

TerranearPMC Safety Share

Week of June 11, 2012 – Personal Protective Equipment

Recently, the DOE reported three separate events at a single facility where it was observed that respirators were not properly worn (donned). These incidents occurred over a period of one and a half months (February 8 through March 23, 2012). Below is a brief description of the incidents.

Incident 1: On February 8, an employee left the cartridges off of his negative-pressure respirator while he taped the facepiece to his hood. He failed to install the cartridges prior to entering the work area and also failed to perform a negative and positive seal check to ensure the respirator was properly seated. The employee proceeded to enter the airborne radioactivity area without cartridges in place until it was noticed by a co-worker. No work was being conducted at the time.

Incident 2: On February 21, an employee was working when one of the crew members noticed that the employee's filter was missing from the worker's powered-air purifying respirator (PAPR). The filter was found lying on the floor close to where work was being performed. The employee picked up the filter and put it back on the motor blower unit of her PAPR without first having the filter scanned by a Radiological Protection Technician (RPT).

Incident 3: On March 23, a laborer was performing demolition on a pump. Upon exit from the work area, a co-worker noticed that the laborer's PAPR filter cartridge appeared to have come loose from the PAPR motor. When the outer coveralls were removed, they observed that the cartridge, which was taped to the outer clothing (to prevent contamination of inner clothing), was not connected to the motor.

Because all three incidents involved work in radiological areas, there was a concern of an employee uptake. Fortunately, results for all three cases (assessed through personnel contamination monitors, personal air monitors, nasal smears, and bioassay) were below reporting limits (note: information did not indicate whether the amount of uptake was quantifiable).

Subsequent investigations revealed that employees were not performing negative and positive user seal checks during the donning process and were not inspecting their equipment prior to use. These factors are considered crucial elements to ensure the assigned respirators will provide the proper protection based on the OSHA Respiratory Protection Program, 29 CFR 1910.134.

As a result of the investigation, corrective actions were developed, capturing the reasons why these events occurred. These actions included formal reminders to all employees as well as strengthening their respirator training and PPE inspection protocols.

The cause for these incidents can be associated with the reason why all PPE (which includes respirators, safety glasses, hearing protection devices, hard hats, etc), is considered as the last option for controlling work place hazards. The accepted hierarchy of controls should always be:

- Remove the hazard (example: using a non toxic material in place of a toxic one – such as water based solvents as opposed to organics).

- Engineering controls (example: localized ventilation to remove an airborne hazard before it becomes a personal exposure)
- Administrative controls (example: training, alternating/shortened or rescheduled work shifts, postings, medical surveillance, etc)
- Personal Protective Equipment: (examples are respirators, coveralls, gloves, etc)

There are a number of reasons why PPE is considered to be the last resort to protect people. Some these are:

- PPE protects only the person wearing it, whereas measures controlling the risk at source can protect everyone at the workplace
- Theoretical maximum levels of protection are seldom achieved with PPE in practice and the actual level of protection is difficult to assess
- Protection is often ineffective because the PPE is not suitable, incorrectly fitted, not properly maintained, and may be used improperly (pertinent to these cases)
- PPE may restrict the wearer by limiting mobility or visibility, or by requiring additional weight to be carried. As well as the health and safety problems that this may cause, it can also lead to a 'blame the worker' culture when the PPE is discarded because of the discomfort that it can cause
- Using PPE in a hot climate can be very uncomfortable for the worker. For example, using a full-face mask and body protection in full sunshine during the hot season can be almost impossible. It can result in dehydration, headaches and even fainting

Because respirator training is mandatory for all respirator wearers and work was performed within the DOE complex, it is required to have the respirator training program reviewed and approved by responsible and knowledgeable personnel. Such requirements as pre-inspection of PPE and performing mandatory checks are integral parts of this training. Yet, these steps were not properly practiced. Did the persons involved with these infractions forget the proper protocol or simply decided to skip these steps? While we may never know, it must be acknowledged that the human aspect played a significant role in these incidents. We are human, and therefore, according to the philosophy of Human Factors Improvement, we are fallible; making mistakes and unsound decisions many times throughout a given day.

We, as humans, need to be reminded and be armored with positive reinforcement mechanisms constantly. We need to be watching out for each other and to speak up when we see something that may cause harm to team members. Working alone, without any type of buddy system, makes us susceptible to our own mistakes and misjudgments.

The persons that were cited with improper use of respiratory protection equipment were very fortunate as their exposures were within reporting limits. In addition, the contractor made the right decision to elevate these occurrences even though no one suffered any negative health effects. Hopefully these incidents can serve as a valuable lesson, reminding us that to use PPE correctly, performing a proper inspection before we start our work tasks and to wear these items correctly.

By failing to prepare, you are preparing to fail

Benjamin Franklin