

BIO-DATA

1. Name (IN BLOCK LETTERS)Dr./Sh/Ms. : **T. VENKATA RATNAM**
2. Date of Birth (dd/mm/yyyy) : **06-02-1966**
3. Date of present Rank (dd/mm/yyyy) : **01-09-2007**
4. Lab/Estt/Unit : **Naval Science & Technological Lab.**
5. Whether SC/ST : **Not Applicable**
6. Educational qualifications :

SNo.	Certificate/ Diploma/ Degree	Trade/ Subject of Study	Year of passing	Institution/ University
i.	L. M. E.	Mechanical	1986	Andhra Polytechnic, Kakinada
ii.	B. E.	Mechanical	2001	Andhra University, Visakhapatnam
iii.	M. Tech.	Computer Science & Technology	2004	Andhra University, Visakhapatnam
iv.	Ph.D.	Computer Science & Systems Engg.	2018	Andhra University, Visakhapatnam

7. Details of appointments held :

SNo.	Position	Lab/ Estt/ Unit/ Dte.	From	To
1.	J.S.A-II	N.S.T.L., Visakhapatnam	27-01-1988	27-01-1991
2.	J.S.A-I	N.S.T.L., Visakhapatnam	28-01-1991	15-03-1994
3.	S.S.A/S.T.A	N.S.T.L., Visakhapatnam	16-03-1994	31-08-1996
4.	TO-A	N.S.T.L., Visakhapatnam	01-09-1996	31-08-2002
5.	TO-B	N.S.T.L., Visakhapatnam	01-09-2002	31-08-2007
6.	TO-C	N.S.T.L., Visakhapatnam	01-09-2007	31-08-2013
7.	TO-D	N.S.T.L., Visakhapatnam	01-09-2013	Till to-date

8. Training Courses/CEP's attended in the present Grade
(Mention topic, year & Venue):

SNo	TOPIC	MONTH/ YEAR	VENUE
i)	<i>Third</i> "National Conference on Condition Monitoring (NCCM-2012)".	15-16 Jun 2012	R & D Engr (E), Pune
ii)	<i>First</i> "International Conference on	24-24 Feb 2011	GITAM University,

iii)	Condition Monitoring (ICCM-2011)". <i>CEP Course on "Application of MATLAB for Scientists".</i>	14-18 Dec 2009	Visakhapatnam NSTL, Visakhapatnam
iv)	<i>Fourth International Conference on "Vibration Engineering & Technology of Machinery (VETOMAC-IV)".</i>	17-19 Dec 2007	BHEL, Hyderabad

SL NO	TRAINING	INSTITUTION	PERIOD (From -To)	REMARKS
1	Three Day Workshop on "Optimisation and Reliability Approaches in Engineering Design (ORAED-12) "	GITAM Institute of Technology	'22-11-2012'- '24-11-2012'	
2	National Conference on "Artificial Intelligence, Robotics, and Embedded Systems (AIRES-2012) "	Andhra University	'29-06-2012'- '30-06-2012'	
3	National Conference on "Condition Monitoring of Engineering Systems & Structures (NCCM-2012) "	R&D Engineers, DRDO, Pune	'15-06-2012'- '16-06-2012'	
4	National Workshop on "Cloud Computing and Its Applications (NWCCA-2012) "	Andhra University	'29-09-2012'- '29-09-2012'	
5	A Course on "Finite Element Analysis with some modules on ANSYS Software"	CBIT, Hyderabad Conducted at NSTL	'28-06-2010'- '03-07-2010'	
6	Workshop on "Collaborative Product Development and Nano Technology"	SRKR Engg. College, Bhimavaram	'23-07-2010'- '24-07-2010'	Bhimavaram
7	International Conference on "Condition Monitoring"	GITAM Institute of Technology	'24-02-2011'- '25-02-2011'	ICCM-2011

9. Details of awards/honors/prizes/papers/patents etc., if any:

- (i) Received **“Technology Group Award”** as a team member of Vibration and Noise Division.

Authored/ Co-authored Papers Titled

"Mechanical Impedance Measurements On Plane Plates", Published in Journal of The Acoustical Society of India (JASI), NSA-97,6-8 October 1997 at NSTL,Visakhapatnam.

"Development of Expert System for Diagnosis of Bearing and Gearing Faults of Rotating Machinery", Proceedings of National Conference on Condition Monitoring (NCCM-2009), 04-05 Dec 2009, Visakhapatnam, pp. 39-45.

"Design and Development of Tuned Mass Damper for Marine Pump", Proceedings of National Symposium on Acoustics (NSA-2010), Rishikesh, 11 - 13 Nov 2010, pp. 19-24.

"Vibration Reduction from Marine Machinery: Implementation of a Compound Mounting System", Proceedings of 6th International Conference on Vibration Engineering Technology of Machinery (VETOMAC-VI), IIT-Delhi, 13-15 Dec 2010, pp 887-895.

"Design and Optimization of Low-density mastic Treatment for Marine Applications", Proceedings of National Symposium on Acoustics (NSA-2011), Jhansi, 11 - 13 Nov 2011, pp. 167-173.

"Defect Identification in Foundation of a Pump through Vibration Measurement", has been accepted for NCCM-2013, being held at GTRE, Bangalore during 04-05 Oct 2013.

Editorial member of a Quarterly News Letter 'MONITOR' published by Condition Monitoring Society of India (CMSI), Visakhapatnam.

"Shock and Vibration Mounts for Machinery Onboard Naval Ships", Naval Research Board, Stealth as Applicable to Naval Environment, Published in Seminar Proceedings of Stealth as Applications, NRB, 27 & 28 November 1998 at NPOL, Kochi.

"Defect Diagnosis of Air Compressor using Vibration Measurement Technique - A Case Study", 15-16 December 2006, National Conference on Condition Monitoring (NCCM-2006), Published in Proceedings.

"Excessive Local Vibration Onboard Ship - A Case Study", National Conference on Condition Monitoring (NCCM-2006), 15-16 December 2006. Published in Proceedings.

"Condition Based Maintenance of Ore Handling Facility - A Case Study", 15-16 December 2006, National Conference on Condition Monitoring (NCCM-2006), Published in Proceedings.

"Development of Two-Stage Mounting System for Machinery Vibration Control", National Symposium on Acoustics: MEMS Technology & Active Noise Control (NSA-2004), Attended Conference on 25-27, November 2004.

"Design and Optimisation of Low Density Mastic Treatment for Marine Applications", National Symposium on Acoustics (NSA-2011), Published in Proceedings.

"Design and Implementation of Embedded Computer based ANCS for Reducing Noise in an Acoustic Duct", National Symposium on Acoustics (NSA-2010), Attended Conference and Presented Paper.

"Vibration Reduction from Marine Machinery: Implementation of a Compound Mounting System", VETOMAC-VI, Published in Proceedings of 6th International Conference. 13-15 December 2010, IIT Delhi.

"Design and Development of Tuned Mass Damper for Marine Pump", National Symposium on Acoustics (NSA-2010), Attended Conference and Presented Paper.

"Development of Active Noise Control (ANC) System for an Acoustic Duct", IEEE ICARET-2013, The IEEE International Conference on Advanced Research in Engineering and Technology, Attended Conference and Presented Paper.

"Design and Development of Tuned Mass Damper for Centrifugal Pump", SEM-2007, International Conference & Exposition on Structural, Feb 19-22, 2007.

"Development of Expert System for Diagnosis of Bearing and Gearing Faults of Rotating Machinery", 4-5 December 2009. National Conference on Condition Monitoring (NCCM-2009), Published in Proceedings.

"An Embedded Computer Based Active Noise Control in a Duct", International Journal of Embedded Systems and Computer Science and Systems, Accepted for publication.

Brief resume of work carried out by T. VENKATA RATNAM, TO 'C'

I). Application of Acoustic Stealth Products:

Developed and installed acoustic stealth products under Project EAST (Engineering Application of Stealth Technologies) to enhance stealth capabilities of naval platforms. As part of this project, I am responsible for design, development and installation of following vibration and noise control devices:

i) *Two-stage mounting system:*

Two-stage mounting systems are more useful for reduction of machinery vibration transmission through its foundation to the hull. These systems provide significantly higher vibration isolation compared to the conventional single stage mounting system. Two-stage mounting systems were designed and developed for shipboard applications. Vibration reduction achieved was 25-30 AdB. Development of these systems include configuration of suitable mounts for each stage, design of raft structure, installation and performance evaluation of the system. Two-stage mounting systems were developed for the following machinery:

- a) *Motor driven HP air compressor of INS Khukri*
- b) *Refrigeration plants of INS Ranjit*
- c) *BMA pumps of INS Ranjit*

These systems were accepted by Indian Navy for induction into service.

ii) *Tuned Mass Dampers:*

Tuned Mass Damper (TMD) is a passive vibration control device appended to a vibrating structure. Proper selection of parameters of these appendages, tunes the TMD to one of the forcing frequencies of the vibrating system to reduce the structural motion. TMDs were designed, developed and installed on sea water pump of onboard INS RANJIT and achieved considerable vibration reduction at forcing frequency targeted.

As part of development of TMD, I am responsible design of TMD parameters, fabrication of TMDs, installation and performance evaluation without and with TMDs.

iii) *Surface damping Treatments:*

Surface damping treatments are useful to reduce structure-borne noise transmitted from the machinery foundations. Constrained Layer Damping (CLD) and Free Layer Damping (FLD) treatments were applied on the structural foundations. Tasks involved are evaluation of composite loss factor, application of damping treatment, performance evaluation trials at lab and onboard IN ships. Damping treatments are applied on the following machinery foundations:

- a) *CLD treatment on diesel driven compressor of INS Khukri.*
- b) *CLD treatment on foundation of motor driven compressor of INS Ranjit.*
- c) *Mastic (FLD) Treatment on hull in steering gear compartment of INS Sukanya.*

II). Vibration Condition Monitoring and Testing:

Carried out vibration measurements and analysis for various main and auxiliary machinery of IN Ships, Merchant Vessels and Shop-floor installations for the purpose of collection of baseline signatures, condition monitoring and fault diagnosis. The vibration data recorded, analyzed and interpreted for fault diagnosis. In number of cases, faults were identified. Few such cases are:

- Vibration Measurements on Turbine Alternator Feed Pump
- Defect Identification - Auxiliary Feed Pump

Carried out static and dynamic tests on various types of elastic mountings required for Naval applications for evaluating dynamic parameters such as natural frequency, stiffness and transmissibility.

III). Computational Studies:

i) Carried out computational studies to select suitable mounts for machinery such as:

- Hull & fire pump of INS Magar and Auxiliary feed pump

Selection of mounts includes computation of natural frequencies, load distribution among the mounts, displacements on each mounting location, shock and vibration isolation of the mounted system.

ii) Development of Software for design of Two-stage Mounting System for given machinery.

iii) Development of software for design of Tuned Mass Damper (TMD) for given machinery.

IV). Techno-Managerial Tasks:

I was associated with conduct of National/ International Conferences on Condition Monitoring (**NCCM-2009, ICCM-2011 and NCCM-2012**) as a member of Proceedings Committee. As a member of the committee, I was responsible for compilation of technical papers and preparation of proceedings document.

I was also associated with conduct of CEP course on “Emerging Trends on Vibration & Noise Control” organized by Vibration Division, NSTL.

Present Tasks:

A) Contributions to EAST Project:

- Associated in preparation of Acoustic Stealth Compendium. Prepared design guidelines for Tuned Mass Damper. Prepared document on design norms for development of passive vibration control of constant speed machinery using tuned mass dampers. Prepared RSQR and Initiated CARS project titled "Design Studies of Nano Composite Foundation for Marine Machinery".
- Carried out vibration measurements on AC seawater pump. Prediction of Composite Loss Factor and Young's Modulus for CLD using CLD Software.
- Application and Performance evaluation trials of low density mastic on Barge.
- Selection of Shock & Vibration Mounts for LOx Tank & Fuel Cell. Preparation of Specifications for Fuel Cell Mounts.
- Testing and Validation of Software developed for Two-Stage mounting system using MDOF approach.

B) Vibration Testing

- Vibration testing of torpedoes, mines, decoys and its sub systems as per the specifications.
- Experimental determination of static and dynamic characteristics of shock and vibration mounts.

C) Controlling and Maintenance of Temperature Chambers:

- Responsible for conducting temperature cycling testing of various equipment of DRDO labs, Indian Navy and other products developed/ supplied by consultants for Defence applications as per specifications. Rendering consultancy services to various organisation through temperature cycling testing under resource generation.
- Responsible for controlling and maintainance of the following chambers:
 - Rapid Heating and Cooling Chamber
 - Constant Heating and Cooling Chamber
 - Walk in Cold, Heat and Humidity Chamber
- Calibration of temperature chamber sensors periodically for maintaining its sensitivities.

D) Institutional Requirements

- As Chairman (Sports, Cultural & Welfare Committee), responsible for issuing welfare and emergency/ education loans to employees (staff), conducting sports for employees and selecting players to central zone tournaments, Organising central zone tournament and allotment of function halls (Family Welfare Centre and Community Hall) to employees, etc.
- Maintaining Accounts of Sports & Cultural, Employees Welfare Association and Community Hall Funds.
- **Executive member of NSTL Educational Society.**