administration of the standardized questionnaire contained in Appendix D, Part 1 during the initial examination and updating of the abbreviated standardized questionnaire contained in Part 2 of Appendix D during periodic examinations, (4) a physical examination, including a chest roentgenogram (if deemed necessary by the physician) and pulmonary function tests, and (6) any other examinations or tests deemed necessary by the examining physician.

The content of the revised standard's required physical examination is consistent with the identification of the adverse health effects that have been associated with asbestos exposure. A complete work history including information on any past occupational exposures to toxic substances is necessary for implementing an effective medical surveillance program.

Information regarding such past exposures can alert the physician as to the employee's current health status and the possible health consequences of continued exposure to asbestos. As discussed in Section IV (Health Effects) of the Preamble, OSHA has determined that asbestos can cause lung cancer, mesothelioma, asbestosis, and an increase in esophageal, stomach, colo-rectal, kidney, laryngeal, pharyngeal, and buccal cavity cancers. It is therefore important that the physical examination be directed to a determination of the condition of the pulmonary, cardiovascular, and gastrointestinal systems. In addition, a complete assessment of pulmonary status is essential for employees required to work in asbestos-containing atmospheres; this is accomplished through a pulmonary function test that measures forced vital capacity (FVC) and forced expiratory volume at one second (REV_1), and if desired by the physician a chest X ray. These tests are designed to allow physicians to diagnose the presence and extent of pulmonary fibrosis caused by the accumulation of asbestos fibers in the lungs and additionally to determine an employee's capability to wear negative-pressure respirators.

The respiratory disease questionnaires contained in Appendix D must be administered to construction employees during their medical examinations. These questionnaires will elicit information from the employee about his or her work environment and job responsibilities; symptoms of possible respiratory illness such as coughing, chest tightness, and breathlessness; tobacco smoking habits; and occupational history, and will be used in conjunction with the results of the pulmonary function testing to detect the early stages of asbestos-induced respiratory disease. In addition, information from these questionnaires can be used to increase medical knowledge about specific work exposures, doses, and durations and their relations to the later development of asbestos-related disease, and can also be used by OSHA to revise the permissible exposure limits for asbestos, if this is determined to be necessary.

OSHA has granted greater discretion to the examining physician by allowing him or her to choose whether to administer chest X rays. The Agency believes that the physician is the best judge of whether it is necessary, and at what intervals to conduct these X rays and will make this judgment based on the employee's health and the exposure conditions prevailing in the employee's work environment.

To aid in the physician's evaluation of an employee's health in relation to that employee's assigned work duties, paragraph (m)(3) requires that the employer provide the examining physician with the following information: (1) a copy of this standard and appendix I; (2) a description of the employee's duties as they relate to the employee's asbestos exposure; (3) the employee's representative or anticipated level of exposure to asbestos; (4) information regarding the employee's use of any personal protective equipment, including respiratory equipment; and (5) information from previous work-related medical examinations that is not otherwise available to the physician.

These requirements have been included in the revised standard to ensure that employers provide examining physicians with adequate data to facilitate analysis of the test results and to aid in the determination of the overall health status of the employee; they are also consistent with requirements in other recent OSHA health standards. Appendix I provides general information to the examining physician on the adverse effects of asbestos exposure and on the appropriate diagnosis for specific tests for asbestos-related diseases, such as the proper interpretation of chest X rays and spirometry readings. Inclusion of such informational appendices is standard in OSHA rulemakings, e.g., ethylene oxide (49 FR 25798, June 22, 1984) and inorganic arsenic (43 FR 19628, May 5, 1978).

The revised asbestos standard mandates at paragraph (m)(4) that the employer receive a written opinion from the physician that shall include the results of the medical examination, the physician's opinion as to whether the employee has any medical conditions that would increase his or her risk of material health impairment from asbestos exposure, any recommended limitations on employees or upon the use of personal protective equipment such as respirators, and a statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions that may result from asbestos exposure. The employer shall instruct the physician not to reveal in the written opinion specific findings or diagnoses unrelated to occupational exposure to asbestos. The employer is also required to provide a copy of the physician's written opinion to the affected employee within fifteen days of its receipt. These requirements have been added to the revised standard for construction to ensure adequate communication between the employer, the employee, and the physician, and are consistent with requirements in other OSHA health standards e.g., ethylene oxide (49 FR 25798; June 22, 1984), inorganic arsenic (43 FR 19628; May 5, 1978), and lead (43 FR 53011; Nov. 14, 1978). OSHA's analysis of the record evidence on these medical surveillance requirements is discussed below.

Section 6(b)(7) of the OSH Act mandates that

> . . . where appropriate, any such standard [promulgated under subsection (6)(b)] shall prescribe the type and frequency of medical examinations or other tests which shall be made available, by the employer or at his cost, to employees exposed to such hazards in order to most effectively determine whether the health of such employees is adversely affected by such exposure.

OSHA accordingly includes medical surveillance requirements in all of its health standards. In addition, the Agency considers these programs to be an appropriate means of monitoring the adequacy of the standard's permissible exposure limit.

Most commenters favored the inclusion of medical surveillance provisions in the revised rule for asbestos in the construction industry (Exs. 84-424, 84-457, 123-A, 277, 330, Trs. 6/20, 6/26, 6/27, 7/3, and 7/12). A few commenters, however, questioned the feasibility of requiring medical monitoring for the construction industry because of the high turnover rate and transient nature of the construction work force and because it is expensive (Exs. 84-233, Trs. 6/21, 7/6, and 7/10). For example, the Asbestos Information Association of North America (AIA/NA) stated that