APPENDIX 7.3.4: DETAILS OF SEQUENTIAL INM ANALYSIS

1.0 INTRODUCTION

The Environmental Impact Assessment (EIA) Study Brief (ESB-250/2012) Appendix C Section 2.3.1(a) requires an assessment of aircraft noise impact based on "the worst operation mode which represents the maximum noise emission in connection of combination of number of aircraft, type of aircraft which utilize each flight track in time periods for both approaches and departures for the selected year". This Appendix describes how the worst assessment year is selected based on the air traffic forecast data developed by IATA for each year from years 2023 to 2038 using the Sequential INM Analysis.

2.0 SEQUENTIAL INM ANALYSIS

The Sequential INM Analysis is a screening process that involved development of a simplified INM model to provide an estimate of changes in noise contour areas for an airport given the types of aircraft and the number of operations for each aircraft. The noise contour area is a measure of the size of the landmass enclosed within a level of noise as produced by a given set of aircraft operations.

The latest INM version 7.0dsu1 was used in the current Sequential INM analysis. During the analysis, runway utilization and flight track utilization were held constant, while aircraft fleet mix and day/night split were varied according to the IATA forecasted flight schedules. Given the purpose of the Sequential INM Analysis which serves as a screening tool such that more detailed subsequent analysis may focus on the worst assessment year identified, it shall be noted that the simplified INM model developed for the Sequential INM Analysis cannot be directly compared with the detailed INM analysis that focused on the worst assessment year in terms of both input data and results.

3.0 DETERMINATION OF WORST ASSESSMENT YEAR

Operational data including fleet mix, day/night split, and operational levels was extracted from the detailed flight schedules prepared by IATA.

The Sequential INM Analysis was used to determine the worst assessment year that represents the maximum noise emission by analyzing NEF25 noise contour areas for the flight schedules between 2023 and 2038 for the three-runway system. The results reflect that the area peaks in Year 2030 for the three-runway operation. Therefore, the subsequent aircraft noise analysis using INM for the three-runway system will be focusing on Year 2030 as the worst assessment year.

In addition to the worst assessment year as mentioned above, based on the IATA's forecast developed for each year from 2023 to 2038, it is predicted that the future operation of the three-runway system may start to reach design capacity from Year 2032. The change in fleet mix has also been considered in the Sequential INM Analysis and the results indicated that Year 2032 would be the most representative in terms of noise emission and has been selected to represent the design capacity scenario.