

“Driving India Into The Future”



WP 29 – Nov 10th-13th, 2015
Geneva, Switzerland

National Automotive Testing and R&D Infrastructure Project (NATRIP)

- The most significant initiative in Automotive Sector by Govt. of India with an initial investment of Rs 1718 Cr. in 2005, revised to Rs. 2288 Cr in 2011.
- A unique joining of hands among the Government of India, a number of State Governments and Indian Automotive Industry to create state-of-the-art Testing facilities.
- Creating core competencies in automotive technology in India and to facilitate seamless integration of the Indian Automotive Industry with the world.



NATRIP – Vision & Mission

Vision - Create state-of-art research and testing infrastructure to drive India into the future of global automotive excellence.

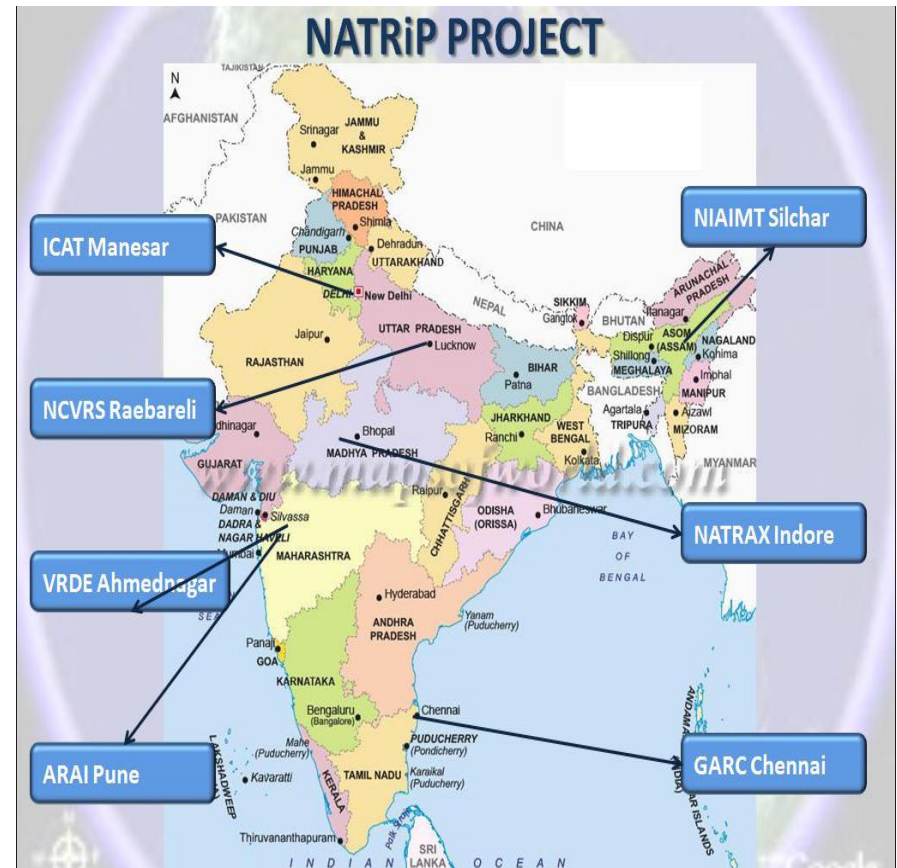
Mission - NATRiP aims at setting up of seven state-of-the-art automotive testing and R&D centres across the country and thereby:

- Creating core global competencies.
- Enhancing competitive skills for product development leading to deepening of manufacturing.
- Synergizing India's unique capabilities in Information Technology with the automotive sector.
- Facilitating seamless integration of Indian automotive industry with the world to put India strongly on the global automotive map.



NATRIp Centres

- A full-fledged testing and homologation centre within the Northern hub at **ICAT**-Manesar, Haryana and Southern hub at **GARC**-Oragadam, Chennai, Tamil Nadu.
- Up-gradation of existing centres at **ARAI**-Pune and **VRDE**-Ahmednagar in western hub, in Maharashtra.
- A world-class Proving Ground on 4,123 acres of land at **NATRAX**- Pithampur, near Indore, Madhya Pradesh.
- Hill Area Driving Training Centre and In-Use Vehicle Inspection & Maintenance Centres in North East at **NIAIMT**-Silchar, in Assam.
- A Centre for Testing of Tractors and Off-Road Vehicles with national facility for accident data analysis at **NCVRS**-Rae Bareli, Uttar Pradesh



Facilities at various centres under NATRIP

ICAT Manesar	GARC Chennai	NATRAX Indore	ARAI Pune	VRDE Ahmednagar	NIAIMT Silchar	NCVRS Raebareilly
•Powertrain	•Powertrain	•Powertrain	• <u>Powertrain</u>	•EMC	•I&M	•Powertrain
•Fatigue & Certification	•Fatigue & Certification	• <u>Vehicle Dynamics</u>	• <u>Fatigue</u>	•ABS Track	•Driving Training	•Fatigue
•Passive Safety	• <u>Advance Passive Safety</u>	• <u>Test Tracks</u>	•Passive Safety		•Mechanics Training	•Track & Field
•EMC	• <u>EMC</u>					•Accident Data
• <u>NVH</u>	• <u>Infotronics</u>					
•Test Tracks	•Component					
• <u>Component</u>	• Test Tracks					

 - Centre of Excellence



Powertrain

Completed facilities –

- Mileage Accumulation Chassis Dynamometer (MACD) for 2W, 3W & 4W at **ICAT & GARC**
- Engine Test Cell (ETC) for Heavy duty and Light duty engines at **ARAI**
- Sealed Housing Evaporation Determination (SHED) facility for 2W, 3W and 4W at **ICAT**
- Vehicle Test Cell (VTC) for 4W at **ICAT & NATRAX**

Upcoming facilities –

- Vehicle Test Cell (VTC) for 2W, 3W & 4W at **ARAI & GARC**
- Engine Test Cell (ETC) for Heavy duty & Light duty engines at **ICAT & GARC**
- Climatic Vehicle Test Cell & Low Temperature Soak Room for 4W at **ICAT, ARAI & GARC**
- SHED facility at **ARAI & GARC**



Powertrain Cont'd



MACD at ICAT & GARC



VTC at ICAT & NATRAX



Powertrain Cont'd



SHED at ICAT



ETC at ARAI



Powertrain Cont'd



CVTC & LTSR at ICAT



Soak Room at ICAT



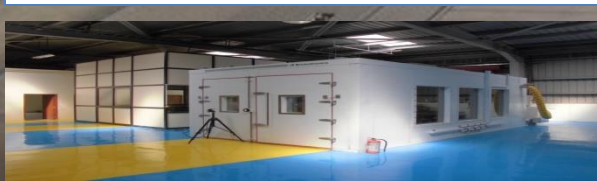
Passive Safety

Completed facilities –

- Pedestrian lab at **ICAT & GARC**
- Airbag lab at **GARC** (only facility in India)

Upcoming facilities –

- Static roll-over test, Dynamic roll-over test, De-celeration SLED test, Side impact test at **ICAT, ARAI & GARC**
- Frontal impact test, Offset frontal impact test, Rear impact test, Pole impact test at **ICAT, ARAI & GARC**
- Angular car to car crash test at **GARC**



Passive Safety Cont'd



Dummies at GARC



Pedestrian lab at ICAT



Passive Safety Cont'd



Airbag lab at GARC



Pedestrian lab at GARC



Fatigue & Certification

Completed facilities –

- Electrodynamics vibration shakers integrated with climatic chamber, Interior fitting test rig, Head restraint test rig for seats, Bus window retention test rig, Bumper test rig at **ICAT & GARC**
- Kinematic & Compliance (K&C) machine, Steering test rig, Elastomer test rig, and Damper test rig at **NATRAX**
- MAST for component at **ARAI**

Upcoming facilities –

- High frequency Multi Axis Simulation Table (MAST) with climatic chamber for component testing at **ICAT**
- MAST with climatic chamber for component testing, Universal Test Bench for component, X-poster test rig for passenger cars at **ARAI, ICAT & GARC**
- Heavy duty X-poster test rig at **ICAT**



Fatigue & Certification Cont'd

Upcoming facilities –

- Drive-in four poster with climatic chamber for vehicles, X-Poster for 2&3 wheelers at **ARAI**
- Tilt test platform, Universal Pneumatic actuators, Seat & seat belt anchorage, Resistance of seats for buses, Coupling devices, Cab pendulum, Bumper pendulum, Ballast plates, Upper & Lower head form, Traction devices, Shoulder belt traction devices and ISOFIX fixtures at **ICAT & GARC**
- Cyclic actuators at **GARC**



Fatigue & Certification Cont'd



ED-Shaker with Climatic Chamber at ICAT & GARC



Pneumatic Coupling Test Rig at ICAT & GARC



Fatigue & Certification Cont'd



**Interior Fitting & Steering Impact
Test system at ICAT & GARC**



**Head Restraint Test Rig at ICAT &
GARC**



Fatigue & Certification Cont'd



Bumper Pendulum Test Rig at GARC



Rotary Actuator at ICAT



Fatigue & Certification Cont'd



K & C Machine at NATRAX



Damper Test Rig at NATRAX



Electromagnetic Compatibility (EMC)

Upcoming facilities –

- Vehicle Semi Anechoic Chamber (VSAC) for electromagnetic compatibility up-to heavy commercial vehicle, Component Semi Anechoic Chamber (CSAC) at **ICAT & GARC**
- Vehicle Semi Anechoic Chamber for small vehicles and components at **GARC**

Noise Vibration Harshness (NVH)

Upcoming facilities –

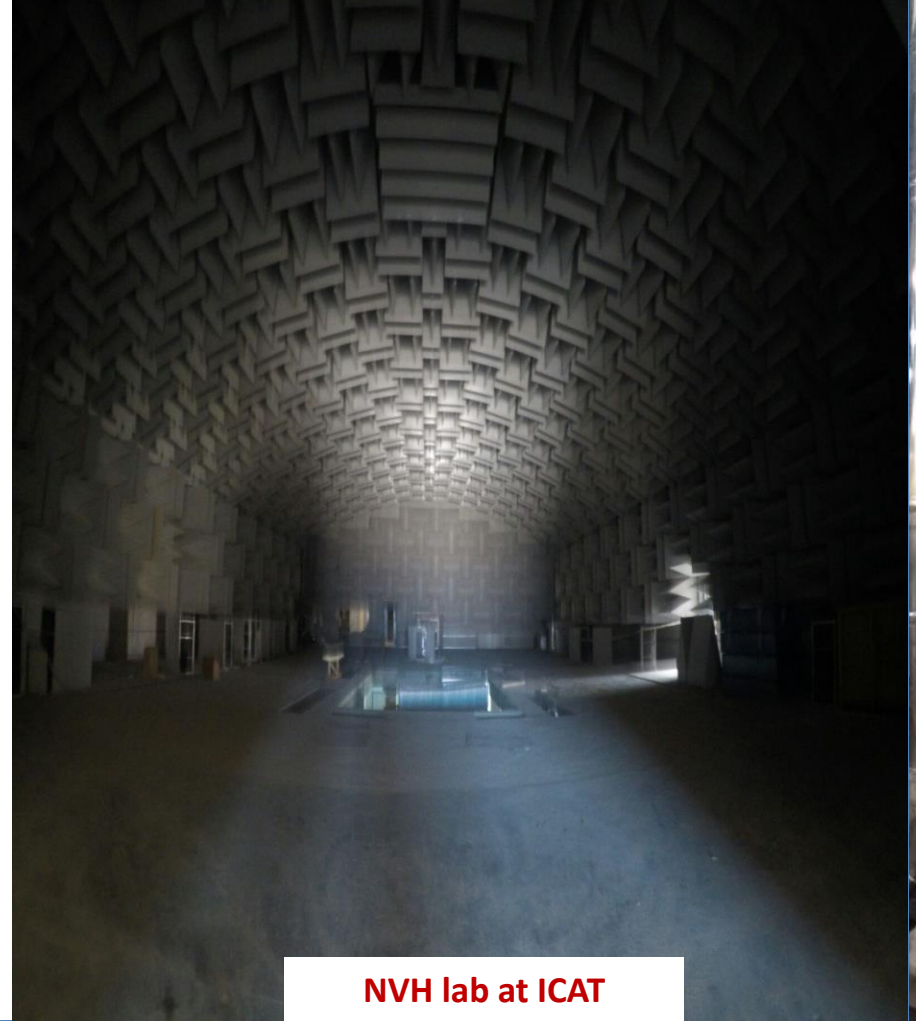
- Transmission test bed, Vehicle Semi Anechoic Chamber (VSAC) for passenger car with 4X4 chassis dyno, Heavy Duty Semi Anechoic Chamber for trucks with 4X2 chassis dyno and Pass by Noise instrumentation at **ICAT (only facility in India)**



EMC & NVH



EMC lab at ICAT



NVH lab at ICAT



Test Tracks

Completed Test Tracks –

- Steering pad track & External noise track (ENT) at **GARC**

Up-coming Test Tracks –

- Steering pad track, Comfort track, Hill track, Oval track, Water flood track and Braking surface track at **ICAT**
- Oval track (High Speed), Test hills track & Braking surfaces track at **GARC**
- Dynamic platform, Straight braking track, Hill test track, Accelerated fatigue track, Gravel and Off-road track, Dry handling circuit, Comfort track, Handling track for 2&3 wheelers, Sustainability track, Wet skid pad and External noise track at **NATRAX**



Test Tracks Cont'd



Steering pad at GARC



External Noise Tract at GARC



CAD-CAE lab

Completed facilities –

- Simulia-Abaqus, Ansys, Altair-Hyperwork, Catia V6, Siemens NX 13100, MSC-Nastran, MSC-Fatigue, MSC-Adams at **ICAT & GARC**
- Siemens and MSC-Adams Car at **NATRAX**

Automotive Infotronics lab

Upcoming facilities –

- MATLAB, Measurement Calibration & Diagnostic Tools (MCDF), Hardware in Loop (HIL) system for Single ECU test bench for Powertrain & Chassis, Plant models (for Car & Engine) with Model in Loop (MIL), Rapid prototyping system for ECU development at **ICAT & GARC**



Other Facilities & Labs

Completed facilities –

➤ Photometry lab



Photometry lab at GARC

➤ Inspection & Certification centre at NIAIMT:

- Fixed lane & Mobile lane for Inspection & Maintenance, Mechanical training along with Driving Simulators.



Inspection & Maintenance



Fixed lane at NIAIMT



Mobile lane at NIAIMT



Inspection & Maintenance Cont'd



Mechanical Training Centre at NIAIMT



Driving Simulation lab at NIAIMT





“Driving India Into The Future”

Thank You

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