected carcinogens. These include paints, resins, adhesives, solvents, acids and lubricants.

   Reviews are carried out periodically to confirm that these products are necessary to carry out their functions, or if there are other safer products on the market that could accomplish the same results.

   Employees are informed of the hazards through Material Safety Data Sheets (MSDS) and periodically in shop safety meetings and training sessions.

   Employees are provided all the necessary personal protective equipment to be used when working with the substances. This includes gloves, disposable coveralls, respirators, fresh air hoods, goggles, and face shields.

   Some operations are carried out under fume hoods or with localized exhaust systems to minimize the migration of fumes into the general workplace.

   The body shops are equipped with full size paint booths for use when painting buses or applying products that are particularly noxious or dangerous.

   Air quality tests have been conducted to confirm that exposure levels are below safe limits.

3. *What administrative or engineering controls and additional personal protective equipment is available to*

employees exposed to any/all of these carcinogens?

See the response to question 2 above.

4. *What consideration has been given by the Occupational Health and Safety Committee to this issue?*

   Air quality in the bus garages has not been discussed at corporate Occupational Health & Safety (OH&S) Steering Committee meetings. It has been discussed at Mobile Equipment Services Branch OH&S meetings and at monthly shop safety meetings in each of the garages. Suggestions are solicited on ways to mitigate the problem, members are informed of steps being taken, and information is shared on air quality test plans and results.

5. *What assessment has Administration done on the "additive" effect – whereby exposure to a combination of risk factors (i.e., smoking and diesel fumes) puts workers at greater risk?*

   The combined effects of chemicals can be additive, independent, or antagonistic (subtractive). The Occupational Health and Safety Code provides a formula for adjusting the exposure limits for additive interactions.

   There are no concurrent or additive effects from exposure to the various air borne contaminants present in the bus garages.

   Administration is not aware of an additive effect between cigarette smoke and diesel fumes, but since the concentration of cigarette smoke being inhaled by a worker cannot be measured or controlled, the approach to such an effect would be to ban smoking by the worker. Smoking is prohibited in the garages, so there will not be a concurrent exposure during the employees work day.

   Smoking cessation programs are offered to workers who indicate a desire to quit.

6. *Please provide a summation of Material Safety Data Sheets (MSDS), education and training materials provided to employees (as required by law) on how to deal with diesel exhaust and other carcinogenic substances.*

   New employees are given an orientation program that includes a short introduction to the Workplace Hazardous Materials Information System (WHMIS) and to Material Safety Data Sheets. They are shown a short 20-minute video on the topic, and they are given computer training on how to access the MSDSs on SAP. If they have not had WHMIS training previously, their foreman is informed so they can be scheduled for a full day of training from the corporate WHMIS/MSDS trainer.

   A review of selected MSDSs is one of the topics included in monthly shop safety meetings conducted in each garage

   There is no MSDS specifically on diesel exhaust fumes. The MSDS for Diesel Fuel states in the Toxicological Information Section under 'Other Considerations' that "Diesel engine exhaust particulate is probably carcinogenic to humans (IARC Group 2A)."