

A DETAILED INVESTIGATION OF LOW-FREQUENCY-NOISE COMPLAINTS

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1. INTRODUCTION

Many cases of noise annoyance deal with noise that has a significant content of low frequencies and the complainants typically describe the noise as "rumbling". The cases are often solved, either by use of traditional noise limits and measurement methods, or by use of special low-frequency procedures as introduced by some countries.

However, there is a group of cases where persons claim to be annoyed by rumbling noise, but where they are not helped in a way that they find satisfactory. This often leads to repeated complaints, anger at authorities, feeling of helplessness, and reports in the daily press. To a certain extent, these cases have some common characteristics. There is often no obvious noise source, and often only one or a few persons are annoyed. Many of the cases are in areas that are generally quiet, and, if measurements are made, they often show low values.

From 203 cases of low-frequency-noise complaints a random selection of twenty-one cases were investigated. The main aim of the investigation was to answer the question whether the annoyance is caused by an external physical sound or by a physically non-existing sound, i.e. low-frequency tinnitus.

2. METHODS

Noise recordings were carefully made in the homes of the complainants, taking into account the possible problems caused by standing waves. The complainants were exposed to these recordings from their own home in blind test listening experiments carried out in a special low-frequency test facility. Furthermore, the low-frequency hearing function of the complainants was investigated, and characteristics of the annoying sound was matched.

3. CONCLUSIONS

The results showed that some of the complainants are annoyed by a physical sound (20-180 Hz), while others suffer from low-frequency tinnitus (perceived frequency 40-100 Hz). Physical sound at frequencies below 20 Hz (infrasound) is not responsible for the annoyance – or at all audible – in any of the investigated cases. None of the complainants has extraordinary hearing sensitivity at low frequencies. For comparable cases of low-frequency-noise complaints in general, it is anticipated that physical sound is responsible in a substantial part of the cases, while low-frequency tinnitus is responsible in another substantial part of the cases.