

From Team NATRIIP

As the New Year dawns, we are delighted to apprise you about the latest developments in NATRIIP.

Last week, we moved into the 69th of the 312 weeks of project duration. A sustained active handholding with a battery of technical experts in India and abroad as also with continued guidance and support from the Government, it has been possible for us to copiously adhere to a rigorous activity schedule so far. We have been able to complete the preliminary design phase well in time and move into the detailed facility design activities. We have set out to substantially complete this phase in next 8 weeks.

Initial packages of civil works and equipments would be floated in February-March 2007 marking the launch of ground activities at all greenfield NATRIIP sites except Rae Bareilly where land availability is likely to take little more time. Up-gradation activities at ARAI and VRDE as also major expansion of Manesar facilities are already progressing apace.

We have pleasure in informing that the International Center for Automotive Technology, Manesar (erstwhile RCN of ARAI) has now been notified by the Government as authorized type approval agency of India under rule 126 of CMVR and a final notification on this account is expected soon. A bevy of advanced testing services have now become available at iCAT. Please do visit www.icat.in for more information.

Laying of the foundation stone of Global Automotive Research Center, Chennai, our South Center, by Hon'ble Prime Minister on 4th November and signing of collaboration agreement with the Vehicle Certification Agency (VCA) of UK to facilitate export homologation/certification within India have been two significant events in recent weeks about which this Update carries more details.

A cutting edge infrastructure of this dimension would need large talent pool to operate. We are conscious of this challenge and are in the process of finalizing our HR strategies focused not only on attracting the best brains but also in creating and fostering world-class working environment at each of the NATRIIP Centers where professionalism and creativity could flourish.

In order to address the oft-articulated need for simplification and rationalization of the homologation process in India, we are engaged in setting up automated and IT-driven internal systems and procedures for adoption in NATRIIP Centers to make this process as paperless and short as possible for our domestic and overseas customers as well as the centers themselves. In a couple of months, we will share with you the advances made by us on this front.

As a member of the Central Motor Vehicle Rules Technical Standing Committee (CMVR-TSC), the Standing Committee on Emission Legislations (SCOE) and permanent invitee to the National Standing Committee on WP-29 affairs, we have started contributing to need-based and well-reasoned regulation formulation in India and their harmonization with global regulations. We are committed to ensure that introduction of regulations is preceded by availability of testing infrastructure as also adequate developmental time.

As we move into field activities, the real test of our grit, capabilities and sustained perseverance has begun. While it is for our stakeholders to judge how we fare in this critical phase, on our part, we wish to share at the dawn of this New Year our unwavering sense of faith, resolve, confidence and commitment to deliver to our country truly world-class automotive testing and R&D infrastructure to help India transform into a global automotive hub.

May the New Year fill your life with cheers, peace and contentment!

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NATRIp drives Chennai to Global Automotive Stage



Dr Manmohan Singh, Prime Minister of India laid the foundation stone of the Global Automotive Research Centre, the Southern Centre of NATRIp on November 4, 2006 at Oragadam, Chennai in presence of Mrs Sonia Gandhi, Chairperson, UPA, Dr M Karunanidhi, Chief Minister of Tamil Nadu, Shri Sontosh Mohan Dev, Union Minister of Heavy Industries and Public Enterprises and other distinguished ministries and Senior Officers of the Union and the State.

In a glittering function attended by more than 6000 people from all walks of life, the Prime Minister said that NATRIp testing infrastructure will enable the Automobile and Auto components Industry achieve global standards and will help our enterprises reduce product development cycles enabling them to become more dynamic and flexible in responding to changing customer needs.

Dr Karunanidhi emphasized that the project will help in harnessing the potential of auto industry in the region to reach a target of \$ 20 billion by 2015. He also said the centre will attract considerable share from the estimated global homologation and testing business of about \$ 560 billion.

G-ARC, coming up on 304 acres of land with Rs 470 Crore investment will be the largest greenfield homologation centre under NATRIp

In addition to the full homologation facilities, G-ARC will also house centres of excellence for Passive Safety, EMC and Infotronics along with test tracks including high speed oval test track of more than 4.5 km length, dynamic pad, various braking surfaces, gradient track, etc.



"The Indian Automobile Industry has, like a beautiful butterfly, come out of its protective cocoon and is showing its wares across continents"

Dr. Manmohan Singh

"Chennai being one of the fastest growing automotive hubs in the country and being very well connected by road, international airport and a modern port, provides strategic advantages to G-ARC".

Shri Sontosh Mohan Dev

Union Minister for Heavy Industries & Public Enterprises

New Era for Export Certification in India -

NATRIp Signs MoU with VCA, UK



Signing of Memorandum of Understanding between NATRIp, India and VCA, UK on 27th October 2006, at New Delhi



"Homologation and certification costs that Indian industry incurs overseas at the moment are estimated at around Rs. 450 crore per annum. The MoU will help in reducing these costs."

NATRIp signed Memorandum of Understanding with Vehicle Certification Agency (VCA), in the august presence of Shri Sontosh Mohan Dev, Hon'ble Minister for Heavy Industries & Public Enterprises, on 27th October 2006, at New Delhi.

With signing of this MoU, new opportunities have ushered for the Indian Automotive Industry. The MOU involves joint cooperative activities which include:

- Certification for Export markets
- Utilization of NATRIp facilities imparting training to NATRIp manpower

The MoU is an outcome of the meeting of Shri Sontosh Mohan Dev and Dr. Stephen Ladyman, Minister for Transport, Government of UK in July 2006.

The MoU marks culmination of the bilateral efforts and adds a new

chapter in the technical collaboration between the two nations.

The cooperation will help :

- in reducing the cost of certification for export markets for Indian OEMs by 40% or more.
- in shortening the time of export certification testing.
- in developing the skill sets within the country for certification.

iCAT to be Notified as Homologation Centre



The Regional Centre North (RCN) of ARAI has come under the fold of NATRIp from April 1, 2006. The Centre has been rechristened as International Centre for Automotive Technology (iCAT) and is being comprehensively upgraded to a world class homologation and R&D Centre. Ministry of Shipping, Road Transport and Highways (MoSRT&H) has issued a draft notification listing International Centre for Automotive Technology (iCAT) as one of the authorized homologation centres in India.

The final notification is expected soon.

iCAT will be the first centre to be fully operational under NATRIp.

Additional land of 42 acre is being procured for the extension of the existing facility at Manesar with an investment of Rs 440 crore.

iCAT will also house the centres of excellence for Components Development and NVH.

The Onset of Centre of Excellence for Powertrain at ARAI, Pune



ARAI
Progress through Research

Shri Sontosh Mohan Dev, Hon'ble Minister for Heavy Industries & Public Enterprises inaugurated the new emission certification lab at ARAI Pune, funded by NATRiP in the presence of Shri Prithviraj Chauhan, Hon'ble Minister of State, Prime Minister's Office, on July 17, 2006.

The new facility will enable ARAI to test and certify engines for Euro IV emission standards.

Under NATRiP Rs 210 crores will be invested in ARAI to develop new facilities for homologation. Keeping in view the existing capabilities of ARAI, it will be developed into a centre of excellence for Powertrain development, fatigue and materials.



Symposium on International Automotive Technology (SIAT) Organised by ARAI & NATRiP

- SIAT 2007 will be inaugurated by His Excellency, the President of India on 17th January, 2007 at Pune.
- January 17-21, 2007 would be the technical extravaganza in ARAI, Pune
- The technical experts from various parts of the world would meet, display their capabilities and discuss emerging advanced technologies in this symposium.
- SIAT 2007 is a unique platform in India for exchange of ideas on the technological innovations across the World.



Come 2011, India will have one of the world's largest Proving Ground, being developed under NATRiP at Indore. Spread over 4123

acres with an investment of Rs 430 crore, this facility will house world's largest high speed track of 14 kms length.

In addition to the high speed circuit, the Indore Proving Ground will have dynamic platform of 150m radius, Braking tracks with four different surfaces, Hill test tracks with various gradients, noise track, and host of other tracks required to test the vehicles for durability and reliability.

The centre will also be equipped workshops which can be hired by users for development of their vehicles. A control tower will be set up to monitor and schedule the vehicles on different tracks. The centre will have a powertrain lab, Fuel stations, and other utilities required to run this large facility.

Indore centre will also be developed into the Centre of Excellence for Vehicle Dynamics and Tyre Testing.

Indore Centre has been named as National Automotive Test Tracks (NATRAX).

Rae Bareilly Centre to Facilitate Tractor Exports

India is one of the largest agricultural tractor manufacturers in the world. The exports of Indian tractors have grown at a CAGR of 55% in past three years. To boost the potential of tractor production and exports, NATRiP has planned a dedicated tractor testing facility at Rae Bareilly in Uttar Pradesh.

This Centre will offer homologation services for agricultural tractors, off-road vehicles and gensets, in line with Indian and global standards. The Centre will also be involved in imparting specialised driver training using simulators and multi-purpose training tracks.

In addition, a Centre of Excellence for Accident Data analysis is being planned at this centre. This facility will be first of its kind in this part of the world and will help in promoting safety on roads.

An investment of Rs 85 crore has been envisaged at this Centre.

Silchar Centre to lay the foundation for the I&C regime in the Country

In order to promote the development of In-Use Vehicle management infrastructure in the country, NATrIP is setting up a model state-of-the-art Inspection and Maintenance Centre in the North-Eastern part of India at Silchar, with an investment of Rs 40 crore.

This facility will also house an Institute to train technicians for servicing of automobiles.

A multi-purpose hill driving track supplemented by driving simulators is planned to train the drivers of commercial vehicles for hill area driving.

Team NATrIP is keen to constantly understand from all its stakeholders their views, comments, suggestions on various aspects of the project or its implementation modalities. We have always been benefited through continued interaction with all our stakeholders so far and this interaction has tremendously helped us in shaping the contours of the project facilities.

As we move to the ground for the real implementation, we would like to beseech various technical experts, project managers and other partners to send us their views, comments and suggestions.

Kindly send your input to : team@natrip.in



NATrIP to Host the First ever SAE Baja in India

In December 2007, NATrIP will be hosting first ever Baja event in India. Co-organised with SAE India and ARAI, BAJA 2007 will be a landmark in ushering in motor sports in the students community in this part of the world.

BAJA SAE is the name of a series of widely popular and innovative international competitions that simulate real world engineering challenges. This interesting event traces its origins back to the

University of South Carolina in 1976. Within its purview, groups of students are assigned the tasks of designing, building, testing, promoting and racing an off road vehicle that will withstand the rigours of a rough terrain. The underlying purpose of the event is to provide SAE student members with challenges that reflect the steps involved in the entire process from design and engineering to production and marketing. Teams vie with one another to get their designs accepted by a virtual firm and are expected to raise funds for supporting their projects without hampering their educational priorities.



For Details please visit : www.bajasaeindia.org

NATrIP brings Centre of Excellence on EMC to India : A Special Report

As the electronic content in modern day automobile grows, the Electro Magnetic Compatibility of the systems is emerging as an area of consistently growing attention. Rapidly enhancing electronification is leading to increased research on how to harmonise the performance of various sub-systems within the vehicle as also the environment outside. New technologies and communication systems in vehicles require extensive testing and evaluation before electronic modules are used in real installation to ensure safety and reliability. Electromagnetic compliance is intended to avoid malfunctioning of the vehicles and their sub-systems due to electromagnetic interference between the different components and sub-systems, and between the vehicle and its environment.

Technological Challenge:

To name few,

One critical aspect of EMC modelling in the automotive industry is the interaction of electromagnetic field with cable harnesses. This includes both the radiation of electromagnetic fields (for instance a mobile phone operated inside a car or an external antenna) and coupling into cables, but also the radiation of cable currents and interference with other electromagnetic devices. These problems are typically too demanding for any type of traditional electromagnetic field solver due to the complexity of the cable harness (multiple leads, dielectric insulation etc.). On the other hand, pure transmission line codes are not able to cope with the 3-D environment in the electro dynamic case (3-D car body with currents at high frequencies).

From EMC point of view, the integration of electric drive systems in today's cars is a new component consisting of high voltage power source, a frequency converter, and electric motor and shielded or unshielded high-power cables. The components of the drive system have been analysed being the noise sources are part of the coupling path

within the new electrical system of the car.

The transient testing on vehicle battery supply lines and RF conducted and radiated immunity, battery supply simulation for electrical loads connected to the 12 V, 24 V or future 42 V supply is becoming more and more important. The area of transient testing of vehicle for EMC is covered by ISO 7637 (Part 0 to 3). However, now a days, the vehicle manufacturers specifically do a large number of such tests exceeding by far what ISO 7637 requires. In various manufacturers' specification there are a large number of additional tests like micro-interruptions, dips and drops, all with considerable fast rise and fall times, voltage variations, over voltage and under voltage test and reverse voltage test etc.

The automotive electromagnetic environment faced by electronic modules is very challenging as it contains intentional transmitters, accidental sources of RF emissions as well as conducted transients and electrostatic discharges. It is necessary to put in place certain requirements both at vehicle and component levels to ensure electronic equipment can operate in harmony with each other and without interfering with broadcast and radio communication services. There are minimum levels of legal requirements in developed nations, but these are not sufficient to ensure product quality and customer satisfaction.

The presence of on-board electronic devices in new technology vehicles having electronics in Powertrain, Engine Management, Drive Train Management, ABS Management, Air bags, Steering Wheel (with servo mechanical devices), Traction control system (ESP), Active-aid Driving System, Security Systems including vehicle along and Intelligent Entry System Voice/ Data Communication System, Navigation System, Traffic Control System and the electromagnetic fields intensity etc, adds to complexity of electromagnetic environment in and around the vehicles.

In the last few years, full-vehicle radiated EMC tests have become mandatory in most of the countries, leading to the necessity of shielded anechoic chambers, amplifiers and antennas. Additionally, components and sub-systems are also subjected to regulations and must be tested separately. For full-vehicle tests, as per regulations the vehicle needs to be working in normal conditions, which means that the wheels must be turning, hence, a dynamometer is also required inside the anechoic chamber.

Upcoming NATrIP Infrastructure

Keeping the above cited technological challenges in mind, NATrIP has planned state-of-the-art EMC test facilities at three centres, namely, G-ARC at Chennai, iCAT at Manesar and VRDE at Ahmednagar. The facilities at iCAT and VRDE would be primarily focussed on homologation requirement but would be capable of providing R&D services also. The facilities at iCAT and VRDE will include :

- ◆ Semi-anechoic chamber for full vehicle capable to accommodating vehicle upto 10 tonnes unladen weight.
- ◆ Semi-anechoic Chamber for Components and sub-systems.

The facilities would be capable of performing tests as per various standards including following :

1. Shielding Attenuation
 - a. EN 50147-1
 - b. IEEE 299
 - c. NSA 65-6
2. NSA for semi-anechoic chamber
 - a. EN 50147-2
 - b. ANSI C 63.4-2001
 - c. EN 55022
 - d. CISPR 22
3. Field Uniformity
 - a. EN 61000-4-3+A1
 - b. IEC 61000-4-3

4. Flammability of absorbers
 - a. NRL 8093-1, -2,-3,-4,-5
 - b. DIN 4102 B1, A2 (non-combustible)
5. Chambers Compliance capabilities
 - a. EU directive 95/54/EC
 - b. ECE R 10
 - c. ISO 7637
 - d. ISO 11452-2
 - e. CISPR 25, CISPR 16
 - f. AIS 004/1999
 - g. SAE J555

G-ARC will house a Centre of Excellence on EMC. In addition to the above facilities, this centre will also have a separate semi-anechoic chamber for 2G3 wheelers and a shielded chamber for BCI tests. The facilities at G-ARC will be aimed at providing comprehensive infrastructure for research & development in the field of EMC to the automotive and allied industries.

The construction of the EMC facility at VRDE has already begun and the facility is planned to be operational by April 2008. The facilities at iCAT will be commissioned by February 2009. The facilities at G-ARC will be commissioned in two phases. In phase I, by September 2009, the homologation related facilities will be operational and in phase II, by December 2010, the Centre of Excellence will be fully commissioned with comprehensive R&D facilities.

Snapshot of EMC Infrastructure Planned under NATRIp

Facilities	i CAT (Manesar)	VRDE (Ahmednagar)	G-ARC (Chennai)
VSAC for 4 Wheelers			
Anechoic chamber	30x20x10m	32x18x8m	30x20x10m
Main Turntable	9.2m diameter, 10 tons	8m diameter, 10 tons	9.2m diameter, 10 tons
Integrated Chassis Dyno	–	4x4 up to LCV, 120km/h	4x4 up to LCV, 120km/h
Second turntable	–	for components	–
Portable Chassis Dyno	4x4 + 2/3W, 120km/h	-	for HD
Equipment			
<i>EMI: Emissions</i>	20Hz - 3GHz	9kHz - 18GHz	20Hz - 3GHz
<i>EMS: Immunity</i>	>50V/m 10kHz - 18GHz	150V/m	>100V/m 10kHz - 3GHz
Control Room	not shielded	shielded	shielded
Amplifiers	500W+150W+50W	10kW	10kW+2kW+240W
VSAC for 2/3W wheelers			
Anechoic chamber			14x12x9m
Turntable			5m diameter, 3 tons
Integrated Chassis Dyno			120km/h
Portable Chassis Dyno			–
Equipment			
<i>EMI: Emissions</i>			20Hz - 40GHz
<i>EMS: Immunity</i>			>100V/m 10kHz - 18GHz
Control Room			shielded
Amplifiers			shared
SAC for components			
Anechoic chamber	7x6x4m	8x5x3m	7x6x4m
Turntable	1.5m diameter, 500kg	under discussion	1.5m diameter, 500kg
Equipment			
<i>EMI: Emissions</i>	homo + basic R&D	R&D	R&D
<i>EMS: Immunity</i>	homo + basic R&D	R&D	R&D
Control Room	not shielded	shared	shielded
Amplifiers	shared	shared	shared
Shielded for BCI tests			
Shielded chamber	9.2m diameter, 10 tons	8m diameter, 10 tons	NEW
Equipment			
<i>EMI: Emissions</i>	20Hz - 3GHz	9kHz - 18GHz	R&D
<i>EMS: Immunity</i>	>50V/m 10kHz - 18GHz	150V/m	R&D

V·I·S·I·O·N

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



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