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Recycled material failed Nirbhay: DRDO

By Sumit Bhattacharjee

Same vendor to make another missile 'free of cost'

The fourth test of Nirbhay, the long-range sub-sonic cruise missile designed and developed by the Defence Research and Development Organisation (DRDO), failed on December 21 last year due to use of faulty material, said Chairman of the DRDO and Secretary of Department of Defence R&D S. Christopher here on Saturday.

Speaking to The Hindu after inaugurating a workshop on indigenous lithiumion batteries for special applications, hosted by the Naval Science and Technological Laboratories, the DRDO chief said, "The missile's fourth test took place from the Launch ComplexIII of Integrated Test Range at Balasore in Odisha and after lift-off, the missile developed snags on one of its wings and started to bank on one side and veered dangerously. We had to activate the 'self-destruct' mechanism to kill it mid-air."

'Insufficient strength'

"On investigation, it was found that the vendor who manufactured it used recycled material for one of the key components that operates the missile wings. The strength of the recycled material was not sufficient. Though the vendor followed all specifications, the use of recycled material was not disclosed," he said.

Fifth test soon

But, according to Dr. Christopher, the same vendor had been told to produce another one 'free of cost' under the same specifications but without any shortcuts.

"Everything was right in the missile, only this faulty material caused the failure. It will now be ready by Julyend or August. We will go for the fifth test," Mr. Christopher said.

THE ASIAN AGE

Manipur killings prompted 2016 surgical strikes; planned 15 months back: Parrikar

A small terrorist organisation of 200 people killing 18 Dogra soldiers was an insult to the Indian Army, Parrikar said.

Panaji: Former defence minister Manohar Parrikar has said the planning for the September 2016 surgical strikes in Pakistan Occupied Kashmir started in June 2015 after the NSCN-K ambushed an army convoy in Manipur. Recapping events that led to the surgical strike in September last year, Parrikar told a gathering of industrialists on Friday that he felt "insulted" when he heard about the June 4, 2015 incident in which 18 jawans were killed. "The starting of September 29 (2016) surgical strike on the western border was 9th of June, 2015....We planned 15 months in advance. Additional troops were trained. Equipment was procured on priority basis," he said.

The Swathi Weapon Locating Radar, developed by the DRDO, was used first in September 2016 to locate "firing units" of Pakistani Army, though the system was inducted officially three months later, Parrikar said.

It was thanks to the Swathi Radar that 40 firing units of Pakistani Army were destroyed, he added.

Disclosing that the surgical strikes against PoK militants were planned 15 months in advance after the Manipur killings, he said, "I felt insulted....A small terrorist organisation of 200 people killing 18 Dogra soldiers was an insult to the Indian Army and we sat in the afternoon and sat in the evening and worked out the (plan of) first surgical strike which was conducted on 8th June morning in which about 70-80 terrorists were killed (along the India-Myanmar border)."

"It was a very successful strike," he said. On the Army's side, the only injury was a leech attaching itself to a soldier's leg. Contrary to some reports, no helicopters were used. "I had placed helicopters (on stand-by) only in case of emergency evacuation," he said.

He also listened intently to a TV discussion with his ministerial colleague Rajyavardhan Singh Rathore.

"... One question (from media) hurt me. Rajyavardhan Singh Rathore, an ex-Armyman, was on TV and he was explaining about all kinds of search operations. An anchor asked him 'would you have the courage and capability of doing the same on the western front'," Parrikar recalled.

"I listened very intensely but decided to answer when the time came.



Sun, 02 July, 2017

Naval Cmdr who bombed Karachi in 1971 dies

Destroyed Pak's sea power

- Lieutenant Commander (later promoted as Commander) BN Kavina on December 4, 1971, took INS Nipat to within 25 km of the Karachi shore and fired a missile at Keamari oil terminal, setting it on fire
- This set the stage for the second missile attack on Karachi after which what was left of the Pakistani fleet never again ventured out to sea. Thereafter, the Indian Navy was in total control of the seas during 1971

Commander BN Kavina, a Vir Chakra recipient, who led his warship to launch a missile attack on Keamari oil refinery at Karachi harbour during the 1971 war with Pakistan, has died in Adelaide, Australia, where he was living with his son. He was 80 years of age.

During the war, he was commanding officer of the INS Nipat, which was part of flotilla of three warships under the 25th missile squadron tasked to launch missiles at Karachi under 'Operation Trident'. Commodore BB Yadav was leading the flotilla. He died in 2010.

Lieutenant Commander (later promoted as Commander) BN Kavina on December 4, 1971, along with Commander (later Commodore) BB Yadav took INS Nipat to within 25 km of the Pakistan shore, from where they fired a Soviet Union supplied Styx missile at the Keamari oil terminal, setting off a blaze.

This set the stage for the second missile attack on Karachi after which what was left of the Pakistani fleet never again ventured out to sea. Thereafter, the Indian Navy was in total control of the seas during 1971.

INS Nirghat led by Lieutenant Commander IJ Sharma launched missiles at PNS Khaiber around 10.30 pm that night. INS Nipat sank merchant vessel Venus Challenger carrying ammunition and crippled its escort, destroyer PNS Shah Jehan. INS Veer led by Lieutenant Commander OP Mehta fired at minesweeper PNS Muhafiz, sinking it.

Commander Yadav was awarded the Mahavir Chakra, the second highest gallantry medal while Kavina, Sharma and Mehta – all his juniors – got the Vir Chakra, the third highest gallantry medal.

Chinese map claims areas in India and Bhutan as its own

Beijing: The borders depicted in a map released by China to buttress its allegation that Indian troops “trespassed” into its territory in Sikkim sector are in dispute with India and Bhutan’s perception of the frontiers in the region. The map, posted on the Chinese section of the foreign ministry’s website on Friday, is especially different from the Indian perception of the Line of Actual Control in the depiction of the strategic tri-junction of India, Bhutan and China.

The Chinese have claimed areas far south of what both India and Bhutan claim – New Delhi’s claim is till Batang La, while Beijing has laid claim to the territory till Mount Gipmochi.

The situation is further complicated by Bhutan’s claims. China and Bhutan have a territorial dispute over the location – Donglang or Doklam – where the current standoff began on June 16.

India acknowledged on Friday its troops had worked in coordination with the Bhutan government to ask a Chinese construction party to “desist from changing the status quo” by building a road in Donglang area. India and Bhutan have asked China to maintain status quo, with New Delhi saying the construction activity has “serious security implications”.

New Delhi has also said any move to “unilaterally determine tri-junction points” violates a 2012 India-China agreement to finalise the boundary in this region in consultation with all concerned countries.

China, of course, has claimed the Donglang area has been with it since “ancient times”.

“There is solid legal evidence to support the delimitation of the Sikkim section of the China-India boundary. It is stated in article one of the Convention Between Great Britain and China Relating to Sikkim and Tibet (1890) that ‘the boundary of Sikkim and Tibet shall be the crest of the mountain range separating the waters flowing into the Sikkim Teesta and its affluents from the waters flowing into the Tibetan Mochu and northwards into other rivers of Tibet’,” Chinese state media reported after the standoff began.

“The line commences at Mount Gipmochi on the Bhutan frontier, and follows the abovementioned water-parting to the point where it meets Nepal territory,” the report added.

The foreign ministry has repeatedly said the spot where Indian border troops “trespassed” is Chinese territory.

The state media also reported that China and successive Indian governments had recognised that the Sikkim section of the boundary “has been delimited”. This, the report said, had been “confirmed by Indian leaders, the relevant Indian government document and the Indian delegation at the special representatives’ meeting with China on the boundary question that India and China share common view on the 1890 convention’s stipulation on the boundary alignment at the Sikkim section”.



Amid Sikkim face-off, India attends SCO meet in China

Talks on Border Control and Anti-Terror Steps

Amid a stand-off in the Sikkim sector with Chinese troops, India has attended an SCO meeting in China to enhance anti-terrorism and border control mechanisms, the first plenary meeting after India and Pakistan became full members of the Chinadominated security grouping.

Seven Shanghai Cooperation Organisation (SCO) member states, including China, India and Russia participated in the organisation's meeting of heads of border control departments on Thursday in Dalian, Northeast China's Liaoning Province.

Officials from the Indian embassy attended the Dalian meeting of the SCO.

This is the first plenary meeting since India and Pakistan joined the grouping in June. The other members are Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan. India and Pakistan last month became full members of the SCO that is increasingly seen as a counterweight to NATO.

India's membership was strongly pushed by Russia while Pakistan's entry into the grouping was backed by China. Member states discussed how to cooperate on combating terrorism, separatism and extremism, state-run Global Times reported.

The members also talked about a joint operation along the border to prevent trans border crimes and to improve the organisation's cooperation on safeguarding border security at the SCO meeting, the report said.

Border enforcement cooperation is an important part of cooperation between China and other SCO member states, Chen Dingwu, a senior official at China's ministry of public security's border control department, said.

He said China values the collaboration with border control departments of other countries, and has already built cooperation mechanisms with 11 neighbouring countries, including SCO members. PTI

Beijing releases map of disputed area

China has hardened its position on its border standoff with India over the Sikkim-Bhutan-Tibet tri-junction by releasing a map support its claims over the disputed area. The map was released night.

on the foreign ministry's website in Chinese language on Friday China has been maintaining that the Indian Army had attempted to “trespass“ on its territory.

Business Standard

Sun, 02 July, 2017

Ukraine blames Russia for recent cyber attack

Relations between Ukraine and Russia went into freefall after Moscow's annexation of Crimea in 2014

By Pavel Polityuk

Ukraine said on Saturday that Russian security services were involved in a recent cyber attack on the country, with the aim of destroying important data and spreading panic.

The SBU, Ukraine's state security service, said the attack, which started in Ukraine and spread around the world on Tuesday, was by the same hackers who attacked the Ukrainian power grid in December 2016. Ukrainian politicians were quick to blame Russia for Tuesday's attack, but a Kremlin spokesman dismissed “unfounded blanket accusations”.

Cyber security firms are trying to piece together who was behind the computer worm, dubbed NotPetya by some experts, which conked out computers, hit banks, disrupted shipping and shut down a chocolate factory in Australia. The attack also hit major Russian firms, leading some cyber security researchers to suggest that Moscow was not behind it.

The malicious code in the virus encrypted data on computers, and demanded victims pay a \$300 ransom, similar to the extortion tactic used in a global WannaCry ransomware attack in May. But Ukrainian officials and some security experts say the ransomware feature was likely a smokescreen.

Relations between Ukraine and Russia went into freefall after Moscow's annexation of Crimea in 2014 and the subsequent outbreak of a Kremlin-backed separatist insurgency in eastern Ukraine that has killed more than 10,000 people.

Hacking Ukrainian state institutions is part of what Ukraine says is a "hybrid war" by Russia on Kiev. Russia denies sending troops or military equipment to eastern Ukraine.

"The available data, including those obtained in cooperation with international antivirus companies, give us reason to believe that the same hacking groups are involved in the attacks, which in December 2016 attacked the financial system, transport and energy facilities of Ukraine using TeleBots and BlackEnergy," the SBU said.

"This testifies to the involvement of the special services of Russian Federation in this attack."

The SBU in an earlier statement on Friday said it had seized equipment it said belonged to Russian agents in May and June to launch cyber attacks against Ukraine and other countries.

Business Standard

Sun, 02 July, 2017

Hacks raise fear over NSA's hold on cyberweapons

Twice in the past month, National Security Agency (NSA) cyberweapons stolen from its arsenal have been turned against two very different partners of the United States — Britain and Ukraine.

The NSA has kept quiet, not acknowledging its role in developing the weapons. White House officials have deflected many questions, and responded to others by arguing that the focus should be on the attackers themselves, not the manufacturer of their weapons.

But the silence is wearing thin for victims of the assaults, as a series of escalating attacks using NSA cyberweapons have hit hospitals, a nuclear site and American businesses. Now there is growing concern that United States intelligence agencies have rushed to create digital weapons that they cannot keep safe from adversaries or disable once they fall into the wrong hands.

On Wednesday, the calls for the agency to address its role in the latest attacks grew louder, as victims and technology companies cried foul. Representative Ted Lieu, a California Democrat and a former Air Force officer who serves on the House Judiciary and Foreign Affairs Committees, urged the NSA to help stop the attacks and to stop hoarding knowledge of the computer vulnerabilities upon which these weapons rely.

In an email on Wednesday evening, Michael Anton, a spokesman for the National Security Council at the White House, noted that the government "employs a disciplined, high-level interagency decision-making process for disclosure of known vulnerabilities" in software, "unlike any other country in the world."

Anton said the administration "is committed to responsibly balancing national security interests and public safety and security," but declined to comment "on the origin of any of the code making up this malware."

Beyond that, the government has blamed others. Two weeks ago, the United States — through the Department of Homeland Security — said it had evidence North Korea was responsible for a wave of attacks in May using ransomware called WannaCry that shut down hospitals, rail traffic and production lines. The attacks on Tuesday against targets in Ukraine, which spread worldwide, appeared more likely to be the work of Russian hackers, though no culprit has been formally identified. In both cases, the attackers used hacking tools that exploited vulnerabilities in Microsoft software. The tools were stolen from the NSA, and a group called the Shadow Brokers made them public in April. The group first started offering NSA weapons for sale in August, and recently even offered to provide NSA exploits to paid monthly subscribers.

Though the identities of the Shadow

For the American spy agency, what is unfolding across the world amounts to a digital nightmare

Brokers remain a mystery, former intelligence officials say there is no question from where the weapons came: A unit deep within the agency that was until recently called “Tailored Access Operations.”

While the government has remained quiet, private industry has not. Brad Smith, the president of Microsoft, said outright that the NSA was the source of the “vulnerabilities” now wreaking havoc and called on the agency to “consider the damage to civilians that comes from hoarding these vulnerabilities and the use of these exploits.”

For the American spy agency, which has invested billions of dollars developing an arsenal of weapons that have been used against the Iranian nuclear programme, North Korea’s missile launches, and Islamic State militants, what is unfolding across the world amounts to a digital nightmare. It was as if the Air Force lost some of its most sophisticated missiles and discovered an adversary was launching them against American allies — yet refused to respond, or even to acknowledge that the missiles were built for American use.

Officials fret that the potential damage from the Shadow Brokers leaks could go much further, and the agency’s own weaponry could be used to destroy critical infrastructure in allied nations or in the US.

“Whether it’s North Korea, Russia, China, Iran or ISIS, almost all of the flash points out there now involve a cyber element,” Leon E Panetta, the former defense secretary and Central Intelligence Agency chief said in a recent interview, before the weapons were turned against American interests.

“I’m not sure we understand the full capability of what can happen, that these sophisticated viruses can suddenly mutate into other areas you didn’t intend, more and more,” Panetta said. “That’s the threat we’re going to face in the near future.” Using the remnants of American weapons is not entirely new. Elements of Stuxnet, the computer worm that disabled the centrifuges used in Iran’s nuclear weapons programme seven years ago, have been incorporated in some attacks.

In the past two months, attackers have retrofitted the agency’s more recent weapons to steal credentials from American companies. Cybercriminals have used them to pilfer digital currency. North Korean hackers are believed to have used them to obtain badly needed currency from easy hacking targets like hospitals in England and manufacturing plants in Japan. And on Tuesday, on the eve of Ukraine’s Constitution Day which commemorates the country’s first constitution after breaking away from the Soviet Union - attackers used NSA-developed techniques to freeze computers in Ukrainian hospitals, supermarkets, and even the systems for radiation monitoring at the old Chernobyl nuclear plant.

The so-called ransomware that gained the most attention in the Ukraine attack is believed to have been a smoke screen for a deeper assault aimed at destroying victims’ computers entirely. And while WannaCry had a kill switch that was used to contain it, the attackers hitting Ukraine made sure there was no such mechanism. They also ensured that their code could infect computers that had received software patches intended to protect them.

“You’re seeing a refinement of these capabilities, and it only heads in one direction,” said Robert Silvers, the former assistant secretary of cyber policy at the Department of Homeland Security, now a partner at the law firm Paul Hastings.

Though the original targets of Tuesday’s attacks appear to have been government agencies and businesses in Ukraine, the attacks inflicted enormous collateral damage, taking down some 2,000 global targets in more than 65 countries, including Merck, the American drug giant, Maersk, the Danish shipping company, and Rosneft, the Russian state owned energy giant. The attack so crippled operations at a subsidiary of Federal Express that trading had to be briefly halted for FedEx stock.

Sun, 02 July, 2017

ISRO'S rockstar PSLV launched 209 foreign satellites since '99

By Surendra Singh

With Many Firsts to Its Credit, Vehicle Being Readied For Solar Mission

Polar Satellite Launch Vehicle (PSLV) has turned out to be the most trusted and reliable satellite carrier of the Indian Space Research Organisation (Isro). It has not just launched 209 satellites of 28 countries since May 1999, the vehicle has also placed 48 Indian satellites in their respective orbits till now.

After its first copybook launch in October 1994, PSLV has built a reputation of being a highly versatile spacecraft with 39 consecutive successful missions till June this year.

Among all foreign satellites launched by the PSLV till now, the heaviest so far was the 400kg TeLEOS earth observation satellite of Singapore on December 16, 2015. Among the others heavyweights hauled to space by the PSLV are Italy's Agile satellite (352kg), equipped with scientific instruments on April 23, 2007 and Israel's reconnaissance (spy) satellite TecSAR (295 kg) on January 21, 2008.

The vehicle has been a commercial hit earning the space agency global fame for several landmark missions. The vehicle was used for launching the cost-effective Chandrayaan-1 (lunar) mission in 2008 and Mars mission in 2013.

Speaking to TOI on PSLV's track record, Isro chairman A S Kiran Kumar said, "We are progressively trying to improve PSLV's features and capabilities with each launch. Today with ability to provide multiple capabilities, it has attracted the attention of many satellite operators and they are looking for an opportunity to make use of PSLV for their launch." The chairman said, "PSLV has been very versatile as it has launched satellites in lower orbit, geo-stationary transfer orbit, lunar orbit and also Mars orbit."

With the successful Mars mission, India became the first Asian country to reach the Red Planet and accomplished the mission in the first attempt itself. Several countries, including China, supposedly more advanced than India, had attempted the Mars mission but failed. In February this year, PSLV achieved another milestone when it (PSLV C37) made history by placing a record 104 satellites in their desired orbits, breaking the previous record held by Russia (37 satellites) and the earlier record of the US (29).

Launching dozens of satellites in different orbital slots is an extremely complex manoeuvre. However, PSLV proved its mettle. The vehicle's latest multiple launch was on June 23 this year when PSLV C8 carried with it India's surveillance satellite Cartosat-2E along with 29 nano foreign satellites.

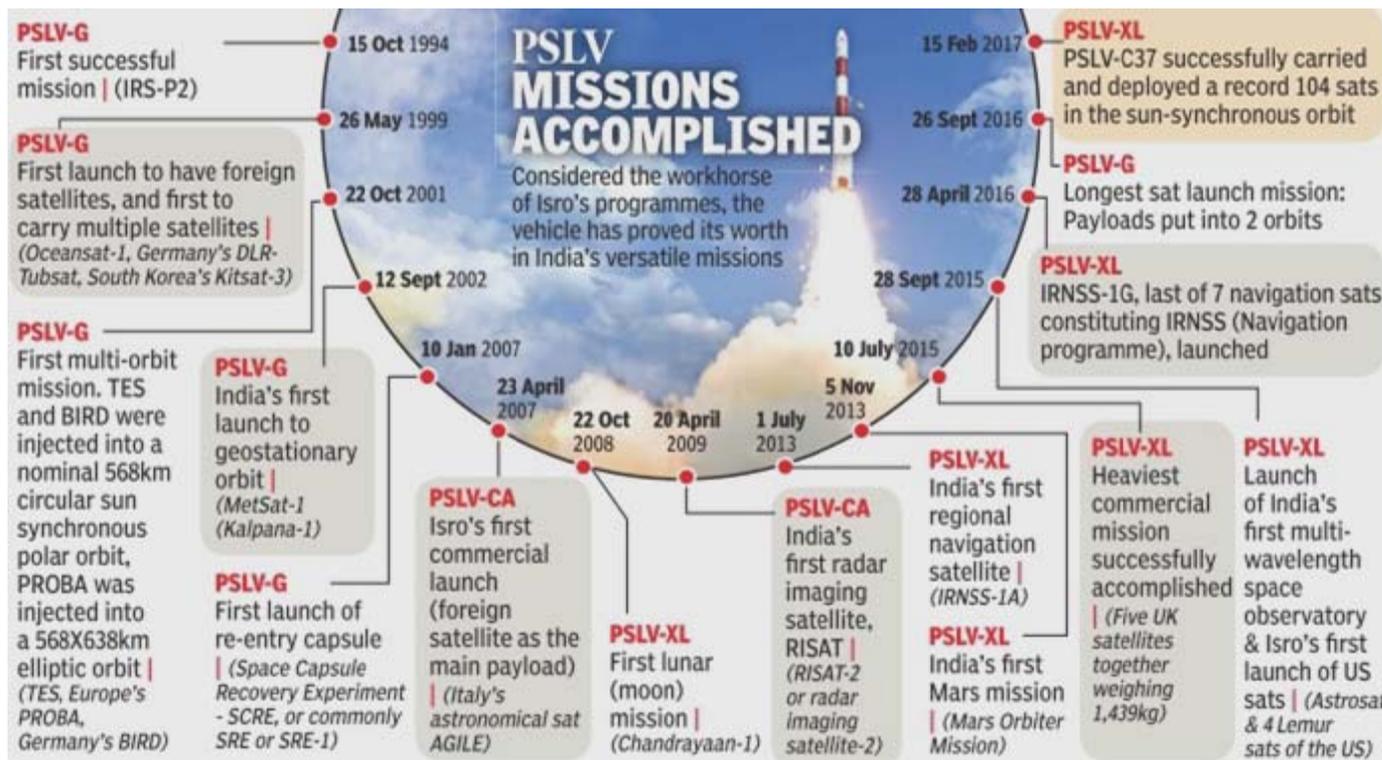
PSLV was originally developed by Isro to launch Indian Remote Sensing (IRS) satellites. However later, it was used for a variety of missions. The vehicle launched different kinds of satellites, including surveillance satellites like Cartosats, the country's first multi-wavelength space observatory Astrosat and navigation satellites (IRNSS). Known for charting an incredible trajectory, PSLV is, therefore, called the workhorse of Isro's space programmes.

The PSLV was first launched on September 20, 1993. The first and second stages performed as expected, but an altitude control problem led to the collision of the second and third stages at separation, and the payload failed to reach the desired orbit.

Dr K Sivan, director of Thiruvananthapuram-based Vikram Sarabhai Space Centre told TOI, "The first launch of PSLV in 1993 was unsuccessful. However, data collected from this failed mission was used to take all corrective measures for subsequent missions. After the 1993 setback, PSLV has never seen failure as all subsequent launches till now have been successful. Proving its versatility, PSLV had carried payloads not

only to the lowearth orbit (350-400 km altitude) but also to the furthest Mars orbit (Mangalyaan travelled 650 crore km from the Earth for over 300 days to reach the Red Planet's orbit).“

“PSLV , however, will not be used for Chandrayaan-2 as Isro is planning a heavier payload carrying a lunar rover to Chandrayaan this time. Therefore, GSLV is the preferred choice. But PSLV is definitely being readied for the Aditya mission (solar mission in 2019),“ Dr Sivan added.



Sun, 02 July, 2017

IIT Guwahati succeeds in regenerating damaged nerve

By R. Prasad

Rats with regenerated sciatic nerve exhibited significantly better walking pattern

Researchers at the Indian Institute of Technology (IIT) Guwahati have taken the first successful step in treating peripheral nerve damage which can result from traumatic injuries caused by accidents, physical conflict, bullet wounds as well as during surgical intervention. The nerve conduits synthesised by the researchers and implanted in rats with sciatic nerve injury showed “excellent” functional recovery one year after implantation. The results were published in the journal *Biomedical Materials*.

A team led by Prof. Utpal Bora from the Department of Biosciences and Bioengineering at IIT Guwahati synthesised nerve conduits by electrospinning a mixture of silk fibroin protein and electrically conductive polymer called polyaniline. To produce tubular shaped nerve conduits, the researchers rolled the electrospun sheets multiple times over a stainless steel spindle.

“In tissue engineering, silk fibroin protein is routinely used as a scaffold. Since silk is not electrically conductive we coated it with polyaniline nanoparticles, which is a good electrical conductor,” says Dr. Suradip Das from the Department of Biosciences and Bioengineering at IIT Guwahati and the first author of the paper; he is currently at the University of Pennsylvania, U.S.

Nerves are like electrical wires where the conducting portion of the nerves is covered with myelin (a fatty white substance) sheath secreted by specialized cells called Schwann cells that forms an insulating layer. To fabricate a conduit that mimics this native architecture, the Schwann cells, which surround the axons, were cultured on the conduits. The Schwann cells were found to grow between the multiple layers of silk fibroin-polyaniline composite, and also on the surface and inside of the conduit.

“The Schwann cells produce myelin sheath which act as biological insulators and play a crucial role in nerve regeneration. Our aim was to seed the conduit with Schwann cells so they initiate the regeneration process when the conduits are implanted in animals,” says Dr. Das.

To test how well the nerve conduit synthesised in the lab helped in nerve regeneration, the researchers removed 10 mm of sciatic nerve from rats and implanted the conduit. The surgical area was reopened after six and 12 months.

Compared with untreated animals where the nerve gap was found to have grown further, the conduits in the treated animals showed no deformation or dislocation. The polyaniline was not toxic to rat Schwann cells when 0.1% of polyaniline was used.

Regenerated neurons

“But most importantly, we found regenerated neurons and Schwann cells inside the conduit. And there was myelin sheath over axons in the regenerated tissue from inside the conduits,” he says. “The conduit helped initiating and enhancing the quality of regeneration across the nerve gap.”

In terms of functional neuro-regeneration, the conduits seeded with Schwann cells exhibited as high as 86% velocity of current propagation through the nerve. The ability of the nerves to control muscle contraction was also found to be good at 80%.

“Nerves when electrically stimulated contract the muscles. We stimulated one end of the conduit electrically and recorded electrical output from the muscle. If there is a gap along the conduit then the signals won’t travel,” Dr. Das explains.

Finally, the electrical property of the muscles that are directly innervated was 70%. “If the nerves don’t reach the muscles then we won’t be able to register muscle electrical activity. If there is good muscle electrical response then it is an indication that the nerve has grown and is able to communicate with the muscles and the muscles are not dead,” he says.

Rats with regenerated sciatic nerve exhibited significantly better walking pattern compared with other groups in the study. “This is proof that our work could restore a lot of the sciatic nerve functions in rats,” Dr. Das says.

From rats to pigs

The next step is to conduct trials on pigs, which are genetically and physiologically closer to humans. “We have plans to undertake trials on pigs to collect more animal data,” says Prof. Bora. But conducting trials on bigger animals might be a challenge in India. “Conducting research on higher animals is proving to be difficult in India,” says Dr. Kushal K. Sarma from the College of Veterinary Science, Khanapara, Guwahati and one of the authors of the paper.

“There is a growing demand for nerve implants with increasing number of road accidents but there are no indigenously developed nerve conduits available in India. We have taken the first step to make locally developed nerve implants available in India,” Prof. Bora says.