

SOUND LEVELS AND NOISE EXPOSURE IN TWO ONTARIO GENERATING STATIONS

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ABSTRACT

A study of sound levels throughout two fossil fired generating stations, and the noise exposure to staff, was carried out to evaluate the noise hazard and to establish the relative importance of various equipment in the noise doses incurred.

Ontario Hydro has carried out a study of sound levels and noise exposure levels in two of its thermal generating stations: Lakeview, an older station to the west of Toronto; and Nanticoke, a large modern thermal station on the shore of Lake Erie. The study was carried out jointly by the Health and Safety Division and the Power Equipment Department, with the two objectives of

- (i) determining the levels of noise exposure in various job classifications, and
- (ii) determining the equipment most responsible for the noise exposure, particularly with a view to the design of new stations.

The various workers and teams were accompanied on the job by junior engineers equipped with sound level meters, and the time spent in specific areas was noted as well as the sound levels there. At the same time a detailed sound level map was plotted for the whole station and sound pressure level spectra taken for locations where particular items of equipment were predominant.

Noise dosimeters were discarded after some initial attempts as these gave some rather erratic results and could not, of course, identify the source of noise causing the exposure to a quite mobile worker.

The major conclusions of the study are that mechanical maintenance staff had the highest noise dose and that the doses at Lakeview were higher than at Nanticoke. Most of the exposure is the result of working on the ground floor of the Station. Noise from the motor driven boiler feed pumps at Lakeview was a major contributing factor to employee

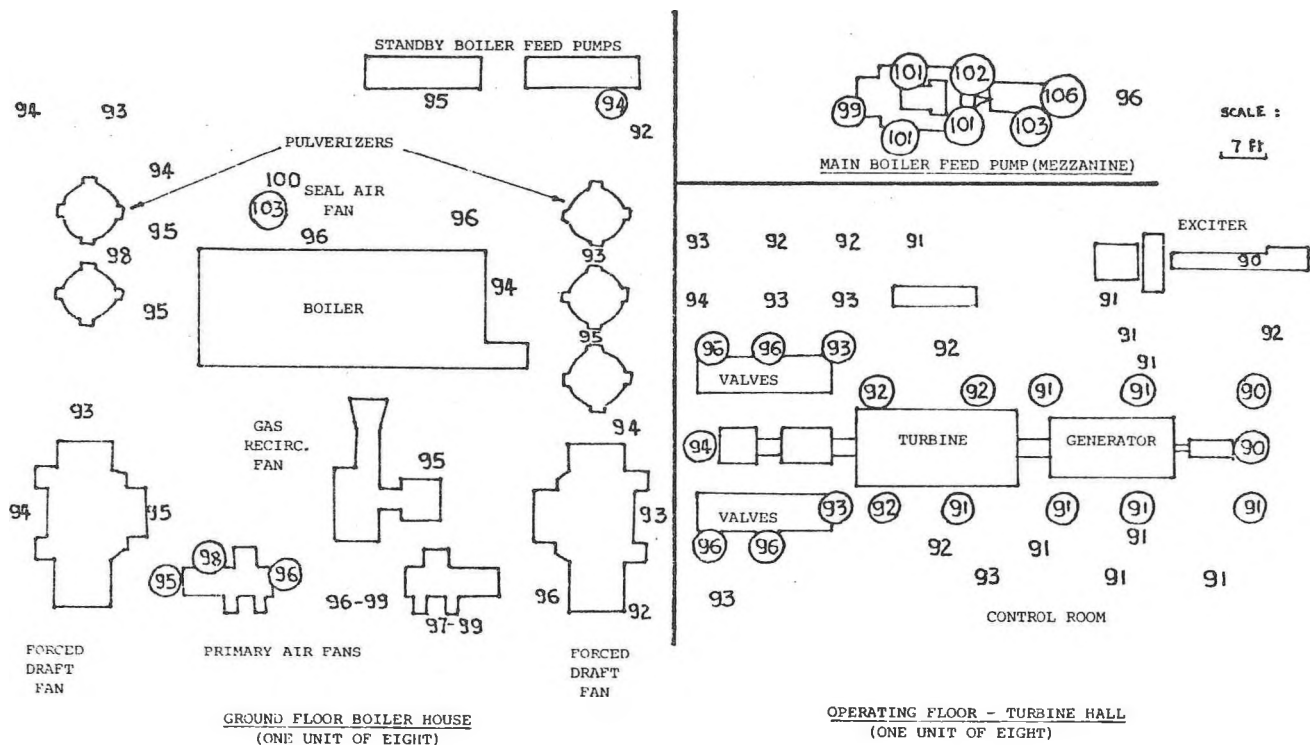
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noise dose. Although the steam turbine driven boiler feed pumps at Nanticoke are noisy (see map) they are located on a less travelled mezzanine floor.

It would require a reduction of approximately 7 dBA on the ground floor at Lakeview and 5 dBA at Nanticoke to result in a noise dose lower than 85 dBA for an 8h equivalent shift (OSHA system) without hearing protection.

The centrepiece of the Generation Station, the Turbine Hall, does not produce a major contribution to noise exposure. Most exposure here is to maintenance staff when working on a "down" unit while the others are still running. Sound levels are in the mid and upper 80's dBA around the down unit. The turbine halls are extremely reverberant: 2-4 dBA variation throughout. Acoustical treatment of the walls as has been done in Belgium and the US is being considered for future stations with a view to reducing the exposure obtained here rather than enclosing the turbine generator set, which is extremely costly and rather impractical.

Noise-thermal enclosures are planned for future boiler feed pumps and wrappings for the very large boiler fans and ductwork to reduce noise exposure on the ground floor. New coal pulverizers are expected to be about 7 dBA quieter than the ones measured here. Sound level criteria form part of the specifications for pumps and motors but to this date very little design effort has been expended by manufacturers to produce quiet pumps except for military application.



Nanticoke Generating Station
 A-weighted sound levels: circled numbers at 1 m from machine surface outline, other numbers at shown locations; microphone height at all locations, 1.2 m