

however, it was not uncommon for applicants transferring from one dial-painting plant to another to deny any previous experience because it might prejudice their chances of securing the new job. Therefore, it is to the best interests of all concerned to require rigid medical examinations, including blood counts, of all prospective workers. In particular, those already suffering from anemia or leucopenia, or showing symptoms of tuberculosis, should be rejected. In addition, the expired air should be tested for radon. If, after repeated and careful measurements, this exceeds the tolerance limit of 10^{-12} curie of radon per liter of expired air, the applicant should not be employed in this work.

General Procedures. Emphasis should be placed on cleanliness and neatness on the part of all persons in the factory. This must extend to every stage of the work and to all parts of the building occupied by dial painters. Carelessness in personal habits of neatness, and much less in the handling of radioactive compounds, cannot be condoned. A careless worker exposes fellow employees to illness unnecessarily and jeopardizes his own health as well. Great care should be taken to see that any radioactive substance accidentally spilled, whether on a work table or on the floor, is immediately cleaned up and any waste disposed of in a thoroughly safe manner. Workers should wear coveralls or smocks while in workrooms and should keep these garments, as well as hands and hair, free of radioactive material. No food or refreshments of any kind should be consumed in the workrooms, and smoking there should be prohibited.

Brushes. The most satisfactory method of applying radioactive luminous paint seems to be by the use of a small brush. Since tipping of brushes by the lips led to many of the early fatalities, this procedure must be eliminated entirely and subjected to the most careful scrutiny. Fortunately, the adhesives currently used require organic solvents of unpleasant odor and taste, thus reducing the tendency to point brushes by the lips. The use of bare fingers for this purpose is dangerous, also. One of the most satisfactory procedures for wiping and pointing brushes entails the use of small squares of cleaning tissue, which are discarded immediately after use into containers reserved for this purpose.

All such discarded material containing radioactive compounds must be frequently and carefully collected and disposed of in such a way as not to constitute a hazard somewhere else, either inside or outside the plant. Large plants frequently return this waste to the manufacturer of the compound for recovery of the radium.

Supervision. One of the best safeguards that can be provided for the protection of dial painters is a thoroughly experienced supervisor, familiar not only with the manufacturing process but also with the stages at which hazards may develop. In spite of instructions, employees are frequently tempted to devise methods and procedures of their own, which may not be safe. It should be the duty of the supervisor to detect and prevent the continuance of any unsafe practices, as well as to instruct the employees in the hazardous nature of the material with which they work and in approved methods of procedure. Routine

inspections of employees for neatness and the presence of radioactive material on clothing or hands should be made by the supervisor. Inspection for luminous compound can best be made in a darkened room provided with an ultraviolet lamp of moderate intensity. Even small particles are instantly detected by their fluorescence. It is sometimes convenient to inspect floors and work tables for scattered luminous material by ultraviolet light, making the inspections at night if the rooms cannot be completely darkened.

Equipment. The utensils and equipment used by each dial painter must be kept neat, and should always be arranged in a definite and orderly manner, convenient for the type of work in progress. No untidiness involving radioactive materials can be tolerated. The number of utensils and tools on each table should be reduced to the minimum required for the work, and no articles extraneous to the work should be permitted on the work tables at any time. This refers to the personal effects of the worker, including purses, clothing, cosmetics, and so forth. It is important that the surfaces of all tables on which radioactive compound is handled be smooth and impervious to the solvents used for the adhesive. Likewise, smooth floors that can be cleaned readily by mopping should be provided. Dry sweeping should be prohibited in work rooms.

Storage and Drying of Completed Work. Painted articles should be removed from the vicinity of the worktables frequently, to prevent any considerable accumulation, which might produce a gamma-ray hazard. If these articles are placed in drying racks, such racks should be enclosed and provided with sufficient mechanical exhaust ventilation, at an exit port, to maintain an air inflow of at least 75 linear feet per minute at all other ports and at all cracks when the cabinet is closed. Cabinets containing 500 or more dials should be located at least three feet distant from the permanent station of any worker. Finished dials may be stored on open shelves, if in a physically separated room supplied with ventilation of not less than 400 cubic feet per minute per thousand dials. Since dials in racks and cabinets may be a source of overexposure to gamma radiation, the gamma-ray intensity in their vicinity should be checked by suitable instruments, and workmen should spend only the minimum required time in or near storage areas.

Ventilation. Any operations that produce radioactive dust, such as grinding or scraping surfaces where radioactive luminous compound has been applied, should be avoided as far as possible. Where such procedures are necessary, the operation should be enclosed and protected by ventilation designed to prohibit the escape of respirable particles.

Where any considerable amount of radium luminous compound is applied, the concentration of radon in the air will soon exceed permissible amounts; therefore, a system of forced ventilation is essential. In present plants this ventilation has been accomplished in two ways, both effective if properly installed and operated. Some use general room ventilation adequate to keep radon concentrations below tolerance. Others rely on individual hoods placed over each worktable and connected to an exhaust system. A combination of the two is also used because the