

Registration Form:

**VIDYAVARDHINI'S
NATIONAL CONFERENCE ON
TECHNICAL ADVANCEMENTS FOR
SOCIAL UPLIFTMENT
VNC - 2020 TASU**

Name:

Email ID:

Title of paper:

Registration Category:

Mailing Address:

Contact No:

Payment Details: Net Banking

Amount in Rs.:

Date:

Signature of Participant

HEAD
Dept. of Mechanical Engg.
Vidyardhini's College of
Engineering & Technology
K.T. Marg, Vasai - 401202.

Account Name: Vidyardhini's College of
Engineering and Technology

Bank Name: Union Bank of India

Branch: Vidyardhini College Branch, Vasai Rd (W)

Account Number: 320602011001031

IFSC: UBIN0562556

MICR: 400026153

Chief Patron

Shree Vikas Vartak, President, Vidyardhini.

Patrons

Shree Arun Vartak, Chairman, Vidyardhini.
Shree Shantilaram Jadhav, Vice President, Vidyardhini.
Shree Pandurang Naik, Vice President, Vidyardhini.
Shree P. D. Kodolkar, Vice President, Vidyardhini.
Shree Hasamukhal Shah, Treasurer, Vidyardhini.
Shree Udhav Gharat, Secretary, Vidyardhini.
Shree Bhausaheb Mohol, Secretary, Vidyardhini.

Honorary Conference Chair

Dr. Harish Yankudre, Principal.

Conference ChairDr. Vikas Gupta, Dean Academics,
HOD, Electronics and Telecommunication Engg.**TPC Co-Chair**

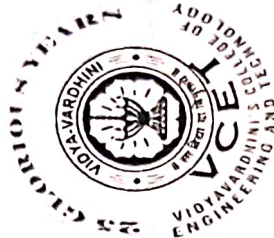
Dr. Uday Aswalekar - HOD, Mechanical Engg.
Dr. Deepak Gawali - HOD, Instrumentation Engg.
Dr. Megha Trivedi - HOD, Computer Engg.
Dr. Ashish Vanmail - HOD, Information Technology.
Dr. Sunil Kirloskar - HOD, Civil Engg.

Publication Chair: Dr. Ashish Chaudhari.**Finance Chair:** Dr. Amrita Ruperee.**Publicity Chair:** Mrs. Kanchan Sarmalkar.**Web Administration Chair:** Mr. Yogesh Pingle.**National Advisory Committee**

Dr. M. N. Hoda, Director, BVICAM, New Delhi
Dr. Vishal Jain, BVICAM, New Delhi
Dr. Suresh K. Ukarande, Associate Dean,
Faculty of Science and Technology, University of Mumbai
Dr. J.W.Bakal, President, IETE, New Delhi.
Prof. Kiran Talele, IEEE, Mumbai Section.
Mr. Pramod Laxman Fegade, Manager L&T Ltd, Mumbai.
Dr. Ketan Kolecha, Director Symbiosis Institute of Technology, Pune
Dr. Mukesh Patil, Principal, RAIT, Mumbai
Dr. Arvind Nema, IIT Delhi
Dr. G.N. Jadhav, Earth Sci. Dept. IIT Bombay
Prof. Dr. P.P. Date, IIT Bombay
Dr. V. R. Kalamkar, VNIT Nagpur
Dr. Tansen Chaudhari, CEO, M/s Fluid Controls Pvt. Ltd., Mumbai
Prof. P. Padmanathan, VIT, Vellore
Dr. D.G. Thakur, Defence Institute of Advance Technology, Pune
Dr. V.B. Tunglikar, SGGs IE&T Nanded
Dr. Bindu Garg, Bharti Vidyapeeth University College of Engg., Pune
Mr. Vikram Murthy, Director, Univac Environment Systems Pvt Ltd,
National President, ISHRAE

**VIDYAVARDHINI'S
NATIONAL CONFERENCE ON
TECHNICAL ADVANCEMENTS FOR
SOCIAL UPLIFTMENT**

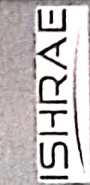
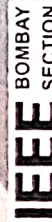
**VNC - 2020 TASU
4TH APRIL, 2020**



Organized by:
Vidyardhini's College of
Engineering & Technology
K.T. Marg, Vasai (W) - 401202
Affiliated to University of Mumbai
Approved by AICTE
Accredited by NAAC

In Association With:

BJIT - BVICAM's International Journal of Information
Technology. BJIT is now indexed at DBLP, INSPEC
& UGC - CARE List. ISSN: 2511-2104 (Print Version),
ISSN: 2511-2112 (Electronic Version)
IJERT - International Journal of Engineering
Research & Technology ISSN: 2278-0181

Conference Website: www.vcet.edu.in/vnc2020**Technically Sponsored By:**

About us:

Vidyavardhini means a Body committed to enhancement of Knowledge. Vidyavardhini was established as a registered society in 1970 by late Padmashri H. G. alias Bhausaheb Vartak for the noble cause of education in rural areas.

Vidyavardhini's College of Engineering and Technology, Vasai is located on the sprawling campus of Vidyavardhini, spread over an area of 12.27 acres. It is a short, two minutes walk from Vasai Road (W) Railway Station. The college is also accessible by road from Mumbai.

Vidyavardhini Society received approval from AICTE to start the new college of Engineering & Technology with effect from July, 1994. The college is affiliated to the University of Mumbai for the four year degree program leading to the degree of Bachelor of Engineering in six branches.

Objective of VNC 2020 TASU

Technology has always been potential tool for simplifying the way we do things. Present time demands directing the technological advancements towards addressing societal challenges such as improving health care, education environment, sanitation, agriculture, smart city, etc., VNC 2020 TASU aims to provide an opportunity to researchers, academicians, industrialist and students to interact and share their ideologies and contributions made for social upliftment with the aid of technological advancements.

Call for paper

We welcome submission in following area

1. Sustainable Computing
 2. High Performance Computing
 3. High Speed Networking and Information Security
 4. Software Engineering and Emerging Technologies
 5. Mathematical, Experimental, Computational and AI, IoT Techniques in Mechanical Engg.
 6. Industrial Engg., ERP, MRP, SCM
 7. Renewable Energy Technologies
 8. Pollution control and Waste Management
 9. Advances in Structural engineering
 10. Present geotechnical practices
 11. Present practices in construction management
 12. Recent developments in Instrumentation, control and automation
 13. Embedded Systems, IoT and VLSI Design
 14. Optical and Wireless Communication for NGN
 15. Antenna and Microwave Devices
- Any other relevant topics

Publication Information

Proceedings of VNC - 2020 TASU will be published with ISBN number

1. Selected Papers will be published in International Journal of Information Technology, Published by Springer Nature, ISSN: 2511-2104 (Print Version), ISSN: 2511-2112 (Electronic Version)

2. All papers will be published in IJERT, ISSN: 2278-0181

Important Dates:

- Submission of full length paper 15TH Feb 2020
- Paper Acceptance Notification 22ND Feb 2020
- Submission of Final Version of Paper 29TH Feb 2020
- Registration Deadline 5TH March 2020
- PPT Submission 20TH March 2020
- Conference 4TH April 2020

Registration Fee Details:

| Category of Delegates / Authors | Indian Authors & Delegates (in INR) |
|--|-------------------------------------|
| Full Time Students (UG) | 1,500.00 |
| Teachers/ Research Scholars/ PG students | 2,500.00 |
| Industry | 3,500.00 |

Paper Submission:

Paper submission should be made strictly via Easy Chair the submission link for VNC 2020 "TASU": www.easychair.org/conferences/?conf=vnc2020

Download paper template from:

https://www.vcet.edu.in/vnc2020/Template_For_Full_Paper%20VNC%202020.doc

Contact Us:

Mr. Yogesh P. Pingle
Vidyavardhini's College of
Engineering & Technology
K. T. Marg, Vasai (W) - 401202
Maharashtra, India
Contact No.: 9665009742
Email ID: vnc20@vcet.edu.in
Website: www.vcet.edu.in/vnc2020/

***Best paper award
for each track***

Review of Fatigue crack growth and microstructure of rail.

Prof. Priti Vairagi

Department of Mechanical Engineering
Vidyavardhini's College of Engineering and
Technology
Vasai West
priti.vairagi@vcet.edu.in

Tanuj Surve

Department of Mechanical Engineering
Vidyavardhini's College of Engineering and
Technology
Vasai West
survetanuj98@gmail.com

Shubham Mandavkar

Department of Mechanical Engineering
Vidyavardhini's College of Engineering and
Technology
Vasai West
shubhammandavkar@gmail.com

Yash Mhatre

Department of Mechanical Engineering
Vidyavardhini's College of Engineering and
Technology
Vasai west
mhatreyash1212@gmail.com

Ronak Hadal

Department of Mechanical Engineering
Vidyavardhini's College of Engineering and
Technology
Vasai west
ronakhadal143@gmail.com

Abstract—The aim of the paper is to provide the nature of Fatigue crack growth in rail steel. Study of microstructure of rail is presented. The hardness for the rail at the various cross sections is provided. Numerical as well as experimental methods are used to study the behaviour of the cracks in the rail. Study of Fractography is done to comply the fatigue crack growth and hardness test. FEA analysis for the same is presented to study the fatigue crack growth under stress field. The paris law is used for the purpose of fatigue crack growth studies. Study of FEA analysis is compared with experimental and theoretical studies.

Keywords—Fatigue crack growth, Fracture surface, Crack, Rail, Fractography, Fracture Surface.

I. INTRODUCTION

The material used for rail is mostly steel of grade 880, 1080Cr, 1080HH, Special rail steel, Niobium, Vanadium, Corrosion resistant rail steel, Copper- Molybdenum, Alloy of Nickel Chromium Copper. The different types of rail are double Headed, Bull Headed & Flat Footed. The standard Flat Footed Section is mostly used. The rail is designated by weight per unit length. A 60 kg/m rail denotes that it's weight is 60 kg per metre. The standard sections used in Indian Railways are 60 kg, 52 kg, 90 R, 75 R, 60 R and 50 R. Indian Railways mostly use medium Manganese rails manufactured by Bhilai Steel Plant having ultimate tensile strength of 72 kg/mm². The various test are done for the acceptance of the rails such as Chemical Analysis, Tensile Test, Sulphur Print, Hardness test, Falling weight test, Hydrogen content, inclusion rating level. The study is carried out on the rail of grade 880. There are various defects in rail under operating conditions. A rail is considered to be failed if it is necessary to remove it immediately from the track on account of the defects noticed on it. Most of the failures in the rail originate from the fatigue cracks caused due to alternating stresses created in the rail section on account of the passage of moving loads. A rail section is normally designed to take a minimum GMT of traffic, but sometimes due to reasons like inherent defect in the metal, etc, there is weakness in the section at a particular point

and that section gives way premature, causing failure of the rail.

The main causes for failures of rails are inherent defects in the rail, defects due to fault of the rolling stock and abnormal traffic effects, Excessive Corrosion of Rails, Badly maintained joints, Defect in Welding of joints, Improper maintenance of track, Derailments, etc. Rolling Contact defect is one of the prime concern which is affecting the service life of the rails. Rolling Contact defect is caused due to contact between wheel and rail. The cracks that are formed by rolling contact defect are divided into two categories first are the cracks that are formed on the surface and second are the cracks that are formed under the surface. The cracks formed under the surface are mainly due to vertical load and the material defects. The cracks formed in the surface are due to interaction between wheel and rail and large load transport to a small area. Contact area is elliptical and relatively small. Cracks formed due to the rolling contact fatigue and due to shear stress in the contact area of wheel and rail will grow when the stresses exceed the permissible tension of rail steel. Cracks advance towards the top of the rail and leads to failure of the rail under lower vertical load.

The detection of rail flaws is done by using visual examination or by rail flaw detection equipment. In visual examination the rail ends are cleansed by kerosene oil and visually examined in detail with the help of magnifying glass. In ultrasonic rail flaw detectors, vibrational waves above the hearing range of the normal ear, having the frequency of more than 20000 cycles per second are used. Whenever there is a change in media some of the ultrasonic energy gets reflected and the rest gets transmitted. When ultrasonic waves are fed at location on a rail, they pass through the rail metal and are normally reflected only from the foot. However the flaws near the surface sometimes remain undetected. Also the flaw should be perpendicular to wave detection if not it will not be detected. It also fails to detect the two flaws falling in the straight line. The reflecting surface should be parallel to the scanning surface otherwise there would be no back echo. Wrong

HEAD
Dept. of Mechanical Engg.
Vidyavardhini's College of
Engineering & Technology
Vasai Road-401202.

Vidyavardhini's College of Engineering and Technology
(Approved by AICTE and Affiliated to the University of Mumbai)
(NAAC Accredited)



VNC - 2020 TASU
27th June, 2020

IEEE
BOMBAY
SECTION



WASAI CENTRE
HEAD
Dept. of Mechanical Engg,
Vidyavardhini's College of
Engineering & Technology
Wasai Road-401202

ISHRAE



Certificate of Participation

This certificate is presented to
Priti Shashikant Vairagi
of
Vidyavardhini's College of Engineering and Technology

for presenting paper titled
Review of Fatigue crack growth and microstructure of rail
in the Vidyavardhini's National conference 2020 "Technical Advancements for
Social upliftments" organised by Vidyavardhini's College of Engineering and
Technology, Vasai held on 27th June, 2020

Dr. Vikas Gupta
Dean Academics
Conference Chair

Dr. Harish Vankudre
Principal
Honorary Conference Chair

CERTIFICATE ID NZSALC-CE000269