LESSONS LEARNED

A "Lessons Learned" column is instituted in this issue as a continuing feature of this journal for the express purpose of reviewing events that led, or could have led to occupational illness, injury, or death. It is with the hope and firm expectation that a thoughtful recapitulation of these events and the causal relationships will help others to avoid a repetition. We are thankful when "near misses" are only that, but they hold the same lessons for us as the full blown event would have, without the accompanying tragedy. Therefore, these events should be analyzed and reported as fully and promptly as possible. Journal readers are invited to submit their "lessons learned" as a contribution to the maintenance of biological safety and the continuing education of biological safety professionals. Identification of persons and places is not required.

Melvin W. First
Editor

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A Laboratory Infection

This lesson involves a qualified and experienced laboratory technician engaged in culturing sputum samples for the diagnosis of pulmonary tuberculosis. The procedure occurs in two steps: sputum, as received, is incubated on a diagnostic growth medium, and, when growth occurs, pure cultures are prepared for confirmatory identification. The second procedure is considered the more hazardous.

After being engaged in this activity for several years, the technician responded positively to a tuberculin test. No contact person could be identified as a source. An investigation of the work environment brought out the information that the work practices of the technician were excellent, but a 6-ft. Type A, Class 11 biological safety cabinet, where the pure cultures were processed, had a failed HEPA filter that was discovered and was patched by the accredited cabinet certifier on a routine six-month inspection. The patched filter was later replaced. This cabinet has a thimble connection above the cabinet discharged air port that is connected to an exhaust fan on the roof. The roof fan is rated at 500 CFM and the cabinet emits 500 CFM, meaning that some of the air from the cabinet spills back into the room, negating the added safety feature of a thimble connection for a Type A biological safety cabinet. In addition, there is no visual or audible alarm in the laboratory to signal when the roof fan is not operating. Finally, it was found that the supply air to the laboratory is so deficient relative to the exhaust requirements that there is serious doubt that the roof fan could ever reach its rated airflow volume of 500 CFM. The defective thimble system appears to have been the source of the exposure to the technician when the HEPA filter failed.

The lesson to be learned by this event is that cabinet field certifiers need to test the entire system for correct function, not just the cabinet alone. This cabinet was tested repeatedly by an
accredited certifier who removed the thimble each time to verify the discharge rate from the cabinet, but never measured the exhaust volume from the thimble. The protective function of the thimble was never verified. NSF Standard 49, Section F, Field Tests, does not call for this procedure, but it should. The cabinet field certifier can rightfully claim that the thimble system should be maintained by the facility’s HVAC personnel, but that should not prevent the cabinet certifier from verifying that the thimble system is functioning correctly. Deficiencies should be reported to the facility representative and cabinet certification withheld until the entire system is safe to use.

Contributed by Melvin W. First