

# NVSAGE

Newsletter on Noise and  
Vibration Engineering

[www.nvdynamics.com](http://www.nvdynamics.com)

[services@nvdynamics.com](mailto:services@nvdynamics.com) | +91 7760381818



## FOREWORD

By Krishna Balamurali,  
Principal Engineer

I'm pleased to share that NV Dynamics has entered its 20th year of trusted operations. Our sincere thanks go out to all our customers and stakeholders — your continued support has been instrumental in shaping our journey and growth into what we are today.



YEARS OF  
ENGINEERING  
DYNAMICS  
2005-2025

As the saying goes, legacy brings with it greater responsibility and accountability. This ethos continues to drive us to raise the bar on service quality, deliverables, and the overall value we deliver to our clients — who remain the foundation of our expertise, experience, and growth. The next decade is charted for purposeful expansion, with a clear focus on broadening our customer base, scaling revenues and deepening the technical capabilities of NV Dynamics.

The first steps of calibrated expansion is already in place; NV Dynamics is now a Pvt. Ltd. Company. This change in company legal status allows us to configure a better management structure with designated responsibilities and deliverables. We also envisage improved operational processes and workflow that helps in our service delivery.

This quarter of the financial year has seen a steady buildup of exciting and strategic inquiries. Notable among them are a full-scale consulting engagement for acoustic treatment from a major aerospace R&D facility, modal testing requirements for a monorail project, a specialized testing request from a fighter jet development program and SBN improvement plans for a leading compressor manufacturer, among others. These opportunities are currently in advanced stages of discussion and I look forward to sharing progress updates in the upcoming edition of our newsletter.

# NOISE AND VIBRATION ASSESSMENT OF GENERAL CARGO VESSEL

By Chiranjeevi A M, Engineer - Technical Services

## BACKGROUND

General cargo vessels are fundamental to global maritime logistics, transporting diverse cargo across international waters. These vessels are constantly subjected to dynamic forces generated by engines, propellers, and onboard machinery, making noise and vibration assessment critical for ensuring crew comfort, safety and machinery integrity. M/s. Udupi Cochin Shipyard Limited commissioned NV Dynamics to conduct a comprehensive noise and vibration evaluation of WILSON ECO 1, a 3,800 DWT general cargo vessel. The assessment focused on key onboard areas, including crew accommodations, the engine room and control spaces. The scope included noise measurements in harbour and combined noise and vibration measurements at sea. The collected data was evaluated against IMO RESOLUTION MSC.337(91) for noise, ISO 20283-5:2016 for habitability, and ISO 20816-1:2016 for machinery.

## TASK TAKEAWAY

**Comprehensive onboard measurements and analysis on WILSON ECO 1 confirmed that noise and vibration levels comply with IMO Resolution MSC.337(91) and relevant ISO standards. A clear link was identified between structural vibrations in machinery spaces and noise in nearby habitability zones. Both airborne and structure-borne levels remained within permissible limits, ensuring adherence to regulatory requirements for crew comfort and machinery space performance.**

## SITE ACTIVITIES

In accordance with IMO Resolution MSC.337(91), noise measurements were conducted using a calibrated Class 1 sound level meter under both harbour and sea conditions at several designated locations, covering habitability and machinery spaces. Each measurement was recorded over a representative duration sufficient to capture steady-state noise levels and reported as the A-weighted equivalent continuous sound level (LAeq).

Vibration measurements were conducted using a DAQ system and two tri-axial accelerometers compliant with ISO 20283-5 and ISO 20816-1. Multiple measurement locations were selected to cover both habitability and machinery spaces. Accelerometers were floor-mounted in habitability areas and mounted on bearing housings in machinery spaces. Vibration levels were recorded as overall RMS vibration velocity in the 1–80 Hz range for habitability zones and 1–1000 Hz range for machinery spaces, ensuring comprehensive assessment of structural and equipment vibrations.





# VIBRATION MONITORING FOR KOCHI METRO PHASE 2

By Deepak D, Engineer - Technical Services

## >>> BACKGROUND

Kochi Metro Rail Limited (KMRL) Phase 2, also known as the "Pink Line," is an extension of the Kochi Metro from JLN Stadium to Infopark via Kakkanad. The entire stretch is being built as an elevated viaduct to reduce interference with existing infrastructure. Afcons Infrastructure Limited was awarded the construction contract for this phase, which involves the development of elevated viaducts and metro stations along the route.

Furthermore, Afcons engaged NV Dynamics to carry out periodic vibration assessments throughout the construction phase to monitor and evaluate the potential impact of construction-induced vibrations on nearby structures, utilities and sensitive infrastructure.

## MONITORING INSIGHTS

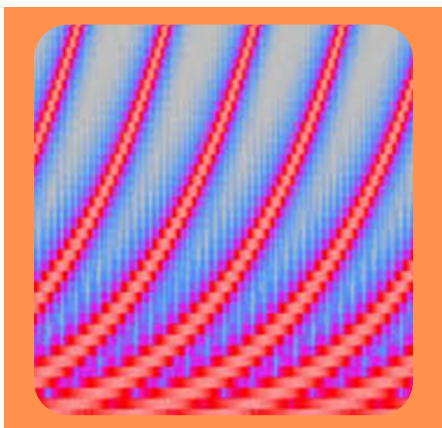
This ongoing assessment being carried out over an 18-month period, ensures construction activities remain compliant with safety guidelines. Using the SIEMENS Test Lab platform, data is carefully analysed and compared with FTA standards, showing that the vibration levels recorded so far are well within safe limits. It is important to recognize that the results are specific to each monitoring event and site conditions and should not be applied broadly to other areas.

## >>> SITE ACTIVITIES

Periodic vibration monitoring is being carried out by NV Dynamics along the Kochi Metro Phase 2 corridor at sensitive locations to accurately assess and manage the impact of ongoing construction. NV Dynamics site activity involves identifying active construction zones, locating the nearest vibration-sensitive receptors and conducting detailed vibration monitoring using ultra-sensitive seismic-grade transducers positioned in three orthogonal directions. These assessments focus on capturing ground-borne vibrations generated specifically from high-impact construction activities such as piling, helping to ensure compliance with safety and environmental standards. To maintain data integrity, careful measures are taken to ensure that the recorded vibrations are solely due to construction activities, free from external influences such as road traffic or other unrelated sources.



## >>> PHYSICS TO KNOW

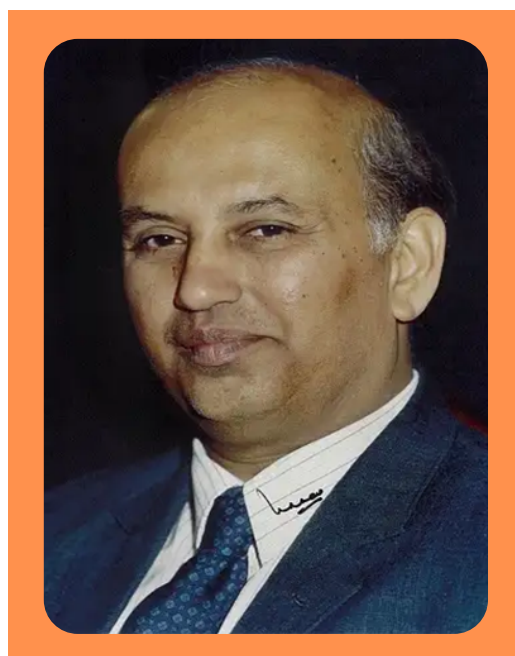


**Shepard tone** is an auditory illusion that creates the impression of a continuously rising or falling pitch, yet it never seems to get higher or lower. This is achieved by playing overlapping notes that are an octave apart, creating what's known as a Shepard scale. The illusion works by fading these notes in and out, making the beginning and end of the scale indistinguishable, thus creating the perception of a never-ending rise or fall in pitch. This effect is often used in music, movies, and sound design to build tension or a sense of infinite movement.

To experience the Shepard tone illusion, [click here](#) to listen.

## >>> GREAT MINDS & THEIR CONTRIBUTION TO THE WORLD OF SCIENCE

**Udupi Ramachandra Rao**, popularly known as U.R. Rao, was a pioneering Indian space scientist born in 1932 at Adamaru, Udupi. He played a crucial role in the development of India's satellite program and was instrumental in launching the first Indian satellite, Aryabhata, in 1975. Rao served as the chairman of the Indian Space Research Organisation (ISRO) from 1984 to 1994, overseeing significant missions like the INSAT and IRS satellite series, which greatly enhanced India's communication and remote sensing capabilities. He was also a strong advocate for space technology's application in national development. His contributions earned him numerous awards, including the Padma Bhushan and Padma Vibhushan. Rao's visionary leadership laid the foundation for India's prominence in global space exploration.



## CERTIFICATIONS



## CLIENTELE

