

# **USING A SYSTEMATIC RISK BASED NOISE IMPACT ASSESSMENT FOR INDUSTRIAL NOISE CONTROL**

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## **INTRODUCTION**

Rural residents in general are very tolerant and not normally quick to complain about things like noise from a nearby industrial facility. Therefore when a complaint is registered against an industrial facility it is likely that the complainant's quality of life or health is clearly being affected or perceived to be affected. For this reason it is essential that the industrial operator move quickly to identify the source(s) of the offending noise and address it with appropriate noise control options. If however, either from inexperience or lack of expertise with industrial noise control, a speedy resolution does not occur, this will cause further anxiety to neighbours, loss of credibility for future projects and potential non-compliance condition with the regulator. Is this a risk that operators can afford to leave to chance or is there a practical way to minimize exposure to non-compliance with regulatory requirements and public confidence? Luckily the answer is "yes" and this paper will outline one such risk based noise impact assessment process that can be used to essentially illuminate all potential environmental and occupational noise compliance or complaint related risk.

## **UNDERSTANDING RISK**

Risk is one of life's certainties, and how successfully organisations deal with it can have a major impact on the achievement of their key business goals. Despite this, relatively little is formally done to evaluate and manage risk. This paper aims to raise awareness about the need to address environmental and occupational noise related risks and to provide good practical guidance for operators to manage such risks in a more effective and formalised way.

Good environmental and occupational noise risk management supports the achievement of objectives and has a vital role to play in ensuring that a company is being managed effectively. The benefits vary depending on the way in which noise risk management is planned and implemented. It is critical to find the proper balance in the scope and depth of the noise risk management process ensuring that it is functional but not overly complex. The key for the company is to identify the degree of risk exposure that may be related to their operational facilities and have a comprehensive strategy in place for how to deal with each risk level in a consistent manner across the organization. Each organisation must decide what benefits it would like as a result of its risk management programme and plan its approach accordingly.

The benefits of a systematic and consistent approach to noise related risk management are considerable and the following are some of the most obvious ones:

- Better management of potential noise related risk exposures
- More satisfied neighbours
- Increased focus on what needs to be done (and not done) to meet objectives.
- Supports innovation.
- Fewer complaints.
- Competitive advantage.
- Better quality service from suppliers.
- Enhanced ability to justify actions taken.
- Delivering best value.
- Protection of reputation.
- Getting things right first time.

Indeed risk management is an integral part of good corporate governance and is a process whereby:

- there is shared awareness and understanding within the company of: – the nature and extent of the risks it faces; – the extent and categories of risks regarded as acceptable (the authority should formulate a sound policy on its threshold to risk); – the likelihood and potential impacts of the risks materialising; and – its ability to reduce the incidence and impact on the organisation of risks that do materialise;
- there is regular and ongoing monitoring and reporting of risk including early warning mechanisms;
- an appropriate assessment is made of the cost of operating particular controls relative to the benefit obtained in managing the related risk;
- the authority conducts, at least annually, a review of the effectiveness of the system of internal control in place;
- and the authority reports publicly on the results of the review, and explains the action it is taking to address any significant concerns that it has identified

The process should be ongoing, embedded in the culture of the authority and have the potential to re-orient the whole organization around performance improvement. It is not about eliminating risk but about understanding risk and managing it more effectively.

Ideally an annual assessment should be performed to consider issues that may have surfaced during the year, together with any additional information necessary to ensure that a company has taken account of all significant aspects of regulatory compliance for the upcoming year. The annual assessment should, in particular, consider:

- the changes since the last annual assessment in the nature and extent of significant environmental and occupational noise related risks, and the company's ability to respond to these;
- the scope and quality of management's ongoing monitoring of environmental and occupational noise related risks and of the system of internal control, and, where applicable, the work of its internal audit function and other providers of assurance;
- the extent and frequency of the communication of the monitoring results to the company executive (or Health Safety & Environment Committee(s)) which enables it to build up a data base on the effectiveness of its environmental and occupational noise related risk management program;
- the effectiveness of the company's stakeholder involvement processes.

## COMMUNICATION

Effective communication is critical to the implementation and the ongoing success of environmental and occupational noise related risk management. This requires consultation on changes to operations and promoting the benefits that will result and the actions that will facilitate those changes. The objective must be to provide timely, accurate and straightforward communication in order that all stakeholders understand the implications of the operational changes.

A big question that companies have to deal with is, "Are we compliant?" This can be restated as, "Are we at risk?" These two questions have an inverse relationship. You can't know if you are compliant unless you know your necessary baseline risk level relative to a regulation which in this case is directed at environmental and occupational noise legislation.

To set an acceptable risk level for a company, a few things need to be investigated and understood. A company must understand its federal, provincial/state, and local regulatory noise requirements, and its business drivers and objectives. The only practical way to do this is to carry out a systematic risk based noise impact assessment. The result of these findings is then used to define the company's acceptable risk level, which is then outlined in operational policies, standards, guidelines and procedures.

## STEPS IN SYSTEMATIC RISK BASED NOISE IMPACT ASSESSMENT

In assessing current and prospective operational activities for level of organizational risk related to environmental and occupational noise compliance, assessors will generally follow six major steps in the process, as outlined in Figure 1.

**Figure 1.**

### **Flow Chart of Steps in Risk Management**

1. Description of Program, Process or Task
2. Describe the Objectives
3. Identify Exposures & Understand Risks
4. Examine Risk Control & Mitigation Options
5. Determine Risk Exposure Levels
6. Recommendations

The following describe each of these six steps to identify the many opportunities available for licensees to practice risk management prior to submitting a plan for approval.

*1. Description of Program, Process or Task* – An organization must fully understand the various activities and steps that must be taken to arrive at a point of usable data. Knowing clearly what needs to be examined, what degree of information is required, the amount of input that maybe necessary and the need for access to records will help in the speedy seamless completion of the various steps in the process.

*2. Describe the Objectives* – It is critical to establish the objectives of the program to ensure that the full extent of the project are completed and to the level of expectation that has been met. This prevents any creeping scope issues that may push the project beyond its expected targets.

*3. Identify Exposures & Understand Risks* – Ensure that the regulatory and corporate requirements that are going to be used to identify exposure are valid and applicable and then agree on what the frequency and consequences metrics that will be used to assess the level of risk for non-compliance or non-conformity to regulations and policy.

*4. Assess Facilities* – Examine each facility that has been selected for the Risk Based Noise Impact Assessment and evaluate the Risk Control & Mitigation Options that exist at the time.

*5. Determine Risk Exposure Levels* – After completing the assessment and evaluating the current risk control and mitigation levels complete the Qualitative Risk Analysis that was calculated for the organization and categorize all the facilities into the various categories of risk that have been established.

*6. Recommendations* – With the risk Exposure Levels in place appropriate recommendations can be made relative to high, medium and low risk facilities. These recommendations can vary from significant noise control modifications to no action required at this time.

To assist the Assessors in completing the Systematic Risk Based Environmental and Occupational Noise Impact Assessment a detailed worksheet is advised. The Worksheet will allow all six steps described above to be incorporated into a self audit where all relevant questions will be asked and the necessary data collected to complete the evaluation. Figure 2 is an example of one type of worksheet that is used by Noise Solutions Inc.

Figure 2 - Noise Impact Assessment Worksheet

<b>Facility for Assessment:</b>	
<b>Evaluate For Risk From Noise To:</b>  (Mark as many as applicable with an X)	<b>Worker Safety:</b> _____, <b>Environmental Regulation:</b> _____, <b>Corporate Policy/Reputation:</b> _____,
<b>Company:</b> _____,	<b>Contact:</b> _____,
<b>Introduction:</b> Operators want to comply with all regulatory requirements related to occupational, environmental, and corporate noise policies. This program, is designed to evaluate the operator’s level of compliance with pertinent regulatory requirements including any related internal company policies. Upon completion of the assessment a report will be submitted to the operator outlining the findings defining either compliance or any recommendations necessary to return to compliance.	
<b>Objectives</b>	<p>Ensure that, to the extent possible occupational and environmental noise responsibility situations are understood, documented, and maintained.</p> <p>Ensure employees are protected from noise induced hearing loss or damage.</p> <p>Ensure facility neighbours are minimally impacted from environmental noise &amp; vibration.</p> <p>Identify &amp; document, to the extent possible, the acceptable level of noise impact risk for each facility.</p> <p>Deliver a report that will ensure the operator must assess and manage compliance with government regulations and internal policies.</p>
<b>Process used to identify &amp; evaluate risks</b>	<p>Noise Solutions Inc. team operator will meet to outline program and ensure any questions or concerns are addressed satisfactorily.</p> <p>Team to review any existing internal policies and related documentation of potential occupational and environmental noise care and custody situations</p> <p>Initiate field surveillance programs and conduct facility audit, SWOT (strength, weaknesses, opportunities, threats) analysis &amp; issues identification as they relate to occupational &amp; environmental noise.</p> <p>Ensure operator is knowledgeable on internal policy and regulatory compliance requirements related to occupational and environmental noise issues.</p> <p>Prepare and submit report of findings and any associated recommendations in the areas of preventative, detective, and corrective measures.</p>
<b>Implement Control and Mitigation Action Plan</b>	<p>Review noise control recommendations with engineering &amp; design to confirm specific noise control and mitigation equipment needs.</p> <p>Pass on equipment needs to project manager along with expected timelines (upcoming turnarounds/shut downs etc.)</p> <p>Project manager establishes priority for manufacturing queue</p> <p>Installation of equipment</p> <p>Verify equipment performance and submit final report to operator on control and mitigation results with schedule for follow-up as per Customer Service Management (CSM) program.</p>

<b>Audit Checklist:</b>	Yes	No
<p>Does the operator have an internal policy regarding the management of occupational and environmental noise?            If "Yes" identify any required changes:            ,            ,            If "No" what is recommended:            ,</p>		
<p>Has the operator identified and documented its risk for all occupational and environmental noise regulatory requirements?            If "Yes" identify process &amp; related documents/reports:            ,            ,            If "No" what is required:            ,</p>		
<p>Has a facility noise analysis been performed?            If "Yes" identify documents/reports:            ,            ,            If "No" what is required:            ,</p>		
<p>Does the facility noise analysis identify any areas of risk?            If "Yes" identify what these are:            ,            ,            If "No" identify if anything else is required:            ,</p>		
<p>Do programs exist to assign priority to existing and potential risk condition?            If "Yes" identify programs:            ,            ,            If "No" what is required:            ,</p>		
<p>Is there a history of noise concerns from employees?            If "Yes" detail the history:            ,            ,            If "No" identify :            ,</p>		
<p>Is the compliance framework &amp; review process documented? (development, surveillance, compliance, reporting)            If "Yes" identify process:            ,            ,            If "No" what is required:            ,</p>		

<p>Are all applicable regulations reviewed &amp; communicated on a regular basis?</p> <p>If “Yes” identify process:</p> <p>,</p> <p>If “No” what is required:</p> <p>,</p>		
<p>Do internal programs achieve the desired results?</p> <p>If “Yes” identify programs:</p> <p>,</p> <p>If “No” what is required:</p> <p>,</p>		
<p>Has non-compliance been identified and prioritized?</p> <p>If “Yes” identify documents/reports:</p> <p>,</p> <p>If “No” what more is required:</p> <p>,</p>		
<p>Are routine noise impact assessments performed?</p> <p>If “Yes” identify applicable documents/reports:</p> <p>,</p> <p>If “No” what is required:</p> <p>,</p>		

## RISK ASSESSMENT CHECKSHEET

Assign appropriate Consequence and Likelihood score to the matrix to establish the Overall Risk Exposure.

<b>Consequence</b>		<b>Score</b>
Exceed PSL set out in EUB Directive D 038		<b>6</b>
SPL exceeds maximum for hearing loss		<b>5</b>
Less than 5 dBA Leq of PSL		<b>4</b>
SPL requires use of hearing protection		<b>3</b>
More than 5 dBA Leq of PSL		<b>2</b>
SPL below need for hearing protection		<b>1</b>
<b>Likelihood</b>		<i>Rank</i>
<b>Risk</b>	Frequent (occurs between 75% - 100% of the time)	<b>F</b>
	Highly Likely (occurs between 50% - 75%) of the time)	<b>E</b>
	Likely (occurs between 10% - 50%) of the time)	<b>D</b>
	Occasional (occurs between 5% - 10% of the time)	<b>C</b>
	Unlikely (occurs between 1% - 5% of the time)	<b>B</b>
	Highly Unlikely (will not occur)	<b>A</b>



**Matrix**

<b>LIKELIHOOD</b>	<b>F</b>						
	<b>E</b>						
	<b>D</b>						
	<b>C</b>						
	<b>B</b>						
	<b>A</b>						
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>CONSEQUENCE</b>							

	Extreme Risk & Priority – Requires immediate review.		Moderate Risk & Priority – Some noise controls required
	High Risk & Priority – Extensive noise risk controls required.		Low Risk & Priority – Acceptable level of noise control,

<b>Overall Risk Exposure:</b> <i>(before considering controls)</i>	Low Moderate High Extreme	<b>Overall Risk Exposure:</b> <i>(after considering controls)</i>	Low Moderate High Extreme
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**Recommendation(s):**

<b>Noise Solutions Inc. Management Acceptance:</b>  Agree Disagree	<b>Conclusion:</b>  All criteria met Most criteria met Some criteria met No criteria met
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<b>Management Comments:</b>	
<b>Date:</b>	<b>Signed:</b>
<b>Lead Assessor Comments:</b>	
<b>Date:</b>	<b>Signed:</b>

## **PITFALLS TO CONSIDER**

As with every process there are pitfalls that can conspire to reduce the effectiveness of the Risk Based Noise Impact Assessment and some of these are listed below:

- Lack of member involvement
- Failure to link risks with corporate objectives
- Risk management systems that are too complex
- Failure to prioritise and focus only on significant risks
- No clearly-defined risk management policy
- Lack of planning and buy-in – no clear implementation strategy
- Failure to identify clear objectives
- Viewing risk management as a compliance exercise
- Failure to consider risk in the broadest context
- Establishing risk management as a separate initiative
- Lack of clearly identified roles and responsibilities
- Inadequate focus on control strategies and risk exposure
- Inappropriate or no risk champions identified
- Lack of consultation throughout the process
- Bottom-up’ rather than ‘top-down’ approach
- Lack of regular monitoring and reporting
- Poor communication
- Not addressing the change management issues from a human resource and cultural perspective
- Inadequate resourcing and training

## **CONCLUSION**

The track record of the risk-management approach, as applied by operators for environmental and occupational noise exposure, offers reason for optimism that interests in risk analysis and environmental protection are compatible. The energy industry may not be representative of the entire economy and it is easy to see how the regulation of these industries could have been made more timely, effective, and economical. It is also critical to recognize that these industries will require adequate technical resources to implement the risk-management framework. If operators are not willing to provide such resources, it may be appropriate to shift the technical burden to third party providers with peer-review procedures that assure competence and credibility. A comprehensive risk based noise impact assessment can provide peace of mind for all parties that environmental and occupational noise will be responsibly managed and the impacts kept to a minimum.