

MONITORING OF AIRCRAFT NOISE LEVEL
ON RESIDENTS NEARBY MALAYSIAN
AIRPORTS

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I hereby declare that I have checked this thesis, and, in my opinion, this thesis is adequate in terms of scope and quality for the award of the degree of Master of Science.



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I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.

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ABSTRAK

Penduduk yang tinggal berhampiran lapangan terbang sentiasa terdedah kepada bunyi pesawat yang berbahaya. Kajian ini dilakukan untuk menyasat kesan pendedahan bunyi bising pesawat terhadap penduduk yang tinggal berhampiran dengan lapangan terbang. Secara khusus, kajian ini bertujuan untuk menentukan tahap gangguan bunyi bising pesawat di Lapangan Terbang Sultan Mahmud (SMA), Terengganu dan Lapangan Terbang Sultan Ismail Petra (SIPA), Kelantan. Objektif kedua adalah untuk mengukur dan menyasat tahap pendedahan bunyi bising terhadap penduduk yang tinggal berhampiran SMA dan SIPA. Objektif ketiga adalah untuk menentukan kaitan antara persepsi penduduk berhampiran terhadap pendedahan (gangguan/gangguan) dan tahap pendedahan bunyi yang diukur. Kajian ini dijalankan dengan dua fasa. Fasa 1 ialah tinjauan soal selidik yang dijalankan di kawasan kediaman berkenaan dengan tahap gangguan bunyi bising. Fasa 2 pula dilakukakan untuk mengukur dan memantau paras bunyi bising pesawat di kawasan sekitar lapangan terbang di mana ukuran paras bunyi bising di tapak direkodkan selama 2 minggu di setiap kawasan lapangan terbang. Di SMA, kajian bunyi telah dilakukan di lima titik lokasi (P1-P5), manakala tujuh titik lokasi (P1-P7) di SIPA iaitu di sekitar lapangan terbang. Setiap lokasi mewakili jarak yang berbeza daripada sumber bunyi bising. Analisis regresi logistik telah dijalankan untuk menentukan perkaitan antara pembolehubah. Keputusan daripada Fasa 1, seramai 152 peserta telah menjawab soal selidik dari kedua-dua kawasan lapangan terbang. Keputusan menunjukkan 52.63% peserta bersetuju bahawa bunyi bising pesawat adalah punca gangguan dalam rutin harian mereka. Keputusan daripada Fasa 2 pula menunjukkan bunyi bising maksimum yang direkodkan di SMA ialah 92.5 dB (A) dan 86.3 dB (A) di SIPA. Secara umum, purata tahap bunyi bising harian adalah dalam lingkungan 47–65 dB (A) untuk kedua-dua lapangan terbang. Ia melebihi tahap bunyi bising dalaman maksimum yang disyorkan Pertubuhan Kesihatan Sedunia (WHO) iaitu tahap bunyi bising luar maksimum adalah 35 dan 55 dB (A), masing-masing. Selain itu, purata tahap bunyi bising harian adalah lebih rendah daripada had pendedahan 8 jam yang dibenarkan iaitu 90 dB (A). Analisis statistik menunjukkan bahawa tidak terdapat perkaitan yang signifikan antara model yang digunakan. Berdasarkan keputusan, dapat disimpulkan bahawa tahap pendedahan bunyi bising boleh mengganggu penduduk yang tinggal berhampiran lapangan terbang. Bunyi tersebut juga mungkin menjejaskan kualiti hidup mereka jika mereka terdedah kepada bunyi pesawat dalam jangka panjang.

ABSTRACT

Residents who live near airports are constantly exposed to harmful aircraft noise. This study investigates the effect of exposure to the aircraft noise on residents who live nearby the airport. Specifically, this study aimed to determine the aircraft noise disturbance level at Sultan Mahmud Airport (SMA), Terengganu and Sultan Ismail Petra Airport (SIPA), Kelantan. Second, to measure and investigate the noise exposure level of residents living near the SMA and SIPA, and thirdly, to determine the association through perception on the exposure (disturbance/annoyance) on residents nearby and measurement of noise exposure measured. The work was undertaken in two phases. For phase one, a questionnaire survey was undertaken at the residency area regarding the noise disturbance level. The second phase measured and monitored the aircraft noise level at the airport's surrounding area in which on-site noise level measurements were recorded over 2 weeks at each airport area. At SMA, five location points (P1-P5) were measured while seven locations (P1-P7) for SIPA that surrounded the airport, in which each location represented a different distance from the noise source. Logistic regression analysis was undertaken to determine the association between the variables. The results from Phase 1, consisting of 152 participants answered the survey questionnaire from both airport areas, reported that 52.63% of participants agreed that aircraft noise was a source of disturbance in their daily routines. The result from Phase 2 indicated the recorded maximum noise measurement at SMA was 92.5 dB (A) and 86.3 dB (A) at SIPA. In general, the daily average noise levels were within 47–65 dB (A) for both airports, which exceeded the World Health Organization (WHO) recommended maximum indoor noise level recommending a maximum outdoor noise level of 35 and 55 dB (A), respectively. Also, the daily average noise levels were lower than the 8-hour permissible exposure limit of 90 dB (A). The statistical analysis indicated that there was no significant association between the model employed but the data fit the model. Based on the results, it can be concluded that the level of noise exposure may disturb residents living nearby the airport, possibly affecting their quality of life if they exposed to aircraft noise long term.

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