

THE DRONE CHRONICLE

“By creating an enabling regulatory framework and policy, the government is encouraging manufacturers to enhance capabilities and increase production.”

Neel Mehta,
Co-founder & Director, Asteria Aerospace
Interview with Business Today



DGCA India and EASA have signed a letter of intent for technical cooperation & developing common understanding on Unmanned Aircraft Systems and Innovative Air Mobility.

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ASTERIA AEROSPACE RECEIVES TYPE CERTIFICATION FOR ITS SURVEILLANCE & INSPECTION DRONE A410-XT

Asteria Aerospace, a full stack drone technology company, has received type certification for its A410-XT drone from the Directorate General of Civil Aviation (DGCA). Asteria now is the first company to have 3 DGCA type certified drones – 2 under the small category and 1 under micro category. This certification makes the A410-XT drone fully compliant with the safety and quality standards laid down in the Drone Rules, 2021 for operations in the Indian airspace.

Asteria’s A410-XT drone is a multirotor platform with a best-in-class endurance of more than 60 minutes and versatile payload capabilities suited for surveillance & security and industrial inspection applications. It is

packed with safety features such as dual GPS sensors for redundancy, terrain follow, geofencing, and failsafes for low battery, communication loss, and high winds. The drone features quick-connect swappable payloads providing day or night, high resolution, high zoom aerial video and images.

The A410-XT ensures robust and secure communication in all environments with a long-range, digital Multi-Input Multi-Output (MIMO) communication link integrated with AES-128 bit data encryption for maximum security. With its lightweight and flexible design, the A410-XT drone is ideal for serving both defence and enterprise applications.

Asteria becomes the first company with 3 DGCA type certified drones



DRONES WORLD INTERVIEW



Drones World Editor Bethireddy Kartikeya in conversation with - **Mr. Neel Mehta, Co-Founder & Director, Asteria Aerospace Limited**

What was your key objective behind starting Asteria Aerospace?

When we started Asteria over a decade ago, our main objective was to use our experience and knowledge in the aerospace sector, apply it towards developing a nascent drone industry, and in the process reduce India’s foreign dependence in a core engineering field. The defence market was the largest market for drones at

that time and hence we set our sights to design, develop, and manufacture high-performance, rugged, and reliable drones for military and paramilitary end users.

“Drones are also being used to digitize and inspect critical infrastructure spread across the country, such as telecom towers, oil & gas pipelines, and heavy industry facilities for preventive maintenance, audit, and optimization purposes.”

What is your biggest USP that differentiates the company from competitors?

Asteria is vertically integrated in hardware design & manufacturing, software platform development, and providing drone services at scale. This integration allows us to develop and deploy deeply customized solutions for our customers and provides them with a one-stop partner for all their aerial data needs. Asteria is also first drone manufacturer in India with 3 DGCA type certified drones – 2 under the small category and 1 under micro category. We have a growing team of more than 300 people and are one of the few companies in India that can manufacture and deliver hundreds of drones per year. Our focus on customer needs, long term solutions, and our scale differentiates us from competitors.

What are some of the new and emerging areas of potential growth in the drone industry?

While drone technology evolved to primarily serve military forces, today it finds uses in sectors as diverse as agriculture, oil & gas, mining, telecom, and healthcare – to improve operational efficiency, safety, and cost. For example, Kisan drones are being used for effective spraying of pesticides and nutrients over farms, thereby reducing time, improving efficiency, and enhancing safety. Drones with advanced sensors are also being used in digitizing farms for crop health analysis, land usage planning, transparent & quick settlement of insurance claims, and other areas.

Drones are also being used to digitize and inspect critical infrastructure spread across the country, such as telecom towers, oil & gas pipelines, and heavy industry facilities for preventive maintenance, audit, and optimization purposes. One of the innovative use of drones is for the faster transport of critical items such as medicines, vaccines, blood samples, and other healthcare items. In hilly and mountainous areas, drones can cut the transport time of these items by as much as 5-6 times compared to road transport, with the potential to save human lives. Over time, logistics drones carrying cargo and people can be an area of high potential growth.

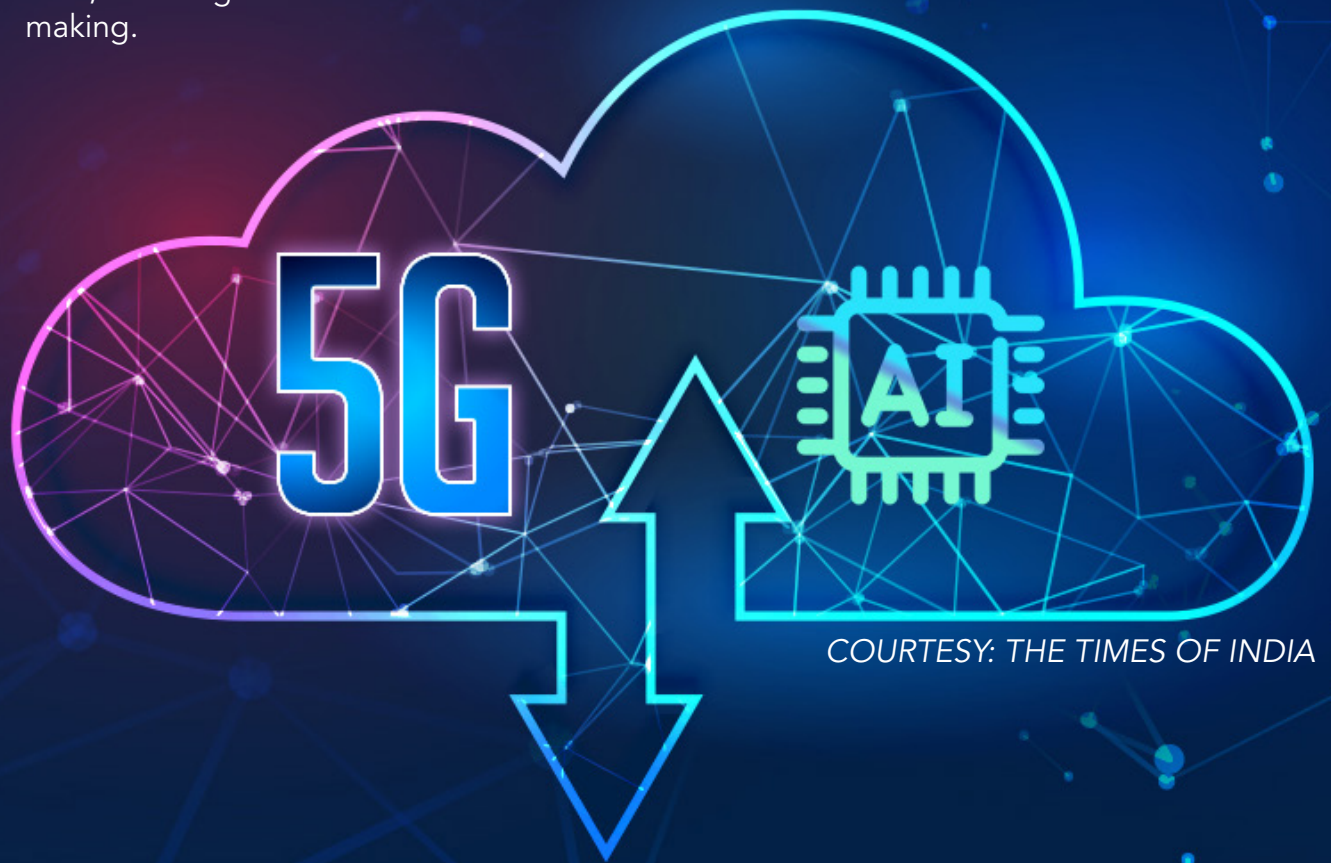
ASTERIA: INNOVATING IN DRONES WITH AI, 5G, CLOUD

Neel Mehta and Nihar Vartak founded Asteria Aerospace over 10 years ago, with the idea of developing drones for defence applications. The two developed and sold drones to the Indian military, paramilitary, and state police forces, who used the services for surveillance and reconnaissance purposes. The liberalization of drones in 2021 encouraged the two to become more ambitious. Last year, Asteria launched a drone operations and analytics platform called SkyDeck, which helps to streamline the delivery of Drone-as-a-Service solutions for diverse applications.

Asteria has IP across the drone tech stack – hardware, software, and analytics. “We design and manufacture multiple drone platforms ranging from 2kg to 25 kg. They are easy to use, they are rugged, and performance driven,” says Neel. Their drones, he says, can be used across industrial

applications, such as surveillance and security, land surveys, agricultural surveys as well as inspection of critical assets like pipelines, powerlines, and telecom towers. SkyDeck helps in seamlessly managing the planning & execution of drone flights, data processing, visualization, and analytics to provide business insights from drone data. It enables AI-based analysis of drone data, ensuring easier and faster decision-making.

Today, Asteria has a team of more than 300 people, out of which more than 60 are in R&D. In 2019, Reliance Industries’ arm Jio Platforms acquired a majority stake in Asteria. Mehta says there are lots of opportunities to innovate in drone solutions using emerging technologies, such as 5G, AI, edge/cloud computing, fuel cells, and advanced sensors.



COURTESY: THE TIMES OF INDIA

HOW CAN DRONE TECHNOLOGY TRANSFORM OIL & GAS PIPELINE MONITORING?



Advancements in drone technology are revolutionizing the oil and gas industry. Drones are helping oil & gas companies to detect problems, keep track of safety conditions, and reduce damage caused by leaks and other such issues. In this blog, we will discuss a specific use case of drones in the oil & gas industry – pipeline monitoring.

Drone technology is improving, and it’s becoming more cost-effective than other methods. With drone technology, you can monitor pipelines in places that are not accessible by other methods. This can be especially useful if you have multiple pipelines to monitor or if there are areas where vehicles cannot go due to terrain or weather conditions.

Drone-based monitoring involves the use of drones to monitor oil and gas pipelines. It can be used to detect problems, such as leaks or cracks in the pipeline. Drone monitoring also has applications for safety conditions, such as detecting if a pipeline segment has been damaged by an accident or construction activity. With drones, monitoring can be done remotely without deploying manpower on field. This helps in optimizing resource allocation and utilization and fast-tracking data collection.

Using drones for pipeline monitoring makes it easier to detect

problems, keep track of safety conditions, and reduce damage. Some of the benefits of drone-based pipeline monitoring include reduced human risk, time and cost efficiency, increased asset safety with more frequent inspections, better record keeping of asset condition, easier to track differences in old encroachments and formation of new ones, and hassle-free maintenance of the overall integrity of the pipeline network.

We’re already seeing a shift in how drones are being used for pipeline monitoring. It’s not just about inspecting the pipeline, but also about how we can use drones to better monitor our infrastructure and reduce the risk of accidents.



BLOOD DELIVERY BY DRONES ACROSS INDIA MAY SOON BE REALITY, SAYS ICMR AFTER SUCCESSFUL TRIAL RUN

Blood delivery through drones can soon be expanded to the whole country, a senior official said after the Indian Council of Medical Research successfully conducted a trial run of blood bag delivery by drones under its iDrone initiative on Thursday. The initiative was in continuance with the national mission of expanding the drone ecosystem in India. The ‘i-DRONE’ was first used by ICMR during the COVID-19 pandemic for distributing vaccines to hard-to-reach areas.

COURTESY: BUSINESSINSIDER.IN

CASE STUDY

Client: A leading agriculture & crop science company

Industry: Agriculture

EMPOWERING FARMERS AND IMPROVING CROP PRODUCTION

Need for Innovation in Agriculture

The agriculture and crop science company develops new seed hybrids and varieties that can increase crop yield for farmers. The seed development process requires performing seed trials, testing, and analysis in different fields across geographies and seasons. During these trials, thousands of seeds need to be planted and the growth of the emerging plants need to be monitored to select the best performing seed candidates for development. Manually assessing the physical traits (phenotypes) of the plants, such as emergence, vigor, uniformity over a growing cycle is a time-consuming process which lacks accuracy and transparency. The company needed a faster, digital, and accurate method of plant phenotyping to streamline field operations and downstream decision-making.



Field Operation Needs	Challenges in Manual Data Collection
Precise measurement of field area and field isolation distances in critical to estimate output and reduce possibility of cross-pollination.	Measurement of field area and field isolation distances performed manually with GPS devices delivers can result in errors of up to 10 meters.
Emerging plant stand count is needed to compare performance between different seed hybrid varieties, and for estimating yield during seed production.	Performing stand counts by walking through a field is a hugely time-consuming task. Typically, sample measurements are taken in a small area and extrapolated over farm plots which gives inaccurate results.
Uniformity of plant growth and plant height is critical to compare the performance between different seed hybrid varieties.	Understanding the uniformity of a field is difficult without the right technology.
During seed production, de-tasseling is performed manually to prevent self-pollination and improve seed hybrid quality.	No effective and transparent way to verify 100% detasselling of plants to achieve optimum yield.

Asteria's Role

The agriculture and crop science company reached out to Asteria with the goal of exploring how drone imagery can simplify field operations for their seed development and seed production activities. It needed to have access to near real-time farm and crop imagery and analytics to make the right decisions, at the right time. Asteria, with in-house drones, pan-India drone operations teams, and end-to-end cloud platform SkyDeck, were put to work to bring more transparency and efficiency to seed trials and seed production operations by turning aerial data into actionable intelligence. Drones were flown over each farm plot, two to three times in a growing season to collect imagery. The images were then processed by Asteria and analysed using AI/ML algorithms to generate desired business outputs.

Technology at Work



DGCA type certified A200 drone

- Flight Altitude: 25 meters above ground level
- Flight Speed: 2 m/s
- Sensor - Sony 36 Megapixel APS-C sensor
- Ground Sampling Distance: 0.2 cm/pixel
- Flight Time: Less than 20 minutes to cover 1.5 acres of field

SkyDeck

A cloud-based drone operations platform that facilitates the delivery of drone-as-a-service solutions to enterprises across several industries, including agriculture.

Output

- Digitized, ortho-rectified images of all farm plots throughout the growing season visualized on SkyDeck.
- Field boundaries, field area, and field isolation distances with an accuracy of less than 50 cm.
- Report of geo-referenced plant stand counts plot with an accuracy of more than 92%.
- Report of plant uniformity per plot.
- Measure field area & determine and annotate field boundaries on SkyDeck.
- Isolation distance in Excel from Field A to Field B.
- Tassels detected with 99% accuracy and flower bud recognition with 90% accuracy.
- Multispectral maps depicting plant stress level (NDVI, NDRI, SAVI, etc.).

Benefits

- Faster, data-backed decision-making for field operations
- Accurate plot level insights that would be difficult or impossible with other methods
- Simplified seed trials by timely deactivation of non-performing hybrids
- Greater transparency and quality assurance in seed hybrid selection process with digital documentation
- Higher production and quality of seed varieties

The Impact

Asteria Aerospace helped the agriculture and crop science company make their farming operations faster, more transparent, and more accurate with drone-based aerial data.

WHAT MAKES THE BEST PILOT TRAINING DRONE?



The drone industry has been on an upward growth trend ever since the Indian government started coming up with supportive measures to simplify production, operation, and adoption. The manufacturing and operational rules have been relaxed. There has been a significant increase in production, thanks to the favourable schemes brought up by the government in the last 2-3 years. We are seeing drones being used in newer applications across industries every other day.

However, there are some specific requirements put forward by the DGCA

for becoming a professional drone pilot. The most important requirement is to get certified by a drone training institute approved by DGCA. Similarly, for a training institute to be DGCA certified, it should have a DGCA type certified drone along with fulfilling other requirements laid down by the aviation regulator.

Institutes without DGCA certification looking to make the most of the opportunities presented by this growing industry have certain requirements to fulfill. One of the most important requirements is to have a training drone that is type certified by DGCA and comes with all the advanced features required to provide drone pilot training to candidates. Also, drone training institutes that are DGCA certified but don't have a drone that could take their training programme to the next level, also need to switch to a better drone, both in terms of safety and performance.

Asteria's A200-XT training drone has best-in-class features that set it apart from other training drones. It is a DGCA type certified easy-to-use drone, which means that it meets the highest standards of safety &

quality under Drone Rules, 2021. It also weighs 50% lighter than other available alternatives. It has a dual controller with Master-Slave configuration, which allows both trainer and student to gain control of the drone at the same time. The trainer can control the drone better during training session with master-slave configuration to keep it safe.

The A200-XT training drone is intuitive & easy-to-use. It comes with Asteria's proprietary Mission Control Software (MCS) that makes piloting the A200-XT effortless. MCS features point-and-click mission planning, full payload control with video, snapshot and record/playback to unlock the full potential of the drone platform. It provides 360° peace of mind with safety first features. With obstacle detection system and dual GPS sensors along with its built-in features, such as geofencing, quick return to launch, and multiple failsafe modes ensure complete protection. In addition, it is compact, portable, and comes with tool-less assembly. The A200-XT comes with an ergonomic backpack, which makes it highly portable and ready for immediate training use - from box to flight in under 5 minutes.

DRONES – THE SUNRISE SECTOR

Authored by, **Nihar Vartak, Co-founder & Director, Asteria Aerospace**

Drones are expected to emerge as the most versatile tools by the end of this decade. NITI Aayog reaffirms this statement as it predicts the drone market to expand to \$50 billion in the coming 15 years.

The drone manufacturing landscape has changed for the better in the last few years. The government and its industry-friendly policies have made a world of difference to fast-track the evolution of the drone sector. In the last couple of years, the government has introduced several policies and schemes for the betterment of the sector. A much-relaxed regulatory framework has created a conducive environment for drone manufacturers, encouraging them to enhance their capabilities and increase production. The first edition of the PLI scheme has worked wonders as more and more startups are coming to the fore to be a part of this growing sector. It is a tremendous initiative on the part of the government considering the investment and participation it could attract in the coming time. Before the PLI scheme was launched, more than 90% drones used in India were imported. The PLI scheme has given local manufacturers the boost and financial push they require to increase their manufacturing capabilities and capacity. Other initiatives, such as Drone Shakti and Kisan Drones are expected to increase the adoption of drones across industries in the next few years.

Innovation has been the key to the year-on-year progression of the drone sector. Drone companies are investing significantly in R&D

to ensure that they deliver high-quality, safe, and outcome-oriented solutions to their respective customers. The growth of Asteria Aerospace Limited over the years is a good case in point. It has reaped excellent rewards for its focus on innovation as it has emerged as one of the leading drone manufacturing companies in the last few years that is firmly behind the government's objective of making India a global drone hub by the end of the decade.

Drones have the potential to completely transform operations across sectors. By automating operations, drones can improve operational efficiency, ensure worker safety, and significantly cut the time between data gathering and decision-making. Drones eliminate the need for human intervention in collection and analysis of data, thus fast-tracking these processes and reducing the chances of human error. Drones also make data collection easier in locations that are hard-to-reach through traditional methods. By conducting AI-based analysis of data collected by drones, stakeholders across industries can gather actionable insights that can ultimately help in simplifying the decision-making process.

A very good example of the effectiveness of drones in different sectors is how they are being used in agriculture. Automation through drones is helping the agriculture sector solve several problems that have been plaguing its growth for years. Drones are bringing more efficiency and accuracy into various processes across industry sub-sectors, including crop production, crop insurance, and crop plantations.

COURTESY: E-PAPER - SWADESHI JAGARAN MANCH



India is keen to leverage its nascent civilian drone (or unmanned aerial vehicle) industry to become a global hub. Since 2021, it has built a conducive policy ecosystem to support the domestic drone industry. In what this brief collectively calls the Drone Regulations 3.0, it includes the liberalised Drone Rules 2021, a production-linked incentive scheme, the unmanned aerial vehicle traffic management policy, the certification scheme for unmanned aircraft systems, the drone import policy, and the Drone (Amendment) Rules, 2022. This brief traces the evolution of the regulatory environment for the domestic drone industry since 2014 and recommends actions to address the remaining gaps to transform India into a global drone hub.

The Drone Rules (New Rules) 2021 defines drones as "an aircraft that can operate autonomously or can be operated remotely without a pilot on board." Drones, also known as unmanned aircraft systems (UAS) or unmanned aerial vehicles (UAVs), were previously primarily used to carry lethal weapons. However, with technological advancements, their use for civilian purposes has evolved in recent years.

COURTESY: HINDUSTANTIMES.COM