The Evolution Of Environmental Noise Legislation For Alberta's Energy Industry Over Three Decades

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INTRODUCTION

The energy industry in Alberta is pervasive as development extends across the entire province. Over the years the energy industry and the Alberta economy have in turn attracted many tens of thousands of new citizens to its borders. Since 1970, Alberta's population has doubled to almost three million people. This, of course, is coincidental to an order of magnitude increase in the number of energy industry related facilities. Consequently, conflict between an expanding population and the booming surface-based energy industry is inevitable as they compete for land use. One of the most significant and common impacts to arise from this problem of proximity is the increase in environmental noise.

BACKGROUND

Environmental noise is simply unwanted sound where people live, socialize or participate in recreational activities. The challenge in trying to limit environmental noise is to establish what is an acceptable level of unwanted sound given that it is impossible to eliminate all sources of environmental noise. When the Alberta Energy and Utilities Board (EUB), the Alberta energy industry regulator, first started addressing environmental noise in 1969, it took a very simplistic approach in using a single day-time and night-time noise level maximum measured in dBA. These levels were later published in the first EUB Noise Control Guideline in 1973. This one-page guideline stated that energy industry facilities could not exceed a 65 dBA day-time or 55 dBA night-time sound levels at nearby residences. It was felt that a receptor-based criterion would be best, as this could take advantage of the already existing buffer which existed between industrial facilities and rural residences.

It was only a few short years before the EUB conceded that measuring and ultimately controlling environmental noise was much more complicated than first realized. To be effective, a noise control guideline for industrial facilities would need to consider many technical challenges, as well as show a better understanding of human psychological response to environmental noise. A task force was formed of academics, acoustical engineering consultants, members of the public, knowledgeable industry, government, and EUB representatives to develop the next generation of Noise Control Directives. After a very lengthy process, the task force presented its recommendations for a new guideline that included the following:

· Criteria for instrumentation and measurement techniques.
· The adoption of A-weighted level energy equivalent (Leq) as the new metric system.
· A stepwise process for determining the permissible environmental sound level at a receptor location which was based on dwelling unit density and proximity to transportation corridors.
· Adjustment factors for unique ambient conditions, and the quality and duration of the noise.
· A detailed guide, including technical glossary, example problems, and flowcharts to assist the user.
· A requirement for conducting a noise impact assessment for proposed new facilities to ensure the permissible sound levels could be met.
· A mandatory two-year review process.

After lengthy deliberation and requests for further refinement, the EUB adopted the task force's recommendations and published what was believed to be an unprecedented comprehensive environmental noise control regulation. Known as Interim Directive ID 88-1 and companion Guide 38, the new policy provided the public with a consistent and fair process to ensure noise impacts would be kept to and acceptable minimum.

WHAT'S NEW

Since its first publication the Noise Control Directive ID 88-1 has undergone several reviews and revisions. The most recent of these has concluded with the publication of ID 99-8. The new edition reflects many significant changes in the structure and format of the directive. Highlighted below are areas where the most significant change occurred:

Noise Impact Assessments: As part of the energy facility application process, operators must prepare an appropriate noise impact assessment (NIA) when noise is a consideration for the proposed facility. New requirements and protocol for an NIA will help reduce common errors such as using near field manufacturers sound data to calculate far field estimates and underestimating the overall sound level as a result of not considering all noise sources.

Complaint Investigation: A facility that was not subject to a noise impact assessment because it predated the issuance of ID 88-1, are not required to determine compliance with the directive unless a noise complaint is filed against it by a nearby resident. Comprehensive surveys conducted as a result of a complaint must be performed under representative conditions, similar to those of when the noise is a problem. Matching these conditions is often difficult, and it is necessary to get from the complainant a clear understanding of what they are. The expectation is to not get the absolute worst case but rather a time when conditions are similar.

Measurement Instrumentation: The condition of measurement instrumentation is critical to the credibility of any noise survey. The new directive requires both the meter and calibrator to be calibrated and certified on a regular basis in accordance with ANSI S1.4 - 1983, S1.4A - 1985 or later revisions, and ANSI S1.40 - 1984.

Construction Noise: Operators are encouraged to take mitigative measures during construction to reduce any exceptional impacts, as this phase of the project is not required to be included in the noise impact assessment. Such steps include limiting construction to daylight hours, scheduling noisy activities with nearby residents, fitting all combustion engines with suitable mufflers, and using existing screening to shield residences from equipment noise.

Heavy Industrial Area Designation: The directive recognizes that some areas of the province will present unique challenges. One of these is heavy industrial areas, because within them are EUB-regulated facilities and, alternatively, non-EUB-regulated facilities which are not required to adhere to the EUB Noise Control Directive.

Compliance and Enforcement: It is essential that operators know and understand the consequences of failing to meet the established environmental noise criteria. The directive lays out what are considered "major" and "minor" noncompliance events, along with the action that will be taken by the EUB accordingly. This action ranges from immediate suspension of operations to requiring a written response from the operator. However, too many minor events can escalate matters to a serious level if necessary.

FUTURE DIRECTIONS

One portion of the directive and guide which have changed little since the issuance of ID 88-1 are the technical requirements used to establish the permissible sound level, the metrics, or how to conduct measurements. With the possible exception of the metrics, changes are not being contemplated or pursued in the other technical sectors.

As stated earlier, the directive uses an A-weighted Leq measurements, which are able to average the sound over time in a way that approximates the way the human ear hears different frequency sounds. The current Noise Control Directive fails to properly account for the presence of low-frequency noise (LFN) in survey data. This is primarily due to the use of A-weighted energy equivalent sound levels, which do not accurately account for LFN. Since most energy facilities are located in rural areas, the noise they produce will predominantly travel over acoustically soft and very soft surfaces. Therefore, whatever noise reaches the survey field (receptor) from an energy facility will consist mostly of LFN. The psychoacoustic research has shown that LFN can have serious negative effects on an individual's quality of life. Unlike high-frequency noise, LFN is difficult to suppress. Closing doors and windows in attempt to diminish the effects of LFN will often make the noise worse for the affected individual. This is due to the propagation characteristics of LFN and the low-pass filtering effect of structures. Individuals often become irrational and anxious as attempts to control LFN fails, serving only to increase their awareness of the noise.

For this reason, the Noise Control Directive should in some way account for LFN. Methods that are currently being investigated are loudness (as described by ISO 532 Method B), C-weighting (including dB(C) minus dB(A)), and appropriate maximum SPL's for one-third octave bands below 200 Hz. The advantages and disadvantages of each method must be fully considered before implementing a course of action. Work to date has been slow and sometimes frustrating as limitations in each new measurement system are discovered. Most probably, a hybrid approach will have to be developed. Modifying one of these methods might make it more applicable to the field conditions and the current approach adopted in ID 99-8. Inevitably, the work will be the main focus of the next directive review in 2002.

CONCLUSION

The Noise Control Directive ID 99-8 continues to serve industry, the public, and the EUB as a useful tool to control environmental noise. Continued review and improvement will guarantee its effectiveness and acceptability as a fair regulatory approach. The Directive can be viewed on the EUB Web site http//www.eub.gov.ab.ca

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A message from John Hemingway - The Role of a CAA TREASURER

After serving several years as Treasurer of the CAA, I have decided that the time has come to pass the reins on to someone else. As Past President I am also responsible for finding a replacement! If you would be interested in taking on the post of Treasurer or know of someone who might be interested, please call me at (416) 798-0522. The following is a listing of the Treasurers duties:

- Update the CAA Ledger for the Operating and Capital Funds from Monthly Bank Statements;
- Receive paying in slips from the Secretary who does the banking of membership fees;
- Write Cheques for Prizes, Student Travel Subsidy, Journal expenses etc.;
- Liaise with the Advertising Sub-Editor re payment of Journal advertising fees;
- Receive and bank cheques (mainly advertising fees); and
- Present the Ledger, receipts, vouchers, statements, etc. annually to the Auditor.