Noise Monitoring in Tallinn Airport

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Technology has produced a sound which is stronger and different from natural sound. Noise is an increasing environmental factor. Every day a number of persons will increase who are exposed to unacceptable noise levels. Noise is a health risk to everyone.

More and more passengers are travelling by air, aircraft are becoming bigger and faster, and they are causing more noise pollution. To decrease the noise pollution we have to establish noise monitoring system. The purpose of noise monitoring is to control the noise pollution and to take measures to apply noise value according to noise limits in force. It is also necessary to inform the local municipalities and public about the noise pollution.

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ACTION PLAN

COMPLAINTS          NOISE
HANDLING            MAPS

MEASUREMENT DATA

Software

MEASUREMENTS
Hardware

Estonia in association with Denmark has set up a noise monitoring system in Tallinn Airport. Danish working group (Carl Bro a/s in collaboration with DELTA Acoustics & Vibration) carried out a training concerning noise measurements and computations.

The purpose of the work was in the collaborations with Danish working group to calculate the total sound energy (TDENL) on the Tallinn Airport, to measure and calculate helicopter’s noise and to analyse the suitability of the new European Union (EU) Directive 2002/49/EC in Estonia.

The present work consist of two parts. In the first part there is the overview of the monitoring system in the Tallinn Airport. The second part consists of computations and analyses which have carried out.

Tallinn Airport is relatively small international airport, were are performed 25 000 aircraft operation by the year and 60 by the day. Tallinn Airport is situated south east of Tallinn, 4 km from the city centre.
It was major objective of the project to purchase and install a noise monitoring system at Tallinn Airport. The installed system includes: two noise monitoring terminal situated east and west of the runway; a data link to main computer; a link to the EANS radar; a main computer with software for data processing, radar tracking, event analysis etc. and a mobile noise monitoring.

The most important part of the diploma work was helicopter noise measurements and computations.

Figure 2: Tallinn Heliport

Tallinn Heliport is situated near noise sensitive residential areas and there have been complaints about the noise.

Figure 3: using the mobile noise monitoring unit

Measurements were carried out on April 23, 2003, at Suur-Patarei 18 a, Tallinn. Outdoor measurements were taken at 6 meters height, 2 meters in front of the façade. Distance from the building to helicopter were approx. 400 meters

Figure 3: map of the measurements place

Helicopter noise calculations were carried out according to the Estonian regulation for environmental noise.

All noise results are given as sound pressure levels in dB:
- Lday (7.00 - 19.00) - 60.6
- Lnight (19.00 – 23.00) – 57.6
- Lall day (7.00-23.00) – 61.6
- Landing – 68.9
- Take off – 67.7

Helicopter’s noise measurements and calculations indicated that noise is causing disturbance to the people who are living nearby. It is recommended to use the penalty +5 dB by the assessment of the helicopter’s noise.

The calculations showed that 30% of aircraft operations cause the worst noise pollution when aircrafts fly over the city. The highest noise levels occur in the residential area (3 km²), which is situated on the west side of the airport.

Noise mapping of Tallinn Airport by using the new noise indicator $L_{den}$ gives the
necessary information according to the requirements of the directive 2002/49/EC. In order to get more information of the noise pollution around the airport, the additional noise indicator $L_{A_{\text{max}}}$ have to be taken into use. To get the adequate picture of the noise pollution, it is recommended to carry out supplementary noise maps by using maximum noise level $L_{A_{\text{max}}}$. For the planning purposes it is needed to develop a new national normative document for noise zoning procedures around Tallinn Airport.

TDENL (Total Day Evening Night Level) value decreased in the year 2002 comparable to 2001.