

## TELECOM EQUIPMENT MANUFACTURERS ASSOCIATION OF INDIA (Electronics, Mobile, Telecom, ESDM, Manufacturing & Innovations Association)

Shri Anshu Prakash, IAS  
Secretary  
Dept. of Telecommunications  
Govt of India.  
New Delhi

January 16, 2020

Dear Shri Anshu Prakash Ji

TEMA and SITARA welcome DoT and Niti Aayog's initiative to involve indigenous companies in 5G trials. TEMA-SITARA have been making various submissions to Govt of India on 5G. Our outreach has been to the Hon'ble PM, the National Security Advisor (NSA) and NCS and other stakeholders.

We would like to formally convey our views on developing national capability in 5G, thus laying the ground for **6G**, the concept of which has already been patented in the United States by one of our distinguished members. We are also listing below the **specific capabilities** of TEMA-SITARA Member Companies in 5G technologies.

We wish to underline that the purpose of doing so, i.e., listing out the capabilities of SITARA /TEMA members, is to assist in drawing up a national strategy to fill required technology gaps indigenously. The intent of the proposed 5G Trials should not be for DoT to determine whether or not domestic Indian companies have the capability to offer 5G services. Indian companies have the capabilities and the nation cannot afford to jeopardise these. Toby Simon of Synergia Foundation had shared a heat-map (enclosed) which also clearly shows that Indian companies have 90% of the technological capabilities required to indigenously deploy 5G.

Our recommendations are as follows:

1. In view of the enormous national security risks of inducting foreign equipment in national ICT networks, **Government must take the lead in supporting development of indigenous capabilities**, guaranteeing national security, the nation's economic future and technological capabilities.
2. **We feel that Government would leave a lasting legacy, akin to India's successful space and atomic energy programs, if it took up the 5G challenge as a national PPP project, something**



along the Mission-mode lines of the famous *Manhattan Project* (which led to the development of the 1<sup>st</sup> atomic bomb during WW-II). **This is essential given the importance and urgency of the proposed trials.** That approach would change the focus- and hence remove the perceived hesitation - from helping highly innovative yet fund-constrained Indian companies. **We strongly urge DoT to view this as investing in a critical national project** as part of a larger and more profound technology indigenization strategy. Like DARPA in USA, this investment into development of highly strategic indigenous technology will ensure India's safety, security and technological development. It will also lay the foundation for a high-tech driven future for the benefit of the people of India.

3. We therefore urge Government to set up an organization patterned on DARPA or the Indian Space Research Organisation- for creating an indigenous 5G capability and ICT network. Both DARPA and ISRO have been very effective in delivering high technology goals. DARPA involves a Whole of Government-and-ecosystem approach. DARPA contracts projects to the Federal Funded R&D Centres (FFRDCs, which include genuinely recognizable institutions with proven records like Los Alamos, Lawrence Livermore etc.). ISRO has perfected the art of delivery of high-tech space capabilities on a shoe-string budget because of its flat organization, open exchange of ideas, and blue-sky thinking. Both are possible models to follow and the **new entity for implementing 5G should also be headed by eminent technocrats with domain knowledge, like ISRO.**
4. It is also recommended that funding for the technology development projects – which must be undertaken on mission-mode basis as mentioned earlier - must preferably be given directly to the entity rather than routed through academic institutions or bureaucracies. We need a dynamic and imaginative organization, one patterned on DARPA or ISRO, one capable of generating and implementing new ideas.
5. We also wish to place on record our deep reservations about seeking the advice of - and / or involving **experts close to the Chinese Government in a vital project affecting national security. We believe this poses grave risks to India's National Security. In this connection, we wish to underline that anyone with connections with the Chinese Government must be automatically excluded from any project of such national significance. The project has to be piloted by eminent technocrats dedicated to indigenisation.**
6. We understand that funding this technology development effort would not be cheap. However, we strongly believe that **funding could be given to this specially created entity involving security and defence forces, scientists, technocrats, industry and Government. USOF is one of the possible sources.** We have learnt it has been used to fund a Japanese company. **USOF could therefore also be used for indigenous technology development.**
7. Deployment of 5G **must not be rushed**, especially since pressing and urgent "use-cases" are yet to be identified in India. Typical use-cases, such as large adoption of Industry 4.0, autonomous vehicles or remote surgery etc. has not yet emerged in India. **Telcos are suffering from serious financial issues** and are not in a position to either buy spectrum or uproot and reinstall fresh equipment in the near future. As far as the public is concerned, our



firm belief is that the Indian consumers would be happy if at least 4G can be offered without interruption. 5G is suitable only for highly technologically advanced economies with 21<sup>st</sup> century level digitized/ intelligentised Industry. **The so called "urgency" about 5G is exclusively based on hype created by foreign equipment vendors, especially Chinese entities who are blacklisted in Western Countries, who are only interested in dumping 5G equipment in India. At this point in time, India has neither the capacity to afford the investment required, nor the need, for this technology.** Hence, we can afford to take a little more time to ensure our national and economic security concerns are fully addressed.

8. **Securing ICT networks, particularly 5G ICT networks, is critical for national development and security. 5G enhances military lethality by a multiple of 10** vs. conventional weapons. Experts the world over recognise that 5G brings in additional vulnerabilities and US Govt reports state that 5G *exponentially* increases cybersecurity risks. A massive exercise in decoupling is going on in the United States to ensure security of critical infrastructure, as they seek to curtail their **over-dependence on Chinese equipment**. We must be **wary of this trap from the beginning**, keeping in mind that we can never be fully secure unless we source our hardware and software indigenously. We must also keep in mind that **induction of Chinese equipment into our networks may not find support in the United States and some other countries.**
9. India also needs to build 5G security into design rather than bolting it down as an after-thought. 5G security is different from 2G/3G/4G security. India has the cyber security ecosystem which can be leveraged to build this capability and capacity, which will require additional investment.
10. India's national priority is the development of **indigenous capabilities** for 5G deployment. You would agree, as the **custodians of national interest and national welfare**, that it is **heartening** that several **Indian companies have 5G technologies** despite the constraints they suffer. With the **funding support expected following recent high-level decisions taken by GoI, it is possible to realise the dream of indigenous 5G deployment.**
11. We must also guarantee business opportunities for our own companies, as no other country will help Indian companies. This will create massive multipliers for national benefit. The US has hurt the Chinese economy by denying markets. **We are hurting ourselves by denying market opportunities to our own companies.** Appropriate policies must be formulated so that induction of foreign and Chinese equipment in sensitive networks is **not repeated**. **The Telecom Security Act, a ban on Chinese equipment in particular, and a modification of L1 for the benefit of indigenous companies** must be implemented. We are glad that the Niti Aayog document has incorporated some of the suggestions we have made earlier in this regard.
12. While a consortium approach is favored, it must be understood that **none** of the major *large* Indian companies reportedly under consideration by GOI have 5G expertise, while **several SMEs have**. Given the **history of licensed production and weak R&D of most of these large companies**, they would also **succumb to the temptation of inducting foreign components when Indian technologies are available**. It would be better to have as a leader an entity that has *actually developed these technologies*. We have submitted a proposal for a **Large-Scale**



**Integrator** (LSI) which could do the job better than some of the Companies under consideration. The excellent technological solutions developed by the constituent companies including a Battle Management System exported to Malaysia, have won admiration and respect abroad. At the very least, a company which has some experience in 5G, or is willing to commit funding, must be the lead entity from Industry's side.

13. Last but not least, it must be acknowledged that some of the indigenous products are years ahead of their foreign competitors. In fact, leading foreign companies are signing non-disclosure agreements with Indian SMEs and sourcing products which they then sell at a premium back to us!
14. Following are the companies in alphabetical order with the capabilities. It is understood that **Prof Kamakoti of IIT-Madras**, has a longer list, and this can be obtained from him (companies like Sookta and perhaps VVDN for example). A heat map is enclosed although it does not cover security capability development. **Most of the technologies are available in India and the map is over 90% Green.** We rejoice and hope DOT and Niti Aayog also feel pride that Indian SMEs have mastered such a futuristic technology on their own.

### INDIAN COMPANIES WITH 5G CAPACITIES

#### LEKHA WIRELESS CAPABILITIES

CEO: Sri Ramu T.S

[ramu@lekhawireless.com](mailto:ramu@lekhawireless.com)

Below is the description of Lekha's product portfolio and PFA the company profile. Lekha has been in discussion with DoT for last 2 years for pilot trials opportunity for 4G products. They hope the new effort finds serious consideration from the concerned people.

#### 4G Trials

**Vyapi LTE eNodeB(4G)** (*Data sheet attached.*) AVAILABLE IMMEDIATELY

Lekha is presently working with Indian Navy to setup 4G network on naval ships for tactical communications. They have achieved TRL8 (technology readiness level 8) maturity level. Lekha looks forward for any opportunity to deploy their 4G network along with Indian operators.

#### 5G Technology.

**5G gNodeB reference design** (*Data sheet attached.*)

Status: AVAILABLE FOR LAB INTER-OP WITH 3<sup>RD</sup> PARTY UE

1. Both HW and SW technologies are developed and owned by Lekha Wireless:
2. Lekha's Wave5G solution which demonstrates fully featured 5G FR1 physical layer stack.
  1. Data sheet for 5G NR UE L2 and L3 stack.
  2. Videos of some of Lekha's products in action at the link below.

<https://drive.google.com/drive/folders/OByJHuMA0z6tBVmM4SXM5MmJRU0U>

#### Future technology



Lekha has a deep investment in 5G NR technology.  
On-going investment to develop 32T32R Massive MIMO RU.  
Both HW and SW technologies are developed and owned by Lekha Wireless.

#### **NIVETTI SYSTEMS**

CEO: Sri Raghuvver BK  
[raghuveerbk@gmail.com](mailto:raghuveerbk@gmail.com)

India's indigenous Security architecture for 5G Networks would have to be based on Network traffic monitoring, AI/ML based Security Analytics and Traffic Visualization.

#### **Products:**

##### **5G Backhaul & Core:**

1. Nivetti can contribute significantly to building out the 5G IP and Cloud infrastructure as follows:
  - Cell site routers
  - Access and aggregation IP Routers
  - Virtual IP Routers for Cloud Networking
  - Data Centre Switching
  - Ethernet Switches for the Network.
2. **Security Architecture:** Nivetti Security Architecture for 5G Networks.
3. **Mobile Edge Computing:** Nivetti has some emerging solutions in this space.

#### **QUIK PROTO RESEARCH LABS**

CEO: Dr Prem Chand  
[prem@quikproto.com](mailto:prem@quikproto.com)

##### **5G equipment security by the QuikProto Security Stack**

#### **Products:**

1. **Military Grade Secure Storage:** The system has already been proven and inducted into Strategic Forces and has undergone evaluation at DRDO for 3 years.
2. **Digital Rights Management Integrated with Work Flow:** System already evaluated and being used by DRDO, Army and ISO (securing standards).
3. **Hardware Enforced Security to Prevent Kernel Level Attacks:** Demonstrable prototype has been developed and its customization for Mobile Phones, End-Point Appliances, Servers (cloud, data centre), Networking Components (Routers/Switches).

#### **Under development for future deployment:**

ICS/ SCADA Applications is underway.  
Estimated: 18 to 20 months to complete.  
The company is looking for funding assistance.



## SAANKHYA LABS

CEO: Sri Parag Naik

[parag@saankhyalabs.com](mailto:parag@saankhyalabs.com)

### Products:

1. **UHF based TVWS 4g boxes** for rural broadband. These are being deployed all over the world in pilots. Roadmap exist to make these 5G ready
2. **Chipsets** for IoT, mobile TV receivers
3. **Satellite IoT** solutions
4. **5G broadcast** which is an **indigenous effort** for broadband-broadcast convergence that is a value differentiation w.r.t standard 4G/5G .
5. Have built a Radio head for broadcast ***which is being deployed by operators in the US***

### Future technologies

#### Near to mid-term 5G Roadmap

- **SDR IP** that be extended to support 5G receiver chipsets
- **5G Radio Units** for Low band and mid band
- **ORAN based Radio Interface controller** for network automation

#### Long term Roadmap

- **Prototype of 6G stack.** IPR filed
- **Next generation Silicon DU** platform that we are building in stealth mode

## TEJAS NETWORKS

CEO: Sanjay Nayak

[sanjay@tejasnetworks.com](mailto:sanjay@tejasnetworks.com)

## VNL

VNL has end to end technical competence to undertake development and deliver 5G Radio access node, transmission, SDR, core and other nodes of 5G. VNL have already indigenously developed and successfully commercialised end to end 2G and 4 G mobile systems in the Indian and global market.

Full documents regarding the capabilities on offer are enclosed.

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We request DoT to identify and involve other Indian companies having 5G capabilities, which means those headquartered in India and owning their own IPR and not undertaking licensed production or systems integration only, which have these capabilities.



In conclusion, it is clear that there are multiple domestic Indian Companies which have several vital parts of the 5G technology puzzle. As we have said before and are reiterating here, the strategic and national security concerns about the 5G technology make it imperative that we actively support and encourage Indian Companies to develop this technology indigenously.

With kind regards, and looking forward to concrete progress on the deployment of indigenous 5G capabilities.



**Prof N K Goyal**  
**Chairman Emeritus TEMA**



**Smita Purushottam**  
**Chairperson SITARA**

Copy to

PS to Hon'ble Prime Minister of India

Lt. Gen. Rajesh Pant, National Security Council Secretariat (NCSC)

Sh. Ajay Kumar, Defense Secretary, Ministry of Defense, Government of India, New Delhi

Sh. Ajay Sawhney, Secretary, MEITY

Dr. Guruprasad Mohapatra, Secretary, DPIIT

Sh. VK Saraswat, Member, Niti Aayog