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NVSAGE

Newsletter on Noise and Vibration Engineering

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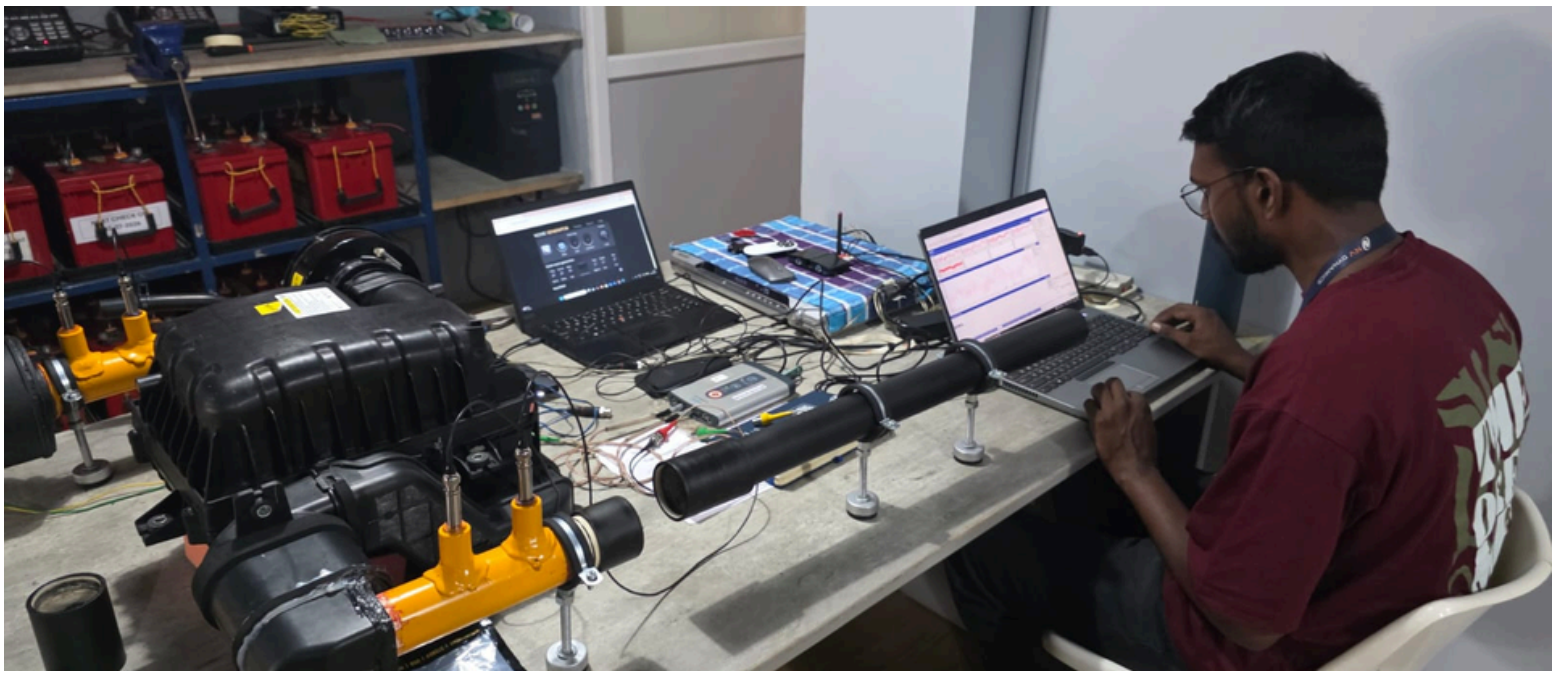


FOREWORD

**By Ajith Krishna,
Lead Engineer**

Q1 FY26–27 has opened on a strong note, with a steady flow of new enquiries and RFPs across the verticals NV Dynamics serves.

Semiconductor research labs and fabs across India continue to show growing interest in micro-vibration and acoustic evaluations for their facilities, given the sensitivity of the equipment housed within. The notable shift here is in the scope: demand is moving beyond compliance-driven audits towards full-scale pre-assessments conducted before vibration-sensitive facilities are even established. In step with this, we have expanded our offering into a complete turnkey solution — from assessment through to mitigation — which has been warmly received by our clientele across the semiconductor industry.

We are also seeing a rise in demand for core vibration engineering services, particularly investigations, root-cause analysis and mitigation. This is an encouraging trend for us, as it sits squarely within our area of bespoke expertise.

Our maritime noise and vibration practice continues its steady growth. We successfully completed N&V audits for six ships at Udupi Cochin Shipyard Limited (UCSL) and have since secured a new contract with a premier shipbuilder in Goa to carry out N&V assessments for indigenously designed Air Cushion Vehicles (ACVs)/hovercrafts.

Finally, we're pleased to share that our corporate brochure has been fully redesigned, with a renewed focus on the specialised N&V services we offer across industries. After months in the works, it's ready for release — keep an eye on your inbox or visit our **website** to take a look now.

TRACK DECAY RATE EVALUATION OF A HIGH-SPEED RAIL CORRIDOR AS PER BS EN 15461

By Deepak D, Senior Engineer - Technical Services

BACKGROUND

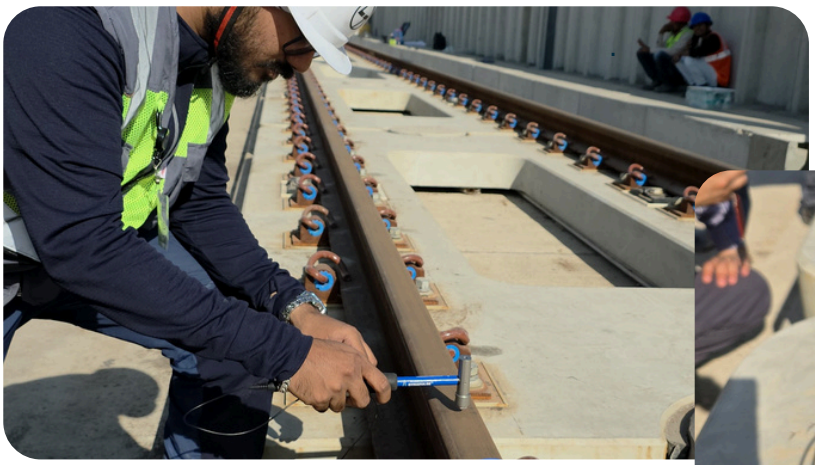
With the high-speed rail infrastructure gaining momentum, ensuring optimal track performance and acoustic behavior has become increasingly important. NV Dynamics was commissioned to perform a Track Decay Rate (TDR) assessment in accordance with BS EN 15461. The standard specifies a procedure for determining the vibration decay rate of the track by quantifying the reduction in vibration amplitude as waves travel along the rail from the point of excitation. This parameter is used to characterise the vibration attenuation behaviour of the rail and forms an important input for railway pass-by noise measurements and rolling noise prediction studies.

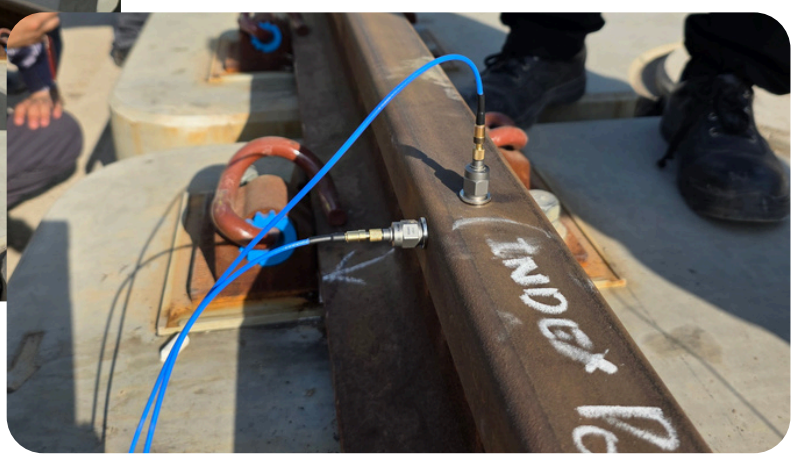
TASK TAKEAWAY

The assessment provided critical insight into the vibration attenuation characteristics of the high-speed rail track system across a broad frequency range. The measured data demonstrated effective dissipation of vibration energy and satisfied the acceptance criteria specified in BS EN 15461. These findings provide confidence in the dynamic behaviour of the track system and establish a strong basis for subsequent acoustic performance evaluations, pass-by noise measurements and railway noise prediction studies.

SITE ACTIVITIES

The Track Decay Rate (TDR) assessment is carried out on a high-speed rail track section in accordance with BS EN 15461. Prior to testing, the track is inspected to ensure compliance with the requirements of the standard and to verify suitable conditions for reliable measurements. Vibration transducers, instrumented impact hammer and a multi-channel data acquisition system were used to capture the dynamic response of the rail. Repeatability checks were performed to confirm the consistency of the measurement setup before conducting the main tests. Controlled impacts were then applied to the rail and vibration responses were recorded in both vertical and transverse directions. The collected data were analysed across a range of frequencies to determine rail decay rates and associated dynamic parameters. The results were subsequently evaluated against the acceptance criteria specified in BS EN 15461 to verify the validity of the measurements and assess the vibration attenuation characteristics of the track system.





ASSESSMENT OF VIBRATION LEVELS IN COOLING WATER PUMP HOUSE STRUCTURE

By Chiranjeevi AM, Senior Engineer - Technical Services

BACKGROUND

The cooling water pump house is a critical component of the circulating water system in thermal power stations, supporting reliable and uninterrupted plant operation. As these facilities are subjected to continuous dynamic loading during service, periodic evaluation of its structural response is important to ensure long-term integrity and serviceability.

One such assessment is undertaken by NV Dynamics, following reports of elevated vibrations on the RCC floor slab adjacent to the cooling water pump house at Sri Damodaram Sanjeevaiah Thermal Power Station (SDSTPS). The observed vibration levels raised concerns regarding their acceptability and potential effects on the structure. Accordingly, a detailed vibration assessment was conducted in accordance with DIN 4150-3:2016 to identify the excitation mechanism and recommend appropriate corrective measures.

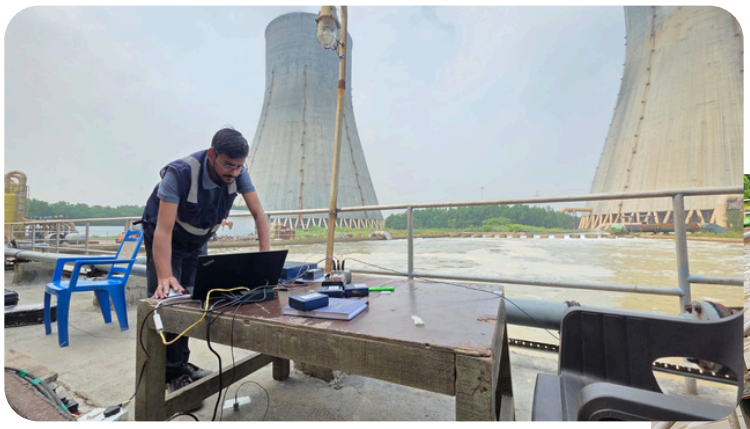
TASK INSIGHTS

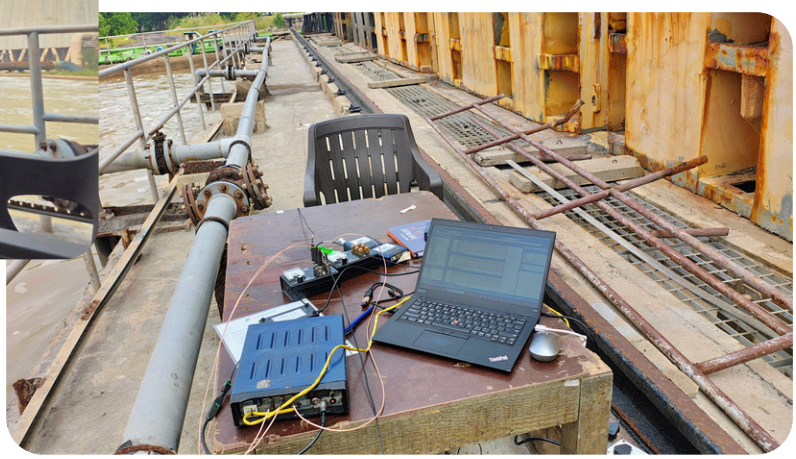
The assessment identified localized vibration amplification on the RCC floor slab structure under specific operating conditions, with measured levels exceeding applicable DIN 4150-3 limits. Detailed vibration analysis confirmed that the observed response was not linked to equipment faults, structural resonance, or bearing-related issues. The study indicated that fluid-induced dynamic forces and pressure pulsations were the most probable cause.

SITE ACTIVITIES

The cooling water pump house comprises eight operating pumps. Based on preliminary site observations and reported vibration issues, three representative pump locations were identified for detailed investigation. Vibration assessments were conducted on the RCC floor slab regions corresponding to these pumps to assess the spatial distribution of vibration levels and identify areas exhibiting the highest dynamic response.

Vibration transducers were mounted on the RCC floor slab in both vertical and horizontal orientations and connected to a multi-channel data acquisition system to capture the structural response. Assessments were then performed under multiple pump operating combinations using an iterative assessment approach, wherein initial datasets guided subsequent measurement conditions to isolate the dominant excitation mechanisms under different operating scenarios. Based on the trends observed from the slab measurements, additional assessments were conducted on motor foundations, cardan shaft supports and structural members within the pump house.



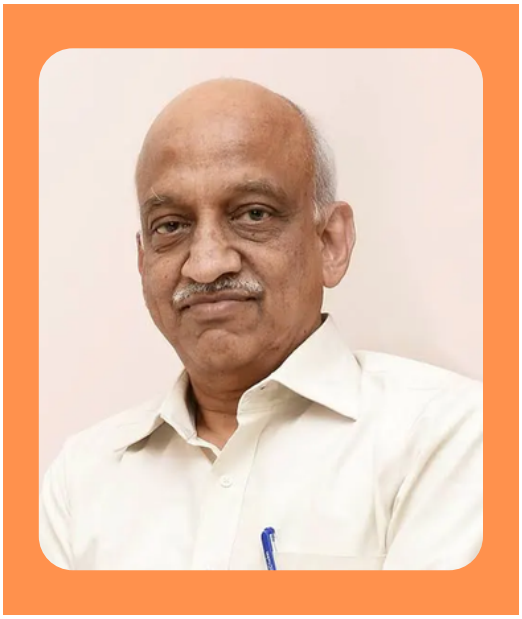


PHYSICS TO KNOW

Pistol shrimp is a fascinating marine creature that uses a specialized snapping claw to hunt and defend territory. When the claw closes, it generates a high-speed water jet that forms a cavitation bubble. As this bubble collapses, it produces a powerful shockwave, intense low-frequency sound and even a brief flash of light known as shrimpoluminescence. These effects can stun or kill nearby prey and transmit signals through murky waters. Scientists study pistol shrimp to better understand acoustics, sonar interference and biomimetic technologies, inspiring innovations in underwater engineering.

GREAT MINDS & THEIR CONTRIBUTION TO THE WORLD OF SCIENCE

A. S. Kiran Kumar is an eminent Indian space scientist and former Chairman of the Indian Space Research Organisation (ISRO), serving from 2015 to 2018. With a career spanning over four decades at ISRO, he played a pivotal role in the development of advanced electro-optical imaging sensors used in Earth observation, communication and planetary missions. He made significant contributions to the Chandrayaan-1 and Mars Orbiter Mission (Mangalyaan) programmes and was instrumental in the successful Mars Orbit Insertion strategy. Prior to becoming Chairman of ISRO, he served as Director of the Space Applications Centre (SAC), Ahmedabad. A recipient of the Padma Shri in 2014, Kiran Kumar's work has strengthened India's capabilities in space technology and inspired future generations of scientists and engineers.



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