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My name is Roger L. Daniel. I am manager of Environmental Health Services which is the name of the industrial hygiene function at the Texas Division of Dow Chemical U.S.A.

There are 88 manufacturing plants at our location and we have 6,900 employees. We have 2,900 hourly employees with either maintenance or operating assignments. In addition, there are 1,400 contractor employees with maintenance and operating assignments. We are one of the major producers of chlorine in the U.S. and consume the majority of our output in the production of chlorinated hydrocarbons, glycols, glycerine and magnesium. Our interest in this public meeting stems from our concern for providing the best respiratory protection for our employees in widely dispersed work situations. I will be discussing our overall respiratory training program and particularly our utility of the mouthpiece respirator in intermittent use and escape situations.

We constructed our first respirator testing and training facility in mid-1975. Although our work was aimed primarily at preventing chlorine inhalation in the case of a gas release, it became obvious that all personnel would benefit from training in our facilities. In brief, the facilities are housed in 16'x8' portable buildings. One end of the interior is walled off to provide a chamber, 8'x5'. A circulation fan for uniform mixing and an exhaust fan for clean-out are installed in the chamber. Breathing air and Refrigerant 12 are piped through the wall of the test chamber. Refrigerant 12 is introduced into the chamber to establish a 500 ppm level. Breathing air is supplied through a demand regulator to the employee's test respirator. The exhaled breath of the test subject is collected by attaching a

silicone rubber cup and polyethylene hose to the exhalation valve of his respirator. The expired breath is continuously analyzed by a halide detection meter and recorded on a strip chart recorder. A level of 10 ppm in the expired breath is easily determined by the meter. The test can determine 10/500th's or 2.0% leakage.

Using four such facilities as the above, we have now trained over 6,000 Dow and contractor employees in the proper use of the specific respirator used in their work environment. We have retested sufficient personnel to allow us to draw a comparison between the effectiveness of the mouthbit respirator and a half-face respirator.

- (1) An accurate index of mouth-bit respirator proficiency has been achieved. Better than 99.5% of the personnel make an effective use of the respirator after testing and training. Respirator usage training is a highly retained skill. Tests show 89.5% of the test group retained the respirator skills that they learned initially.
- (2) In contrast, a 46 employee volunteer group was trained to properly adjust a half-face respirator, and, after a minimum use period of 30 days, were retested. Only 50% of the employees passed with 2.0% or less facepiece leakage. Facial hair and improper strap adjustment accounted for the failures. Face pieces are prone to slip in the warm, humid Gulf Coast work environment if strap adjustment is not properly made.

We have concluded that there are a number of advantages to the mouth-bit respirator for intermittent and for escape use.

- (1) The respirator is easily carried, either by a belt hook or around the neck.

- (2) The respirator can be put into service, without removal of a hard hat, in contrast to a half-face mask, under emergency situations.
- (3) Mouth-bit respirators do not interfere with chemical goggle fit. It has proven to be very difficult to fit employees with both a half-face respirator and chemical goggles.
- (4) Climatic conditions do not affect fit or proficiency of a mouth-bit respirator.

The above data were collected from personnel using the mouth-bit respirator without a nose-clip. Obviously, the proficiency of the mouth-bit respirator would be even greater had the test data been collected with a nose-clip in use. We contend that these data support our conclusion that a mouth-bit respirator is at least equivalent, if not superior, to a half-face respirator for intermittent use situations and that 30 CFR Part 11 should be modified to reflect this fact. We recognize that it is impractical to consider use of a mouth-bit respirator for continuous use.