Abstract
At a small unionized factory in northwest Ohio, the UAW encountered concerns expressed by employees about metalworking fluid exposures and illnesses, during a Participatory Action Research activity being conducted by the University of Michigan School of Public Health.

Over the course of the next few months, two cases of Hypersensitivity Pneumonitis were diagnosed, and others were suspected. The company initiated investigation, with Local Union assistance, and found bacterial contamination of reservoirs of metal working fluids within the worksite.

After much trial and error, workers and management found that the problems encountered with metal working fluids could be controlled, but not entirely eliminated. This poster presentation outlines the experience of the joint labor management team working on the identified problem, and which also provided

Background
This presentation follows up on a long history of responding to health and safety issues which were present at a small metals machining and parts manufacturing facility in the late 1990's. The company's hourly employees are represented by a UAW Local Union.

The manufacturer, based in northwest Ohio, is a producer of specialty bearings and precision machined components serving the automotive, heavy-duty truck, and specialty anti-friction bearings and precision-machined components which improve the efficiency and performance of both gas and diesel engines. Company facilities are equipped with turning machines, heat treating machines, and precision grinding machines. These facilities are designed to support both moderate and extremely high volume bearing products and precision turned and precision machined components serving the automotive, heavy-duty truck, and fabricated parts industries, specializing in products for engine applications.

The company is a major supplier of cam follower rollers, roller axles, and other specialty anti-friction bearings and precision-machined components which improve the efficiency and performance of both gas and diesel engines. Company facilities are equipped with turning machines, heat treating machines, and precision grinding machines. These facilities are designed to support both moderate and extremely high volume bearing products and precision turned and precision machined components serving the automotive, heavy-duty truck, and fabricated parts industries, specializing in products for engine applications.

According to the OSHA log of injuries/illnesses, reports of rashes and dermatitis from machine operators, plant laborers, and finished parts inspectors increased notably in 1997 and 1998. After the company experienced a sentinel event involving two diagnosed cases of hypersensitivity pneumonitis (HP), and three to six suspected cases of HP, the company initiated investigation, with Local Union assistance, and found bacterial contamination within the worksite.

After much trial and error, workers and management found that the problems encountered with metal working fluids could be controlled, but not entirely eliminated. This poster presentation outlines the experience of the joint labor management team working on the identified problem, and which also provided an opportunity to follow up and determine whether measures taken during the abatement continue to work.

Methods
The strategy included:
- Assembly of a facility “Coolant Task Force”
- Identification of other potential HP cases within the facility
- Implementation of closer medical surveillance of machine operators and other facility employees
- Identification and testing of MWFs specific to the company’s machining operations that were less likely to pose bacterial/fungal contamination problems

Results
- Installation of improved ventilation equipment
- Implementation of a MWF preventive maintenance program including:
  - A dedicated, joint labor/management Coolant Management Team
  - Regular testing for bacteria, fungus, coolant concentration, pH, ion levels, tramp oil, and water hardness
  - Regular machine cleaning
  - Pumping/recharging MWFs as necessary
  - Personal and area air sampling
  - Training for employees to recognize potential hazards posed by MWFs
  - Minimization of the use of biocides (used only as a last resort)

Discussion and Conclusions
The MWF preventive maintenance program adopted by the company and the UAW Local Union is based on OSHA and NIOSH best practices. UAW and facility management jointly agreed that development of a site-specific awareness level presentation, focused on signs and symptoms of MWF exposure, hygiene, day-to-day and longer term housekeeping, and a visual work instruction with before/after photos, coupled with the UAW’s MWF curriculum as a handout, would be best to inform workers at the company of all issues related to MWF exposures and control measures.

Consultation with the Local Union and management representatives during a follow-up site visit in September 2010, determined that two critical factors helped in controlling MWF exposures and consequent health problems that occurred at the company:
1. Finding the “right” MWFs to use in the machining operations. Numerous tests of over 12 different coolants led to the use of a synthetic “oil rejecting” fluid. At the company, they have never found mycobacteria in free flowing coolant, and sampling of oils separated from the coolant found bacteria in the oils, but not the coolant.
2. The use of Reverse Osmosis water. The local water source was too hard, so untreated coolant makeup water would cause the coolant to physically break apart.

In one of the facility buildings, a 10,000 gallon central system supplies MWFs to about six machines. On a visit in 1998, this system was observed to be an open system, with minimal ventilation. The central system has since been enclosed, and ventilation has been added to control MWF mists. A discussion with the UAW Health & Safety Representative in this building – who was one of the people diagnosed with HP – indicated that his symptoms have largely subsided, though with his increased sensitivity, he knows when coolant is about to go bad. He stated that he has not had to add biocides to the central system in this building in about five years.

Since the implementation of the company’s MWF control program, no further cases of HP have occurred, and reports of dermatitis and respiratory conditions are near zero. One UAW Health & Safety Representative at the factory stated, “We know that we can’t eliminate entirely the problems with growth of bacteria and fungi in our machines, but we do know the problems can be controlled.”

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