

Tejas Mark II to replace Mirage 2000s with capability to deep-strike into enemy territory?

The HAL Tejas Mark II, fitted with heavier GE 414 engine will roll out in 2022 will take to the skies in 2023. The Tejas Mark II is expected to join the Indian Air Force by 2026 with the capability of striking deep into enemy territory just like Mirage 2000s.

The indigenous built Tejas Mark II fighter jet will have the capacity to conduct operations such as the one the Indian Air Force undertook in Balakot and will replace the ageing Mirage 2000 fighters according to Program Director (Combat Aircraft), Aeronautical Development Agency Girish Deodhare.

On February 26, 2019, IAF's Mirage 2000 entered a Jaish-e-Mohammed (JeM) terror camp in Balakot in Pakistani territory as retaliation for the terror group's suicide attack on a CRPF convoy in Pulwama, Jammu & Kashmir.



The Hindustan Aeronautics Limited (HAL) Tejas Mark 2 is a single-engine multirole fighter designed by Aeronautical Development Agency (ADA) and HAL. The plane has tailless compound delta-wing configuration with high manoeuvrability.

The Mark II, fitted with heavier GE 414 engine, will roll out in 2022, take to the skies in 2023 and join IAF by 2026. The Tejas MK II is a 4.5 generation aircraft.

Program Director Deodhare said that the MK II will have double the range of its predecessor MK I and will be fitted with Astra II BVR air-to-air missiles with a range of at least 150 km.

“While Tejas MK I is for combat air patrol within the Indian territory, MK II will have the capacity to conduct Balakot-like surgical strikes in enemy territory as it will carry heavy standoff weapons like Crystal Maze and Spice missiles,” added Deodhare.

While work on MK II is proceeding as per schedule, ADA and Indian Air Force (IAF) sealed a deal for twin-engine advanced medium combat aircraft (AMCA) in the next three months. Earlier, IAF gave a written commitment to DRDO that it would buy the fifth-generation AMCA to strengthen its strike capabilities. AMCA is expected to roll out in 2024 and take to the skies the following year.

According to Deodhare, Hindustan Aeronautics Limited (HAL) will produce 16 FOC 9(Final Operational Clearance) Tejas plus eight trainers before the reverse integration of IAF's Tejas in the initial configuration is taken up.

“HAL has done a commendable job to produce a FOC Tejas within a year of the design being frozen. This will help up in faster development of MK II as this only involves in upscaling of the existing platform with superior armaments, radar and avionics,” he said.

For the MK II, ADA in collaboration with its parent DRDO is developing the indigenous active electronically scanned array (AESA) radar, which is not only difficult to detect but also has a high resistance to jamming by the enemy during an engagement.

The Tejas Mark II would incorporate the new features of the Mark 1A as well as a new glass cockpit with an eight-by-twelve-inch multifunction display and an onboard oxygen system that collects air from the outside, removing the need for oxygen bottles.

According to secondary research by EurAsian Times and quoting open sources – Tejas Mark II will be equipped with a multi-sensor data fusion system which will feature an active electronically scanned array radar, infrared search and track and a missile approach warning system.

The fighter jet will also comprise of an internalized electronic warfare suite. The aircraft will be designed to have network-centric warfare capacity and will be equipped with artificial intelligence-based “optimally manned” cockpit. The cockpit will be designed such that the ground control would be able to take over the controls of the aircraft in case the pilot becomes unconscious, after being alerted by a sensor in the helmet of the pilot.

<https://www.defencenews.in/article/Tejas-Mark-II-To-Replace-Mirage-2000s-With-Capability-To-Deep-Strike-Into-Enemy-Territory-809840>



Sun, 22 March 2020

Coronavirus: Defence, atomic energy labs too roped in for testing

Bengaluru: As concerns of a probable community spreading linger and governments — Centre and states — scramble to marshal all resources to mitigate the same, it has been decided to rope in even labs under the Defence Research and Development Organisation (DRDO) and Department of Atomic Energy for testing Covid-19. Other national labs under the department of biotechnology (DBT), department of science and technology (DST) and the Council of Scientific and Industrial Research (CSIR) will also be allowed to do the same.

The decision was made at the first meeting of the Empowered Committee for Covid-19 response, which was co-chaired by Niti Aayog member Vinod Paul and Professor K VijayRaghavan, principal scientific advisor to Government of India.

An office memorandum issued after the meeting late on Saturday reads: “National research labs (defined as labs of DBT/DST/CSIR/DRDO/DAE for this directive) are permitted to carry out clinical testing for COVID19 based on self-assessment and willingness to follow established protocols and all applicable reporting regulations as defined by the DHRICMR.”

These labs are permitted to access samples for Covid19 related research from any government approved clinical testing site or access clinical samples received by them for testing, subject to ethical approval.

“..Results from such research are required to be expeditiously shared in open formats to maximise impact of research. Clinical care agencies are directed to enrich the open dataset by providing de-identified clinical data,” the memorandum adds.

Further, labs with biosafety level three (BSL-3) or BSL-3+ facilities with these agencies (DBT/DST CSIR/DRDO/DAE), are permitted to culture the virus and serve as additional testing and validation sites for research, based on self-assessment of BSL-3 facilities and willingness to follow established protocols as defined by the Department of Health Research and ICMR.

“They may further share reagents and facilities with other national labs to ensure maximum effort for rapid solutions,” the memorandum read, while adding that hospitals (Centre, State and private) must also cooperate with national labs for clinical sample collection where there is an ethical approval in place, subject to capacity for such work and ability to follow established protocols.

<https://timesofindia.indiatimes.com/india/coronavirus-defence-atomic-energy-labs-too-roped-in-for-testing/articleshowprint/74758973.cms>

The history of germ warfare and how prepared India is

The raging advance of Covid-19, the desperate search for a vaccine, clueless politicians, economic crisis and widespread panic could also teach us how to respond to bioterror attacks. Is India ready?


By Ravi Shankar and NC Bipindra

The dying months of 2001 were bad for America and the world. Less than a month after Islamic terrorists crashed airplanes into the World Trade Center, 62-year-old photojournalist Bob Stevens was admitted in a Florida hospital on October 2, 2001. The initial diagnosis was meningitis but it was soon found to be poisoning by anthrax, a weapon of bioterrorism. A few days later, in India, the Postal Department received 17 “suspicious” letters believed to be infected with anthrax spores. Though many individuals and institutions received the envelopes with white powder, none of them tested positive. It was dismissed as a copycat hoax.

“Biological attacks, both state-sponsored and otherwise, are a real threat despite the many treaties prohibiting them. Though the Indian Army is trained to prepare for chemical, biological, radiological and nuclear attacks, the programmes are on the back burner due to lack of resources,” says Centre for Joint Warfare Studies Director Lieutenant General Vinod Bhatia (retired), who was previously Director General, Military Operations. India, with its vast disorganised population, dismal health facilities and poor connectivity, is sitting on a virus time bomb. Though the fatality, infection and recovery rate of Covid-19, as the novel coronavirus is called, is comparatively low, experts are not sure full data is available.

BIOLOGICAL WARFARE PROGRAMMES DURING WORLD WAR II	
Nation	Focus
GERMANY	Plague, typhoid, cholera, anthrax, and a new synthetic medium for the spread of these bacteria; aerosol dispersants and methods of spraying nerve agents like Tabun and Sarin from aircraft; malaria-carrying mosquitoes (secret)
CANADA	Animal and crop diseases, rinderpest, anthrax
UK	Animal and crop diseases, anthrax, foot and mouth disease
JAPAN	Extensive; official information suppressed by a treaty with USA in which all charges for war crimes were dropped for exchange of information from experiments
SOVIET UNION	Typhus, plague
USA	Chemical herbicides, anthrax (started too late to be important)

* Estimated
 Source: Baylor College of Medicine, US, and other research websites

POTENTIAL BIOTERRORISM AGENTS/DISEASES	CATEGORY A	CATEGORY B	CATEGORY C
	Anthrax, Botulism, Dengue, Ebola, Hantavirus, Lassa, Marburg, Plague, Smallpox, Tularemia	Caliciviruses, Chikungunya, Cholera, E. coli O157:H7, Hepatitis A, Ricin toxin, Salmonella, Typhus fever, Yellow fever, Zika	Antimicrobial Resistance, Hendra, Influenza (highly pathogenic strains), MERS, Nipah, Prions, Rabies, SARS, Tickborne encephalitis, Tuberculosis
	<ul style="list-style-type: none"> ❖ Pose the highest risk to national security ❖ Can be easily disseminated or transmitted from person to person ❖ Result in high mortality rates and could have a major public health impact ❖ Require special public health preparedness actions ❖ Have potential to cause public panic and social disruption 	<ul style="list-style-type: none"> ❖ Pose the second highest risk to national security ❖ Are moderately easy to disseminate ❖ Result in moderate morbidity rates and low mortality rates ❖ Require enhanced diagnostic capacity and disease surveillance 	<ul style="list-style-type: none"> ❖ Emerging pathogens that could be engineered for mass dissemination ❖ Are easily produced and disseminated ❖ Have potential for high morbidity and mortality rates and major health impact ❖ Are available
<small>Source: Baylor College of Medicine, US</small>			

Answering the Covid Question

The pandemic has sent countries and economies into a tailspin. As soon as the outbreak began from Wuhan in central China, conspiracy theorists warned that the virus had escaped from the Wuhan Institute of Virology, a military lab in the province which is dedicated to the study of deadly pathogens. According to Dany Shoham, Israeli biological warfare specialist and expert on Chinese biological warfare capabilities, the institute is part of Beijing's secret bioweapons programme. In 2019, Canada expelled Chinese researcher Xiangguo Qiu who was working in a government-run lab, which studies numerous infectious diseases, including Ebola, to create vaccines and cures. She had previous experience working in Chinese labs dealing with lethally infectious diseases. China is currently building around five bio-facilities.

Beijing has blamed the US Army for bringing the virus to their country. Foreign ministry spokesman Zhao Lijian tweeted on March 12, "When did patient zero begin in US? ...It might be US army who brought the epidemic to Wuhan." Tweeting sympathy for China, former Iranian President Mahmoud Ahmadinejad suggested that the "#Corona lab-made virus" was deliberately created as a biological weapon by Beijing's enemies to halt the country's progress. The US, Europe, Russia and Australia have around 50 functioning or under-construction maximum-security labs, according to news reports. Western intelligence suspects that Iran and North Korea also possess chemical weapon labs. The study of dangerous pathogens such as Ebola or Marburg cannot be conducted without importing the viruses into a country. All nations doing virology research have lab biosafety levels of (BSL-4) with 24/7 security with their own air supply and filters.

But in the face of Covid-19 crisis, US President Donald Trump plunged America into panic by dithering, dismissing the impact with outright falsehoods. Many political leaders are in quarantine indicating that nobody is safe. Whole cities and countries are in lockdown. Says a former Indian Air Force Commander-in-Chief of a key Air Command, "The actions and capabilities required to tackle bioterrorism are identical to the ones required to contain coronavirus. Large medical facilities are needed to isolate, treat, and decontaminate patients before discharging them. You need special

clothing for personnel operating in contaminated areas, not just masks.” Two lethal non-conventional warfare threats haunt global security.

- Biological weapons manufactured by terrorists.
- Chemical agents used by totalitarian governments to kill dissidents at home and abroad.

No Prevention for Lone Wolf Attacks

Currently, Japan is on a war footing to prevent bioterror attacks during the July-August Tokyo Olympics, which is expected to attract 600,000 visitors from abroad. For the first time, it has imported five types of live viruses—Ebola, Marburg, Lassa, Crimean-Congo and South American viruses—to study detection and prevention measures. Bringing pathogens into a country is easy for terrorists, since virus sensors are largely ineffective. It is simple for a terrorist to unleash a contagion—germs can be mixed in powders and aerosol sprays. They can be sent by mail on infected envelopes or notepaper. They can be added to food or a city’s water supply. They can be released into the wind from a truck, building, or plane. The modern terrorist is highly motivated and educated, and holds advanced science and IT degrees.

There is nothing to prevent a medical student in a private virology research lab from weaponising a tiny amount of smallpox pathogen from existing stocks. Or he can manufacture synthetic versions. Smallpox is difficult to detect and contain since it is extinct and doctors are unfamiliar with its symptoms, which show only two weeks after incubation. A drug named TPOXX has received FDA approval, but hasn’t gone to the manufacturing stage since the disease is classified only a threat. “All of us wish we did not live in a world where terrorists and hostile nation states aspire to kill millions with biological organisms. Twenty years ago, we found ourselves woefully unprepared for the 9/11. Three thousand Americans died as a result. Next time it may be a pandemic and entire cities decimated by disease,” writes retired undercover CIA officer Charles “Sam” Faddis, who headed the agency’s counterterrorism unit tracking weapons of mass destruction.

An important American counterterrorism official testified before the US House Permanent Select Committee on Intelligence that al-Qaeda in the Arabian Peninsula has “high” intentions to procure chemical weapons and biological devices, particularly in Pakistan and Yemen. According to an Indian Army officer monitoring the quarantine at Manesar in Haryana, the facility has treated several hundreds of travellers from abroad and the military is experienced in handling health emergency cases.

However, the officer, who has over 20 years of service, confided that the Army has not procured new equipment in the last two decades to counter nuclear, biological and chemical attacks, except for developing a Defence Research and Development Organisation (DRDO)-manufactured reconnaissance vehicle for NBC countermeasures in 2003. The Indian military currently deploys nuclear, biological and chemical countermeasures that include DRDO’s domestically developed quarantine vehicles for battlefield decontamination efforts. It has brought Joint Service Lightweight Integrated Suit Technology from the US to help troopers wade through contaminated areas safely and conduct decontamination exercises. Security agencies fear Islamic State (IS) operatives or terrorists could detonate a dirty nuke; after the Pulwama strike-back, Pakistan had threatened nuclear retaliation.

Dirty Bomb is Real

In 1995, Chechen militant leader Shamil Basayev buried a dirty bomb in a Moscow park, threatening to turn the city into “an eternal desert”. Though it turned out to be just a warning, the fear that a small motivated group can make an active dirty bomb became real to world intelligence. A non-nuclear dirty bomb will disperse radioactive materials to contaminate areas and kill thousands. Such explosive devices are easier for a homegrown radical to make in his garage. According to the International Atomic Energy Agency (IAEA), “millions of radioactive sources have been distributed worldwide over the past 50 years” in myriad commercial, industrial, medical and research sites in over 100 countries. Most of these facilities are poorly guarded, making them vulnerable to theft.

In 1987, two Brazilian men stole a teletherapy unit from an abandoned cancer clinic to sell for scrap. Fascinated by the sci-fi deep blue light pulsing through a small opening, they disassembled it. The glow was caused by caesium gamma radiation beams used in the treatment of malignant tumours. Both thieves were infected and died. They had given pieces of the suit to friends and relatives with fatal consequences. The government spent millions of dollars to decontaminate topsoil where the suit was discarded. Buildings were demolished. Locally produced goods were boycotted and prices dropped by 40 percent. Tourism collapsed. Ironically, the same isotopes, which are used to save lives, make ideal materials to produce a dirty bomb.

A malware attack on a nuclear plant could cause another Chernobyl: India has 22 functioning nuclear reactors in seven nuclear power plants with seven more reactors under construction. The world has 450 nuclear reactors in around 30 countries. According to Nuclear Threat Initiative (NTI) Index, a unique public assessment of the status of nuclear materials security conditions in 176 countries, many developing nations are highly vulnerable to sabotage because of poor protective measures.

Fortunately, the Global Threat Reduction Initiative has secured about 1,700 radiological sites around the world containing enough material to make tens of thousands of large dirty bombs. Counter-terrorism experts believe that US President Donald Trump's peace deal with the Taliban which imposes no restrictions on them could lead to the next 9/11 or worse. The impact of the Covid-19 tsunami will prod a rethink on conventional responses to unconventional weapons. "Any anti-India group may be overtly or covertly contemplating a strike. By indoctrination and financial inducement, they could lure scientists and technicians working in biotech and cyber labs," says Major General Nilendra Kumar, who retired as the Judge Advocate General of the Indian Army a decade ago.

Governments as Criminals

Biological terrorism apart, countries at war have mercilessly unleashed chemical warfare on enemy combatants and their own citizens. The Russians and their Soviet forebears were masters at poisoning dissidents. On March 4, 2018, Russian spies smeared respiratory nerve agent Novichok on the doorknob of double agent Sergei Skripal's home, contaminating him and his 33-year-old daughter, Yulia. Once he recovered, MI6 paid for plastic surgery to alter his appearance and gave him a new identity. Previously in 2006, the assassination of former KGB and then FSB agent Alexander Litvinenko—who defected to the UK—by Russians, who covertly put polonium in his food, caused a major diplomatic row between London and Moscow.

In London in 1978, a Bulgarian communist agent using an umbrella gun fired a tiny bullet loaded with deadly ricin into defector Georgi Markov's leg. As is evident in the ongoing strife in Syria, the Assad regime has been using chemical weapons since 2012 on civilians. The devastating sarin gas attack in August 2013 killed over 1,400 non-combatants in Damascus. Ironically Syria is part of the Chemical Weapons Convention (CWC) of 1997, which prohibits chemical weapons development, production and deployment and ordered that existing weapons must be destroyed; Assad's violation of the agreement shows the weakness of enforcing policy.

A United Nations-sponsored organisation discovered that the IS used sulfur mustard gas in Syria against civilians for the first time. The Japanese Army killed tens of thousands of Chinese civilians in World War II using poison gas. The occupiers also poisoned over 1,000 water wells to study cholera and typhus outbreaks using villagers as human guinea pigs. The use of chemical agents against the Native American tribes is one of the most shameful incidents in British history: soldiers distributed blankets used by smallpox patients to infect them.

Is India Ready for Germ Warfare?

As far back as in December 1998, India began to train its medical personnel to deal with the eventualities of bioterror attacks. Since it had ratified the 1972 United Nation's Biological and Toxin Weapons Convention, India has not executed a bioweapon programme. However, the Army does maintain defensive biological warfare equipment at protected sites. With extensive help from the advanced dual-use pharmaceutical industry and defence labs, the military is researching ways to

counter germ warfare. India has the scientific capability to carry out a bio-offensive in case of a first strike, using delivery systems ranging from crop dusters to ballistic missiles.

“India does not hold or believe in nuclear, biological and chemical weapons. However, the National Disaster Management Authority has resources and laboratories to counter bio-aggression by a hostile country. Selective attacks would catch the enemy by surprise, inflict a psychological blow and impose a drain on medical resources necessary to attend the victims,” says Major General Kumar. Sources say that India has a sophisticated globally acknowledged biotechnology infrastructure, and sufficient well-trained and knowledgeable scientists, most of who are adequately experienced in handling epidemics. It has numerous pharma production facilities and biocontainment laboratories with Biosafety Levels 3 and 4, according to NTI, a Washington DC-based think-tank.

DRDO is India's biodefence industry's core, whose top laboratory is the Defence Research and Development Establishment (DRDE) located at Gwalior in Madhya Pradesh. It is India's go-to institution for studies in toxicology, biochemical pharmacology and the development of antibodies against bacterial and viral agents. The DRDO works and focuses on countering biothreats such as anthrax, brucellosis, cholera, plague, smallpox, viral hemorrhage fever and botulism. Additionally, the government has established nuclear, biological, and chemical (NBC) warfare directorates in the armed forces, as well as an inter-services coordination committee to monitor their training and preparation. The military has set up an NBC cell at Army Headquarters as well.

However, DRDO's massive failures of its indigenous weapons programmes do not paint an inspiring picture. Says former Indian Air Force Group Captain Sandeep Mehta, “India's preparedness to tackle a bioterror attack ranges from poor to pathetic, and its capability is limited to helping relief providers who are then expected to deliver.” The Biosafety Level 2 laboratory at the Institute of Preventive Medicine in Hyderabad provides guidance in preparing the government for a biological attack. However, Indian Army's Medical Corps specialists have publicly expressed reservations that Indian hospitals are inadequately prepared. CISF has been enabled to deploy specially trained first responders. In January 2003, the government announced changes in India's nuclear use doctrine, which now retains “the option of retaliating with nuclear weapons”, after the discovery that al-Qaeda manuals taught the production and use of toxins.

After the December 2002 Parliament attack, an Indian parliamentary committee considered plans to make underground bunkers to protect MPs from nuclear and biological attacks. Then defence minister George Fernandes indicated that “the government has initiated necessary steps to ensure protection from a nuclear and bio-attack.” In an apparent follow-up in August 2004, the then Home Minister Shivraj Patil indicated that Indian scientists were formulating a response to potential biological, chemical, and other non-conventional forms of terrorism. India has stringent export control regulations outlined in the Special Chemicals, Organisms, Materials, Equipment, and Technologies (SCOMET) guidelines. Its national export product control list, which identifies goods, technologies and services are subject to dual-use licensing requirements.

However in 2003, the US sanctioned two Indian companies charged with violating government regulations by supplying dual-use plant equipment to the Saddam Hussein regime for its chemical and biological weapons programmes, the NTI website says. In June 2015, India and the US signed a 10-year defence framework agreement for cooperation in the development of defence capabilities, including “a lightweight protective suit effective in chemical and biological hazard environments.” In September last year, Defence Minister Rajnath Singh warned that bioterrorism is among the new threats facing the country and asked the Armed Forces Medical Services to find effective ways to deal with new threats posed by advancing battlefield technologies. Whether Covid-19 is a bioterror weapon which went awry or a virus that got away, the real threat of a humanity ending, manufactured contagion unleashed by hostile countries for world domination haunts governments, military leaders, scientists and security experts worldwide. In spite of sophisticated electronic surveillance,

countermeasures, scientific research and human intelligence, the coronavirus proves that the bugs are never too far to arrive at a location near you soon.

Conspiracy theorists have warned that the novel coronavirus had escaped from the Wuhan Institute of Virology, a military lab dedicated to the study of deadly pathogens. According to an Israeli biological warfare specialist, the institute is part of Beijing's secret bioweapons programme. China is currently building around five bio-facilities.

The US, Europe, Russia and Australia have around 50 functioning or under-construction maximum-security labs, according to news reports. Western intel suspects that Iran and North Korea also possess chemical weapon labs.

Al-Qaeda in the Arabian Peninsula has "high" intentions to procure chemical weapons and biological devices, particularly in Pakistan and Yemen, states a testimony by a top US counterterrorism official.

Syrian ruler Bashar al-Assad has used choking agents, such as chlorine gas and blister agents like sulphur mustard. The 2013 sarin gas attack killed over 1,400 non-combatants in Damascus. Ironically, Syria is part of the prohibitory Chemical Weapons Convention of 1997.

A UN-sponsored organisation has discovered that the IS used sulfur mustard gas in Syria against civilians—the first time an Islamist group used bioweapons. Security agencies fear rogue IS operatives or terrorists could detonate a nuke.

IAEA says "millions of radioactive sources have been distributed worldwide over the past 50 years" in several commercial, industrial, medical and research sites in over 100 countries. Most of these are poorly guarded.

Allegations During the Post-world War II Period

- The Eastern European press stated that Great Britain had used biological weapons in Oman in 1957.
- The Chinese alleged that the USA engineered a cholera epidemic in Hong Kong in 1961.
- In July 1964, the Soviet newspaper Pravda asserted that the US Military Commission in Columbia and Colombian troops had used biological agents against peasants in Colombia and Bolivia.
- In 1969, Egypt accused "imperialistic aggressors" of using biological weapons in the Middle East, specifically causing an epidemic of cholera in Iraq in 1966.

How a Terrorist Can Unleash a Contagion

Viruses can be mixed in powders and aerosol sprays.

They can be sent by mail on infected enveloped or notepaper.

They can be added to food or a city's water supply.

They can be released into the wind from a truck, building, or plane.

A student in a private virology research lab can weaponise a tiny amount of smallpox pathogen from the stocks.

<https://www.newindianexpress.com/magazine/2020/mar/22/the-history-of-germ-warfare-and-how-prepared-india-is-2118975.html>