New strategy for noise in Egypt

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Abstract

A great concern for the modernization of Egyptian airports, roads, Power stations as well as other emissions of sound sources in Egypt was directed to limit the noise effects coming out from these sources
A pre planned program for Airports, Road, power stations and the other sources has been adopted for that and now is being implemented.
For airports the fist phase has been lunched it contain a managements system for two airports including noise monitoring systems for evaluation
For roads and other activity the first step of planning a full strategy for finding suitable regulation and guideline for city noise has also been lunched
The Goals for the two steps varying from reducing noise level at the cities to find the white environmental law at the city activity of course the Maine aim is to find the right ways to reduce noise also to minimize the effect on populations.
The authorities decided to complete the development program fully and allocated the budget necessary for all the mention steps
A pilot projects for airports and Cairo city generate a comprehensive database for the intended permanent automatic noise monitoring stations at the selected best locations
Based on the pilot project a full design of the monitoring for Cairo city and the two airports has been performed
In less then one year Egypt, will have a permanent noise monitoring system for Cairo, Sharm El-Sheikh international airport and Cairo city as a step of a six year program
The current work review the states for this new strategy in Egypt .

KEYWORDS

Noise – Monitoring – Permanent Monitoring – Airport – Noise control - Traffic noise – city noise – prediction- Barrier –- noise reduction – noise managements.

INTRODUCTION

Lake of regulation for airports, power plant and road traffic was the motivati to some pilot projects for optaining a data base and tray to establish a good practis for noise at the mention area.
The airports , roads and power plant represent the Main contributor for noise at city like Cairo for airport the first phase of a permanent system for noise monitoring has been lunched including the selection of best location, for road traffic a noise populated area has been selected to accurately evaluate the noise sources and try to minimize it also for power plant a prediction code and a base line measurements has been performed aiming to find the impact of the new generator been erected at a specific location around Egypt.
Varying from measurements and prediction code, a new era has been started in Egypt

2- WORK PLAN

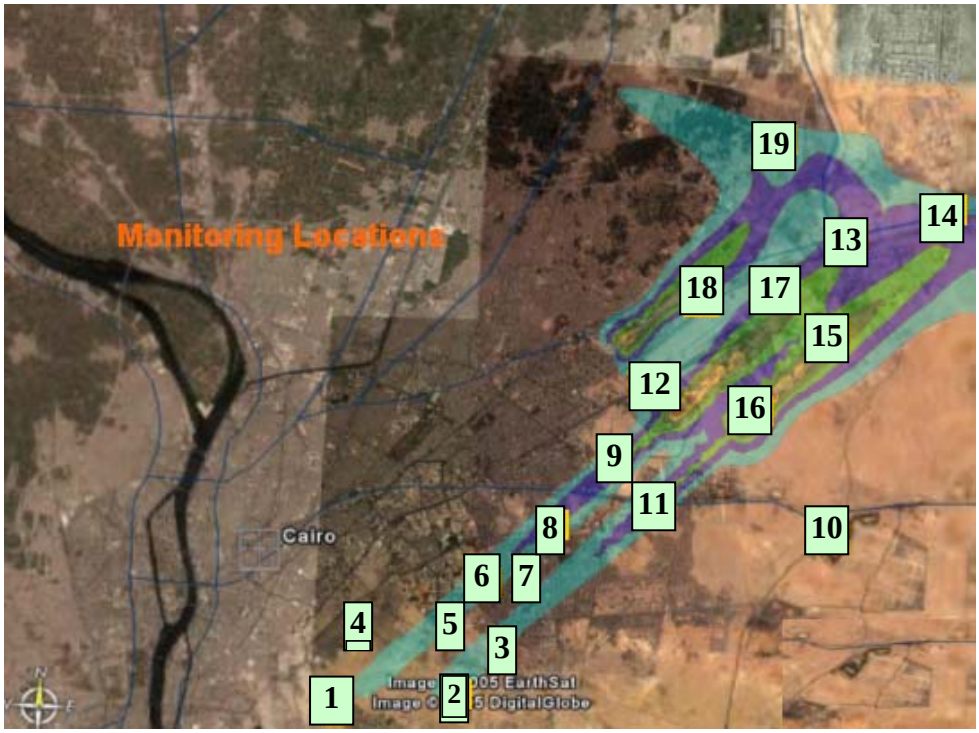
For Airports
A comprehensive and detail study for the best locations to measure noise has been performed to help for the preparation of the permanent automatic noise monitoring stations in Cairo and Sharm El-Sheikh international airports; that include details study for maps, residential areas, flight track, Air ways, procedure for landing and taking-off for planes, attitude of planes at different locations .
For city noise an accurate analysis for noise pollution at Cairo has been performed an area having industrial, residential, high traffic volume has been chosen; ma'ade and Helwan, survey has been performed to chose the Wright locations and a noise traffic code has been performed to estimate the noise at Maine road
For power plant all new power plant has now a base line measurements and a full noise prediction to estimate noise out from that source.
The activity that has been performed in the last year clearly indicate that the new strategy for better understanding the current situation for noise sources identification and analysis aiming to reduce noise level at Cairo is a good step in the right direction.

2.1 For Airports (Cairo International Airport and Sharm international airport) :

A detail study to chose the best locations for permanent monitoring was done and selection for this locations has been performed

2.1.2 Selection Criteria for permanent locations :

For selection of a good location a survey for 18 location at each airport has been performed, Noise Prediction Contour was performed as seen in the graph


Monitoring Locations
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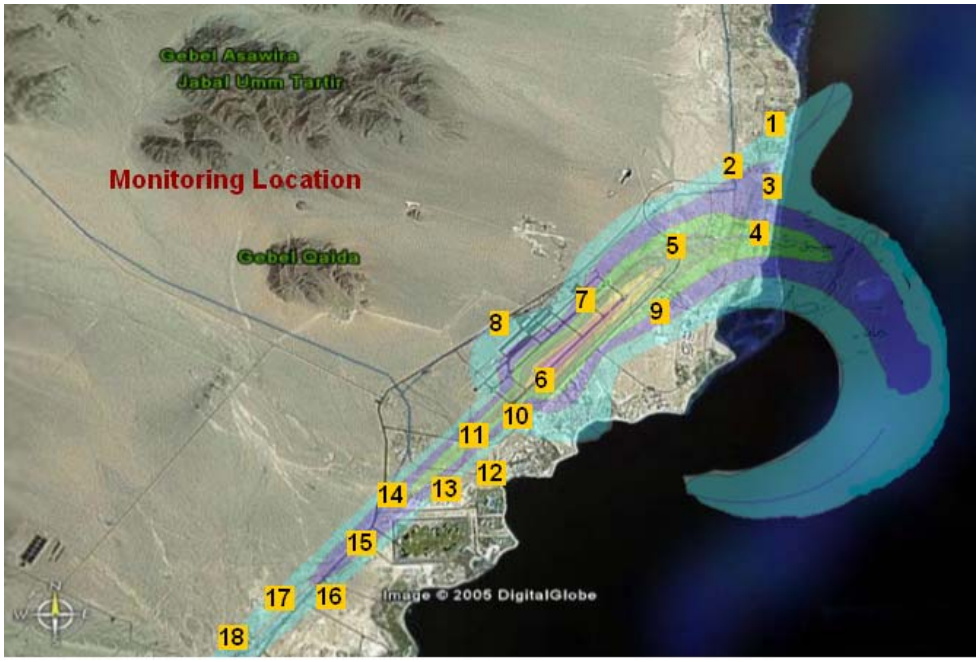
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3. Sites selection criteria for Permanent noise monitoring in the vicinity of CAI and SSH airports:

3.1 General Considerations:

The choice of location for noise monitoring stations is the most important criteria in obtaining accurate and useful noise data. Because the needs for noise data may vary considerably, the scientific and engineering guidelines for placing noise monitor stations may also differ considerably. The selection of monitoring sites should be carefully considered early in the development of a monitoring plan, once the objectives for the monitoring system have been clearly identified.

Typically, noise monitoring information requirements may encompass several different objectives. Because of initial installation and operating costs, there is usually a desire to install the minimum number of stations as are deemed required to meet the program objectives, although the incremental cost of adding additional stations is often low compared with the worth of the improved data obtained.

The selection of noise monitoring sites is usually a two-stage process.
The first stage involved the general location of the monitoring sites. This general selection is based upon monitoring objectives, which include:

- Obtaining accurate noise information in specific noise-sensitive community areas.
- Obtaining accurate noise information for verifying noise contour locations.
- Obtaining accurate information on the noise levels produced by different types of aircrafts at the particular location and operations for noise regulatory (noise limit) purposes, noise budget analyses, etc.
- Obtaining noise information to monitor aircraft departure or landing flight paths, and to determine runway and flight path utilization.
- Meeting noise monitoring system technical considerations, particularly the need to obtain noise information from more than one station under important departure or arrival paths for the screening of aircraft noise signals from other community noises.
- Monitoring compliance with set daily sound exposure level requirements.
- Management of noise at the vicinity of both airports to achieve one of ICAO recommendations of minimizing noise on ground and land use planning around airports.
- Monitoring system such the proposed one will help the authority in Egypt to effectively manipulate the data for better environment.

The second stage of the site selection process is the selection of specific

monitor sites within the airports area. This is based upon practical considerations such as:

Interference from other noise sources (road traffic, industry, etc.)

- Ease of access to utilities (telephone and electrical power)
- Terrain and building obstructions
- Ease and costs of obtaining site access and approvals. (Location on private property may require payments of rent or easements; location on publicly owned land such as parkways may be less costly for public agencies, but obtaining formal approvals may be difficult and/or time consuming.) and this is achieved by selection of some governmental sites.
- Monitor station security considerations (vandalism and theft)
- Extreme environmental conditions especially those, which are not continuous

Basic planning for a monitoring system included the development of a reasonably complete set of sound level or time average level contours for both airports, which covered the community areas of interest. The process of collecting the operational and flight track information for the contours may help to identify weak points in operational information (for example, lack of runway utilization data or existence of major flight tracks beyond a few miles distance from the airport) that may require further investigation during the process of selecting noise monitor locations.
A set or sound level or time average level contours can be useful in estimating relative differences in sound exposure level among candidate monitor locations. The current work of Fixed manual temporary noise measurements is an effective tool in this respect After the monitoring system has been installed and become operational, system noise data output can be valuable in improving and refining the contours themselves. Variations in local topography, particularly hilly terrain, can affect the propagation of sound from aircraft to monitoring locations. Hills between an aircraft flight path and a microphone can shield the microphone, as can intervene structures, reducing measured sound levels. Microphones on high terrain can receive higher levels because of decreased distance from the aircraft source.

3.2 Placement of Monitors under Major Flight Tracks.

To obtain accurate information on runway utilization, i.e., to count the number of arrivals and departures on each runway, the selected stations are placed under or nearly under the primary departure or arrival flight paths such as (International garden-Educational building and others) (Hauza hotel – Plant gardens and other) .
The placement of stations under major flight paths may also be useful when the primary monitoring purpose is to determine contour locations or to

monitor noise in noise sensitive community areas. Monitoring at such positions provides more accurate information about aircraft activity than will monitoring far off the flight track centreline.

Noise information from monitor positions under major flight paths can be valuable in separating the noise of aircraft from that of other sources at different monitoring locations.

The time separation between noise events should be considered when these are used to determine direction of flight and to separate aircraft and non-aircraft noise. A time separation of at least three to five seconds between noise events measured at different monitoring points is desirable. Hence the spacing between stations, measured along the flight track, should be of the order of 600 meter's or more assuming, for jet aircraft, operating speeds in the range of 120 to 160 knots.

Note: It is sometimes very useful to place noise monitors near the ends of active runways where they will receive 'strong aircraft signals and be subject to fewer non-aircraft noise events. This may not always prove desirable, however, because there can be many noise sources within the airport boundaries which produce quite high local noise levels. Such sources include taxiing aircraft, helicopter operations, maintenance vehicles, engine runups, etc. Thus, for positions very close to the runway, investigation is needed to preclude contamination of aircraft operational noise.

Reference position.

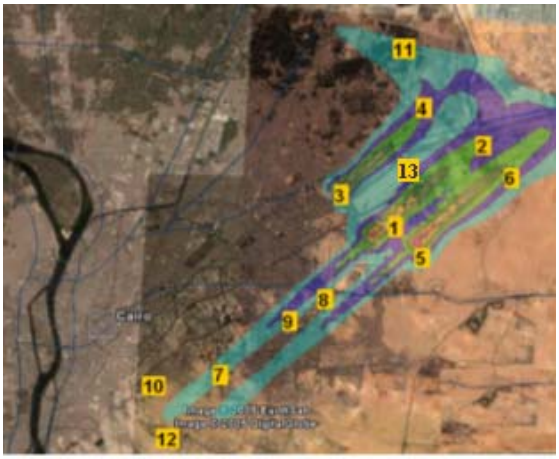
It is recommended that at least one monitoring position shall be as close to a point 1km if possible from the runway threshold.

Note: one important advantage of a 'standardized' 1km monitoring point is that it allows comparison of 'in service' noise between different operators and equipment, also comparison of noise at several airports.

7 locations for permanent monitoring are recommended inside Cairo international airport (05R Runway end – 23L Runway end – 05L Runway end - 23R Runway end – 05RR Runway end – 23LL Runway end – Tarmac area of TB1).

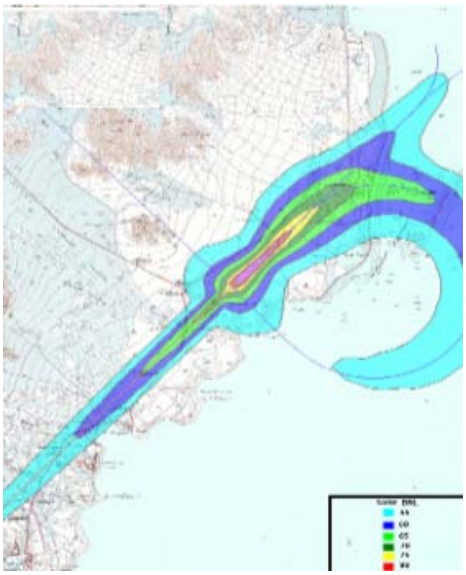
3 locations for permanent monitoring are recommended inside Sharm international airport (04R Runway end – 22L Runway end and tarmac area at airport)

3.3 Monitors to Determine Contour Boundaries.



For monitoring to enable correlation with noise contour locations, stations should be placed at or near the expected contour locations in or near noise-sensitive areas. Since contours may extend quite far to the side of flight tracks, the location of such stations should be coordinated with the location of monitors near the flight tracks, so that noise information from the latter

stations can be used to help separate aircraft from non-aircraft events at the other monitors.



In selecting monitoring stations in relation to contour determination, exact placement on the expected contour line may not be practical. Monitoring stations should preferably be placed outboard of the contours, provided this does not result in undue reduction of aircraft levels or risk of contamination from non-aircraft noise sources. This provides a conservative approach in estimating the noise contour location since to do so one must interpolate inward towards the airport runways or major flight tracks rather than outward.
During the fixed manual temporary noise measurements, this issue has been investigated carefully for a proper selection.

3.4 Monitors for Specific Noise-Sensitive Areas.

There may be special problems in selecting monitor sites in identified noise-sensitive community areas. When these areas are located under or near major flight paths close to the airport such as El-Salam primary school in Cairo, Electricity hospital and El-salam Hospital in Sharm, placement of monitors presents no special problems. However, when a noise-sensitive area is remote from the airport and flight paths, aircraft noise levels may be relatively low in comparison to levels from other community noise sources. While the total sound exposure levels may be measured easily, it may be very difficult to separate the desired category of aircraft noise from other noise contributions. For such locations, extensive preliminary monitoring, together with on-site field observations, was done to identify the actual sources of noise. Special consideration was taken for correlating aircraft noise signals with the flight information and separate other noise source at sensitive locations.

After careful study and analysis of measurements for all locations around both airports, many locations were found to be suitable for permanent monitoring according to the above selecting criteria.

For city noise the first step for an accurate analysis of noise pollution at Cairo has been performed an area having industrial, residential and high traffic volume has been chosen; ma'ade and Helwan, survey has been performed to chose the Wright locations and a noise traffic code has been performed to estimate the noise at Maine road aiming to reduce noise level at the mention area.
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