

**New Jersey Department of Health and Senior Services  
Public Employees Occupational Safety and Health Program**

**Requirements for Preventing Occupational Exposure to Tuberculosis**

Revised November, 2004

**Background**

Tuberculosis (TB), once the leading cause of death in the United States, appeared to be receding into history by the latter part of the 20<sup>th</sup> century. Thanks to improved social and economic conditions and the development of effective drugs, TB case counts had fallen off so dramatically by the 1980's that U.S. experts believed that tuberculosis could be virtually eliminated from the United States by the year 2010.

An unexpected resurgence of tuberculosis occurred in the mid 1980's and early 1990's. This resurgence, which included several outbreaks of the disease among hospital patients and workers, prompted considerable concern among health care workers, administrators, public health professionals, and policymakers. The reversal of the longstanding trend in tuberculosis incidence was fueled by several converging factors: the onset of the human immunodeficiency virus (HIV) epidemic; increases in tuberculosis cases among foreign-born persons; outbreaks in congregate settings (e.g., hospitals, correctional facilities, hospices); and delays in recognizing the appearance and transmission of deadly, drug-resistant TB strains that defy traditional treatments.

In 1993, the trend of increasing TB case rates began to reverse, and declines in the U.S. have now been recorded for 7 successive years. The number of reported cases in New Jersey has declined yearly from 912 cases of tuberculosis reported in 1993, to 565 cases reported in the year 2000.

Despite the general decline in tuberculosis rates in recent years, a marked geographic variation in tuberculosis case rates persists, which means that workers in different areas face different potential risks. Between 1994 and 1998, six states-California, Florida, Illinois, New Jersey, New York, and Texas-accounted for 57 percent of TB cases, but had just under 40 percent of the U.S. population. These states also account for a large proportion of people with risk factors for the disease, notably, HIV infection and immigration from countries with a high prevalence of TB.

**According to the Institute of Medicine's 2001 report, "Tuberculosis in the Workplace", TB remains a threat to some health care, correctional facility, and other workers in the United States. Although the risk has been decreasing in recent years, vigilance is still needed within hospitals, prisons, and similar workplaces, as well as the community at large. It was concluded in the report that the primary risk to workers today is from patients, inmates, or others with unsuspected and undiagnosed infectious tuberculosis. Risk is influenced by the prevalence of tuberculosis in the community that the workplace serves and by the extent and type of workers' contact with people who have infectious tuberculosis.**



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*Mycobacterium tuberculosis* is carried through the air in infectious droplet nuclei of 1 to 5 microns in size. These droplet nuclei may be generated when a person with infectious TB disease coughs, speaks, sings, sneezes or spits. When inhaled by susceptible persons, the mycobacteria in these droplets may become established in the lungs and, in some cases, spread throughout the body. After an interval of months, years, or even decades, the initial infection may then progress to clinical illness (i.e., active TB disease). Transmission is most likely to occur from persons with pulmonary or laryngeal TB who are not on effective anti-TB therapy and who have not been placed in respiratory isolation.

Employees in close contact with persons with infectious TB disease are at increased risk of infection with TB. Certain high-risk medical procedures that are cough-inducing or aerosol-generating can further increase the risk of infection in HCWs.

**NOTE: Active TB disease means that TB bacteria are active and multiplying in the body causing symptoms and illness. Active TB disease may occur in different parts of the body including the lungs, larynx, lymph nodes, pleura (the membranes surrounding the lungs), brain, kidneys, bones and joints. Only a person with active TB disease of the lung or larynx is infectious. Infectious TB disease means that TB bacteria are capable of being expelled into the air by a person with active disease and, therefore, capable of transmitting infection to others.**

In May 1995, the Public Employees Occupational Safety and Health (PEOSH) Program issued their “Requirements for Preventing Occupational Exposure to Tuberculosis” (TB Requirements). On September 1, 1995, the PEOSH Program began to enforce the TB Requirements under the General Duty Clause of the PEOSH Act. On February 9, 1996, federal OSHA issued their new “Directive On Enforcement Procedures and Scheduling for Occupational Exposure to Tuberculosis.” Subsequently, the PEOSH Program has updated the TB Requirements which replace the May 1995 TB Requirements.

**The revised TB Requirements are based on the federal OSHA's 1996 enforcement directive and the CDC “Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-Care Facilities, 1994” (referred to as “Attachment A”). For a copy of the CDC 1994 TB Guidelines, visit the CDC's website at: [www.cdc.gov](http://www.cdc.gov) or call the NJDHSS, PEOSH Program at (609) 984-1863.**

The procedures in the PEOSH Program TB Requirements described below are consistent with the Program's traditional hierarchy of controls and good industrial hygiene practices. The control of TB is to be accomplished through the early identification, isolation, and treatment of persons with TB, use of engineering and administrative procedures to reduce the risk of exposure, and through the use of respiratory protection.

## Inspection Guidance

### I. Section N.J.S.A. 34:6A-33(a) -General Duty Clause

Occupational exposure to TB is a serious and recognized hazard and feasible abatement methods exist. Therefore, application of the General Duty Clause (Section N.J.S.A. 34:6A-33(a) of the PEOSH Act) is warranted where there is a hazard which cannot be abated by compliance with a specific PEOSH Standard.

#### A. Covered Workplaces

**Inspections for occupational exposure to TB will be conducted in response to employee complaints in workplaces where the CDC has identified workers as having a greater incidence of TB infection than in the general population.** The degree of risk of occupational exposure of an employee to TB will vary based on a number of factors discussed in detail by the CDC (see Attachment A, pages 4 - 6). These workplaces have been the subject of reports issued by the CDC which provide recommendations for the control of TB. **Specifically, these workplaces are as follows:**

- **health-care facilities;**
- **correctional institutions;**
- **homeless shelters;**
- **long-term care facilities for the elderly; and**
- **drug treatment centers.**

Refer to Attachment B for examples of New Jersey public facilities that fall into the above five categories.

All inspections in these workplaces conducted by the PEOSH Program will include a review of the employer's plans for employee TB protection, if any. Such plans may include the infection control program, respiratory protection, and skin testing. Employee interviews and site observations are an integral part of the inspection.

#### B. Employee Exposure

These requirements apply only to the employers whose employees work in one of the five types of facilities listed above and whose employees have exposure defined as follows:

1. Exposure to the exhaled air of an individual with suspected or confirmed infectious TB disease; or
2. Exposure during a high hazard procedure performed on an individual with suspected or confirmed infectious TB disease and which has the potential to generate infectious airborne droplet nuclei; (Examples of high hazard procedures include: aerosolized medication treatment; bronchoscopy; sputum induction; endotracheal intubation and

suctioning procedures; emergency dental procedures; endoscopic procedures; and autopsies).

**NOTE: A suspected case of TB is one in which the facility has identified an individual as having symptoms consistent with TB. The CDC has identified the symptoms to be: productive cough; coughing up blood; weight loss; loss of appetite; lethargy/weakness; night sweats; anorexia; or fever.**

### **C. Abatement Methods**

The following are examples of feasible and useful methods which must be implemented to abate the hazard. Deficiencies found in any category can result in the continued existence of a serious hazard and may, therefore, allow citation under N.J.S.A. 34:6A-33(a).

#### **1. Assignment of Responsibility (Non-mandatory)**

In order to have an effective TB Infection Control Program, the CDC recommends that a qualified person or persons be assigned responsibility for the TB Infection Control Program. Refer to Non-mandatory Appendix I for further information regarding the Assignment of Responsibility.

#### **2. Risk Assessment and Periodic Reassessment (Non-mandatory)**

A baseline risk assessment should be conducted to evaluate the risk for the transmission of TB in each area and occupational group within the entire facility and within the community that the facility serves. Information regarding the community profile can be obtained from public health departments. The risk assessment should be conducted by a qualified person or group of persons. Based on the number of individuals identified with known or suspected infectious TB disease within the facility, the assigned risk (minimal, low, intermediate, or high) will dictate the actions which should be taken by the employer. (See Attachment A, pages 8 -19 for guidance regarding risk assessments). Periodic reassessments of risk should be conducted, at a minimum, annually. Refer to Non-mandatory Appendix II for an example of a risk assessment.

**NOTE: The definition of a minimal, low, intermediate, or high risk category is:**

- A **minimal risk** category applies to an entire facility that has not treated, transported, or admitted individuals with suspected or confirmed infectious TB during the preceding year.
- A **low risk** category refers to areas or occupational groups within a facility that treated, transported, and/or admitted fewer than six (6) individuals with suspected or confirmed infectious TB disease during the preceding year.
- An **intermediate risk** category refers to areas or occupational groups within a facility that treated, transported, and/or admitted six (6) or more individuals with suspected or confirmed infectious TB disease during the preceding year.
- A **high risk** category refers to areas or occupational groups in which a) employee purified-protein derivative (PPD) conversion rates were significantly greater than for areas or groups in which occupational exposure to *M. tuberculosis* was unlikely, or greater than previous rates for the same area or occupational group, and epidemiologic evaluation suggests nosocomial transmission; or b) a cluster of PPD test conversions occurred, and epidemiologic evaluation suggests nosocomial transmission of *M. tuberculosis*; or c) possible person-to-person transmission of *M. tuberculosis* has been detected.

**NOTE: a cluster is when two (2) or more PPD skin test conversions occur within a three (3) month period among employees within a specific area or occupational group.**

### **3a. Development of a TB Infection Control Program (Non-mandatory)**

Based on the results of the risk assessment, a written TB Infection Control Plan should be developed and implemented. (See Attachment A, pages 19 -21). Refer to Non-mandatory Appendix III for an outline of the characteristics of an effective tuberculosis Infection Control Program.

### **3b. Development of a Written Protocol for the Early Identification of Individuals with Suspected or Confirmed Infectious TB**

The employer shall implement a written protocol for the early identification of individuals with suspected or confirmed infectious TB.

## **4. Medical Surveillance for Employees**

### **Initial Baseline Screening**

The employer, in covered workplaces, shall offer Mantoux TB skin tests (at no cost to the employees) to all current potentially exposed employees and to all new

employees prior to exposure who work in low, intermediate, or high risk areas or occupational groups. Mantoux TB skin tests are optional for employees in minimal risk facilities. Two-step tuberculin skin testing shall be used for new employees who have an initially negative PPD skin test result, and who have not had a documented negative TB skin test during the preceding 12 months. TB skin tests shall be offered at a time and location convenient to employees. The reading and interpretation of the TB skin tests shall be performed by a qualified individual as described in the CDC Guidelines (see Attachment A, pages 59-65).

### **Periodic Evaluations**

TB skin testing shall be offered annually for employees in low risk categories, every six (6) months for employees in intermediate risk categories, and every three (3) months for employees in high risk categories. (The CDC has defined the criteria for low, intermediate, and high risk categories. See Attachment A, pages 8-17). Employees with a documented positive (in millimeters of induration) TB skin test, who have received treatment for disease or preventive therapy for infection, are exempt from the TB skin test. However, they must be informed periodically about the symptoms of TB, and the need for immediate evaluation of any pulmonary symptoms suggestive of TB by a physician or trained health care provider, to determine if symptoms of TB disease have developed.

### **Reassessment Following Exposure or Change in Health**

Employees who experience exposure to an individual with suspected or confirmed infectious TB disease, for whom infection control precautions have not been taken, shall be managed according to CDC recommendations. An employee who develops symptoms of TB disease shall be immediately evaluated according to the CDC Guidelines (see Attachment A, pages 38-41).

## **5. Case Management of Infected Employees**

### **Protocol for New Converters**

Employees who convert to a positive TB skin test shall be offered appropriate physical, laboratory, and radiographic evaluations to determine whether the employee has infectious TB disease as soon as possible (see Attachment A, pages 65-66). Follow-up and treatment evaluations are also to be offered at no cost to the employees at a time and location convenient to them.

**NOTE: If an employee's initial TB skin test is given within two weeks of his or her start date and is positive, a workplace exposure could not have caused the infection. The minimum time necessary for TB transmission to result in a conversion to a positive skin test is two weeks. The employer is not in violation of this section if they do not provide evaluation and management to employees with infection that is not a result of a workplace exposure.**

## **Work Restrictions for Infectious Employees**

Employees with physician-diagnosed infectious or clinically suspected infectious tuberculosis disease should be restricted from work until a physician certifies that the person is no longer contagious, or infectious TB disease has been ruled out (see Attachment A, page 41).

### **6. Reporting Cases of TB**

**The employer shall report employees with physician-diagnosed active or clinically suspected active tuberculosis by phone to the NJDHSS, Tuberculosis Control Program, within 24 hours and in writing within 72 hours. The phone number is (609) 588-7522. Also, the report can be faxed to the NJDHSS, Tuberculosis Control Program. The fax number is (609) 588-7562.**

**NOTE: Clinically suspected active tuberculosis is a condition in which the individual presents a substantial likelihood of having active TB that is infectious, based upon epidemiologic evidence, clinical evidence, chest radiograph or laboratory test results.**

### **7. Employee Education and Training**

The employer shall provide all current employees and new employees (upon hiring) training and information to ensure knowledge of such issues as the mode of TB transmission, its signs and symptoms, medical surveillance and therapy, and site-specific protocols, including the purpose and proper use of controls (see Attachment A, pages 36-37). Training should be repeated as needed (for example, annually).

Employees shall be trained to recognize, and report to a designated person, any patients or clients with symptoms suggestive of infectious TB disease. They shall also be instructed on the post-exposure protocols to be followed in the event of an exposure incident (see Attachment A, page 23).

### **8. Engineering Controls**

The use of each control measure must be based on its ability to abate the hazard. Individuals with suspected or confirmed infectious TB disease shall be placed in a respiratory acid-fast bacilli (AFB) isolation room except as noted below.

**NOTE: AFB isolation rooms are not required in facilities where:**

- **these individuals are promptly identified and placed in a separate area of the facility, away from others;**
- **appropriate TB precautions are implemented; and**
- **these individuals are promptly referred to a collaborating facility for diagnostic evaluation and treatment or TB rule-out.**

#### **A. AFB isolation rooms are required in facilities which**

- admit individuals with suspected or confirmed infectious TB disease as in-patients;

(Note: medical units in prisons and long-term care facilities that provide medical treatment would be included in this category.)

- perform high hazard procedures on individuals with suspected or confirmed infectious TB disease, and acceptable local ventilation devices (e.g., booths, hoods, or special enclosures) are not feasible or available. High-hazard procedures are those that induce coughing, involve instrumentation of the lower respiratory tract, and/or generate aerosols such as irrigation of the tuberculous abscesses. These procedures have the potential to generate infectious airborne droplet nuclei. Examples of high-hazard procedures include, but are not limited to: aerosolized medication treatment; bronchoscopy; sputum induction; spontaneous sputum collection; endotracheal intubation and suctioning procedures; emergency dental procedures; endoscopic procedures; and autopsies.

## **B. Characteristics of an AFB Isolation Room**

- AFB isolation and treatment rooms in use by individuals with suspected or confirmed infectious TB disease shall be kept under negative pressure to induce airflow into the room from all surrounding areas (e.g., corridors, ceiling plenums, plumbing chases, etc.). (See Attachment A, Supplement No. 3, pages 76-78).
- The employer must assure that AFB isolation rooms are maintained under negative pressure. At a minimum, the employer must use non-irritating smoke trails, or some other indicator to demonstrate that direction of airflow is from the corridor into the isolation/treatment room with the door closed. If an anteroom exists, direction of airflow must be demonstrated at the inner door between the isolation/treatment room and the anteroom. (See Attachment C)

**NOTE: The opening and closing of doors in a isolation/treatment room, which is not equipped with an anteroom, compromises the ability to maintain negative pressure in the room. For these rooms, the employer should utilize a combination of controls and practices to minimize spillage of contaminated air into the corridor. Recognized controls and practices include, but are not limited to: minimizing entry to the room; adjusting the hydraulic closer to slow the door movement and reduce displacement effects; adjusting doors to swing into the room where fire codes permit; and avoiding placement of the room exhaust intake near the door, etc.**

- Air exhausted from AFB isolation or treatment rooms must be safely exhausted directly outside (i.e., away from occupied areas and air intakes) and not re-circulated into the general ventilation system. (See Attachment A, Supplement No. 3, pages 87-88).

**NOTE: In circumstances where recirculation is unavoidable, HEPA filters must be installed in the duct system from the room to the general ventilation system. (See Attachment A, Supplement No. 3, pages 82-84). For these HEPA filters, a regularly scheduled monitoring program to demonstrate effectiveness should include: 1) recognized field test method; 2) acceptance criteria; and 3) testing frequencies (see Attachment A, Supplement No. 3, pages 85-86). The air handling system should be appropriately marked with a TB warning where maintenance personnel would have access to the duct work, fans or filters for maintenance or repair activities.**

- In order to avoid leakage, all potentially contaminated air which is ducted through the facility must be kept under negative pressure until it is discharged safely outside (i.e., away from occupied areas and air intakes), or
- The air from isolation and treatment rooms must be decontaminated by a recognized process (e.g., HEPA filter) before being recirculated back to the room. **The use of ultraviolet (UV) radiation as a sole means of decontamination shall not be used.** The CDC Guidelines allow the use of UV in waiting rooms, emergency rooms, corridors, and the like where patients with undiagnosed TB could potentially contaminate the air. Refer to Attachment A, pages 90 through 95, for the CDC Guidelines on UV use and safety issues.
- After high-hazard procedures are performed and patients have left the booth, enclosure or room, enough time shall be allowed to pass for at least 99% of airborne contaminants to be removed. The time (purge time interval) will vary according to the efficiency of the ventilation system or filtration used. If employees must enter the room before 99% of the airborne contaminants is removed, a respirator must be worn. (See Attachment A, page 35).

**NOTE: The employer must use the formula for the rate of purging airborne contaminants to calculate the purge time interval. (See Attachment A, Supplement No. 3, Table S3-1, page 72).**

- Interim or supplemental ventilation units equipped with HEPA filters (as described in Attachment A, pages 70-73) are acceptable.

## **II. 29 CFR 1910.134 – Respiratory Protection**

- A.** Employees must provide and ensure the use of National Institute for Occupational Safety and Health (NIOSH)-approved respiratory protection in the following circumstances:
1. When employees enter isolation rooms housing individuals with suspected or confirmed infectious TB disease;
  2. When employees are present during the performance of high-hazard procedures on individuals who have suspected or confirmed active TB disease; (Examples of high-

hazard procedures include aerosolized medication (e.g., pentamidine) treatment, bronchoscopy, sputum induction, endotracheal intubation and suctioning procedures, emergency dental, endoscopic procedures and autopsies).

3. When employees must enter a booth, enclosure or room during a purge time interval before 99% of the airborne contaminants has been removed; and
4. When emergency medical response personnel or others must transport an individual with suspected or confirmed infectious TB disease in a closed vehicle.

**B. 29 CFR 1910.134 Respiratory Protection Standard provides in part:**

“Respirators shall be provided by the employer when such equipment is necessary to protect the health of the employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protective program which shall include the requirements outlined in 29 CFR 1910.134(b).”

**C. Requirements for a minimal acceptable respiratory protection program**

The 1994 CDC Guidelines specify standard performance criteria for respirators for exposure to TB. These criteria include (see Attachment A, page 97):

1. The ability to filter particles 1  $\mu\text{M}$  in size in the unloaded state with a filter efficiency of greater than or equal to 95% (i.e., filter leakage of 65%), given flow rates of up to 50 liters per minute (LPM);
2. The ability to be qualitatively or quantitatively fit-tested in a reliable way to obtain a face-seal leakage of less than or equal to 10%;
3. The ability to fit different facial sizes and characteristics of employees, which can usually be met by making the respirator available in at least three sizes;
4. The ability to be checked for face piece fit, in accordance with PEOSH standards and good industrial hygiene practice, by employees each time they put on their respirators.

- D.** Based on revisions of the NIOSH (42 CFR Part 84, Subpart K) Testing Standards for Respiratory Protection, three types of respirators: Type 100 {99.7% efficient}; Type 99 {99% efficient}; and Type 95 {95% efficient}; with three classes (N-, R-, P-series) meet the filter requirements established by the CDC for protection against TB. The N- and R-series’ filters are subject to time-use limitations (i.e., a single shift-time limitation may be appropriate in some workplaces). The N-series is also only recommended for use in oil-free or non-degrading aerosol environments. The P-series has no time-use limitations. However, as for any filter, its reuse will be limited to personal hygiene considerations. **Therefore, the current minimally acceptable level of respiratory protection for tuberculosis is the N-95.**

- E. If a facility chooses to use disposable respirators as part of their respiratory protection program, their reuse (by the same employee) is permitted as long as the respirator maintains its structural and functional integrity and the filter material is not physically damaged or soiled. The facility shall address the circumstances in which a disposable respirator will be considered to be contaminated and not available for reuse.
- F. **When respiratory protection (including disposable respirators) is required, a complete Respiratory Protection Program must be in place in accordance with 29 CFR 1910.134(b).**

### III. **29 CFR 1910.1020 – Access to Employee Exposure and Medical Records**

- A. As defined by 29 CFR 1910.1020, a record concerning employee exposure to TB is considered an employee exposure record. A record of TB skin testing results and medical evaluations and treatment is an employee medical record within the content of 29 CFR 1910.1020. Where known, the worker’s exposure record should contain a notation of the type of TB to which the employee was exposed (e.g., multi-drug resistant TB).
- B. These records shall be handled according to N.J.A.C. 12:110-5 so that the PEOSH inspector may determine compliance with 29 CFR 1910.1020. The employer may be requested to provide the PEOSH Program with employee skin test results.

### IV. **29 CFR 1910.145 – Accident Prevention Signs and Tags**

- A. In accordance with 29 CFR 1910.145(f)(8), a warning shall be posted outside AFB isolation or treatment rooms. Section 29 CFR 1910.145(f)(4) requires that a signal word (i.e., “STOP”, “HALT”, or “NO ADMITTANCE”) or a biological hazard symbol be present, as well as a major message (e.g., “Special Respiratory Isolation,” “AFB Isolation”), or a description of the necessary precautions (e.g., Respirators Must Be Donned Before Entering).
- B. The employer shall also use biological hazard tags on air transport components (e.g., fans, ducts, filters), which identify TB hazards to employees associated with working on air systems that transport contaminated air (see Attachment A, page 85).

### V. **Log and Summary of Occupational Injuries and Illnesses**

- A. Employee TB infections (positive TB skin test) and TB disease are both recordable on the NJOSH 300 Log in covered workplaces. A positive skin test for TB, even on baseline testing (except pre-assignment screening), is recordable on the NJOSH 300 Log because there is a presumption of work-relatedness in these settings, unless there is clear documentation that an outside exposure occurred.

**NOTE: In this case, pre-assignment means the same as pre-employment, and initial testing is the same as baseline testing.**

- B. If an employee’s TB infection, which has been entered on the NJOSH 300 Log, progresses to TB disease during the five-year maintenance period, the original entry for the infection shall be updated to reflect the new information. Because it is difficult to

determine if TB disease resulted from the source indicated by the skin test conversion or from subsequent exposures, only one case should be entered to avoid double-counting.

- C. A positive TB skin test provided within two weeks of employment does not have to be recorded on the NJOSH 300 Log. However, the initial test must be performed prior to any potential workplace exposure within the initial two weeks of employment.

**VI. Citations:**

**Citations under the General Duty Clause for TB exposure will be issued under the following circumstances:**

- **Where the employer failed to implement a written protocol for the early identification of individuals with active TB;**
- **Where the employer failed to establish a medical surveillance program;**
- **Where the employer failed to manage infected employees;**
- **Where the employer failed to provide a worker education and training program; and**
- **Where the employer failed to institute appropriate engineering controls.**

**Citations may also be issued under the following standards as they relate to occupational exposure to tuberculosis:**

- 29 CFR 1910.134 - Respiratory Protection;**
- 29 CFR 1910.145 - Accident Prevention Signs and Tags;**
- 29 CFR 1910.1020 - Access to Employee Exposure and Medical Records; and**
- 29 CFR 1904 - Recording and Reporting Occupational Injuries and Illnesses.**

## **NON-MANDATORY APPENDIX I**

### **Assignment of Responsibility**

The employer should assign supervisory responsibility for the TB Infection Control Program to a designated person or group of persons with expertise in infection control, occupational health, and engineering. These persons should be given the authority to implement and enforce TB infection control policies. (See Attachment A, page 8).

## **NON-MANDATORY APPENDIX II**

### **Risk Assessment and Periodic Reassessment**

A baseline risk assessment should be conducted to evaluate the risk for transmission of *Mycobacterium tuberculosis* in each area and occupational group in the facility. Risk assessments should be performed for all covered facilities. A sample risk assessment outline is provided on the next page.

## SAMPLE RISK ASSESSMENT

- The risk assessment was conducted by \_\_\_\_\_ on \_\_\_\_\_.  
*(Name(s) of qualified person)* *(Date)*
  
- The time frame covered by this assessment was from \_\_\_\_\_ to \_\_\_\_\_.  
*(Month/year)* *(Month/year)*
  
- The number of:
  1. individuals with suspected or confirmed infectious TB identified, assessed, and managed within this facility was \_\_\_\_\_ and \_\_\_\_\_.  
*(# of suspected infectious TB cases)* *(# of confirmed infectious TB cases)*

**OR**

  - individuals with suspected or confirmed infectious TB identified at this facility and then referred to a collaborating facility for diagnostic evaluation and treatment, or TB rule-out was \_\_\_\_\_ and \_\_\_\_\_.  
*(# of suspected infectious TB cases)* *(# of confirmed infectious TB cases)*
  
  2. TB cases in the community served by this facility was \_\_\_\_\_.  
*(# of individuals confirmed to have infectious TB disease)*
  
- Information regarding the community cases was obtained from \_\_\_\_\_.  
*(Name of local or county health department)*  
  
at \_\_\_\_\_ or by contacting the NJDHSS, TB Control Program at (609) 588-7522.  
*(Telephone #)*

*(If your facility has **not** treated, transported, or admitted individuals with suspected or confirmed infectious TB during the preceding year, your facility is MINIMAL RISK and Mantoux /PPD skin testing is optional. You do not need to complete the remainder of this form.)*

- 
- The number of PPD conversions at this facility was \_\_\_\_\_.
  
  - The PPD conversion rate was significantly greater than for areas without TB patients, or than the previous rate in the same area.     YES     NO.
  
  - A cluster of PPD test conversions in one area or a single occupational group working multiple areas occurred during a three-month period.     YES     NO.
  
  - There was evidence of patient-to-patient transmission.     YES     NO.

IF THE ANSWER WAS “NO” TO THE ABOVE, THE FACILITY IS LOW RISK, OR INTERMEDIATE RISK. DEFINITIONS OF RISK CATEGORIES ARE ON PAGES 4 AND 5 OF THE NJHSS PEOSH TB REQUIREMENTS.

IF THE ANSWER TO ANY OF THE ABOVE WAS “YES” THE FACILITY IS HIGH RISK.

## NON-MANDATORY APPENDIX III

### Development of a TB Infection Control Program

Based on the results of the risk assessment, a written TB Infection Control Program should be implemented for each area of the facility, and for each occupational group not assigned to a specific area of the facility.

A TB Infection Control Program should include the development and implementation of written policies and protocols which address the following:

- A. Development of a written protocol for the early identification of individuals with suspected/confirmed infectious TB disease;
  - 1. Create an early identification checklist to screen individuals on initial encounters (e.g., at the time of arrest, first visit to an out-patient clinic, and at the time of admission).
- B. Management of individuals with suspected/confirmed infectious TB disease;
  - 1. Promptly initiate TB precautions.
  - 2. Place in separate waiting rooms or isolation rooms.
  - 3. Provide surgical mask and tissues and give instructions how to use them.
  - 4. Transfer of individuals with suspected/confirmed TB disease to a collaborating facility for TB rule-out or treatment.
- C. Management of inpatients with suspected/confirmed infectious TB disease;
  - 1. Promptly initiate TB precautions.
  - 2. Monitor response to treatment.
  - 3. Follow criteria for discontinuing isolation.
- D. Diagnostic evaluation of individuals with suspected/confirmed TB disease;
  - 1. Perform radiologic and bacteriologic evaluation of individuals who have signs and symptoms suggestive of TB.
- E. Treatment of individuals with suspected/confirmed TB disease;
  - 1. Promptly initiate treatment.
- F. Education and training employees about TB;
  - 1. Required for all exposed or potentially exposed employees.
  - 2. Include epidemiology of TB in the facility.
  - 3. Emphasize pathogenesis and occupational risk.
  - 4. Describe work practices to lessen exposure.
- G. Screening of employees;
  - 1. Perform pre-employment skin testing, and then at regular intervals according to the risk assessment.
  - 2. Evaluate symptomatic employees for active TB.
  - 3. Evaluate any employee skin test conversion or possible nosocomial transmission.

- H. Management and counseling of employees;
  - 1. Counsel all employees regarding TB infection and the increased risk to immunocompromised individuals.
  - 2. Offer appropriate physical, laboratory and radiographic evaluation.
  - 3. Follow-up treatment evaluations to be offered at no cost.
  - 4. Restrict from work those employees with infectious TB until cleared by a physician.
  
- I. Use of engineering controls;
  - 1. Use single-pass air system or HEPA filtration for air circulation in infectious TB patient care areas.
  - 2. Regularly monitor and maintain all ventilation controls.
  - 3. Perform a daily test for negative pressure rooms in use.
  - 4. Exhaust TB isolation room air and local exhaust device air to the outside, or if absolutely impossible, re-circulate after HEPA filtration.
  
- J. Use of respiratory protection;
  - 1. Purchase respirators that meet NIOSH criteria.
  - 2. Establish a written respiratory protection program.
  - 3. Define when the employees must wear a respirator (e.g., when entering a TB isolation room, when performing high-hazard procedures, and while transporting individuals with suspected/confirmed infectious TB disease in a closed vehicle).

**Attachment B**  
**New Jersey Department of Health and Senior Services**  
**Public Employees Occupational Safety and Health Program**  
**Revised TB Requirements**

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The following are examples of facilities which fall under the New Jersey Department of Health and Senior Services (NJDHSS), PEOSH Program “*Requirements for Preventing Occupational Exposure to Tuberculosis*” (TB Requirements).

**Health-Care Facilities**

- state, county, and local hospitals
  - medical and dental wards in correctional and psychiatric facilities
  - nursing homes
  - hospices
  - emergency medical services
  - laboratories (where specimens for mycobacteriologic studies such as AFB smears and cultures are processed)
  - other facilities or residential settings that provide medical care
  - ambulatory care facilities/clinics\*
  - emergency departments
  - morgues/autopsy rooms
  - forensic laboratories in police departments
  - home health-care settings
- \* Including outreach and other medical or dental staff, who have direct contact with patients who have TB or are suspected of having TB, and who perform medical or dental services on behalf of a clinic or other health-care facility.

**Correctional Facilities**

- state prisons
- county and local jails
- police departments
- juvenile detention centers

**Long-Term Care Facilities for the Elderly**

- long-term care wings or units in hospitals
- adult foster-care homes
- board and care homes
- other congregate settings for the elderly

**Drug-Treatment Facilities**

- residential drug-free centers
- day treatment centers
- intermediate medical units (IMU’s)

**Homeless Shelters**

- inexpensive lodging houses
- single-room occupancy hotels
- other types of facilities used to house homeless persons
- night shelters
- common hostels

**Attachment C**  
**New Jersey Department of Health and Senior Services (NJDHSS)**  
**Public Employees Occupational Safety and Health Program (PEOSH)**  
**Smoke-trail Testing Method for Negative Pressure Isolation Rooms**

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**Test Method Description**

One of the purposes of a negative pressure TB isolation room is to prevent TB droplet nuclei from escaping the isolation room and entering the corridor to other surrounding uncontaminated spaces. To check for negative room pressure, use smoke-trails to demonstrate that the pressure differential is inducing airflow from the corridor, through the crack at the bottom of the door (undercut), and into the isolation room. When performing a smoke-trail test follow these recommendations, where applicable:

1. Test only with the isolation room door shut. If not equipped with an anteroom, it is assumed that there will be a loss of space pressure control when the isolation door is opened and closed. It is not necessary to demonstrate direction of airflow when the door is open.
2. If there is an anteroom, release smoke at the inner door undercut, with both doors shut.
3. In addition to a pedestrian entry, some isolation rooms are also accessed through a wider wheeled-bed stretcher door. Release smoke at all door entrances to isolation rooms.
4. So that the smoke is not blown into the isolation room, hold the smoke bottle/tube parallel to the door so that smoke is released perpendicular to the direction of airflow through the door undercut.
5. Position the smoke bottle/tube tight to the floor, centered in the middle of the door jamb, and approximately two inches out in front of the door.
6. Release a puff of smoke and observe the resulting direction of airflow. Repeat the test at least once or until consistent results are obtained.
7. Minimize momentum imparted to the smoke by squeezing the tube or bottle slowly. This will also help to minimize the volume of smoke released.
8. Depending on the velocity of the air through the door undercut, the smoke plume will either stay disorganized or it will form a distinct streamline. In either case, the smoke will directionally behave in one of three ways. It will:
  - a) go through the door undercut into the isolation room;
  - b) remain motionless; or
  - c) be blown back into the corridor.

Compliance with the intent of the CDC Guidelines for negative pressure requires that the smoke be drawn into the isolation room through the door undercut.

9. Release smoke from the corridor side of the door only for occupied TB isolation rooms. If the room is unoccupied, also release smoke inside the isolation room (same position as in Step No. 5) to verify that released smoke remains contained in the isolation room (i.e., smoke as a surrogate for TB droplet nuclei).
10. If photography is performed or videotaping, it is recommended that a dark surface be placed on the floor to maximize contrast. Be aware that most auto-focusing cameras cannot focus on smoke.

### **Testing “As Used” Conditions**

Testing of negative pressure isolation rooms requires that the test reflect “as used” conditions. Consider the following use variables which may affect space pressurization and the performance of the negative pressure isolation room:

1. Patient toilet rooms are mechanically exhausted to control odors. The position of the toilet room door may affect the pressure differential between the isolation room and the corridor. A smoke-trail test should be performed with the toilet room door open and the toilet room door closed. This will not be necessary if the toilet room door is normally closed and controlled to that position by a mechanical door-closer.
2. An open window will adversely affect the performance of a negative pressure isolation room. If an isolation room is equipped with an operable window, perform smoke-trail tests with the window open and the window closed.
3. There may be corridor doors that isolate the respiratory ward or wing from the rest of the facility. These corridor doors are provided in the initial design to facilitate space pressurization schemes and/or building life safety codes. Direct communication with the rest of the facility may cause pressure transients in the corridor (e.g., proximity to an elevator lobby) and affect the performance of the isolation room. Perform isolation room smoke-trail testing with these corridor doors in their “as-used” position which is either normally open or normally closed.
4. Isolation rooms may be equipped with an auxiliary, fan-powered, recirculating, stand-alone high-efficiency particulate air (HEPA)-filtration or ultraviolet (UV) units. These units must be running when smoke-trail tests are performed.
5. Do not restrict corridor foot traffic while performing smoke-trail tests.
6. Negative pressure is accomplished by exhausting more air than is supplied to the isolation rooms. Some heating, ventilation, and air conditioning (HVAC) systems employ variable air volume (VAV) supply air and sometimes VAV exhaust air. By varying the supply air delivered to the space to satisfy thermal requirements, these VAV systems can adversely impact the performance of the negative pressure isolation room. If the isolation room or corridor is served by a VAV system, you should perform the smoke test twice. Perform the smoke test with the zone thermostat thermally satisfied, and again with the zone thermostat thermally unsatisfied, thus stimulating the full volumetric flow rate range of the VAV system servicing the air being tested.

**Smoke:**

Most smoke tubes, bottles, and sticks use titanium chloride (TiCl<sub>4</sub>) to produce a visible fume. There is no Occupational Safety and Health Administration permissible exposure limit (OSHA PEL) or American Conference of Governmental Industrial Hygienist threshold limit value (ACGIH TLV) for this chemical although it is a recognized inhalation irritant. Health care professionals are concerned about releasing TiCl<sub>4</sub> around pulmonary patients. The smoke release at the door undercut makes only one pass through the isolation room and is exhausted directly outside. Isolation room air is typically not “recirculated.”

The CDC in the supplementary information to the 1994 TB Guidelines has indicated that “The concern over the use of smoke is unfounded.” Controlled tests by the National Institute for Occupational Health (NIOSH) have shown that the quantity of smoke that is released is so minute that it is not measurable in the air. Nonirritating smoke tubes are available and should never-the-less be utilized whenever possible.