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NEIGHBOURHOOD NOISE AND INDUSTRIAL PLANTS

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Today, for the majority of industrial developments which could have an impact on their neighbourhood, noise limits are imposed as part of the planning conditions. To achieve the required noise levels, it is often necessary to incorporate special low noise equipment and other noise control measures which add substantially to the cost of the project. To what extent is this expenditure necessary and does it meet the planners' objectives?

The noise limits imposed by the planning authorities should be aimed at achieving the following objectives:

- i) to protect the neighbourhood from an increase in noise levels that would materially affect the lives of people living in the area;
- ii) to allow the development of the industrial site without unnecessarily strict and costly conditions.

It is evident that standards from which community noise limits are derived and presented are diverse and inconsistent (1). Further research is required to establish those parameters which result in justifiable complaints from residents. The results should lead to an agreed method of measurement, evaluation and assessment.

The prediction of neighbourhood noise levels from a plant at the design stage has been an integral part of most major projects in recent years. In the U.K. these predictions would generally be based on the procedure presented by O.C.M.A. (2). The results would be valid for still air conditions over relatively flat terrain. A current study, supported by Stichting Concawe (3), into the various factors affecting sound propagation away from large petrochemical complexes to the surrounding neighbourhood, should on its completion, allow the reliable prediction of plant noise for most weather conditions. There will still be situations where unusual topographical or weather conditions exist, such that the area can only be calibrated from sound propagation tests specifically undertaken in the area.

Background noise, in the absence of any proposed development, will also vary considerably with weather conditions, time of day, time of year, etc. This variation was clearly demonstrated in a recent survey (4). Thus we have a situation where using a combination of measurement and prediction, it is possible to establish the plant noise and background noise over the range of climatic conditions encountered in an area.

At present it is possible to apply different interpretations on the standards used for community noise and the implications with respect to cost are substantial. If a plant is designed to meet the most stringent interpretation of the community, then this could result in the use of acoustic enclosures, or

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buildings around the majority of rotating equipment, bringing major problems of operation, maintenance and safety. The alternative, of taking the least stringent interpretation of the limits, could result in severe complaints being received from the neighbourhood. To remedy this situation would necessitate a post start-up noise control programme. Such a programme would involve replacement of some items of equipment and would interrupt production - the effective cost is likely to be higher than if the more stringent requirements had been adopted at the start. The optimum solution would probably lie between these two extremes allowing some increase in neighbourhood noise levels without putting an excessive burden on the developer.

References

- (1) P. SUTTON, Proceedings of the Institute of Acoustics 1978. Neighbourhood Noise Assessment - Do We Need a Long Term Leq?
- (2) SPECIFICATION NO. NWG-1. Oil Companies Materials Association 1972. Procedural Specification for Limitation of Noise in Plant and Equipment for Use in the Petroleum Industry.
- (3) A CURRENT STUDY BY ACOUSTIC TECHNOLOGY LIMITED ON BEHALF OF STICHTING CONCAWE. A Study of the Various Factors Affecting Sound Propagation Away from Large Petrochemical Complexes to the Surrounding Neighbourhood.
- (4) ACOUSTIC TECHNOLOGY JOB 731. Background Noise Survey Around a Site for a Proposed Refinery.