15.10.1 **INTRODUCTION**

15.10.1.1 Ventilation is defined as a method for controlling an environment by strategic use of airflow. The flow of air may be used to provide either heating or cooling of a workplace, to remove air contaminants, to dilute the concentration of air contaminants to an acceptable level, or to replace air exhausted from an enclosure. Ventilation can be accomplished by artificial means (i.e. positive pressure fan) or natural means (i.e. opening hatches).

15.10.2 **DEFINITIONS**

15.10.2.1 **Dust collector -** A device or combination of devices for separating dust from the air handled by an exhaust ventilation system.

15.10.2.2 **Clean air** - Air of such purity that it will not cause harm or discomfort to an individual if it is inhaled for extended periods of time.

15.10.3 **REQUIREMENTS**

15.10.3.1 Levels of airborne contaminants will be maintained within applicable limits established by MSHA or OSHA. The design, operation, and maintenance of ventilation systems will be in accordance with applicable MSHA / OSHA standards and good engineering practice.

15.10.3.2 Adequate ventilation shall be provided in these situations:

- o In designated areas where welding, cutting or grinding operations are performed.
- o Where flammable gases, vapors, or particulates are generated or are likely to be generated.
- o In confined or enclosed spaces where there is potential for a toxic, oxygen deficient, and / or explosive atmosphere.
- o Where necessary, engine exhaust gases will be piped out of shops.

15.10.3.3 The need for ventilation will be determined by considering:

- o The presence and concentrations of contaminants such as solvents or chemical vapors/mixtures which create mists, dusts, vapors or fumes.
- o The health effects of contaminants as listed in Material Safety Data Sheets (MSDS).
- o The results of routine and investigatory hygiene monitoring samples.

References:
MSHA 30 CFR 56 Subpart D.
OSHA 29 CFR 1910.24
American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems
KUCC Safety and Health Standard No. 14.3 Management of Change
KUCC Safety and Health Standard No. 16.2 Confined Space Entry Procedure

Signatures

Original signed by: Frank Klobchar	8/3/05	Original signed by: Chris Crowl	8/3/05	Original signed by: Bill Champion	8/11/05
Standards Committee Chairman	Date	Vice President Human Resources	Date	President, KUCC	Date

15.10.3.4 In situations where toxic contaminants are present (such as solvents or chemical vapors and/or mixtures) contact Safety or Industrial Hygiene personnel. Consult the Material Safety Data Sheets (MSDS) for hazard information the contaminant present. Physical characteristics like vapor pressure and vapor density along with rate of generation and synergistic effects of chemicals must be evaluated for to determine proper ventilation requirements.

15.10.3.5 When new processes are introduced to a plant area (or when existing processes undergo changes) which may generate dust, gas, or vapors, the plant management in consultation with the Safety, Industrial Hygiene, and Environmental Departments shall evaluate the extent of the problem, arrange appropriate corrective action, and establish administrative and operating controls. (Also see Safety and Health Standard 14.3 Management of Change)

15.10.2.6 In situations where employee exposure to airborne contaminants exceeds Occupational Exposure Limits (OEL), elimination of contaminants and the use of engineering controls and / or management controls should be explored first. The use of personal protective equipment (PPE e.g., respirators) is a last resort.

15.10.3.7 Where natural ventilation is inadequate or an OEL is exceeded, air movers or fans shall be used to remove air contaminants.

15.10.3.8 Where ventilation is used to remove contaminants, care must be taken to prevent harmful exposure at the exhaust discharge point. Exhaust points must also be located away from fresh air entry points or intakes which supply employee work areas.

15.10.3.9 Ventilation equipment must be designed and operated to provide the required volume and velocity of air removal necessary to control exposure to contaminants.

15.10.3.10 If a work area requires a ventilation system to control employee exposure to contaminants and the system fails to perform or becomes inoperable, the impact to the work area must be assessed. If contamination control is significantly impaired, plans must be made to repair the system, provide alternative ventilation, or limit employee access to the work area.

15.10.3.11 Temporary ventilation equipment should not be installed in a manner which blocks employee access into and out of work areas. If employees are working inside a confined space that requires ventilation and there is no means to ventilate without blocking access, the employees must be protected by using air line respirators.

15.10.4 **RESPONSIBILITIES**

15.10.4.1 The supervisor must ensure that all ventilation and gas monitoring equipment is kept in good working order and that regularly scheduled preventive maintenance and/or calibration is carried out on such equipment.

15.10.4.2 Supervisors are responsible for familiarizing themselves with the provisions of the Confined Space Entry Procedure (See Safety and Health Standard 16.2), and ensuring that employees are trained in and comply with its provision. Entry in to confined spaces with atmospheres that do not meet acceptable entry requirements under the confined space permit may only be accomplished by exhausting all reasonable ventilation efforts and utilizing SCBA or supplied air respiratory protection. **Under no circumstances shall personnel enter a confined space with an explosive atmosphere.**

15.10.4.3 The Industrial Hygiene Department will determine the frequency and methods of monitoring in the various plants to ensure compliance with applicable standards.