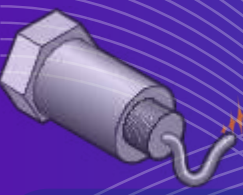
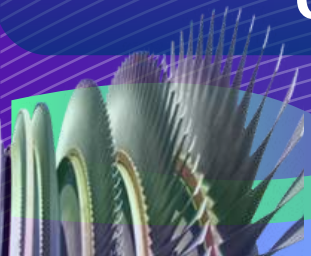
amplitude

DIAGNOSTICS & PROGNOSTICS NEWS

2026, ISSUE 1





COUNCIL OF VIBRATION SPECIALISTS

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INDEX

IRISS
ENGINEERED RELIABILITY

The Game-changing Technology: Motion Amplification

Quick RCA with Real-Time Vibration Visualisation

VIBRATION MONITORING & MOTION ANALYSIS

Motion amplification is a non-contact camera and software-based technology for vibration visualization and analysis that enables you to visualize as well as quantify vibrations invisible to the naked eye and help you perform the RCA in a matter of minutes with millions of data points in contrast to 10-12 from traditional analysis.

IRISS APAC had an exciting and interactive seminar at Navi Mumbai with the **Council of Vibration Specialists (CVS)** discussing about the Game-Changing Technology in the field of Vibration Analysis, Motion Amplification. Exploring about the wider spectrum of area of applications, Motion Amplification gives new ways to monitor asset health while significantly reducing the RCA time from days to minutes!

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Leading Safety and Reliability

For the people who keep the world running

CVS : Vision & Mission

Our Vision

CVS aspires to be the center of eminence at the national and global level for the dissemination of knowledge in the field of vibration science and engineering, through training and post graduate studies, to formulate standards, collaborate with national and international regulatory bodies on vibration science and engineering, to develop and compile information in the field to assist engineers in building reliable, vibration free, stable and longer lasting products in the form of machines, structures and systems

Our Mission

To provide a platform for scientists, researchers and engineers to come together for exchange of vibration knowledge through training programs, seminars, conferences, campus and corporate visits, vibration solution services, recognition of contribution made by the experts in the fields.

To collaborate with similar national and international institutes and organizations for imparting customized various levels of certified training programs, certifying the asset's integrity in industry and enhancing people's capability in solving vibration problems.

To review, modify/ establish vibration standards in the fields of emerging domains such as smart structures, transportation systems, machinery, etc.

From the Editor's Desk

Dr. Barun Chakrabarti, FCVS

Dear Colleagues,

*Greetings from the Editorial Team of **amplitude!***

We take pleasure in bringing to you the first issue of the current year (Issue 01/2026). This issue showcases the CVS events, Chapter activities and achievements of our esteemed Members during the first quarter of this year, along with all the other regular features.

The CVS Family celebrated our 6th Foundation Day together with the 77th Republic Day of the nation on 26th January 2026. On 8th March 2026, we celebrated the spirit of womanhood by commemorating the Internation Women's Day through a colourful event, conceived and delivered entirely by the leading ladies of CVS. Turn the pages to know the details and relive those moments.

During the past quarter we also have had a series of programs curated by CVS Local Chapters, aimed at professional enrichment through knowledge sharing. The Headquarters Team has been busy with driving the CVS collaborative initiatives. Notable among these are the partnership with the Capital Goods & Strategic Skill Council (CGSSC) to develop and deliver customised Training & Certification courses in Vibration and related areas, for Member Industries of CGSSC. As part of the collaboration with Virgo Communications & Exhibitions Pvt. Ltd., CVS is the chosen "Knowledge Partner" to design the technical contents of the prestigious MRAM (Maintenance, Reliability & Asset Management) Expo - 2026 mega event, scheduled to be held in Mumbai during 7th - 9th October 2026.

*As we complete the first quarter of the current year, the countdown is now about to start for the next edition of our flagship event, **INVEST-2027**. The entire CVS Family, from the Governing Council to the Chapter Office Bearers, various Chair Committees and all the Members, will have to join hands to ensure that INVEST-2027 surpasses the previous events in scale, outreach, technical excellence and professional impact. We welcome all to play a role in this exciting journey.*

*By the time this issue reaches you, we will be in the midst of a series of celebrations around the country, marking the start of New Year, fresh harvest and the promise of new beginning through Poila Boishakh, Baisakhi, Bohag Bihu, Vishu, Puthandu and so on. Team **amplitude** joins with all of you in these festivities and we extend our best wishes to you and your families.*

CVS Celebrates 6TH Foundation Day together with the 77TH Republic Day of India on 26TH January 2026

The 6th Foundation Day of the Council of Vibration Specialists (CVS) was celebrated on 26th January 2026 at the Department of Mechanical Engineering, FCRIT Navi Mumbai, Coinciding with the 77th Republic Day of India, the occasion was all the more memorable for the CVS Family. The event was organized by the CVS Mumbai Chapter in hybrid mode and witnessed enthusiastic participation from faculty members, industry experts, CVS members, and students.

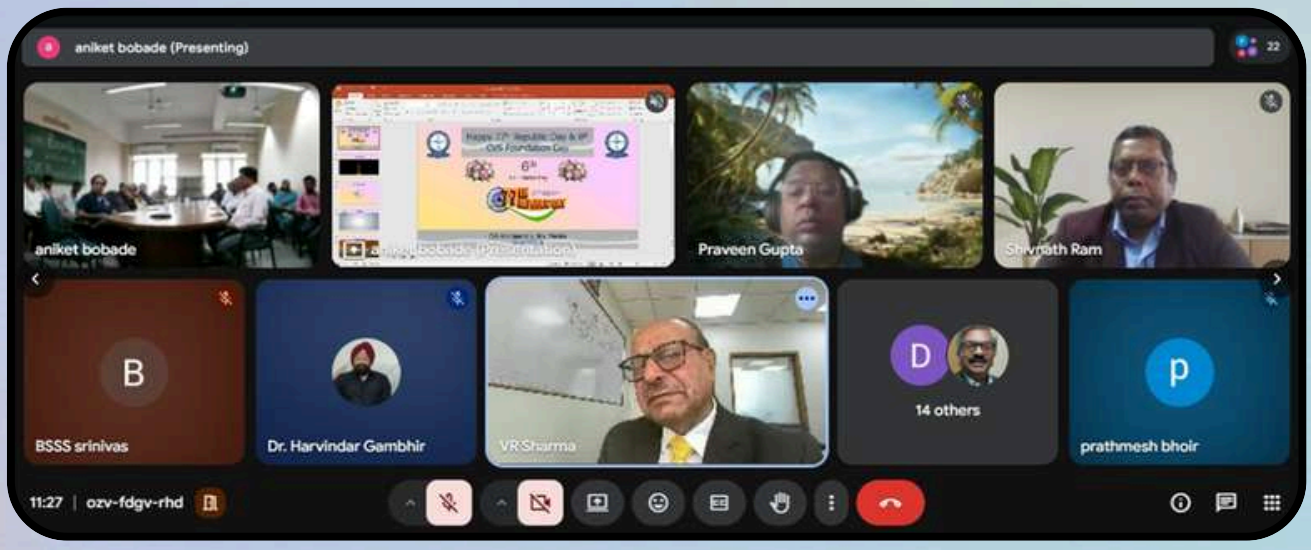
The program commenced with the National Anthem, followed by the ceremonial lamp lighting. The Welcome Address was delivered by Dr. Nilaj Deshmukh, Chairman, CVS Mumbai Chapter, who warmly greeted the dignitaries and participants. In his address, he emphasized the vision of CVS in promoting vibration engineering, asset reliability, and stronger industry-academia collaboration. He also highlighted the achievements of the Mumbai Chapter and encouraged students to actively engage in professional technical activities.

The event was graced by eminent dignitaries including Shri Vidya Rattan Sharma, Vice-Chairman of Jindal Steel Limited; Shri Shivnath Ram, Head - Asset Reliability & Asset Management, Jindal Steel Ltd., Angul; Shri Partha Sarathy Ghose, Group Project Director, Kalyani Steel; Dr. H. S. Gambhir, President of CVS; Dr. Tarapada Pyne, Secretary & Director General, CVS; Dr. S. M. Khot, Principal, FCRIT and Treasurer, CVS; and Dr. Vishal Salunkhe, Treasurer, CVS Mumbai Chapter.

Dr. H. S. Gambhir reflected on the journey and achievements of CVS over the past five years and emphasized the growing importance of vibration analysis and condition monitoring in modern industries. Dr. Tarapada Pyne highlighted the expanding role of CVS in professional development and industry-academia collaboration.

The Chief Guest, Shri Vidya Rattan Sharma, shared valuable insights on sustainable manufacturing, leadership, and the future of the steel industry. The keynote address by Shri Shivnath Ram focused on asset reliability, predictive maintenance strategies, and the integration of Industry 4.0 technologies such as IIoT and AI-based diagnostics in large industrial plants. Shri Partha Sarathy Ghose enriched the session by discussing real-world industrial experiences and the significance of reliability engineering in achieving operational excellence.

Dr. S. M. Khot presented the role of CVS in student activities, showcasing glimpses of initiatives undertaken over the past five years to promote technical knowledge and research culture. The interactive session that followed enabled participants to engage actively with the speakers and gain deeper insights into reliability engineering and digital maintenance practices.



The event concluded with a vote of thanks by Dr. Vishal Salunkhe, who expressed sincere gratitude to all dignitaries, speakers, organizers, and participants for making the celebration a grand success.

The 6th CVS Foundation Day celebration marked an important milestone, reinforcing the commitment of CVS towards knowledge dissemination, professional excellence, and strengthening collaboration between academia and industry in the field of vibration engineering and asset reliability.


Welcome to
6th CVS Foundation Day


aniket bobade (Presenting)
aniket bobade
Praveen Gupta
Shivnath Ram
B
BSSS srinivas
VR Sharma
Dr. Harvindar Ga...
Partha Sarathi G...
D M
14 others
P
prathmesh bhoir


FR. C. RODRIGUES INSTITUTE OF TECHNOLOGY
Sector 3A, Vashi, Navi Mumbai
ciba

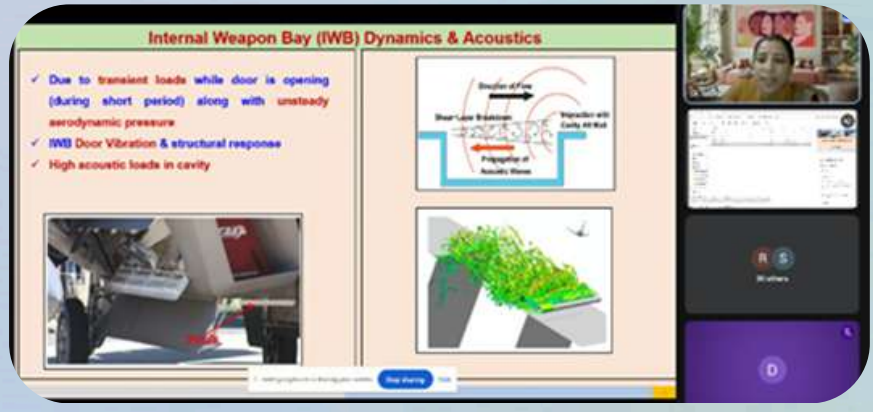
CVS Salutes the Spirit of Womanhood through Celebration of the International Women's Day

The Council of Vibration Specialists successfully celebrated the International Women's Day - 2026 on 8th March 2026 through an event organized in hybrid mode from its Mumbai Headquarters, bringing together distinguished scientists, industry experts, academicians, and students from across the country. The theme of the event was selected as: ***"Women in Vibration Engineering — Advancing Excellence without Barriers"***. The program was conceptualized, curated and presented entirely by the leading ladies of CVS. Publicised through a well-designed and colourful flyer ahead of the D-day, the event turned out to be a thought-provoking and engaging interaction session among the speakers and the audience. Around 35 members tuned in to the program on a Sunday morning and stayed online till the end.

The programme commenced with a traditional Saraswati Vandana, setting a sombre and respectful tone, followed by a welcome and introduction to the theme by Er. Soloni Gosalia, Secretary – CVS Mumbai Chapter.

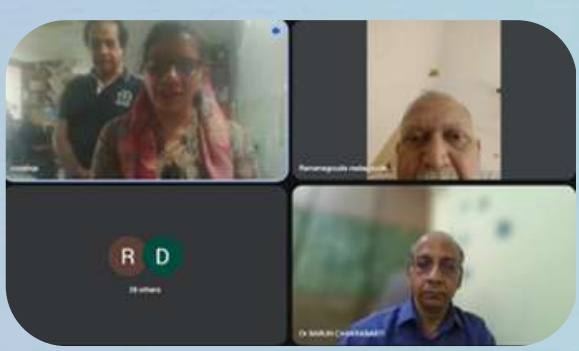
The highlight of the programme was the keynote address by the Chief Guest, Dr. V. R. Lalithambika, Former Distinguished Scientist and Director of the Human Space Programme at ISRO and currently Professor of Practice at IIT Madras. Her extempore address was deeply inspiring, as she shared insights from her remarkable journey in India's space programme, including her leadership in the historic Gaganyaan mission. Delivered in an inimitable style of story-telling, her reflections on balancing a demanding professional career with personal life resonated strongly with the audience, particularly young women aspiring to build careers in science and engineering.

The programme also featured two eminent expert speakers from leading national institutions delivering technical talks.



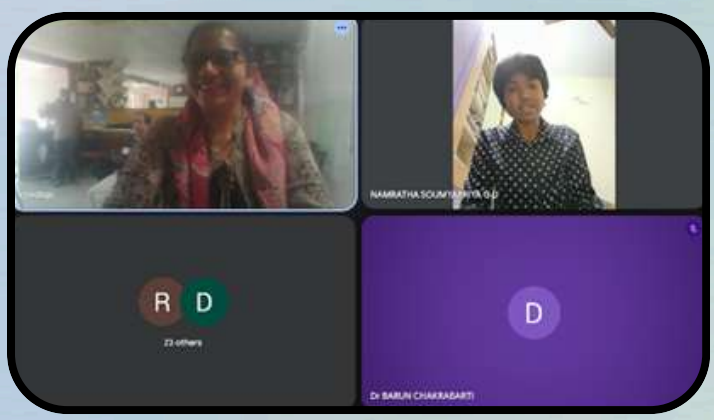
Dr. Sudha U. P. V., Scientist 'F' and Deputy Project Director (Dynamics & Aeroelasticity) at the Aeronautical Development Agency (ADA), Ministry of Defence, Bengaluru, delivered an insightful talk highlighting her contributions to advanced aerospace programmes, including the Advanced Medium Combat Aircraft (AMCA). Her presentation reflected the critical role of vibration and aeroelasticity in ensuring the safety and performance of modern aircraft.

Dr. Kamatchi Palaniyandi, Senior Principal Scientist at CSIR - Structural Engineering Research Centre (SERC), Chennai, shared her expertise in structural dynamics, vibration control, and earthquake-resistant engineering, demonstrating the significant role of vibration engineering in safeguarding infrastructure and enhancing structural resilience.



Adding an industry perspective, Dr. Barun Chakrabarti, Managing Director, Bonitas Consulting Services, Mumbai, shared his experiences about working with women colleagues during his nearly four decades long professional career. He shared personal insights on the contributions of women colleagues in the field, handling challenging tasks and delivering successful projects when supported with the right degree of guidance and

empowerment. As a word of encouragement for all aspiring lady engineers, he quoted Swami Vivekananda's famous message: "Arise, awake and stop not till you achieve what is rightfully yours".



The event also provided a platform for emerging talent, with student speakers Ms. Rajlakshmi (DYPCET, Kolhapur) and Ms. Namratha Sowymapriya (RV College of Engineering, Bengaluru). Representing the next generation of women in the field of vibration, they enthusiastically shared their perspectives, dreams and professional aspirations.

The programme concluded with a summary of the proceedings and the customary vote of thanks by Prof. (Dr.) Aparna (Dey) Ghosh, Founding Fellow, CVS and Dean at IIEST Shibpur, who aptly highlighted the key takeaways and significance of the theme.

The event reflected the continued commitment of CVS towards recognising and promoting the role of women in vibration science and engineering. It reinforced the spirit of "Give to Gain", celebrating knowledge-sharing, mentorship, and collective growth within the professional community, reinforced by mutual respect and empowerment. The celebration was widely appreciated and marked another meaningful step towards fostering inclusivity, excellence, and inspiration in the field of vibration engineering.

CGSSC – CVS Collaboration Meeting at CVS Headquarters

As part of the ongoing collaborative initiative between the Capital Goods & Strategic Skill Council (CGSSC) and Council of Vibration Specialists (CVS), a meeting was organized at the CVS Headquarters in Kharghar, Navi Mumbai on 12th March 2026 to take stock of the progress made and the way forward. The meeting was attended by Mr. Sanjay Bhardwaj, Senior Vice President - CGSSC. The CVS Team included Dr Tarapada Pyne, Secretary and Director General, Er. N P Sundar, GC Member and Dr Barun Chakrabarti, GC Member.

CVS team briefed CGSSC on the strategy, approach and salient features of their Foundation Level and Practitioner Level training courses on vibration analysis, developed for CGSSC Member Organizations. The course structure and outline developed by CVS have received in-principle acceptance from CGSSC. CVS has been requested to conduct an Awareness Workshop for key Member Companies within CGSSC. The course contents and structure will be updated and finalized based on the feedback received from these stakeholders.

CVS and CGSSC also agreed to jointly explore the feasibility of integrating the Foundation Course on Vibration Analysis in the current course module of C4i4 Lab on Smart Manufacturing. It has been planned to conduct the first set of pilot courses for the Foundation Level by September/October 2026. CGSSC and CVS have also agreed to publicise the CVS Courses on respective website. CGSSC will promote the courses among Member Industries and also facilitate their buy-in to conduct these skill-building programs for their personnel.

CVS Bengaluru Chapter Organizes Inter-disciplinary Workshop on Motion Magnification and Vibration Engineering at RVCE - Bengaluru

The Bengaluru Chapter of CVS conducted a One-day Inter-disciplinary Workshop at R.V. College of Engineering, Bengaluru on 8th January 2026 on the topic "Motion Magnification: Video-based Vibration Measurement". The workshop aimed at reinforcing a fundamental message: vibration is a unifying engineering discipline, transcending departmental boundaries. Students and faculty members from Civil, Mechanical, and Aerospace Engineering participated in this common learning platform that combined theory, visualization, and hands-on experimentation.

The Workshop commenced with a structured introduction to vibration fundamentals by Er. Girish Doddamani (Joint Secretary, CVS) and Er. Rajashekhar Uchil (Liaison Officer, CVS). The topics covered essential concepts such as displacement, velocity, acceleration, frequency, mode shapes, and damping. Special emphasis was placed on motion magnification as a non-contact, full-field measurement technique that complements conventional sensors by making otherwise invisible dynamic behavior directly observable.

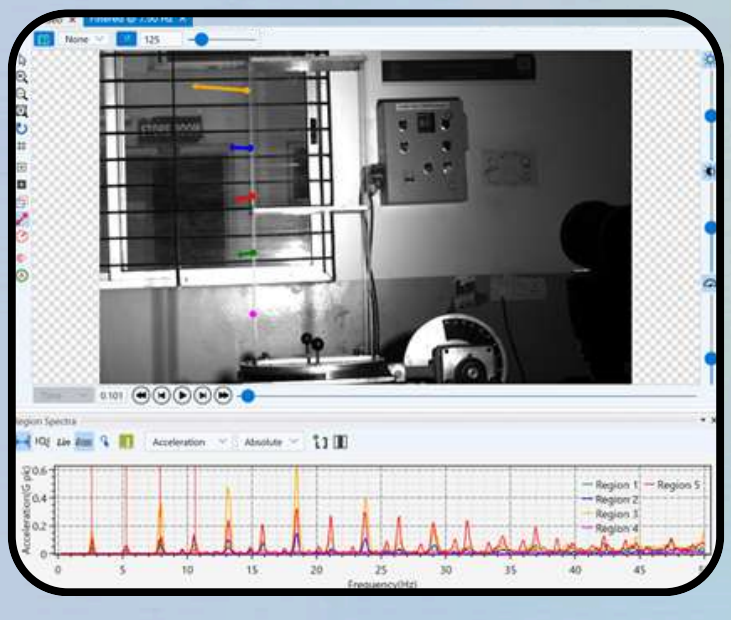
The Workshop included two demo session in the area of Civil Engineering, one involving motion visualization from vibration of a Frame structure and the other dealing with vibration from a stone crusher. Application in the domain of Aerospace Engineering was demonstrated using a Wind Tunnel Test to visualize the modal vibration pattern. In the area of Mechanical Engineering, motion visualization technique was used to study the vibration pattern from a running CNC machine.

The workshop concluded with a live measurement of metro-induced vibration measurement on a girder and column during the simultaneous passage of two trains on Namma Metro, reinforcing how vibration principles extend from laboratory models to large-scale infrastructure.

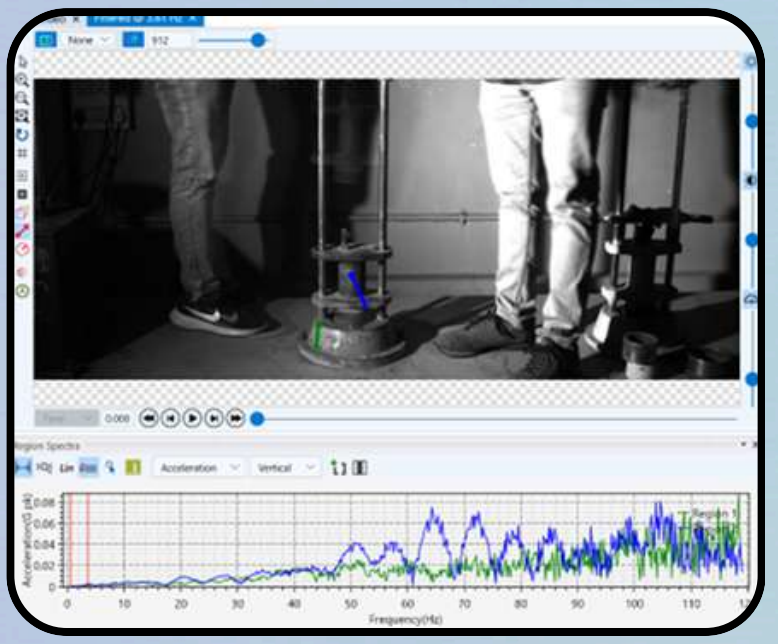
Overall, the Workshop successfully bridged theory, measurement, and visualization, clearly demonstrating that vibration engineering is a shared language across civil structures, mechanical systems, and aerospace platforms. The strong student engagement underscored the educational value of motion magnification as a powerful tool for interdisciplinary learning.

Civil Engineering Demonstrations

Two experiments highlighted the relevance of vibration in structural systems.
The hand-excited single-bay, two-storey frame test successfully identified multiple natural modes. The fundamental mode (~2.6 Hz) exhibited classical global sway behavior, while higher modes (~5.3 Hz, ~7.9 Hz, ~10.6 Hz) revealed inter-storey deformation, partial phase reversals, and localized member flexibility—clearly demonstrating VibVue's capability to distinguish global and higher-order structural responses under low-level excitation.



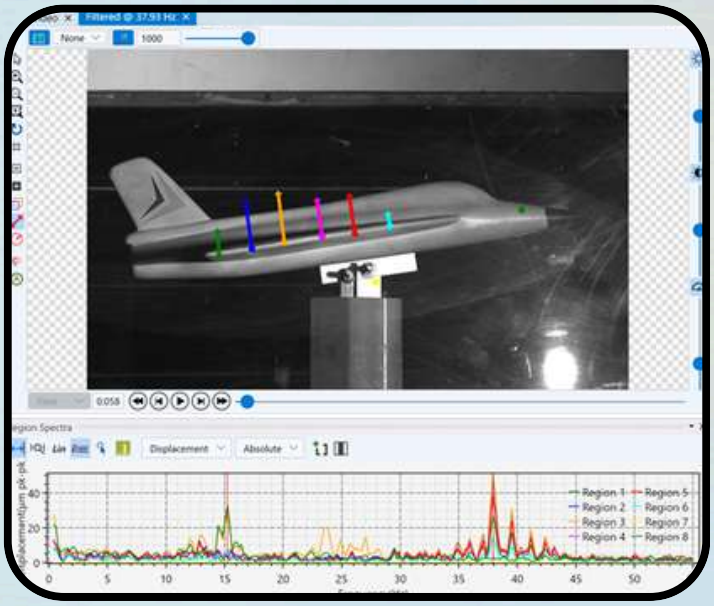
In the stone crusher visualization, motion magnification revealed dominant low-frequency (~0.60 Hz) rigid-body rocking caused by inadequate base fixity, later confirmed by a loose fastener. A higher mode (~3.61 Hz) represented the true structural response, with no evidence of cracking or damage—illustrating how boundary conditions critically influence measured vibration behavior.



Aerospace Engineering Demonstration

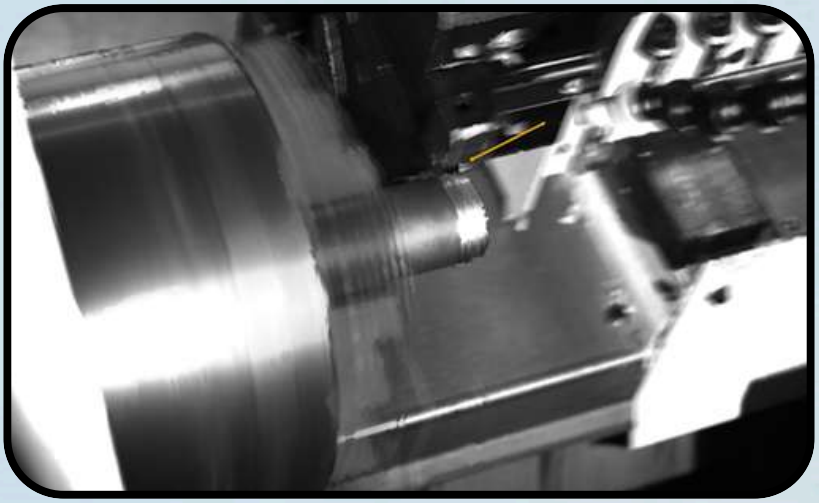
Aircraft Wind Tunnel Test

VibVue analysis identified two clear vibration modes at 15.25 Hz and 37.93 Hz, with 37.93 Hz as the dominant fuselage bending/torsional mode. The 15.25 Hz response is likely linked to global bending or mount coupling. Peak motion occurred in the mid-fuselage, while the mount remained rigid. Sharp spectral peaks confirmed clean structural resonance, validating VibVue as an effective non-contact modal visualization tool for wind tunnel testing.



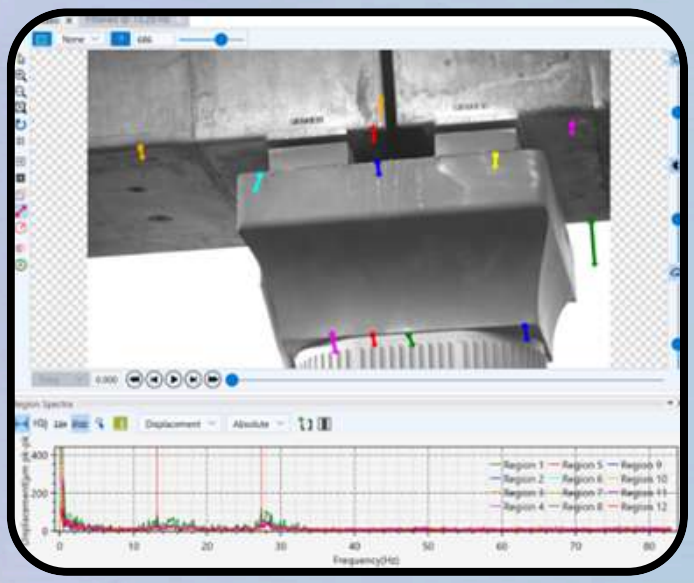
Mechanical Engineering Demonstration

A CNC machine vibration study demonstrated direct industrial relevance. At a spindle speed of 800 RPM (13.33 Hz), VibVue spectra identified dominant peaks at 53.4 Hz and 66.7 Hz, corresponding precisely to tooth-passing frequencies of a multi-flute cutter. A local resonance near 72–73 Hz indicated potential incipient chatter, while a large low-frequency component at 6.7 Hz highlighted machine or fixture compliance rather than cutting instability. This experiment effectively linked vibration theory with real-world manufacturing diagnostics.



Field Measurement and Integration

The workshop concluded with a live metro-induced vibration measurement on a girder and column during the simultaneous passage of two trains on Namma Metro, reinforcing how vibration principles extend from laboratory models to large-scale infrastructure.



SARVA SHIKSHA ABHIYAN

EDUCATION FOR ALL

CVS Mumbai Chapter Organizes Technical Seminar at FCRIT – Navi Mumbai

The Mumbai Chapter of CVS joined hands with Fr. C. Rodrigues Institute of Technology - Navi Mumbai to organize a Technical Seminar titled "Vibration Monitoring in Industry 5.0: Integrating Human Expertise with AI-Driven Diagnostics" on 4th February 2026. Dr. Vishwadeep C. Handikherkar, Assistant Professor (Production Engineering) at VJTI, Mumbai delivered the interesting talk. Hosted by the Department of Mechanical Engineering, the session focused on introducing students to the emerging paradigm of Industry 5.0, which emphasizes human-centric smart manufacturing systems supported by advanced technologies like Artificial Intelligence (AI) and Machine Learning (ML). The seminar highlighted the importance of vibration monitoring as a critical tool for condition monitoring of rotating machinery and explained how early fault detection can significantly reduce downtime and maintenance costs. Students were exposed to modern diagnostic techniques where AI models analyze vibration signals to detect faults, while human expertise plays a key role in interpreting results and making informed maintenance decisions.

The seminar proved highly beneficial for students, as it bridged the gap between theoretical concepts and real-world industrial applications. It enhanced their understanding of vibration analysis, sensors, and data acquisition systems, while also introducing them to AI-driven predictive maintenance strategies. The integration of mechanical engineering principles with data-driven technologies encouraged interdisciplinary learning and improved students' analytical and problem-solving skills. Furthermore, the session increased the awareness about current industrial trends, making students more industry-ready for careers in maintenance, automation, and smart manufacturing. It also motivated them to explore research opportunities and projects in condition monitoring and intelligent diagnostics. Overall, the seminar had a significant academic, technical, and professional impact by equipping students with knowledge and skills aligned with the future of Industry 5.0.

Here are a few glimpses from the event.

CVS Students' Chapter at IIT Delhi Organizes Technical Seminar on Novel Computational Approaches in Mechanics

The CVS Students' Chapter at Indian Institute of Technology - Delhi organized a Technical Seminar on 27 February 2026 on the topic "Novel Computational Approaches for Simulation of Geomechanical Deformation and Failure Behaviour using Mesh-Less Methods". The seminar talk was delivered by Prof. Raj Das from RMIT University, Australia. Dr Das is a Professor of Applied Mechanics at RMIT University and leads the 'Simulation of Advanced Materials and Structures (SAMS)' research group in the Sir Lawrence Wackett Defence and Aerospace Centre. He is also the Program Director in the Aerospace Engineering and Aviation discipline of the School of Engineering

Council of Vibration Specialists (CVS) Indian Institute of Technology (IIT) Delhi Student Chapter
in collaboration with
Scheme for Promotion of Academic and Research Collaboration (SPARC)

The talk primarily covered developments in novel numerical methods for computational modelling of large scale geomechanical structures, with focus on a mesh-free numerical modelling approach, called Smoothed Particle Hydrodynamics (SPH). A number of extensions of the SPH method incorporating material discontinuity and damage models required for modelling geomechanical behaviour were discussed during the lecture. The broad application areas for such advanced simulation include rock fracture and fragmentation in mineral exploration, mining, and rock slope analysis problems.

The event was moderated by Prof. Dr. Arnab Banerjee and was organized in collaboration with the "Scheme for Promotion of Academic and Research Collaboration (SPARC)".

आत्मनिर्भर भारत

Know Our Members

Er.Ikshit Shrivastava, SMCVS

Ikshit Shrivastava is an automotive engineering professional with over 15 years of experience in Noise and Vibration Engineering, specializing in NVH and vehicle refinement. He currently serves as Manager – NVH at the International Centre for Automotive Technology (ICAT), Manesar. Since joining ICAT in 2010, he has played a key role in building and strengthening NVH testing capabilities.He was instrumental in the development of India's largest NVH testing facility at ICAT, contributing to both infrastructure and technical capability creation. He leads NVH and vibration engineering activities, including benchmarking, target setting, Design of Experiments (DoE), and validation.

His expertise includes vibration analysis, structural dynamics, transfer path analysis, and advanced noise and vibration measurement techniques. He has extensive experience in multi-channel data acquisition, real-time analysis, and post-processing methodologies. His work supports domestic and global OEMs through comprehensive vehicle evaluation and benchmarking programs.

He represents India at the GRBP under UNECE at the United Nations Headquarters in Geneva, contributing to global NVH regulatory discussions, and is also a member of multiple committees working on test standard development for Indian applications.Ikshit holds an M.Tech in Automotive Engineering from BITS Pilani and a B.Tech in Automotive Design Engineering from UPES

Er. Sunny Sarraf, MCVS

Er. Sunny Sarraf is an Assistant Professor in the Department of Mechanical Engineering at Fr. C. Rodrigues Institute of Technology (FCRIT), Vashi, Navi Mumbai. He brings over nine years of combined teaching and industry experience. He holds an M.Tech in Mechanical Engineering (CAD/CAM) from VNIT Nagpur and a B.Tech in Mechanical Engineering from Bharath Institute of Science and Technology, Chennai. He is a GATE-qualified engineer with a 97.67 percentile. His areas of expertise include CAD/CAM/CAE, Additive Manufacturing, 3D Printing, Finite Element Analysis, and Product Design. He has completed several NPTEL and ATAL FDP certifications and has contributed to research through publications in reputed journals and conferences.

Er. Sarraf has actively guided student projects that have received recognition at national and international levels. He has also held key roles such as Co-Convener for INVEST-2025 Publications Committee and Faculty Advisor for the IEI Mechanical Student Chapter at FCRIT.

He is a Senior Member of the Council of Vibration Specialists and an Associate Member of The Institution of Engineers (India). His achievements include Elite NPTEL Certification, Star Performer Awards, and honors at INVEST-2025. In addition, he is a National Judge and Black Belt in Martial Arts. He has been recently elected as a Managing Committee Member of IEI, NMLC.

Dr. Naqeeb Ul Islam, MCVS

Dr. Naqeeb Ul Islam is an Assistant Professor in the School of Civil Engineering at Shri Mata Vaishno Devi University (SMVDU), Katra, Jammu & Kashmir, India. He specializes in structural engineering with a focused research interest in structural dynamics, vibration control, earthquake engineering, and advanced structural control systems.

He obtained his Ph.D. from IIT - Bombay, where his research focused on innovative vibration mitigation techniques, including base isolation, inerter-based systems, and negative stiffness devices. Following his doctoral studies, he served as an Institute Postdoctoral Fellow (IPDF) at IIT Bombay, contributing to advanced research in structural control and seismic resilience. Dr. Islam completed his Master's degree in Structural Engineering from the NIT - Srinagar and earned his Bachelor's degree in Civil Engineering from the Islamic University of Science and Technology (IUST), Awantipora.

He has also served as an Assistant Professor at NIT - Srinagar prior to joining SMVDU. His research contributions include approximately 17 publications in reputed SCI and SCOPUS indexed journals and international conferences. His work primarily focuses on the development and application of passive, semi-active, and hybrid control systems for mitigating structural responses under dynamic loads, particularly earthquakes. He is also actively engaged in research related to seismic risk assessment and resilient infrastructure design, especially in the context of Himalayan regions.

Dr. Islam is actively involved in teaching undergraduate and postgraduate courses in structural engineering. He has been instrumental in developing laboratory infrastructure, including structural dynamics and structural analysis laboratories, aimed at enhancing experiential learning and research capabilities for students.

Dr Amit Malgol, MCVS

Dr. Amit Malgol is an academician and researcher specializing in rotor dynamics, vibration analysis, and nonlinear mechanical systems. He is currently working as Assistant Professor in the Mechanical Engineering Department of Fr. C. Rodrigues Institute of Technology (FCRIT), Vashi, Navi Mumbai. He holds a Ph.D. in Mechanical Engineering and has a strong academic background in modeling and analysis of rotating machinery. His research focuses on Jeffcott rotor systems, fluid film bearing effects, gyroscopic influences, and stability behavior of nonlinear systems.

He has published several research papers in reputed journals and conferences, contributing to areas such as resonance analysis, bifurcation studies, and dynamic response of rotor-bearing systems. His work combines analytical techniques with MATLAB-based simulations and experimental validation.

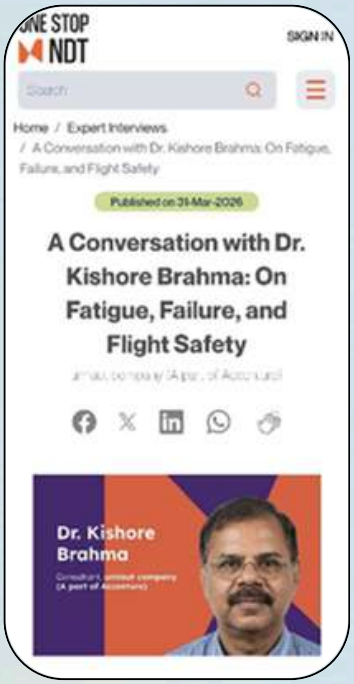
Dr. Malgol is also actively engaged in exploring advanced topics such as fault diagnostics, condition monitoring, and the application of AI and machine learning in rotating equipment health assessment. His ongoing research aims to develop intelligent, real-time monitoring systems for rotatory machinery.
He is passionate about teaching, research and innovation, and bridging the gap between theoretical modeling and practical engineering applications.

Members in News

Heartiest Congratulations! We are proud of you.

Prof. R. N. Iyengar, FCVS and Director of the Center for Ancient History and Culture (CAHC) at Jaiain University – Bengaluru, has been awarded the SASTRA - Mahamana Award by the SASTRA Deemed University, Thanjavur (Tamil Nadu). This Award is in recognition of Prof. Iyengar's outstanding contributions towards integration of traditional knowledge with modern Structural and Earthquake Engineering research. The honour was bestowed on Prof. Iyengar by Shri Shivkumar Kalyanaraman, CEO of Anusandhan National Research Foundation (ANRF), during the National Science Day Awards – 2026 Ceremony.

Dr. Kishore Brahma, FCVS, Consultant with Umlaut Company (A part of Accenture), was featured on OneStop NDT online publication, where he talked at length on Fatigue, Failure and Flight Safety aspects. The interview, published on 31 March 2026, covered his experiences through the over 3-decades long career, involving research in Non-Destructive Evaluation (NDE) techniques, aircraft design, Fatigue & Damage Tolerance (F&DT) analysis, participation in various aerospace programs and certification activities. He also shared his views on the latest computational techniques and digital engineering aspects in aerospace domain.



Dr. Suhasini N. Madhekar, FCVS, formerly of College of Engineering – Pune (COEP), together with Manish Kumar and Dhanashree Rohit Tulankar from IIT - Bombay, Mumbai have been granted a Patent by the Indian Patent Office, entitled "Seismic Isolator Fabricated from a Scrap Rubber Tire and a Method Thereof" (Patent No. 581969 with Grant Date of 27 February 2026). The Scrap Tire Rubber Pad (STRP) Isolator has demonstrated good mechanical performance during experimental investigations, showing its potential to be a cost-effective solution to reduce earthquake-induced damage, while promoting environmental sustainability through waste material recycling.

Er. N P Sundar, FCVS and Director, Stellar Innostrat Consulting, took part in designing and delivering a 2-Day Training Program on Asset Management System, aligned to ISO-55001 : 2024. This was organised during 8th & 9th January 2026 by the Bureau of Indian Standards (BIS) at NITS – Noida. Thirty-eight participants attended the training.

Prof. Dr. Minoru Sasaki, FCVS, from Gifu University – Japan, conducted a 5-Day micro-credit course at SRM TRP Engineering College, Trichy during 16 – 23 February 2026 on the topic "Hybrid Intelligence for Mobile Robots and Manipulators". This was jointly organized by the Departments of Electronics & Communication Engineering and Mechanical Engineering. He was also the Chief Guest at the 1st International Conference on Engineering Materials in Science and Engineering (ICEMSE – 2026), organized at this institute on 19 February 2026. He delivered a talk on "Emerging Smart Actuator Materials and Intelligent Control for Next-Generation Robotics and Precision Engineering".

Prof. Sasaki also visited VelTech (Deemed University) – Chennai to conduct a credit course for the students of Mechanical Engineering. He was also taken around the High-Speed Bearing Test Facility at VelTech by CVS Member, Dr Joseph J Kakkassery.

Er. Anoop Saxena, FCVS, Director/Senior Consultant with Asset Management Consultants, conducted a program on Overall Plant Efficiency at Arjas Steel Plant in Tadipatri, Ananthapur (AP). The event was organized during 28-29 January 2026. The common Workshop Session was attended by over 60 participants. Training sessions were conducted in 8 different production shops, each attended by around 15 participants.

Re-centering Devices

(Book Preview)

Prof. (Dr.) Suhasini Madhekar, FCVS
Former Professor, College of Engineering, Pune
Prof. (Dr.) Vasant Matsagar, FCVS
Professor & Head, Dept. of Civil Engineering,
Indian Institute of Technology, Delhi

1. Introduction

Re-centering refers to a device's ability to return to its original position and configuration after a seismic event. The absence of re-centering can lead to significant damage and structural failure during strong earthquake ground motions. After the load is removed, residual deformation in re-centering devices remains minimal, allowing them to preserve their original shape. Devices with re-centering capability include pressurized fluid dampers, preloaded spring friction dampers, self-centering seismic-resistant systems, and shape memory alloy (SMA) dampers.

2. Pressurized Fluid Damper

Pressurized fluid damper provides both damping and re-centring capabilities, mainly for a base isolation system. A schematic of a pressurized fluid restoring damper is shown in Figure 1. The resistance in the damper arises from various physical phenomena, such as (i) resistance caused by preload induced in the device due to the initial pressurization of fluid, (ii) resistance related to the stiffness of the damper, which is linked to the compressibility of the fluid (silicone oil) in the device, (iii) resistance from seal friction, and (iv) damping generated by the passage of silicone oil through the orifice.

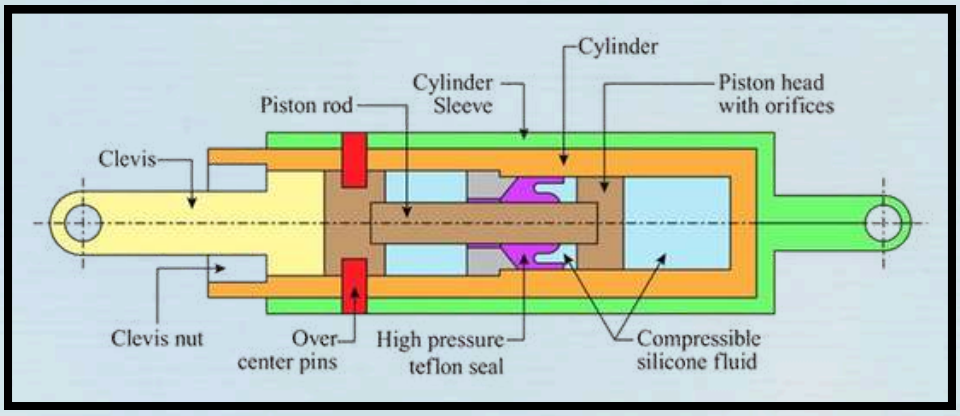


Fig. 1. *Pressurised fluid restoring damper. (Tsopelas and Constantinou 1994.)*

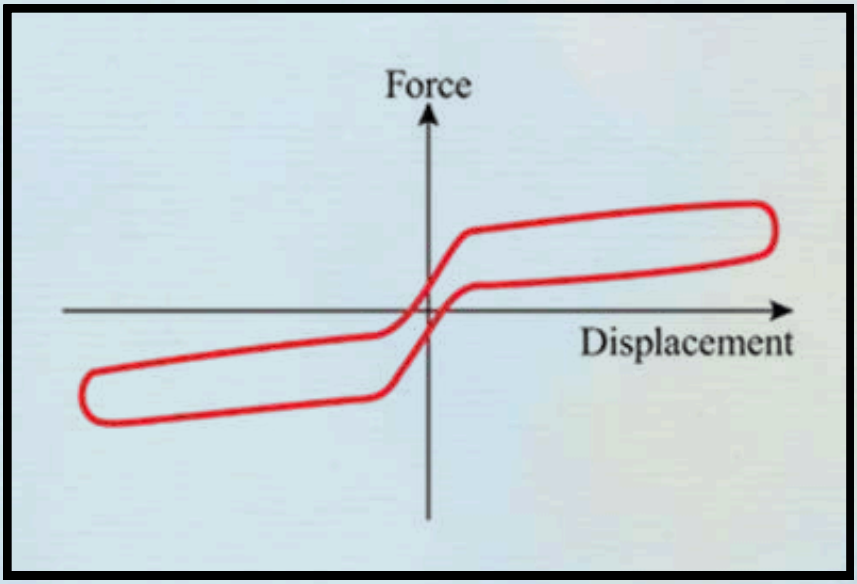


***Fig. 2**. Force-displacement curve of pressurised fluid damper. (Tsopelas and Constantinou 1994.)*

During loading, high damping is observed, while unloading shows lower damping. The typical force-displacement response is shown in Figure 2.

3. Preloaded Spring Friction Damper

The preloaded spring friction damper includes steel compression wedges embedded in a thin cylinder and an internally preloaded spring. A schematic of this damper is shown in Figure 3. The force-displacement loop for a damper with a preloaded spring exhibits a double-flag shape, while the loop with zero preload is triangular, as shown in Figures 4(a) and 4(b), respectively.

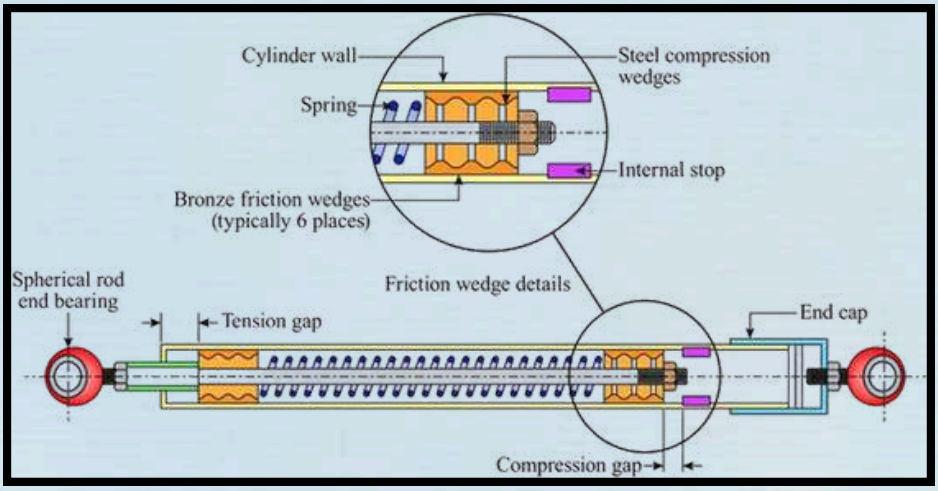


***Fig. 3.** Schematic diagram of preloaded spring friction damper. (Nims et al. 1993.)*

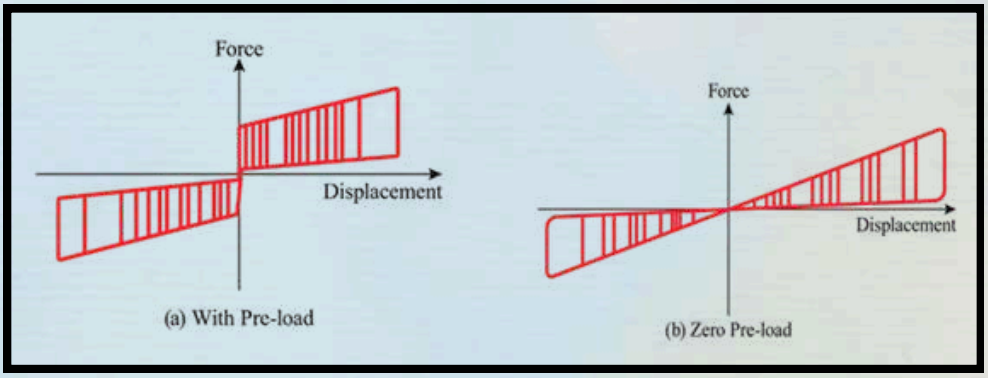


Fig. 4 *Force-displacement loops for spring-friction damper (Nims et al. 1993)*

4. Self-Centring Seismic-Resistant System

The conventional design methodology enables the structure to be designed to respond beyond the elastic limit and, ultimately, to exhibit inelastic ductile behaviour at specified locations. For this purpose, the designated regions are evaluated for ductility and energy dissipation capacity

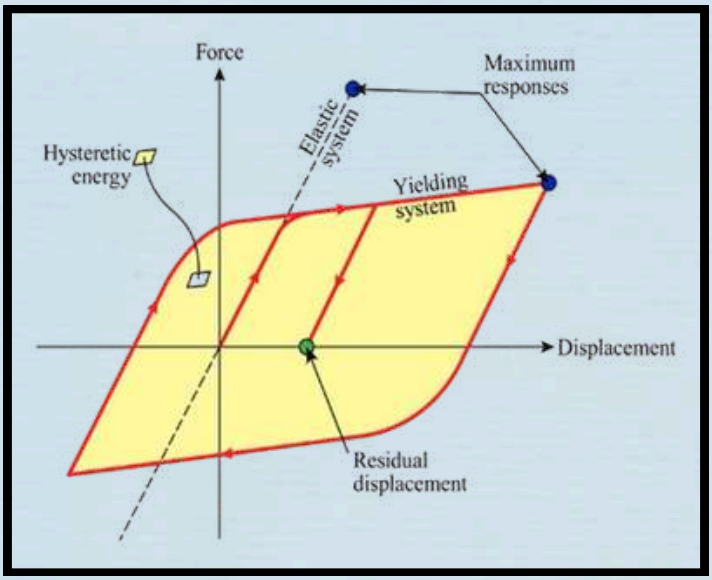


Fig. 5. *Idealized force-displacement relation of a yielding system. (Christopoulos et al. 2002.)*

Figure 5 shows the idealized force-displacement responses of a linear-elastic system and a yielding structure with equal mass and initial stiffness. The maximum seismic force in the yielding system is significantly lower than that of the linear elastic system. The maximum displacement of the yielding system can be smaller, similar, or larger than that of the elastic system, depending on the natural period and the strength of the yielding system. The area of the loop represents the energy dissipated per cycle through hysteretic yielding. Designs aimed at an inelastic response are highly recommended due to their low initial cost; however, they have two main drawbacks:

(i) the regions in the principal lateral force-resisting system are damaged in moderately strong earthquakes and require repair, or are damaged beyond repair in powerful earthquakes; and (ii) current design methods rely on the principle that substantial energy dissipation capacity is necessary to reduce earthquake effects.

This often leads to the idea that a good structural system should be characterized by a wide hysteresis loop. Since a large part of the input energy is expected to be dissipated through hysteresis, significant residual displacements could occur in a structure after an earthquake, as shown in Figure 5. Excessive residual deformations can even cause total damage to a structure because of geometric nonlinearity.

To address these limitations, innovative and cost-effective self-centering earthquake-resistant systems are needed. These systems should (i) incorporate the nonlinear characteristics of yielding structures to limit the inertial force caused by seismic activity and add damping, (ii) have self-centering properties that enable the structure to return to its original position after an earthquake, and (iii) minimize or prevent cumulative damage to the main structural components.

Figure 6 shows a representative flag-shaped force-displacement relationship for a typical self-centering system.In this system,the amount of energy that must be dissipated is relatively less than in the yielding system shown in Figure 5.

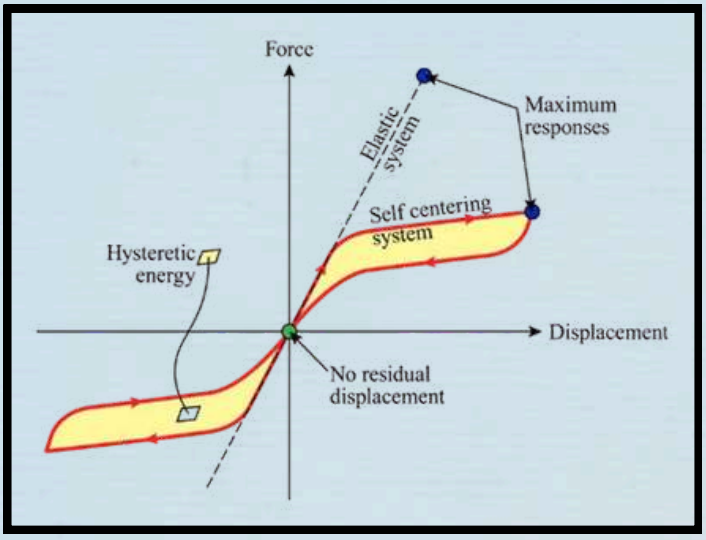


FIG. 6 *IDEALIZED FORCE-DISPLACEMENT RELATION OF SELF-CENTERING STRUCTURAL SYSTEM. (CHRISTOPOULOS ET AL. 2002.)*

5. Applications of the self-centering system

Numerous experimental works have been performed by researchers to enhance the self-centering capabilities of structures. The self-centering capabilities are checked and enhanced for various applications, namely, RC structures, steel structures, masonry walls, and bridges.

(I) Reinforced ConcreteStructures

Figure 7 illustrates a post-tensioned (PT) split-rocking wall system, in which the wall panels are separated to allow each panel to rock about its base. The self-weight of the panels provides re-centering forces. If this weight is insufficient to fully re-center the wall panels, unbonded PT tendons connecting the wall to its foundation can be installed. Energy dissipation can be achieved by grouting reinforcing bars into vertical ducts along the edges of the wall, allowing them to cyclically yield in both tension and compression during an earthquake. Alternatively, ductile shear connectors can be placed between the wall panels, which deform cyclically in shear as the walls rock back and forth.

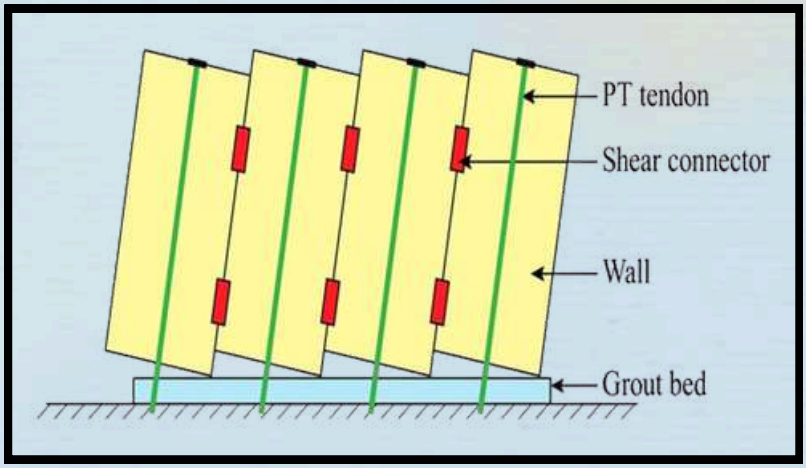


FIG. 7*. POST-TENSIONED SPLIT ROCKINGWALL SYSTEM. (STANTON AND NAKAKI 2002.)*

The self-centering concept can be applied to RC cantilever walls by using a wall system prestressed with unbonded tendons and conventional reinforcement for energydissipation, as shown in Figure 8. The main advantages of this hybrid jointedwall system are the large lateral displacement capacity, the lack of structural damage associated with large displacements, and the ability to return to the original position upon unloading.

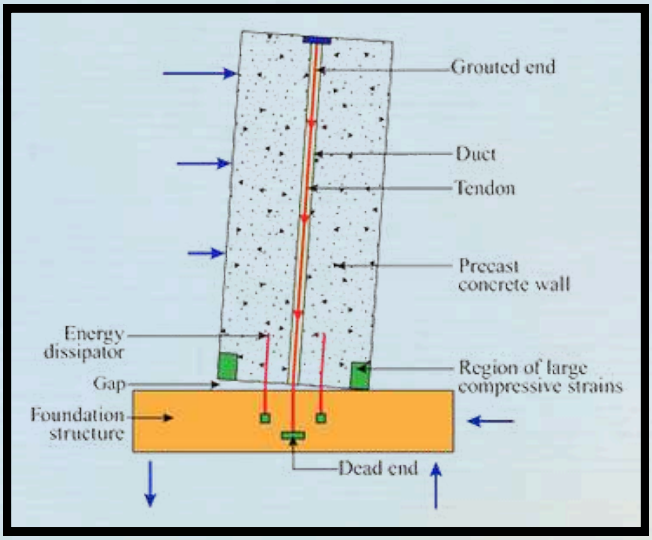


FIG. 8. *HYBRID REINFORCED CONCRETE CANTILEVER WALL SYSTEM. (RESTREPO 2002.)*

(II) Steel Structures

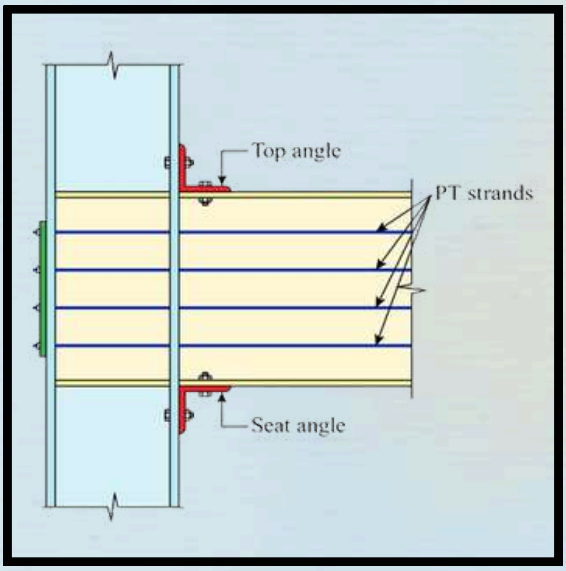


FIG. 9. *HYBRID POSTTENSIONEDCONNECTIONS FOR STEEL FRAMES. (RICLES ET AL. 2001.)*

A hybrid PT connection for steel MRF, shown in Figure 9, consists of high-strength steel strands that run along the beam web and anchor to the exterior column flange at the end of the frame. Additionally, the seat and top angles are bolted to both the column and the beam. Shear resistance is provided by a combination of friction at the beam-column interface and the steel angles. The system is designed so that the steel angles are the only elements that yield. Therefore, only the steel angles need to be replaced after a major earthquake. Additional benefits of this connection include (i) no field welding required, (ii) use of conventional materials and skills, and (iii) initial stiffness equivalent to that of conventional welded connections.

(III) Bridge Structures

The innovative concept, combined with energy-dissipation devices, was successfully incorporated into the design of the stepping-rail bridge over the South Rangitikei River in New Zealand. This approach is similar to that of the self-centering system. The railroad bridge, shown in Photo 1, has been in service since 1981. It measures 70 m in height, features six spans of prestressed concrete hollow-box girders, and has an overall length of 315 m. The base isolation primarily allows for the sideways rocking of pairs of slender RC piers. Torsional-beam dampers are installed to limit this rocking. The bridge's weight, which facilitates its re-centering, is transferred to the foundation through thin laminated rubber bearings. It has been documented that the bridge can realign itself during seismic vibrations.

Photo 1. *Application of self-centering system on the Rangitikei railwaybridge, New Zealand. (Christopoulos et al. 2002.)*

6. Shape Memory Alloy Devices

Passive control systems have proven to be highly effective in protecting structures from earthquake-induced vibrations and the resulting forces. While the efficiency of passive control systems, such as base isolation devices, mass dampers, and viscous dampers, is satisfactory, there remains a need for passive devices that utilise the unique properties of innovative advanced materials to improve energy dissipation. Furthermore, traditional passive devices face various issues related to ageing, durability, installation complexities, and routine maintenance. This has led researchers to explore a new class of materials, such as shape memory alloys (SMAs), in passive isolation systems.

SMA-based dampers can effectively endure severe earthquakes. They help reduce permanent and plastic deformations in structures and absorb a large amount of seismic energy. SMAs are known for two unique features: shape memory effect and super-elasticity. The shape memory effect is the ability of alloys to return to their original shape after heating to their phase transformation temperature. Super-elasticity occurs when alloys show a significant recoverable strain. Different SMA families have various applications depending on their transformation temperature ranges. At higher temperatures, SMAs exhibit superelasticity. However, during loading, stress-induced martensite forms, and during unloading, the martensite reverts to austenite at a lower stress level, creating hysteretic behaviour, as shown in Figure 10. These properties make SMAs suitable for use in seismic energy-dissipation devices within structural control engineering.

At sufficiently high temperatures, the SMAs also exhibit superelasticity, which helps the materials recover large deformations during mechanical loading and unloading cycles performed at constant temperature. This superelasticity is effectively utilized in SMA-based dampers. Figure 11 shows a schematic of an SMA-based damper.

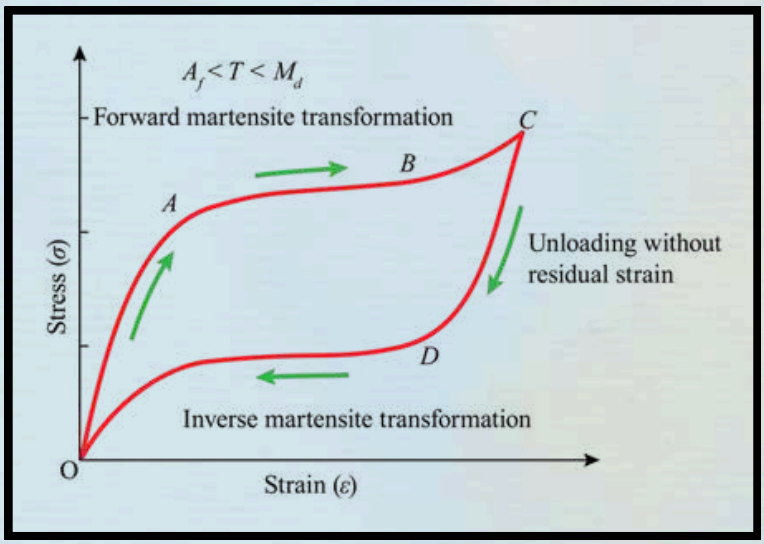


FIG. 10. *SUPER-ELASTICITY EFFECT OF SMAS AND TOTAL STRAIN RECOVERY. (CHOI ET AL. 2013.)*

There are several advantages to implementing SMAs to mitigate the seismic response of structures. (i) SMAs can store a large amount of strain energy when subjected to cyclic loading without causing permanent deformation of the structure. (ii) Nitinol (nickel-titanium alloy) has good fatigue resistance under large amplitude strain cycles and requires minimal maintenance. Because of this property, SMAs perform outstandingly during the most devastating earthquakes. (iii) Nitinol alloys exhibit excellent corrosion resistance and significant resistance to degradation caused by ageing. (iv) SMA materials demonstrate greater durability and are considered reliable devices for long-term use.

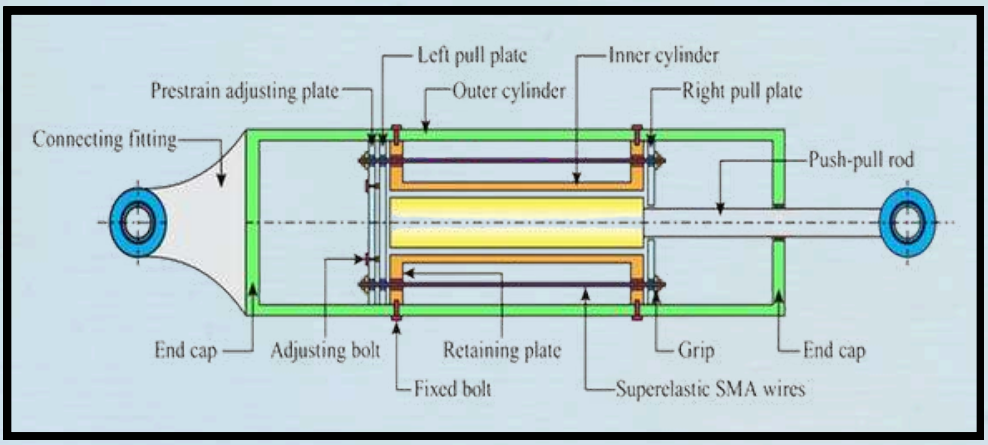


FIG. 11. *SCHEMATIC OF SMA-BASED DAMPER. (CHOI ET AL. 2013.)*

Applications of SMA in Construction

(I) SMAs have been effectively used in various fields, including medicine, robotics, aerospace engineering, and the automotive industry. SMAs have also demonstrated their usefulness in the building and infrastructure sectors, as well as in the repair and reinforcement of architectural heritage structures.

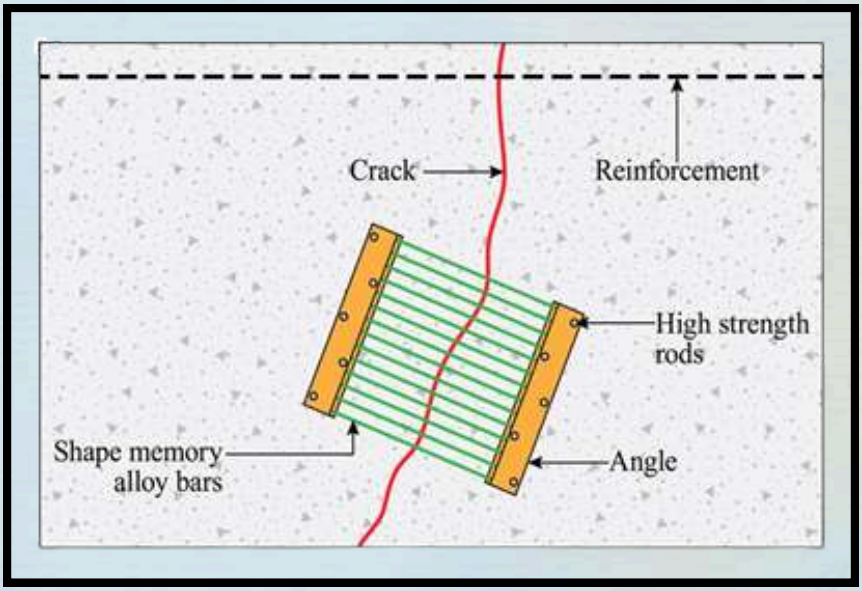


Fig. 12. *The SMA alloy bars used to strengthen the bridge girder.*

The first application of the shape memory effect in the field was for post-tensioning a concrete structure on a highway bridge in Michigan. It had experienced cracks due to inadequate shear resistance. To reinforce the bridge girder, 10-mm-diameter iron-manganese-silicon-chromium SMA rods were installed, crossing the cracks on both faces of the web, as shown in Figure 12. Excessive movement of bridge supports causes the unseating of bridge decks, a major factor in infrastructure failure during earthquakes. Experimental and analytical results have demonstrated that bridge restrainers with SMAs can decrease the movement of bridge decks during earthquakes and reduce residual deformation.

(II) The mechanism of strengthening heritage buildings during earthquakes using SMA devices has been observed in various Italian buildings, such as the Basilica of St Francis of Assisi (Photo 2) and the San Serafino Church, Foligno (Photo 3). In the Basilica of St Francis, 47 SMA devices were installed to repair the facade, which was damaged in the 1997 earthquake.

Photo 2*. Basilica of St Francis Assisi, Italy.*

Photo 3. *San Serafino Church, Foligno, Italy.*

7. Base Isolation Systems with SMAs

A number of base isolation systems have been developed using nickel-titanium SMAs to combine a conventional rubber bearingsystem with SMA.

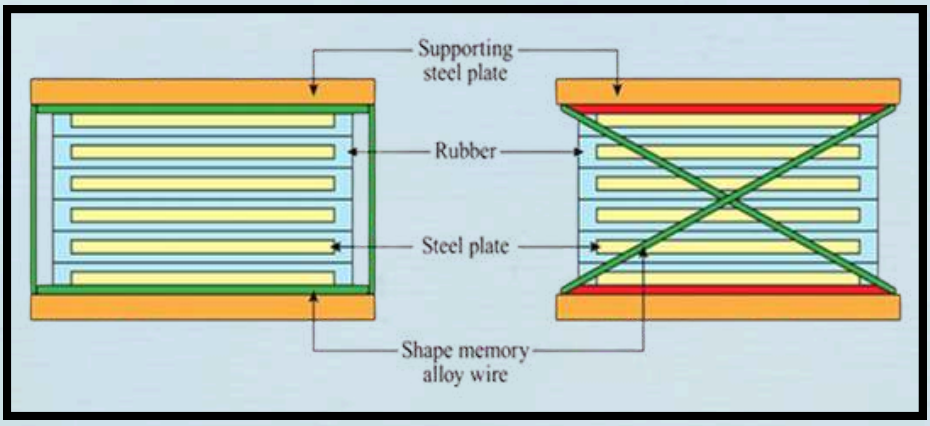


Fig. 13. *Shape memory alloy - rubber bearing. (Das and Mishra 2014)*

The advantage of this combined system is that it can significantly reduce superstructure movement during an earthquake. After an earthquake, the superelasticity of the SMA restores the rubber bearing system to its original position; however, during the earthquake, large deformation can occur in the base-isolation system. To limit this large deformation in a conventional base-isolation system, an SMA-rubber bearing, shown in Figure 13, was proposed. It has been proven to be more efficient than a conventional system. The main drawback of this system is the material and construction costs associated with implementing it within an existing structure.

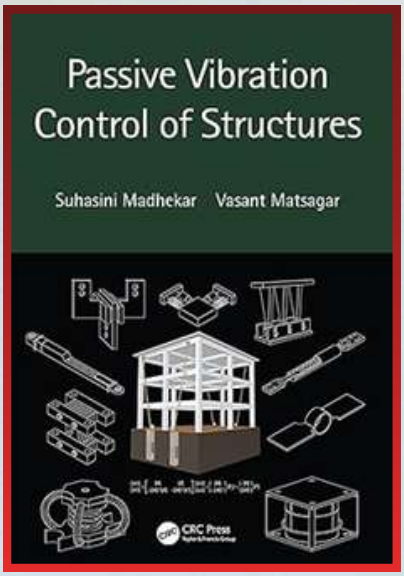
Although SMAs yield during an earthquake, they aid in the structure's recovery from deformation afterwards. Incorporating SMAs into a bracing system can effectively address the pinching in the hysteresis loop of a structure after it experiences large

deformation and exhibits strong re-centering ability. Previous experiences with concentrically braced steel frames indicate that this system has limited ductility and energy-dissipation capacity due to bracing buckling. Research has demonstrated that braces with SMAs are effective at reducing inter-story drift and residual drift during an earthquake.

One of the main barriers to adopting SMAs in construction is the high cost of materials, which are used in large amounts. The expense of producing SMAs includes raw materials, processing, heat treatment, and machining. To increase market adoption of SMAs for construction, it is important to develop affordable, high-performance SMA products.

EDITOR'S NOTE

THIS ARTICLE IS A PREVIEW OF CHAPTER-8 OF THE AUTHORS' BOOK ENTITLED "PASSIVE VIBRATION CONTROL OF STRUCTURES" (CRC PRESS). CHAPTER-7 WAS COVERED IN THE PREVIOUS ISSUE OF "AMPLITUDE". WE PLAN TO PRESENT THE PREVIEWS OF SUBSEQUENT CHAPTERS OF THE BOOK IN FUTURE ISSUES OF THIS NEWSLETTER.



Guidelines for Contributors to "amplitude" Newsletter

- Members are encouraged to contribute short technical notes, articles and other regular features for publication in ***"amplitude"***. Technical articles should be restricted to 4-5 pages (including all figures / illustrations).
- Submissions can be sent to the Editor at barunc1964@gmail.com, with a copy to CVS Headquarters at covshqs@gmail.com
- All text matters should be submitted in editable MS-WORD format with 12-pt Times New Roman font and 1.15 line spacing, in single-column A4 size page
- All figures/illustrations and photographs should be submitted as image files (.jpg. .jpeg, .png etc.)
- Please do not submit entries in PDF or MS-PowerPoint format.

Predictive Condition Assessment of Rolling Mill – Mill Rolls Integrity

(RCFA – O&M, Quality Multi-Parameters Deviation & Engineering Factors)

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Director / Sr. Consultant, Asset Management Consultant
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1. Introduction

This Article deals with Reliability Approach - Root Cause Failure Analysis of complex phenomenon of Roll Breakage in Steel Rolling Mills and the failure modes, through in-depth approach of problem solving through Operation/Maintenance and Quality Multi-Parameters/Factors Analysis. In Rolling Mills, the Roll constitutes an important component of Hot Rolling Mill Process, for processing Flat & Long product from Steel Billets. The rolls are the most critical part of the rolling mills and the performance of the rolling mill depends very much on the quality and the performance of the rolls. Rolls are changeable parts of a rolling mill, which are used to reduce the cross-section and shape of the material being rolled.

RCM and CBM Approach and their solution is applicable to any industries dealing with critical equipment or component failures due to forces, cyclic stress, variable load/ speed, low-frequency vibration, contaminants in Lubrication, wear/tear, moisture, raw material, temperature and metallurgy causing multiple Defects - crack, fatigue, inclusions, etc.

2. Abnormalities and Failures of Rolling Mill Rolls

Roll breakage is a destructive phenomenon that occurs in Rolling Mill rolls and a catastrophe in rolling mill leads to partial or total loss of the rolls, necessitates removal of cobble in mill, causes mill stoppage and equipment damage. The rolls operate in severe conditions and their application demands an optimum combination of several properties, such as wear resistance and toughness, etc. During rolling, rolls are under high load and the contact area between roll and the material being rolled wears out. After the campaign life of rolls is over, rolls are required to be changed. The Surface condition is the key criterion of determining the roll change. Rolls are discarded when the diameter reaches the minimum.

3. Key reasons for Roll Breakage / Failure observed in Mills

- The Roll itself (Material - Chemistry, Manufacturing defect, etc.)
- External O&M factors (Operation conditions, such as rolling force, torque overload, speed, vibration, temperature, water/contaminants ingress in rolls/bearings, lubrication etc.).

Roll Defects & Abnormalities As Per Failed Broken Roll Form - Key Contributors

Broken Roll Form	Attributed Reasons : Roll Defects & Abnormalities / Failure Mode / Factors	Counter Measures & Monitoring / Action Plan
Central fracture of steel plate roll The roll with a hole broken at bottom of groove Root break at roll neck Twisted roll neck Roll head twisted off	❖ Roll material &manufacturing defects ❖ Roll fatigue/ Spalling/ Residual stresses ❖ Roll damage due to single load & thermal breakage/ Fire crack/ hydrogen ❖ Roll hardness variations ❖ Mechanical& Physical damage of rolls	❖ Vendor & Roll Material / Specification changed ❖ Billet Quality/Temp control /Roll-NDT-Section Change ❖ Vibration, SDT- Low RPM Temp, NDT, Lub - WDA ❖ Roll & Fiber Bearing SOP/ Roll Alignment& Water / Scale-Contaminants / Load / RPM trends & Monitoring

Sample images of St. Mill layout, Broken Roll & Microstructure

4. Gains & Benefits

Key Improvements were done through RCFA on Rolling Mill Roll Defects, at Structure Mill (Product: Flats, Angles and Channels) and TMT (Thermo-Mechanically Treated) Products (TMT Rod of various sizes). These included CBM Techniques such as online monitoring of vibration, temperature and RPM; sound monitoring; Non-Destructive Testing and Roll Bearing lubrication monitoring. These were applied as per counter- measures and action plan on Mill Stands.

After modifications and system improvement, Mill Roll Failures reduced at both Structure Mill (from 12 Nos./year to 02 Nos./year) and in TMT (from 05 Nos./year to Zero). The Roll Life also got enhanced, leading to Mill Availability, Reliability and Performance improvements. The resulting cost savings were over Rs. 50 Lakh, in terms of the cost of Rolls, production downtime reduction and planned uptime and maintenance.

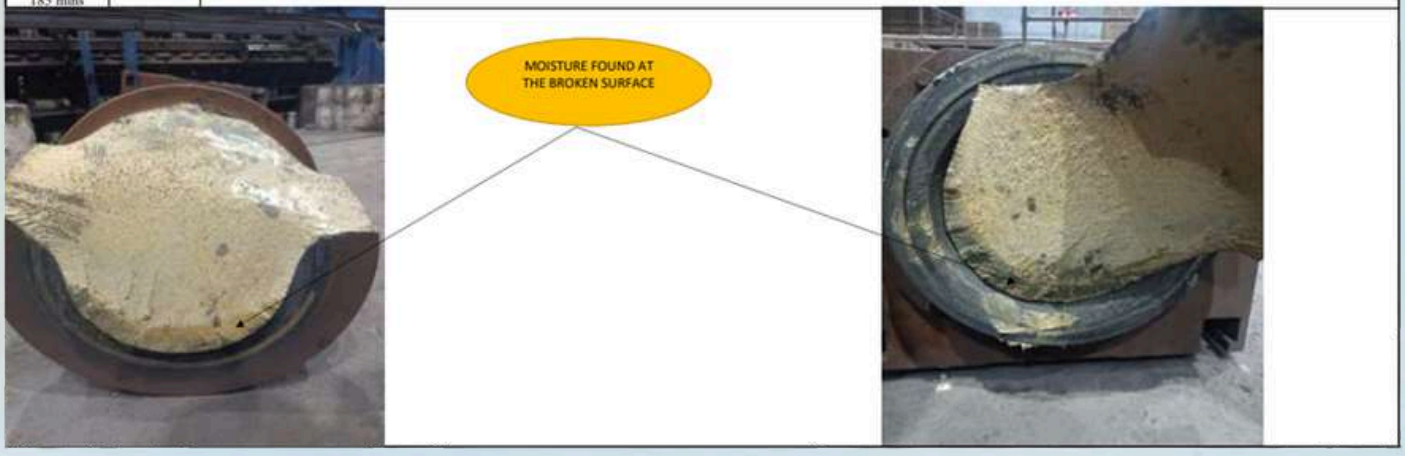
The Annexure shows a sample RCFA for a broken Roll from a Rolling Mill.

Annexure

MULTIPLE WHY-WHY ANALYSIS SHEET

Physical Analysis of Phenomenon Analysis of Processing Point

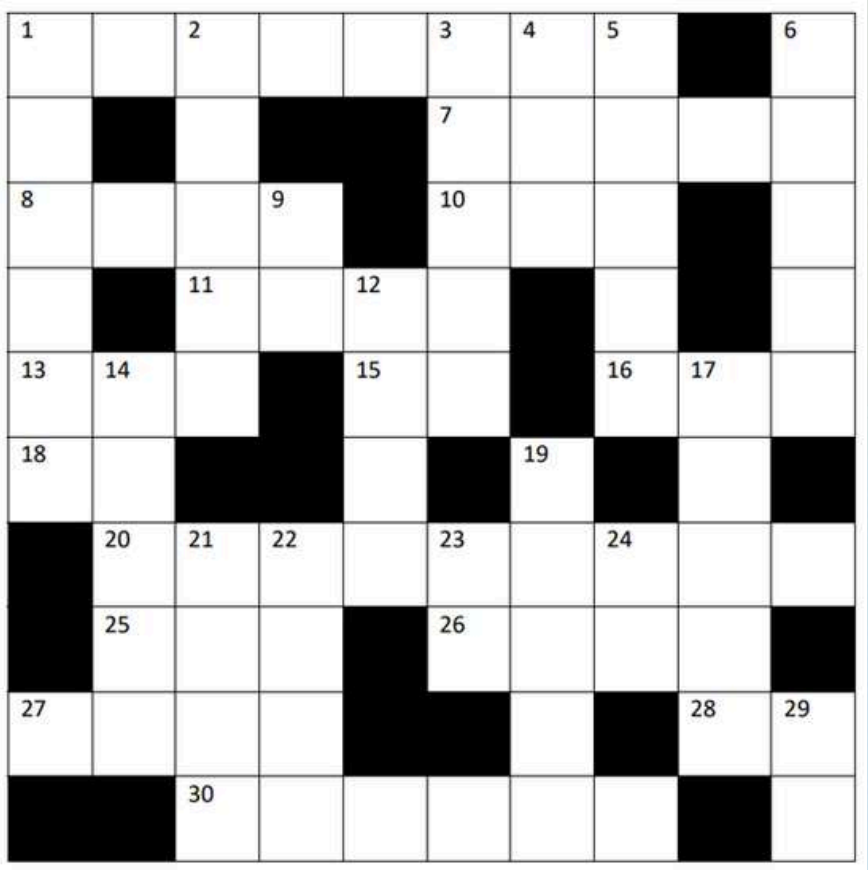
Phenomenon/ Observation	Items Examined	Judgement/Verdict OK/Not Ok	Why 1 for not OK	Why 2	Why 3	Counter- measures	Person	Deadline/ Target	Complete/ Status
Roughing Top Roll Broken	Motor	OK	No unusal sound or any over current observed.			1. We have replaced the roll with the available spare roll. 2. We have decided to not procure roll from KAIDA. 3. Now we will go through a UT test while every dressing of the roughing roll.	Jitendera Balelu Yadav & Team	Immediate	Discussion need to be done with the supplier which is under progress.
	Red. Gear Box	OK	No abonormal sound or any vibration observed.						
	Pinion Gear Box	OK	No abonormal sound or any vibration observed.						
	Cardan shaft	OK	(No axial play found)						
	Roll Dia	OK	596 MM						
	Billet Temperature	OK	1040 °C						
	Billet Rhomodity	OK	No any deviation size found at Billet						
	Roll Composition	OK	C-1.23%,Mn-0.78%,S-0.010%,P-0.019,Si-0.48%,Ni-0.68%,Cu-0.04%,Cr--0.93%,Mo-0.21%,Al-0.017%,V-0.014% (As our Qc team)						
	CI breaker	OK							
	Roll	NOT OK	Found Broken from drive end journal to 2nd pass.	As per QA team report some internal flaw observed on barrel flaw upto 30 % with backwell loss 20% depth 280-290 mm & no recordable indication observed on both & neck.					
How Phenomenon Developed		While going through the investigation we have observed some sepage of around 200MM on the roll which can be caused due to internal cracks on the rolls.							
Corrective action		We have replaced the roll with the available spare roll.							
Date 07-05-2024 Down Time 185 mins	Root Cause	As per QA test report and previous issues from the supplier, it is manufacturing fault as the same cracks phenomenon have been found in both TMT & Structure mill and shared with the supplier.							



The CVS Word Game

Contributed by Dr Arun Jalan, FCVS

Time to stimulate our grey cells!



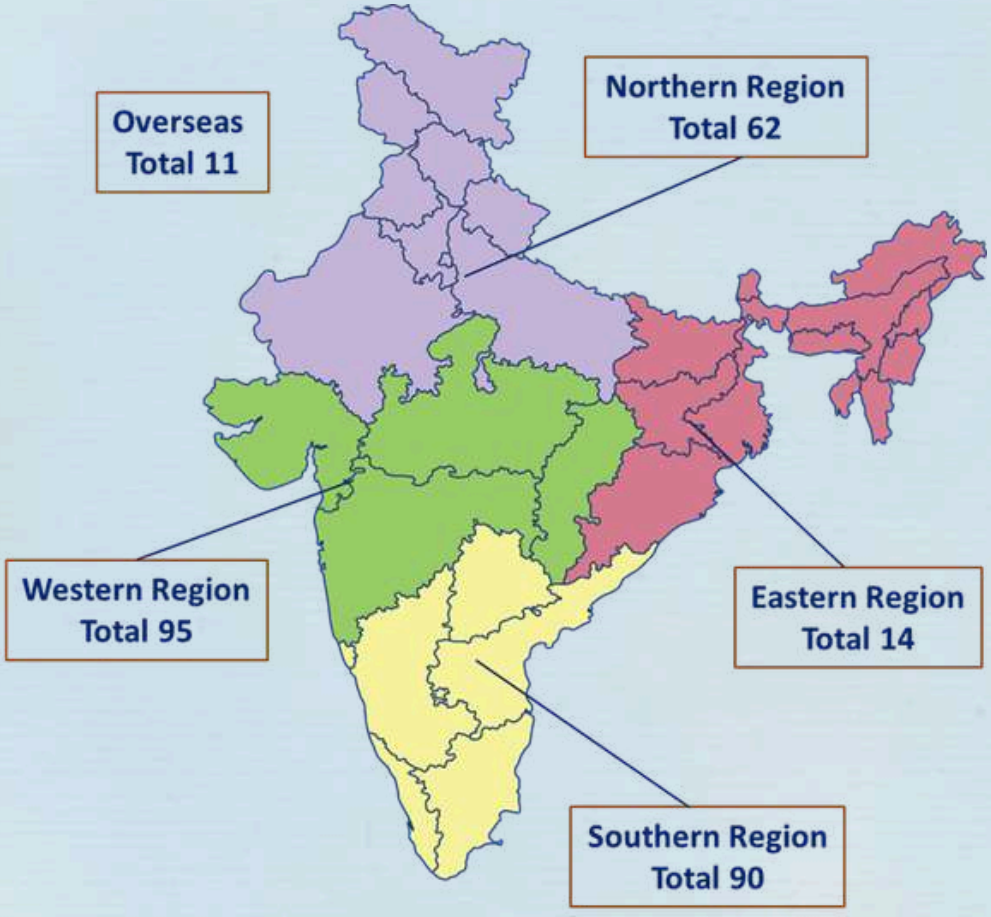
Across	Down
1. ____ day of India: foundation day of CVS. 7. A heavy metal block used as a sturdy surface for hammering, shaping, or forging metal. 8. Make a loud sound with the voice 10. Measures the strength of a desired signal compared to background noise 11. A trigonometric function. 13. A garden tool 15. Overlays digital information onto the real world 16. An immeasurably long period of time 18. Length measurement unit. 20. Study on designed for efficiency and comfort in the working environment 25. Helps to creates new content: including text, images, code, and audio, by learning patterns from existing data 26. One of type of transient force 27. A sudden loud noise, a violent blow, or a thrilling experience 28. A type of vehicle 30. A mechanical device used in vehicle to control vibration.	1. The recurrent pattern formed by a series of sounds 2. Vibration, beat; 3. A device that emits highly concentrated, coherent, and monochromatic light. 4. A small hotel 5. A DRDO Laboratory 6. The process of positioning rotating machine shafts or components to be collinear 9. A chemical element, the lightest metal. 12. Denoting one-billionth of an SI base unit 14. A Greek letter, represents angular speed 17. A combination of oxygen and another chemical element. 19. A sound, especially one that is unpleasant 21. Official currency of South Africa 22. Metric prefix, meaning one billion 23. Short form of a direction 24. A hard, brittle, silvery-gray transition metal 29. A simulated experience that employs 3D head-mounted displays and pose tracking to give the user an immersive feel of a virtual world

CVS Membership Profile

CVS Members	Industry	Academia	Corporate	Total
South (Bengaluru, Chennai, Hyderabad, Tamil Nadu, Telangana)	55	31	4	90
East (Kolkata, Guwahati, Bengal)	5	9	0	14
North (Delhi)	53	9	0	62
West (Mumbai)	59	32	4	95
Overseas	9	2	0	11
Total	181	83	8	272

Category of Membership	Mumbai & West	Bengaluru & South	Kolkata & East	Delhi & North	Overseas
Fellow	51	54	9	16	8
Senior Member	25	15	3	19	3
Member	11	6	2	27	0
Student Member	3	11	0	0	0
Corporate Member	5	4	0	0	0
Total	95	90	14	62	11

(As on 31 March 2026)



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Er.Soloni Gosalia	Secretary, Mumbai Chapter	Former Vice President at AIIPL Tech Pvt. Ltd. (Formally Aimil International Instruments (P) Ltd.)
Dr.Vishal G Salunkhe	Treasurer, Mumbai Chapter	Associate Professor - Mechanical Engineering Department,Fr. C.R.I.T., Vashi, Navi Mumbai
Er. N. P. Sundar	Chapter Liaison Officer - Mumbai	Independent Consultant, Stellar Innostrat Consulting, Mumbai

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Dr Abhishek Goyal	Treasurer, New Delhi Chapter	Director EIP Enviro Control Pvt Ltd, Noida
Dr. Ravinder Goyal	Chapter Liaison Officer - New Delhi	Managing Director EIP ENVIRO LEVEL CONTROLS Pvt Ltd.

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Dr.Tarapada Pyne	Joint Editor
Mr.Shashikant kavar	Design & Production Coordinator

HYBRID MODULAR ENGINEERING

powered by VIBES.technology

Hybrid Modular Engineering, introduced by VIBES.technology, is a product development strategy that combines test & simulation at the component level to develop, update, and optimize complex products. VIBES develops user-friendly solutions, provides engineer training and works as a consultant for customers around the world.

At VIBES, solutions are built to address specific engineering challenges in sound and vibration. Each solution is designed to support engineers in obtaining reliable, high-quality data early in development. By aligning with real engineering processes, our solutions help teams work more efficiently and solve the right problems with confidence.

HYBRID MODULAR MODELLING

This approach breaks complex assemblies into manageable substructures that can be tested and simulated separately. This allows engineers to create accurate system-level models early in development — even before physical prototypes are available.

TRANSFER PATH ANALYSIS (TPA)

Transfer Path Analysis (TPA) methods are various techniques to identify and evaluate the contribution of vibration sources in an assembly. Vibrations and noise levels can be predicted to further understand areas of improvement of the product

SOURCE DESCRIPTIONS

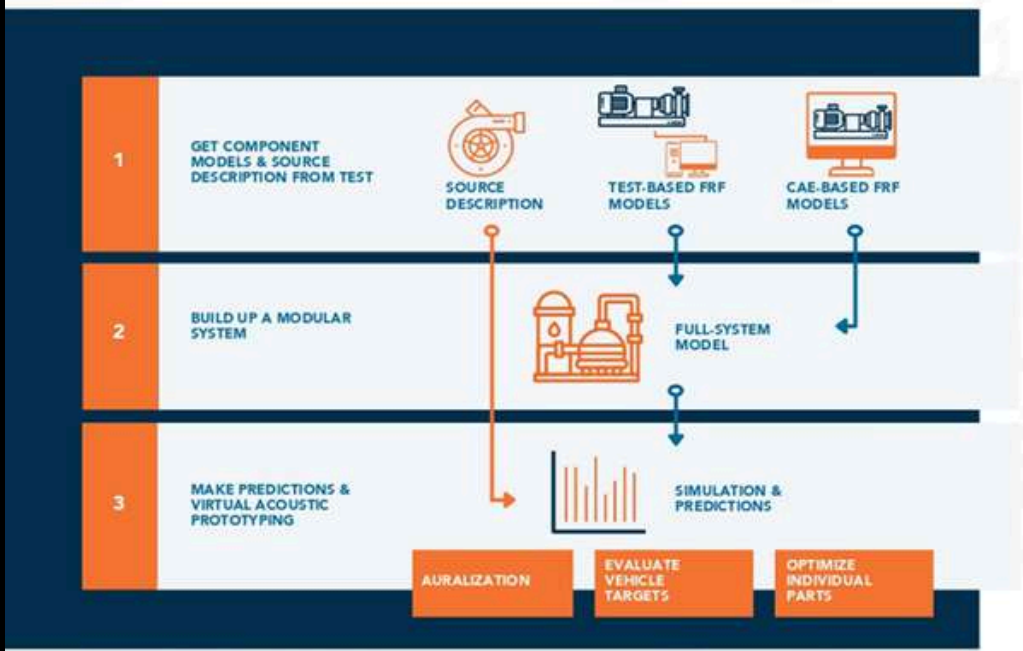
Standardized source descriptions, such as blocked forces, make it possible to characterize active vibration sources independently of the receiving structure. These models can be reused across platforms and integrated into simulations or benchmarking activities.

TEST-BASED MODELLING

When simulation models are not available or not sufficient, test-based modelling allows engineers to build dynamic models of passive components using physical measurement data. These models can be integrated into broader assemblies for NVH analysis.

MODAL ANALYSIS

Modal analysis identifies the natural frequencies, mode shapes, and damping of components or systems. This data supports validation and refinement of structural and acoustic behaviour, particularly in early development stages where accurate models are critical.



INSIDE THE SOLUTIONS

DIRAC

DIRAC enables engineers to prepare, perform and analyse dynamic measurements yielding high quality experimental component models. DIRAC ensures traceability of results and indicates the quality of the measurement. Overall, DIRAC helps to reduce the number of prototype variants needed – thus saving valuable time and resources.

SOURCE

SOURCE is a software tool for Blocked Force Source Characterization (SC) and component Transfer Path Analysis (TPA). It combines all SC and TPA methods in one clear workflow with quality checks. Results are then integrated into CAE simulations, helping engineers address NVH issues early in product development with traceable, reliable data.

COUPLE

COUPLE is a standalone application for assembling, predicting, and improving NVH designs through Dynamic Substructuring. It combines test models from DIRAC and SOURCE with simulation models in a full modular workflow. COUPLE helps avoid late-phase troubleshooting and reduces design cycles, making reliable full-system models available much earlier.

VIBES ENGINEERING SERVICES

Our experts on demand offer customized solutions for every vibration issue. A team of technical consultants helps you optimize complex engineering processes and shows the power of VIBES' methodology on any challenge.

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