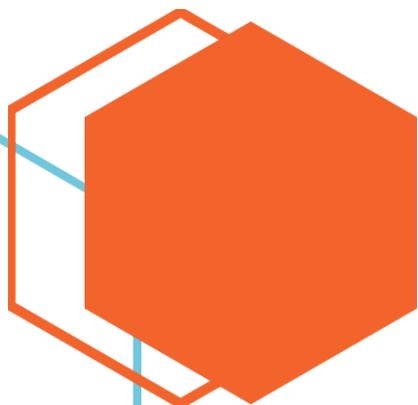




Report of the Working Group

Remotely Piloted Aircraft Systems/ Drone Technology

The report provides a birds eye view of the emerging Drone scenario, risks associated, governance and how insurance industry can make use of the technology and also provide insurance protection to this emerging technology and the various risk factors associated with it.





Dr. Subhash Chandra Khuntia

Chairman
IRDAI
Hyderabad

Respected Sir,

Report of Committee on Remotely Piloted Aircraft System (RPAs) / Drone Technology

I have immense pleasure in submitting the report of Committee on Remotely Piloted Aircraft System (RPAs) / Drone Technology vide circular IRDA/NL/ORD/MISC/160/06/2020 dated 24th July, 2020.

The report and recommendations contains extensive review on the subject, meeting with various Insurers, Re-insurers, Ministry of Civil Aviation (MoCA), State Government of Telangana, manufacturers, operators, FICCI and DFI. The analysis of the report contains the following points:

1. To study the existing practices in the industry on RPA/Drone Insurance.
2. Insurance needs of RPA Owners and operators.
3. To bring uniformity in Product design of RPA owners and operators insurance.
4. Underwriting of such risk by insurers and its re-insurance aspects.
5. Recommendations.

On behalf of the Members of the Committee, and on my behalf, I sincerely thank you for entrusting this responsibility to us. I thank the Authority for giving us the opportunity and support in framing this report.

Place: Mumbai

Date: 12.08.2020

Anjan Dey

Chairman of the Committee

Members

Smt. Arti Mathur
Shri. Savio Fernandess
Shri. S Vishwanathan
Shri. Diptanshoo Singh
Shri. T A Ramalingam
Shri. C. Latha
Shri. Mukesh Kewalramani
Shri. Ajay Kumar



Acknowledgements

At the outset, the Committee expresses its gratitude to the Chairman, IRDAI for providing the opportunity to work on the report on Remotely Piloted Aircraft System (RPAs) / Drone Technology.

The Committee would like to thank the FICCI & DFI for sharing their valuable inputs and suggestions. The suggestions provided a collective industry view and were extremely useful in striking a balanced approach.

The Committee would like to thank the DFS(Ministry of Finance), Ministry of Civil Aviation (MoCA), State Government of Telengana for sharing their valuable inputs and suggestions. The Committee would like to thank the Drone Manufacturers for sharing their valuable inputs and suggestions.

The Committee would like to thank the General Insurance Companies, Re-insurers and others for sharing their views on RPA / drone insurance globally.

The Committee would like to place on record its gratitude to IRDAI for providing the online platform in facilitating the discussions. .

Report of the Working Group



भारतीय बीमा विनियामक और विकास प्राधिकरण
INSURANCE REGULATORY AND
DEVELOPMENT AUTHORITY OF INDIA

IRDAI/NL/ORD/MISC/160/06/2020

Dated:24th June 2020

Sub: Working Group for insurance of Remotely Piloted Aircraft System(RAPS)/ Drone Technology

Drones are emerging as one of the fastest growing technologies and are being used for a variety of purposes. Their numbers are growing rapidly. Drones are playing a significant role in the current COVID 19 situation, assisting various authorities in several activities. There is an immediate need to make available suitable insurance products covering the various risks involved in the use of Drones.

2. In the above backdrop, the Authority has decided to constitute a Working Group as follows:

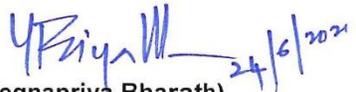
Sr. No.	Name	Designation	Organization	Chairperson / Member
1.	Shri.Anjan Dey	General Manager	The New India Assurance Co. Ltd	Chairman
2.	Smt. Arthi Mathur	General Manager	Oriental Insurance Company Ltd	Member
3.	Shri. Savio Fernandes	Deputy General Manager	GIC Re	Member
4.	Shri. S. Vishwanathan	Head, Commercial Lines Underwriting	SBI General Insurance Company Ltd	Member
5.	Shri.Diptanshookumar	Deputy Vice President	TATA AIG General Insurance Co. Ltd	Member
6.	Shri.T.A.Ramalingam	Chief Technical Officer	Bajaj Allianz General Insurance Company Ltd	Member
7.	Smt. C. Latha	Deputy General Manager	Re-insurance Department, IRDAI,	Member
8.	Shri.Mukesh Kewalramani	Assistant General Manager	Actuarial Department, IRDAI,	Member
9.	Shri. Ajay Kumar	OSD (AGM)	Non-Life Department, IRDAI	Convenor

Report of the Working Group



3. The **Terms of Reference** of the Working Group are as under:

- I. Study and understand the insurance needs of RPAS owners and operators
 - II. Make recommendations relating to design and development of product/s meeting the needs of RPAS owners and operators, including Third Party Liability.
 - III. Make recommendations relating to underwriting of such risks including the re-insurance perspective.
 - IV. To examine any other relevant matter relating to the subject.
4. The Working Group shall submit its report within six weeks of the date of this Order.


(Yegnapriya Bharath) 24/6/2021
Chief General Manager (Non-life)



ABBREVIATION

1. BVLOS	: Beyond Visual Line of Sight
2. CAGR	: Compound Annual Growth Rate
3. CAR	: Civil Aviation Regulation
4. CGL	: Commercial General Liability
5. D&O	: Directors & Officers
6. DAN	: Drone Acknowledgement Number
7. DFI	: Drone Federation of India
8. DGCA	: Director General of Civil Aviation
9. E&O	: Errors & Omission
10. FAA	: Federal Aviation Administration
11. FICCI	: Federation of Indian Chambers of Commerce and Industry
12. LIDAR	: Light Detection and Ranging
13. MoCA	: Ministry of Civil Aviation
14. MoD	: Ministry of Defense
15. MTOM	: Maximum Take Off Mass
16. MV Act	: Motor Vehicle Act
17. NCRD	: National Counter Rogue Drone
18. NOC	: No Objection Certificate
19. NPNT	: No Permit /No Take off
20. OAN	: Ownership Acknowledgement Number
21. RC	: Radio Controlled
22. RPA	: Remotely Piloted Aircraft
23. RPAS	: Remotely Piloted Aircraft System
24. RPV	: Remotely Piloted Vehicle
25. TPL	: Third Party Liability
26. UAN	: Unique Authorization Number
27. UAOP	: Unmanned Aircraft Operator Permit



- 28. UAS : Unmanned Aircraft System
- 29. UAV : Unmanned Aerial Vehicle
- 30. UIN : Unique Identification Number
- 31. UTM : UAS Traffic Management
- 32. VLOS : Visual Line of Sight
- 33. VTOL : Vertical Take Off and Landing



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Report of the Working Group

Remotely Piloted Aircraft Systems/ Drone Technology

A brief on the scope of the report.

The report would focus on the available insurance products in the country and how international insurance markets are helping the Drone sector to manage its risks and grow exponentially as the technology has unlimited scope in its applications.

Action plan carried out by the group

The working group after taking the brief from the Authority, held discussions with Joint Secretary, DFS, Ministry of Finance, Joint Secretary MoCA, various Insurers and Reinsurers, representatives from Drone Federation of India (DFI), Federation of Indian Chambers of Commerce and Industry (FICCI), Representative from the manufacturing Sector and also with Director Emerging Technologies Wing, ITE&C Dept, Govt of Telangana.

Due to the Pandemic situation the discussions were held through web-based interactions and minutes of the meeting were recorded.

The interactions were held after drawing out detailed questionnaire for each of the industry specialist interviewed and further enquiries were made through emails on areas requiring clarity.

Report flow

The report provides a glimpse of Drone Universe, its potential in the country, applications and risks involved, governance and finally the suggested coverage. Few recommendations have been made in certain areas for the Authorities - IRDA, DGCA and Government of India.

Drone Insurance – How Insurers view this emerging Technology

Presently there is no specific insurance product in the country for this sector though few insurers have offered Third Party Liability covers with an amount up to Rs.20 Lakhs.

The Reinsurance Market also is keenly watching this space as various coverage issues have cropped up right from drone itself, the ensuing liability arising out of its use, privacy and data protection risks, effect of cyber-attack on drones and its insurance.



Executive Summary

The drone ecosystem is in nascent stages in our country and finding more usage/ applications in various sectors at a slower pace.

World over drone is classified as an '*aircraft*' and the Aviation Regulators have stepped in to regulate the sector, though regulations for Drone operations differ from country to country. Following the Aviation Regulators, international markets have considered insurance options for the drones under Aviation lines of business and not in the traditional lines of business.

Government of India has brought in policies (*Drone Policy 1.0, 2018 and Drone Policy 2.0, 2019*) which initiated the Aviation Regulator of the country **Director General of Civil Aviation (DGCA)** to come out with Regulations – **Civil Aviation Regulation CAR 1.0, 2018** and recently Draft **Unmanned Aerial Vehicle Systems, 2020**.

Governance aspects have been well addressed in respect of regulating the drone ecosystem. However, issues related to Privacy by design in the manufacturing process of drones, deterrent actions for privacy violations etc. are yet to be addressed.

Various insurance solutions have been in practice internationally covering drone body (**Hull**) and **Third- Party Liability (TPL)** either on a comprehensive basis or only for stand-alone basis TPL. Additional covers for cyber risks, privacy breach, noise pollution is being considered in some markets and of course product innovation like “pay as you fly” is also in existence. Though major insurers are shy of providing drone insurance cover to model clubs / leisure drone flying or competitive racing, it is seen that few niche insurers are offering such coverage's.

The Draft UAS 2020 has suggested compensation in respect of Third-Party Liability to be on the lines of Motor Vehicles Amendment Act 2019, which in the group's opinion is partially acceptable in situations like Section 164 of Amendment Act of 2019 (Payment of compensation in case of death or grievous hurt). However, as per the committee the unlimited liability (Section 166) and Solatium Fund appearing under MV act is a cause of concern to develop a feasible drone insurance ecosystem in view of non-availability of claim data for drone losses and lack of re-insurance support for unlimited liability.

The report has looked into the insurance requirements of the RPA owners and operators, suggested coverage's along with draft / specimen wording, factors which affects the pricing (premium) and finally the underwriting considerations which may be followed.



Few suggestions / recommendations have been made on the governance /privacy issues, and if adopted will provide a robust environment in the country for the drone operations.

The drone insurance market has gained traction over the years, however, the lack of claim data and understanding surrounding the risk involved in UAS operations has made this particular area of Aviation challenging for insurers and re-insurers. Nevertheless, the Insurance market is eager to learn, develop and support this nascent industry.

As the Drone market is still evolving, the group faced challenge in obtaining the claim insights, however an attempt has been made on the procedures to be followed and the documentation required in the event of a claim.



Chapter 1- History of Drones and its Evolution

1.1 Introduction

One can't imagine a life without technology that has far reaching impact in every human's life on our planet Earth. **Remotely Piloted Aircrafts (RPAs)** alias **Unmanned Aerial Vehicles (UAVs)** alias **Remotely Piloted Vehicles (RPV's)** alias **Drones** is a technology which has a rich history of over 170 years.

Before we go there, let's understand what a Drone is? There are various definitions which describe Drones and a couple of them are given below:

- i) *An unmanned aircraft or ship **guided by remote control** or onboard computers¹.*
- ii) *A **drone**, in technological terms, is an **unmanned aircraft**. ... Essentially, a **drone** is a **flying robot** that can be remotely controlled or fly autonomously through software-controlled flight plans in their embedded systems, working in conjunction with onboard sensors and GPS.²*
- iii) ***Unmanned aerial vehicles (UAVs)** are aircraft with no on-board crew or passengers. They can be automated 'drones' or **Remotely Piloted Vehicles (RPVs)**. UAV's can fly for long periods of time at a controlled level of speed and height and have a role in many aspects of aviation³.*

The concept of **Drone** started in 1849 when Austria attacked Venice using around 200 unmanned balloons stuffed with explosives, where each balloon carried around 11-14Kg of explosives. Once in position, these explosives were dropped from the balloons, to create havoc in the city. Though it wasn't very successful at that time, but it surely was an innovation in the field of military technology. And it was this thinking that pushed the Drone Technological development in the coming few decades and centuries

Technically speaking the drone which we know today, is different than the unmanned balloons. And the **first pilotless aircraft** (drone in current avatar) was developed in 1916 during the World War 1. Developed by the British engineer Archibald Lou, the creation was called *Ruston Proctor Aerial Target*, which could be launched from the back of a truck using compressed air.

Shortly after this the U.S. Army built the **Kettering Bug**, which used gyroscopic controls and was intended to be used as an "aerial torpedo". Nicknamed as "Bug", it could be launched from a 4 wheeled dolly that rolled down a portable track.

¹ Source: <https://www.merriam-webster.com/dictionary/drone>

² Source: <https://internetofthingsagenda.techtarget.com/definition/drone>

³ Source: Imperial War Museum: <https://www.iwm.org.uk/history/a-brief-history-of-drones>



After World War 1, the period of 1930-45 saw other major leaps forward in military drone technology which was the result of unwavering and sustained UAV technological developments. It was Vietnam War (1955-75), which saw the first use of drones with cameras for reconnaissance. The need of drones was also felt strongly by other countries too, who began to explore the use of UAVs for different military applications, which led to more sophisticated designs and improved technology.

It was during 1960s when the breakthrough in transistor technology made way to miniature radio-controlled components, which led to boom in **Radio Controlled (RC)** planes during the decade and it became popular among civilians too, when several RC aircraft clubs started by hobbyists.

While Military purpose dominates the first century in Drone technology, *it was in 2006 when **Federal Aviation Administration (FAA) USA, officially issued the first commercial drone permit***⁵. Since then there is no looking back for the commercial drone development and its applications.

1.2 Understanding Drones

Operation of drones can either be remote controlled by a pilot sitting at a remote location or pre-programmed to operate automatically without any human intervention.

Below table⁶ depicts possible main systems and subsystems that form a UAV.

UAV				
Ground Control Systems	Mainframe	Power Plant	Navigation & Electronic system	Payload

⁴ Source: National Museum of the United States Air Force

⁵ Source: <https://interestingengineering.com/a-brief-history-of-drones-the-remote-controlled-unmanned-aerial-vehicles-uavs>

⁶ Source: MDPI Article: Reliability and Maintenance Analysis of Unmanned Aircraft



1.3 Types of Drones:

Drones with their lightweight frames vary considerably in terms of size, weight, payload capacity, flight time and functionality. A lot depends on the purpose for which they are used. There are primarily two types of drones i.e.

- Rotary Drones. Rotary drones in turn can be single rotor or multi rotor drones &
- Fixed Wing Drones

A. Multi Rotor Drones

Multi Rotor Drones are UAVs that use more than two **rotors** with fixed-pitch spinning blades that generate lift. By changing the speed of the **rotors** so that the thrust generated is greater than, equal to or less than the forces of gravity and drag acting on the aircraft, the **drone** can be made to ascend, hover or descend



Source: Google Images

B. Single Rotor Helicopter.

While a multi-rotor has many different rotors to hold it up, a single rotor has just one, plus a tail rotor to control its heading.



Source: Google Images



C. Fixed Wing Drones.

A **fixed-wing drone** has a rigid structure which generates lift under the **wing** due to forward airspeed. This is produced by either an internal engine or electric motor-controlled propeller. They will require either a handheld or runway take-off and can fly continuously over long distances as opposed to hovering



Source: Google Images

Table⁷ below shows typical uses and advantages and limitation for different types of drones

Type	Advantage	Limitation	Typical Uses
Multi-Rotor	<ul style="list-style-type: none"> • Accessibility. • Ease of use. • VTOL and hover flight. • Good camera control. • Can operate in a confined area. 	<ul style="list-style-type: none"> • Short flight times. • Small payload capacity. 	Aerial Photography and Video Aerial Inspection.
Fixed-Wing	<ul style="list-style-type: none"> • Long endurance. • Large area coverage. • Fast flight speed. 	<ul style="list-style-type: none"> • Launch and recovery needs a lot of space. • no VTOL/hover. • Harder to fly, more training needed. • Expensive. 	Aerial Mapping, Pipeline and Power line inspection.
Single-Rotor	<ul style="list-style-type: none"> • VTOL and hover flight. • Long endurance (with gas power). • Heavier payload capability. 	<ul style="list-style-type: none"> • More dangerous. • Harder to fly, more training needed. • Expensive. 	Aerial LIDAR laser scanning.

⁷ Source: <https://www.auav.com.au/articles/drone-types/>



As per 6Wresearch, Rotary blade drones have dominance amongst type in India commercial drone market in terms of revenues. However, the next few years will see rise of Fixed Wing Drones due to their less complex structure and long endurance.



Chapter 2 –Drones Industry Overview

2.1. Global & Indian Scenario

Now that we have a brief background of how Drone Technology was evolved and what are the types of drones, in this section we will look at the current scenarios and trends in Drone Industry of slightly more developed markets and in India.

The commercial drone market has seen substantial growth in last one decade, primarily due to increased adoption of its applications across various sectors, like Infrastructure, Oil and Gas, Agriculture, Mining, Media and Entertainment etc. As per Drone Industry Insights⁸, the drone market will grow from 22.5 billion USD in 2020 to 42.8 billion USD in 2025 at a CAGR (Compound Annual Growth Rate) of 13.8%. The report further says that Asian economies such as China, Japan and India will be the future biggest Regional Markets for the drone sector.

If we look at Europe, the growing drone marketplace is showing immense potential, and is expected to grow to Euro10 billion annually by 2035 and over Euro15 billion annually by 2050. The majority is expected to come from civil missions i.e. government and commercial business, highlighting their importance in the marketplace. Point to note is that Europe is not alone in its persistent efforts to generate value from drones. The USA and China are two other nations which are investing heavily into technology and businesses that currently exceeds the level of total European investments. While the USA is leader in production of defence drones, China is the leader in producing leisure units that also tend to be used for more and more professional purposes too⁹.

In India the Drone Industry and market both are at nascent stage even though the technology has been present in the country for some time now. Indian drone space initially was limited to defence and military purpose but slowly its application is getting momentum in recreational and commercial space. On August 27, 2018, The **Ministry of Civil Aviation (MoCA)** released the **National Drone Policy 1.0**, making flying drones in India legal.

There are multiple government agencies and public sector entities who have piloted and even scaled up operations of Drones. As per **Federation of Indian Chambers of Commerce (FICCI)**, major push from present Indian Government, to use drones for civil purposes shall help in growth of domestic Drone Industry to approximately US\$ 421million (Rs.3100 Crores) by 2021-23. Similarly, as per 6Wresearch, the Indian Unmanned Aircraft Vehicle market is projected to grow at a CAGR of 18% during 2017-23/24*. The Indian market continues to be

⁸ <https://www.droneii.com/the-drone-market-size-2020-2025-5-key-takeaways>

⁹ Source: European Drone Outlook Study 2016- Unlocking the value of Europe



majorly import driven, and the Chinese company DJI held the major market share of approx. 60%. However, it started showing a decline after **NPNT (No Permission NO Take off)** has been made mandatory under the regulations.

The **Director General of Civil Aviation (DGCA)** under **Ministry of Civil Aviation (MoCA)** had come up with guidelines on **Remotely Piloted Aircrafts (Drones)** in August 2018 to flourish drone-based services and safety risk assessment of such operations within the country. Under these regulations, RPA's (Drones) in India are categorized into five segments as per Maximum All up Weight (including payload) as:

- a) Nano: Less than or equal to 250 grams.
- b) Micro: Greater than 250 grams and less than or equal to 2 kg.
- c) Small: Greater than 2 kg and less than or equal to 25 kg.
- d) Medium: Greater than 25 kg and less than or equal to 150 kg.
- e) Large: Greater than 150 kg.

The regulatory framework in India is being discussed in more detail in later sections of this report.

Drone Industry is a fast evolving, where frequent technological changes are the reality. Like any other industry, even this industry has its own set of challenges and the fact that it's at nascent stage; it has more challenges in her share. Few concerns of Indian Drone Industry are mentioned below:

- Dependence on imported drone components.
- Technology is evolving faster than the policy and regulatory regime.
- Concerns around national security, criminal acts, safety and privacy violations.
- Improper infrastructure to support after sale services.
- Drone pilot training is still restricted to only handful of DGCA approved flying schools.

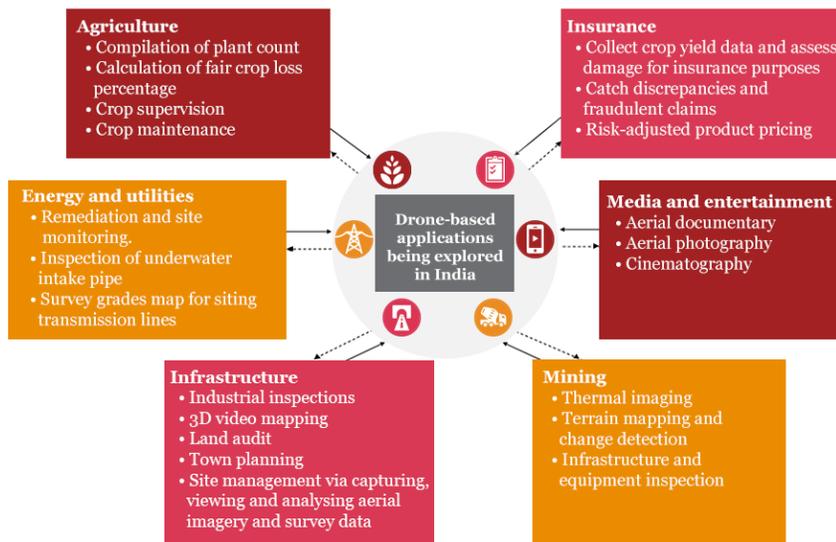
2.2. Applications of Drones

Affordable technology, Easy accessibility, Cost savings against traditional methods, ability to have real time monitoring, and reach for large geographical spreads with better quality output are few key parameters which is driving the adoption of Drones for various civil and industrial applications.



Unmanned Aerial Vehicles (UAV's) when leveraged with other emerging technologies like Artificial Intelligence, Augmented Reality, 3D modelling, Internet of things, Virtual Reality, etc., increases the output quality of data which they collect as a platform. Coupled with these technologies, very meaningful insights are derived out of the collected data, which are used by various industries/sectors.

Image¹⁰ below highlights segments in India where drone-based solutions are being explored



As seen globally, even in India the majority traction has been noticed in Infrastructure and Agriculture

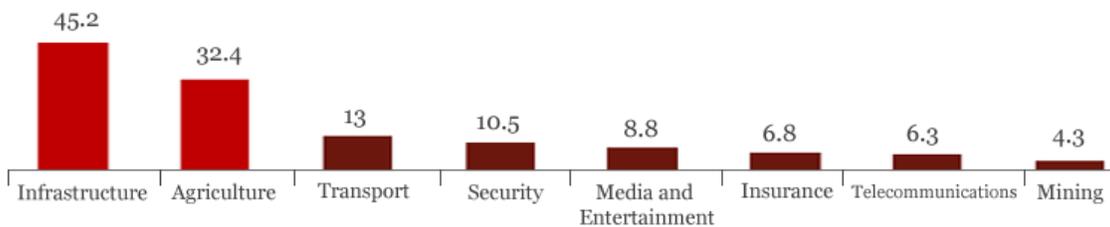


Image Source: PWC Report on Drones¹¹

¹⁰ Source: <https://www.pwc.in/consulting/financial-services/fintech/fintech-insights/data-on-wings-a-close-look-at-drones-in-india.html>

¹¹ Source: <https://www.pwc.in/consulting/financial-services/fintech/fintech-insights/data-on-wings-a-close-look-at-drones-in-india.html>



Following are few examples of drone technology adaption by different sectors in India, which came to limelight and the information is also available in the public domain

Infrastructure: The Andhra Pradesh Government is taking help of Drones to monitor the development activities of the Capital City region i.e. Amravati.¹²

Agriculture: Recently, Drones were used in Rajasthan in Anti Locust operations. In fact, India is the first country to use Drones for anti-locust operations worldwide¹³. Drones are used to estimate the crop yield data on experimental basis.

Power: Maharashtra Transco is the first power utility to get DGCA approval for powerline inspection using drones. Drones not only gives cost-effective solution but also reduces the human life risk.

Oil and Gas: Indian Oil is the first oil company to get the DGCA approval for pipeline inspection using drones. It gives immense benefit by increasing the quality of inspection and minimise the risk of oil theft worth several hundred crores.

Transport: Indian Railways has used drones for monitoring the 25 Km long Seawoods-Belapur- Uran Corridor¹⁴

Mining: As per PWC report, A larger Indian steel multinational company has used drones on pilot basis to monitor mining activities. The objective of the company in using drone application was surveillance of the mining area, lease boundary inspection, inspection of safety zone and counting vegetation in reclaimed area.

Disaster Management: Drones are deployed to scan areas where search and rescue teams could not access. National Disaster Management Authority (NDMA) first used it for Uttarakhand flood.

Surveillance: Drones were actively used for the surveillance and monitoring in containment zones during COVID-19 lockdown.

¹² Source: <https://www.pwc.in/industries/government-and-public-sector/preparing-for-takeoff.html>.

¹³ Source: Ministry of Civil Aviation- Media interaction by Hon'ble Minister of Civil Aviation- 16th July 2020, New Delhi

¹⁴ Source: <https://www.pwc.in/industries/government-and-public-sector/preparing-for-takeoff.html>.



Chapter 3 – Drone Ecosystem governance

3.1 Introduction

As a drone is classified under the family of **Remotely Piloted Aircrafts** (RPA), the **Government of India (GOI)** has decided to regulate this sector through **Director General of Civil Aviation (DGCA)**. The following paragraphs talk about the governance issues in the drone ecosystem.

3.2 Governance through Drone Policies

The **Drone Policy 1.0 (2018)** concentrated on **Visual Line of Sight (VSOL)** operations which can be noticed in the regulations of **DGCA** known as **Civil Aviation Regulation (CAR 1.0, 2018), Section 3- Air Transport Series – X Part 1, issue dated 29th August 2018** with effective date of 1st December 2018. The Regulation attempted the following areas - classification of drones based on weight, imports of drones, local procurement & manufacturing, methods of drone identification, permits and approvals for the drone sector including operator permits, allowed frequencies & flight path, operating restrictions, safety and security issues, drone Pilot training, upkeep and maintenance of drones, legal obligations, insurance and law enforcement.

Subsequently, the **Ministry of Civil Aviation (MoCA)** in January 2019 published the **Drone Policy 2.0¹⁵**, which had widened the scope of drone operations into autonomous operations mode, development of drone ports, drone traffic management (**UAS Traffic Management or UTM**) and extending the operations to **Beyond Visual Line of Sight (BVLOS)** and also beyond the current height limit of **400 feet** and even **Night operations**. Some of the salient features of the policy are as below: -

- The policy advises drone manufacturers to incorporate features to bring in **data protection / privacy** in the design stage itself (**privacy by design**) so that any harm by operators can be eliminated.
- There is a suggestion to UAS operators to have a **Professional Liability Insurance** to cover the cost of legal fees and damages awarded against them.
- The policy recommends allowance of **100% FDI** leading to infrastructure developments such as **Dedicated Drone Corridors** (separate air space for flying the drones), **Drone Ports** (similar to Airports where drones can take off and land) which would eventually require a separate Regulatory body such as **Drone Directorate** under DGCA.

¹⁵ Drone Ecosystem Policy Roadmap – January 2019



- The policy recommends a ceiling on the life of drones (airworthiness) after which UAS owners/operators will have to apply for recertification.
- The policy has given rise to hopes in commercializing the drone segment for payload deliveries such as food items, life-saving drugs, collection of test specimen from patients for testing in laboratories and even cadaver harvested body organs for transplantation surgeries.
- The policy allows new players (Service Providers) in the **Digital Sky**¹⁶ platform, to be known as **Digital Sky Service Providers** (DSPs) who can be a registered entity in India (public or a private) and they would be ultimately managing the drone traffic (UTM) and also provide support to Law Enforcement besides taking care of the UAS operators requirements.
- There are recommendations for improvement in Pilot training so as to meet the professional requirements of emerging situation as above.
- Finally, the policy also suggested newer governance measures either by amending existing CAR 1.0 - Air Transport Series – X Part 1 or by a separate Civil Aviation Requirement covering all aspects.

3.3 Governance through Regulatory Manuals & Amended rules

The Regulator **DGCA** has issued **Guidance Manual**¹⁷ wherein detailed procedural aspects in the acquisition of **RPA's** are explained along with procedures for applying to obtain **Unique Identification Number (UIN)**, and **Unmanned Aircraft Operator Permit (UAOP)**. Also, the requirements for the following are provided - Pilot Training, Manufacturing requirements, **No Permit /No Take off (NPNT)** approvals through Digital Sky platform for ease of operators.

DGCA has recently come out with a draft - **The Unmanned Aircraft System (UAS) Rules, 2020** (3rd June 2020) which is expected to replace the existing **CAR 1.0 (2018)**, in line with the suggestion of **Drone Policy 2.0**. Once notified, it will be tabled in the Parliament and if there are no suggestions from the Parliament, it would come into force as the new Regulation.

We observe there are significant changes in the UAS Rules, 2020, which would bring more control/ governance of the sector.

¹⁶ Digital is an online IT platform developed for handling UIN, UAOP applications, permission to fly RPAs in India. The link for the portal is <https://digitalsky.dgca.gov.in/>

¹⁷ DGCA RPAS Guidance Manual, Revision 1 - 2019



3.4 Governance through ease of Approvals

The **Ministry of Defense (MoD)** has launched a web portal¹⁸ this year (2020) wherein **No Objection Certificate (NOC)** can be obtained for taking aerial survey and **DGCA** would be providing the final clearance.

The portal can be used by **UAS** Operators engaged by state governments/ PSUs etc. in seeking **NOC** from **MoD**. The Ministry will expedite the approvals for carrying out aerial survey and/ or remote sensing surveys.

3.5 Governance through enforcement of noncompliant drones

We have read in newspaper reports of drones being operated without following any Regulations. To control this menace (unregulated /non-compliant drones), **Ministry of Civil Aviation (MoCa)** issued a notice on 13th January 2020 wherein one time opportunity was provided for the voluntary disclosure of drones (applicable to all types of drones, models, prototypes, toys, radio-controlled aircraft, remotely piloted aircraft systems etc).

Subsequently **DGCA** has once again extended this opportunity in the recent **8th June 2020** directive. As per the directive, operators/persons in possession such non-compliant drones can submit the required information/ voluntary disclosure through the online portal **Digital Sky**. Upon providing information drone owners will receive **Ownership Acknowledgement Number (OAN)**. Subsequently drone related technical data needs to be submitted to DGCA upon with **Drone Acknowledgement Number (DAN)** will be provided. In case a drone owner is having multiple drones, the owner can use the same **OAN** for all the drones under his possession, however as separate **DAN** will be issued for each drone.

For an operator, mere possession of Acknowledgment Numbers (**OAN /DAN**) is not sufficient to operate the drones and they must obtain other necessary permissions to fly.

3.6 Governance through Anti Drone technologies.

While there are many positives to the Drone Technology, the negative side usage also is a matter of concern as it can range from plain nuisance to airspace interference, kinetic attacks (where drone can provide lethal blows to soft targets), smuggling activities, arming/weaponizing the drones and electronic attacks. Further the capability of the drones in moving stealthily (undetected) or in swarms (large numbers like locusts) is even more sinister to civil society.

¹⁸ <http://www.modnoc.ncog.gov.in/>



The **Ministry of Civil Aviation (MoCA)** has come out with **National Counter Rogue Drone Guidelines (NCRD Guidelines)** in 2019 wherein the following have been addressed.

- Guidelines for assessing the drone threat.
- Generating technology awareness while handling the danger from drones.
- Counter drone technologies and Counter Rogue deployment plan.
- Creating an institutional setup for Counter drone measures.

3.7 Governance through protecting Privacy.

The **Drone Policy 1.0** in the form of regulation (**CAR 1.0, 2018, Section 12.21**) touched upon privacy issues briefly, where it was suggested that privacy norms of any entity are not compromised in any manner. However, there is no further guideline or directive given when someone's privacy is compromised. The regulation could have provided explicit deterrents such as penalty/cancellation of permit etc., or for that matter jail term for such actions.

Further **CAR 1.0, 2018** informs that an operator should apply for permit when conducting a drone survey (remote sensing) / aerial photography along with details of objects to be photographed, its purpose etc. However, there should be detailed guidelines and appropriate checks and balances to be introduced by the regulator.

The exemptions offered to government agencies in various State Governments and the Central Government are wide in nature. When they (State Governments) engage private vendors to carry out drone activities, then it can become a serious data protection /privacy issue. However, there should be well laid procedures and guidelines related to setting up of technical and organizational measures designed to implement data protection principles as part of any RPA's operations that collects personal data, and to integrate the necessary safeguards to protect the rights of data principles.

It is desired that the agencies who carry out the work on behalf of the State/Central shall not be allowed to retain the data nor to be allowed to exploit the data for any commercial purpose.

The **Guidance Manual under Section 1.4.3** suggests – “The following privacy principles must be embedded into the design:

- Proactive not reactive; Preventative not remedial.
- Privacy as the default setting.
- Visibility and transparency – keep it open.
- Respect for privacy of all the stakeholders – keep it ecosystem-centric.



But there is no further detailing given to the manufacturers as to what is meant by privacy by design. **The guidance manual may include sections to elaborate the design by privacy criteria in future amendments.**

3.8 Governance through Insurance

The **CAR 1.0 2018 under Section 17.1**, suggested that all civilian **RPA** Operators shall have insurance with the liability that they might incur for any damage to third party resulting from the accident/incident.

Recently, the Ministry of Civil Aviation has notified the draft **Unmanned Aircraft System (UAS) Rules, 2020** (3rd June 2020). In the said draft under **Section 52** the following recommendations have been provided, -

- (1) No **UAV** shall be operated in India unless there is in existence a valid **third party insurance policy** to cover the liability that may arise on account of a mishap involving such UA and causing death or bodily injury to any person or damage to property.
- (2) The **compensation** payable in such cases shall be assessed in such a manner and procedure as specified in the **Motor Vehicles Act, 1988** and rules made there under.

Though the regulator has made mandatory on the Third-Party insurances, the compensation to be on the lines of Motor Vehicle act is somewhat not in line with international practices. International markets underwrites Third-Party insurance under Aviation lines of business. Let us see the compensation under MV act.

Section	Liability Type	Procedure	Compensation	Remarks
161	Special provisions as to compensation in case of hit and run motor accident.	“Hit and Run” motor accident means an accident arising out of the use of a motor vehicle or motor vehicles the identity where of cannot be ascertained in spite of reasonable efforts for the purpose;	Rs. 2,00,000/- For Death. Rs. 50,000/- For Grievous hurt.	Fixed compensation claimed under Motor Vehicle Accident Fund.



Section	Liability Type	Procedure	Compensation	Remarks
164	Payment of compensation in case of death or grievous hurt etc.	Fixed compensation	Rs. 5 Lakhs for Death (fixed amount). Grievous hurt Rs.2,50,000 (fixed amount). Grievous hurt as per definition given under section 320 of IPC.	Fixed Compensation If claim is made under section 164, one cannot make claim under 166.
166	Fault Liability: Sec. 147 (2) for the purposes of third party insurance related to either death of a person or grievous hurt to a person, the Central Government shall prescribe a base premium and the liability of an insurer in relation to such premium for an insurance policy.	Claimant /legal heirs of victim must prove in the Court, the wrongful act /negligence/ default of the owner/driver causing injury/death.	Compensation is Unlimited based on age /income /dependency etc. and as per judgement of SC additional liability of future prospects as per age of deceased.	One can claim either under 164 or 166. Once claim is paid under section 164 claims under section 166 is not maintainable.

The fixed compensation arising out of ‘No fault Liability’ basis of Rs.50,000/25,000 not a problem in developing insurance product for drones, ***however aspects like creating a Solatium fund similar to motor vehicles for hit and fly / hit and crash drones is unthinkable, as there is little opportunity for the drone insurance segment to generate such funds. (There is no NFL under new Act and new fund is motor vehicle accident fund is only for road accident cases)***

Similarly, the structured basis formula payment on ‘No fault Liability’ can be considered while designing the insurance product, however the ***unlimited legal recourse brings in an element of uncertainty in determining the exposures which is a key concern to insurers and reinsurers in supporting this promising technology and developing the drone insurance ecosystem within the country.***

Liability as per Sec. 164 can be considered instead of unlimited liability under section 166.

Hence it is recommended that the Third-Party Liability insurance be in line with Aircraft /Aviation liability as is the practice in the developed nations.



3.9 Aviation Liability Cover – an overview.

Aviation Regulators of major countries consider the **drone as an aircraft**. The liability arising out such a flying object is excluded in the **Commercial General Liability (CGL)** policies by way of a standard exclusion as follows

This insurance does not apply to any liability arising out of or connected directly or indirectly with ownership, maintenance, possession, legal control or use (use includes operation and Loading or Unloading) by or on behalf of the Insured of

- a. any Aircraft or aerial device.
- b. Land, Building or Structures in an area where Aircraft land or take off or are housed, maintained or operated (drone ports)
- c. water-borne vessels, Watercraft or Hovercraft.
- d. Auto (including trailer) which is registered or is required under any legislation to be registered; or
- e. Auto (including trailer) in respect of which compulsory insurance is required to be effected by virtue of any legislation or where such insurance cover is in force

This exclusion does not apply to:

- a. a Watercraft while ashore on Premises owned by or rented to the Insured, or
- b. the parking of an Auto on Premises owned by or rented to the Insured, provided the Auto is not owned by or loaned or rented to the Insured, other than for income or reward as an Auto parking operator

Further **CGL** policies have **Aircraft Product** related exclusions as provided below which rule out many things such as **payload, drone control systems**, etc.

This insurance does not apply to any liability arising out of or connected directly or indirectly with **any aircraft** product or any missile or spacecraft or aerial device including any

- a. article, equipment, material, part or spare part installed or otherwise incorporated in, on or under any aircraft, missile, spacecraft or aerial device, or furnished or used in connection therewith;
- b. air or space communication, guidance or navigation system;
- c. ground control, handling or support equipment or tools furnished or used in connection therewith;
- d. equipment or tools furnished or used in connection with manufacturing, repairing or servicing any of the foregoing;



- e. blueprints, designs, drawings, information, instructions, manuals, maps, opinions, reports, representations, software, specifications, surveys, training aids, warnings or warranties or engineering or other data furnished or used in connection with any of the foregoing; or
- f. engineering or other advice, instruction, labor or service relating to any of the foregoing.

Aviation Insurance Policies provide liability coverages (**both Bodily Injury and Physical Damage**) arising out of the use of the aircraft which are listed in the policy in the territories of aircraft operations covered. Typically, this cover is a **duty to defend cover** wherein an insured has to notify a potential threat upon which the insurer is obliged to provide defense against claims made in the liability policy. The standard exclusions are

- Employees and others related to insured's business;
- Operating crew;
- Property belonging to care custody control of insured;

In our view, the Aviation insurance market has not obtained credible experience with the threats perceived from the drones as the penetration of drone insurance is yet to happen in a large scale.

Based on the discussions with few insurers and reinsurers, we understand that they (insurers & reinsurers) are interested in providing a **Comprehensive Insurance Cover** i.e. both **Hull** (drone body) and **Third-Party Liability** rather than stand-alone Liability cover or Hull (drone body).

Though there is no guideline available in our country for arriving at the **Third-Party Liability** limit arising out of drone operations, internationally there are guidelines such as the **European Union Guideline (EU) No 285/2010**. As per this guideline, any aircraft operator (including **UAS**) flying over the territory of **Executive Committee Member** state should have an insurance cover which is dependent on **Maximum Take Off Mass (MTOM)** of the aircraft concerned. For MTOM of upto **500 Kg** minimum insurance requirement in **Special Drawing Rights (SDR)** terms is **0.75 Million (i.e. equivalent to INR 7.5 Cr)**.

In India, as the drone usage being in the nascent stages, we expect the weight of the drones in the market to be much lesser than 500 Kg (may be less than 25 Kg) and hence we may look at liability limits lower than the European Guidelines.



We understand that few insurers in the Indian market are offering a ***Third-Party Liability Insurance*** limit of ***Rs.20 Lakhs*** for the drone operators. The working group is leaving the decision of arriving at the ***Third-Party Liability Limits*** to be underwritten to individual insurers as the underwriting appetite, retention, Reinsurance program devised and finally the business volume generated for the drone segment may differ.

However, the drone owner/operator should choose an appropriate ***Third-Party Liability*** limit when flying the drones in a high value concentration zone, after a thorough assessment of potential scenarios which can lead to liability claims.



Chapter 4 – Risk Management of Drone Ecosystem

4.1 Risks emanating from Drone Technology

According to *Deloitte*¹⁹ article the following arise out of Unmanned Aircraft Systems and its implications.

Physical Risks: Drones can pose serious threats whilst at air to other flying machines (can be a commercial airliner or an army helicopter) as well as other property in the ground in case of a crash. When it comes to hazard a legitimate drone with full permits and certification is as serious as that of an illegal drone meant for smuggling activities. Menace is from amateur hobbyists flying drones over say critical infrastructure like a transmission tower or a large gathering in a big stadium and bigger crisis can happen if a dangerous payload is discharged say a dangerous chemical, explosives etc.

Non-Physical Risks: Drones having higher level of eavesdropping capabilities can pose a major threat to privacy, intellectual property / organizational secrets and they capture details of sensitive documents, keep a watch on meetings held, track research & development activities and even monitoring movement of key personnel and material. Further drone technology can exploit cyber vulnerabilities and can be instrumental in launching cyber-attacks and legitimate data collected by drone operators can be at risk due to leaks either without knowledge or sold intentionally

Regulatory Trends: In the coming days, the drone universe is going to expand with sophistication in technologies also. Higher Altitudes in the civilian side, Beyond Visual Range, Pre-programmed or Autonomous Flight modes can be a big challenge to Regulatory authorities as drone certification and testing, training of pilots through drone schools, monitoring drone ports, regulating the drone corridor air space, watching round the clock for violations and bringing all the non-compliant drones in to regulatory fold is a serious challenge.

¹⁹ Unmanned Aircraft Systems (UAS) Risk Management: Thriving Amid Emerging Threats and Opportunities November 2018



The overall risk exposure arising out of drones can be summed by this picture²⁰

Risk Scenario	Sectors most likely to be affected by Risk Scenario	Actors
Flight Operations Interference UAS flies through controlled airspace and across flight paths		
Infrastructure Damage UAS flies over obstacles to kinetically impact structures		
Facility Trespassing UAS flies over fences and security posts to enter secure facility		
Information Gathering UAS hovers near facility to capture sensitive information or exploit cyber risk		
Illicit Materials Smuggling UAS circumvents transportation hubs and security to deliver drugs or weapons directly to malicious organizations		
Explosives Insertion UAS flies into secure facility and drops explosive payload		
Chemical-Biological Dispersal UAS uses existing agricultural spraying technology to rapidly disperse chemical or biological agents		
Personnel Assassination UAS bypasses security measures to harm individuals with explosives, firearms, or other weapons		

Legend



Figure 1: UAS Risk Scenarios Matrix

As the drone technology, its reach and range are expanding we hope the regulations and control also will be modified suitably in the days to come.

4.2 Risks faced by Drones

Drone ecosystem also faces many risks from its own operations which can arise out of issues related safety & maintenance of drone, operator/pilot training, local environmental hazards, and from compliance, and regulatory issues etc. The insurable areas / risks are enumerated here: -

²⁰ Unmanned Aircraft Systems (UAS) Risk Management: Thriving Amid Emerging Threats and Opportunities November 2018 – Deloitte Paper



S.no	Risk	Insurance products
1	Physical Damage to drone body /hull	<p>A Remotely Piloted drone is classified as 'aircraft' all around the world. The drone body damages are considered as hull damages and aviation insurance policies are sold.</p> <p>Typical to Aviation sector, the deductibles in such policies could be higher, and hence a drone operator should arrive at a trade-off between premium paid and the deductibles enforced. Buying an insurance cover may not be suitable if drone value is lower than the deductible imposed.</p>
2	Liability from Drone accidents	<p>Drones can be either owned/ non-owned and potential liabilities can arise from drone accidents. Insurers prefer Comprehensive form of cover (both Hull & Liability bundled).</p> <p>Internationally following are available:</p> <ul style="list-style-type: none"> • Privacy related covers in case drone accidentally captures footage leading to privacy Lawsuits. • Cover for fleet operations, as well as autonomous mode operations • Model flying/ leisure flying of drones are separately underwritten as the risks posed are different. • Coverage available in international markets start at USD 500,000 and USD 1 million is normal limit though on few occasions USD 5 million limits are considered.
3	Cyber Risks	<p>Drones can be subjected to cyber-attacks as it contains computer chips and software for its functioning. International markets are offering separate coverage which will indemnify the costs associated with cyber-attacks and data breaches. Typical coverage may include costs involved in end user notification of cyber-attack or data breach, PR expenditure, fines and penalties if any. Additional expenditure for utilizing services of IT Forensic experts in finding out the source of hack/breach etc are also considered.</p>



4	Other traditional insurances	<p>Drone owners can avail traditional property insurance policies to insure office premises, accessories storages, EDP assets for data storage (drone footages).</p> <p>Further products like Workmen Compensation for hired workmen, D&O covers for the drone company officers, E&O covers for professional services rendered to third parties and Commercial Crime cover arising out of own employees actions such as theft forgery, computer crime etc can be availed.</p>
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4.3 Drones in Insurance Sector

The drone technology offers number of solutions to the insurance industry in assessing a risk for acceptance or post a claim is lodged. Areas of consideration prior to adopting drone usage are:

- Cost Vs Benefit as Drones are costlier equipment to own and no insurer can derive any benefit from a single drone in their armory when their customer book covers whole length and breadth of the country, which means every insurer will need a fleet of drones at their services.
- Human capital - another major issue to handle as drone set up will need trained pilots, and data handling experts and data security experts.
- Drone inventory management – when a drone fleet is managed by an insurer, it would be necessary for the in-house /contracted technicians to keep the drones ready to fly at all times thereby necessitating timely maintenance and repair/refurbishment of parts including drone worthiness certifications periodically.
- Regulatory Compliance issues as drones are going to fly in the sky and hence should have Identification Number, Operator Permit, relevant permissions with flight path details for every flight undertaken, no violations in flying to restricted zones which will attract regulatory actions
- Appropriate Practices / Protocols to handle privacy issues which can arise anytime in case of data leak of collected images, videos and audio files. This would lead to investments in secure storages and necessary IT Services for retrieval and usage.



Looking in to the above, it may be worthwhile for an Indian insurer to avail the services of a drone operator. Necessary data security agreements including confidentiality clauses are needed when private agencies are going to be roped in. The insurer should have internal guidelines for when drones can be used, which lines of business, on what geographies, expected turnaround times on drone deployment, how to utilize the data received from drones and finally how the data can be securely stored. In respect of drone technology adaption by insurers, we could find the following information in the public domain

- American International Group used a drone²¹ to ease the claims backlog wherein a roof leakage claim could be inspected with the help of drone as it was dangerous to send an inspector up to find the leak.
- Munich Re is partnering²² with a UAV provider to offer drone imagery, analysis, and reporting to their clients.
- In the US Market, major insurer American Family²³ started utilizing drones as early as 2013 wherein it flew unmanned aerial vehicles at the sites where clients have reported property damage or other losses, according media reports.
- Another US insurer All State expects its drone fleet to make at least thousands of flights a week in the damaged areas once its claims processing becomes fully operational.

In India insurers have started using drones in Crop Cutting Experiments and survey of industrial units for the purpose of granting property insurance programs.

²¹ <https://www.cio.com/article/3252093/taking-to-the-skies-using-drones-in-the-insurance-industry.html>

²² <https://www.air-worldwide.com/blog/posts/2018/7/how-are-drones-impacting-the-insurance-industry/>

²³ <https://www.insurancejournal.com/news/west/2017/10/04/466511.htm>



Chapter 5- Present Drone Insurance Solutions

5.1 Drone Insurance Solutions in India

With the growth in the use of drones, few insurers in country are offering drones cover through existing products and extending some of covers as a when required. An insurer has launched **Third-Party Liability** cover of **Rs.10 Lakhs** through one of the Tech firm on “Pay as you Fly” basis where a drone operator can choose flying option – up to 4 hours, 1 day and 1Month. Few other insurers are providing **Third-Party Liability** in a range of **Rs. 10 Lakhs to Rs.20 Lakhs** cover along with optional Hull cover.

Presently drone operators continue to have minimum levels of insurance such as **Third-Party Liability** cover. These may not be comprehensive enough to address the requirement of drone’s operators. In present situation if an accident occurs there is a risk that coverage is not comprehensive and that an injured member of the public may not be able to obtain adequate compensation, or do so easily, from the drone operator. Drone operators looking for more confidence and certainty that their insurance policy would meet their needs and protect them adequately. Comprehensive coverage addressing the different risk profile of drones is necessary to remove negative and ensuring public confidence and trust in drone insurance standards as the market develops.

5.2. Drone Insurance Solutions in International Market

Drone Insurance solution in International Markets is being offered to private and commercial operators, Flight and training schools, manufacturers, distributors, repairers and drone service consumer that hire drones and/or drone operators to fly on their behalf. Covers is being extended for physical damage (hull) for the vehicle including payload and control station, **Aviation Liability, Aviation Commercial general Liability (CGL)** and non-owned aviation Liability. Depending on the type, location and usage, Third-Party liability covers are available for various limits. Drone products are offered by international market on both annual and Pay-as-you fly basis.

Drone technology and its application is still evolving thus bespoke solutions are offered by European and US markets where coverage’s are not limited only to traditional **Hull and Third-Party Liability** but also offered for pilot/operator/controller error and loss of control, Equipment cover out of flight, Alternative Hire Cost, privacy invasion/trespass, cyber-attack/hacking, loss/damage to cargo/goods in transit, night flights, Beyond Visual Line of Sight (BVLOS) operations, Court Attendance Compensation, Noise pollution liability, Employers liability, Loss of License cover for pilots and etc.



Drone Insurance solution in International Markets is being offered by well-known players like STARR, Swiss Re Corporate Solutions, HISCOX, Allianz etc. Types of available commercial drone insurance:

- A. Annual Drone Insurance
- B. Pay-as-you-fly Insurance
- C. Third Party Liability only

A) Annual Drone Insurance

It has component of both Hull Damage cover and Third-party liability cover. Major coverages offered are:

- **Comprehensive Annual Drone Insurance** - Comprehensive annual cover for the equipment and liabilities. Cover up to 10 drones and unlimited pilots on the same policy.
- **Equipment Cover Out of Flight** - All equipment, including drones, detachable payloads, ground equipment, accessories and spares are covered 24/7. Cover includes theft, accidental damage, in transit or storage.
- **Equipment & Liability Cover In-Flight** - Drones and detachable payloads are covered in-flight. This includes unintentional flyaway, mid-air collisions and third-party liabilities
- **Public Liability Cover** - Cover is fully flexible and allows the insured to increase and decrease levels of liability cover needed for any specific job.
- **Multi Drones Fleet Cover** -Cover up to 10 drones on one policy.
- **Unlimited Pilots** -Add Operators Indemnity cover to the policy and any qualified pilot named in the operator's operations manual can fly the insured drone
- **Night Flights** - Night flights are covered (if allowed as per regulations)
- **Cyber Cover** - Cyber cover against the drone system being hacked, with reinstatement of data covered under this section.



B) Pay as you Fly

It is usually being offered for a period of 1day-30 days in European markets and includes covers as mentioned in Annual Comprehensive Cover

C) Third Party Liability Only

Fully flexible third party public liability cover. Covers accidental damage to third property, or to a member of the public, whilst the insured drone is in flight and being operated commercially. Cover includes invasion of privacy and noise complaints. Cover is fully flexible and allows insured to increase and decrease levels of liability cover needed for any specific job

Few markets also provide add-ons like

- Worldwide Cover.
- Employers Liability.
- Court Attendance Compensation.
- Alternative Hire Cost.



Chapter 6 - Suggested Cover for Drones & Underwriting Considerations

6.1 Introduction

This chapter gives a brief overview of suggested coverage which can be offered by Insurers in India. Along with that what are the possible underwriting considerations and premium rating factors are also covered in this chapter.

Drone Insurance coverage can be broken into following three sets i.e

1. Physical Damage / Loss to Drone due to various contingencies.
2. Third Party Liability arising due to usage of Drone.
3. Any additional coverage's.

A more detailed description is given below:

6.2 Coverage Suggested

6.2.1 Physical Damage / Loss to Drone due to various contingencies:

Cover for physical loss of or damage to the drone (inclusive of detachable and non-detachable payloads), inclusive of theft, occurring during the period of insurance and arising from the activities covered, whilst in flight, on the ground or in transit up to the insured value, less any applicable deductible. Coverage is enumerated below: -

Physical Loss (Partial and Total) to/of:

- The drone itself (airframe, propulsion units, operating system, and flight controls).
- The payload (camera equipment, sensors, packages/ "slung items").
- The ground station/control unit.
- Spares.
- Transit coverage.
- Theft
- Loss of possession of Drone as a result of an Accident

In the event of Partial Loss

For any Drone that can be repaired the cost of economical repairs or the Insured value whichever be the least amount less any applicable excess as stated in the policy.



In the event of Total Loss

For Total Loss of the Drone or for any Drone that cannot be economically repaired the cost of replacement or Insured value which ever be the least amount less any applicable salvage and/or excess. The replacement will be new and of similar type or equivalent specification (or its predecessor if that model is no longer being manufactured). Further, a Drone shall be deemed to be a total loss if it is missing for 30 days after commencement of flight and not be found.

6.2.2 Third Party Liability arising due to usage of Drone – Property damage/ injury or any other legal liability.

Cover against legal liability (including Defence Costs) to pay Damages, for third party civil claims arising out of Bodily Injury or death or Property Damage, by an Accident or a handling error on part of the Authorized Operator, in accordance with the terms of this Policy.

6.2.3 Additional covers

➤ Invasion of privacy

Data collected from the drone whilst in flight and subsequently made available to third parties without the consent of the party to whom the data relates, including any breach of confidentiality, infringement, or violation of any right to privacy, or of any statutes, laws and regulations associated with the confidentiality, access, control, and use of personally identifiable, non-public information.

➤ Cyber– Loss of Digital Assets

Cover can be offered for digital asset loss, in excess of the applicable deductibles, as a direct result of damage, alteration, corruption, distortion, theft, misuse, or destruction of the digital assets directly caused by a computer virus, whether through malicious or non-malicious acts.

➤ Noise liability

Claims arising from the operation of the drone whilst in flight, for the activities covered in the schedule following an official noise complaint lodged by a national/state/municipal authority.



6.2.4. Exclusions which forms part the policy structure is:

- Wear and tear, deterioration, depreciation
- War and Allied Perils Claims caused by(a) War, invasion, acts of foreign enemies, hostilities (whether war be declared or not), civil war, rebellion, revolution, insurrection, martial law,
- Atomic or nuclear fission and/or fusion or other like reaction or radioactive force or matter
- Strikes, riots, civil commotions or labour disturbances
- Electrical and Mechanical breakdown
- Claims arising whilst the Drone is being used for any illegal purpose or for any purpose other than those stated in the Policy Schedule
- used any racing or competition Flying
- outside the geographical limits stated in the Policy Schedule
- whilst the Drone is being operated by any person other than the DGCA Authorised Licensed Operator.
- being operated by any person under the age of 18 years
- Claims arising whilst the Drone is landing on or taking off or attempting to do so from a place which does not comply with the recommendations laid down by the manufacturer of the Drone
- Compliance with Air Navigation and Airworthiness Orders and Country Regulations
- Must comply with any usage regulations in force issued by any Country where the Drone is being operated
- When operated by the authorised operator /Pilot under the influence of liquor or such toxic substance
- used for Recreational Flying, unless specifically covered with additional premium and underwriting considerations.

6.3 Major Underwriting Considerations to be made

The underwriting considerations would necessarily focus on the following: -

➤ Size and weight of the Drone

The levels of coverage required, whether by regulation alone, by airport requirement, or client choice, generally increase exponentially with the size and weight of the drone



➤ **Payload carrying capacity and actual cost and type of payload attached to the drone**

Depending upon usage, drones can carry a variety of payloads and these create their own issues. While aerial surveillance/photography is not new, it brings implicit risk since, particularly for the rotary-wing drones, the operator is likely to have equipment slung under the drone that could have a higher intrinsic value than the drone itself. While it is unlikely that any such equipment will become detached during flight, a heavy or forced landing is likely to mean damage will occur first in the location of the payload.

➤ **Usage of the Drone**

Most rotary-wing Drones are manufactured as utilitarian lifting vehicles by design, with most capable of carrying out a variety of tasks using different payloads. Any one UAS can be put to a multitude of uses; theoretically, it could go from carrying out promotional photography one day to powerline inspection the next, for example, unlike one of its manned counterparts. Broad uses pose an issue for the underwriting community, as insufficient knowledge of the aircraft's risk profile and its many different uses may make it extremely difficult to accurately rate the risk against the exposure.

➤ **Operator / Pilot Experience**

Operator must be trained to handle drones as per the drones make/model/technical specifications/ payload carrying abilities etc.

Pilot Experience in terms of flying hour

Past loss experience

➤ **Regulatory requirement for Minimum/Maximum Limit of Liability**

Local Legal compensatory regime for Third Party Damages (Bodily Injury/Property Damage/Business Interruption)

➤ **Add on Covers included**

Breach of privacy – Carries a Moral hazard.

War and Terrorism

Transit Cover



➤ **Change in Regulations**

Frequent change in Regulations could result in uncertainty of coverage and consequent stress on underwriting

6.4 Factors Influencing the Underwriter – A check list

ITEM	HULL	LIABILITY
Operator certified by governing body	√	√
Hours type flown since manufacture	√	√
Single/multi-engine	√	√
Engine type/redundancy	√	√
Overhaul life of the engine	√	
Mean time between maintenance (MTBM)	√	
Control surface redundancy	√	
Message transmission optimization mechanism (MTOM)	√	
Range	√	√
Endurance	√	
Launch and recovery	√	
Autonomy during critical phases	√	
Recovery technique	√	
Navigation	√	
Communication Software	√	
Payload	√	
Hazardous materials (Hazmat)	√	√
Ground control station (and number)	√	√
ATC interaction	√	√
Ground control station redundancy	√	√
Operator's experience	√	√
Usage	√	√
Operating environment (Urban/Non-urban)	√	√
Maintenance	√	
Storage	√	
Method of transit	√	
Security and safety of load while in transit	√	



6.4 Premium Rating:

Pricing of an insurance product is one of the key elements that determines how the product will be taken up by the insuring public, on one end, and the impact of this on insurer's P&L, solvency and return on capital, on the other. Pricing is strictly a domain of Actuaries and Regulations clearly entrust Appointed Actuaries of insurers with the responsibility to ensure that the product pricing is fair to all the stakeholders and the product will be financially viable. Hence the work group has no intention to suggest a particular price for the product recommended in this report and leaves the determination of price on each insurer's Appointed Actuary, in the context of data available with them, the assumptions taken, the underwriting and pricing philosophy of the company and the expense and profit loadings unique to that insurer. However, the Actuaries may consider the following factors while pricing:

- Classification/type of **RPAS** – As per **DGCA** classification i.e. Nano /Micro /Small /Medium / Large.
- Cost of RPAS/Drones – Make and Model, Year Built (Schedule to be provided with Values)
- Payload – Type of Payload, Cost, etc.
- Flying hours completed since manufactured.
- Imported/ Locally Manufactured.
- Whether drone /RPA Under Warranty.
- Safety measures installed in drones e.g. Automatic landing if battery is below certain level, parachute-based landing, etc.
- Onboard electronics and battery.
- Zone of flying (green always permitted, yellow- auto approval with notification, red – manual permission) for no permissions no take of drones (NPNT drones)
- Location of operation/ Population density/ city/ rural - RPAS/Drones are permitted to fly only in permissible area. Also, while pricing Actuary's may have different pricing for different geographical locations. Eg. RPAS/Drones have higher liability risk if they are operated in areas with high rise buildings or near any Govt. owned premises, sensitive locations, etc.
- Command and Control link – Maximum Height and Distance the unmanned aircraft can be operated from remotely.
- Pilot – Experience of the authorized pilot and the type of RPA's/Drones pilot is licensed for.



- RPA observer - A trained and competent person designated by the operator who, by visual observation of the remotely piloted aircraft, assists the remote pilot in the safe conduct of the flight.
- Primary usage of RPAS – Survey, Photo shoot, sanitization, monitoring, etc
- Flying Beyond Visual Line of Sight (VLOS) /Night Flight
 - Whether it is proposed to undertake Flying beyond VLOS.
 - Whether it is proposed to undertake Night Flight.
 - If answer is yes, then whether relevant approvals obtained, and pilots are experienced for this kind of flying.
- Valid Authorization of Owner/ Operator – Shall be as per DGCA rules and possess Unique Authorization Number (UAN)
- Maintenance as per DGCA rules – RPAS/Drones shall have their maintenance manual as part of their mandatory sale document containing the maintenance requirement and procedures and the owner/operator shall ensure compliance with it. Authorized maintenance centers by DGCA and proper record is kept for maintenance.
- Whether Standard Operating Procedure is in Place and being followed.
- Are Basic safety check list and emergency instructions in place?
- Whether RPAS has Unique Identification Number (UIN)
- Weather – Actuary's may include loading in the pricing on usage of Drones under some specific weather conditions such as rain, Storm, etc. Or they may specify in the exclusions under which weather conditions operations of drones shall be avoided.
- Any penalties/ legal action taken by DGCA in Past on the Operator/Owner
- Type of Fuel - Battery operated or petrol operate
- Ground Control Station
 - Value and make of items, spares and equipment (to be listed)
 - Security Aspects
 - Area prone to Nat Cat perils



Chapter 7 - Reinsurance

7.1 Introduction

Most of the drones we are seeing in operation currently fall in the Nano/Micro category where the values of the drone itself would be lesser than the value of a private vehicle. (Excluding drones used for defense purpose). Even the payload equipment would depend upon the usage to which the drone is engaged in and likely to even exceed the value of the drone itself. The drone plus the pay-load equipment, and ground control station together are categorized as Unmanned Aircraft System (UAS). Presently, the largest growth area is expected to be for VLOS operations that require upto US1million physical loss (Hull) sums insured²⁴. This value could most easily be absorbed within the capacity of PSU and major insurers.

The Liability portion whilst awaiting clarity on limits can be considered based on the following options:

A. Written under Aviation Liability:

UAV would be considered under the category of General Aviation business (GA). Domestic liability under GA is based on law of the land and is not covered per the rules framed under International Conventions as applicable to manned commercial aircrafts.

In the event of a loss/damage affecting Third Party under GA the Surveyor would quantify the loss / damage and reach settlement with the affected Third Party/ies through their legal representatives. The same procedure would be applicable to UAS.

B. Written Under MV Act (As Proposed per DGCA UAS 2020 draft):

The compensation structure would be applicable based on the various parameters in terms of degree of injury/damage per the Act.

The Limit of Liability is the determining factor here for Reinsurance purchase.

Under:

A above. The Limit of Liability is determined by the Insured depending on perception of the exposure based on size & Weight of the drone, usage to which the drone is put and its operating environment

²⁴ Marsh Risk Management Research Publication-Dawning of the Drones



B above.: Whilst minimum limits of liability could be set to meet the compensation limits under the MV Act, the Unlimited Liability under the Act would be a major concern for reinsurers in providing the re-insurance capacity to Indian market. A collision involving a UAS striking the engine of a manned aircraft could cause USD 10 Million in Physical Damage alone²⁵.

7.2 Reinsurance Treaties – Aviation

Some of the salient features governing the current aviation reinsurance treaties are enumerated as below

1. Besides the obligatory cession to GIC, companies retain a portion of the risk to their Net Account and the balance remaining (if any), is placed by way of facultative reinsurance.
2. The insurers can buy annual reinsurance treaty to protect their net retention for Aviation line of business when insurer has sizable book. These treaties are usually seen to be on an Excess of loss basis i.e. non proportional reinsurance with companies retaining a small portion to their absolute net.
3. It is envisaged that Drone risks written by insurers having treaties would be unlikely to come up for facultative reinsurance capacity requirement outside their treaty limits subject to conditions that TPL is not unlimited.
4. It is also envisaged that the physical value of the UAS being small could be retained within the Insurance Companies (with/without treaties) and only the liability portion could come for specific reinsurance support. This requirement is not unusual and is often seen for manned aircraft in the domestic market.

7.3 Challenges in Drone Reinsurance

Whilst Reinsurance Capacity per se should not be an issue, the concern for reinsurers would be the volume of premium income to make economic sense for writing the business and to provide a spread of risk. Reinsurers would hence prefer to write this as a bundled or packaged product with minimum premium requirement on an upfront basis and adjustable based on actual usage, rather than writing single drone proposals.

Availability of Professional Aviation Surveyors could be a concern considering the fees would also be relatively small in comparison to survey of manned aircraft.

²⁵ AGCS Report- Rise of the Drone



Unlimited Liability under the MV Act as mentioned in draft *DGCA UAS 2020* is a major concern as reinsurers would like to know their exposures.

Breach of Privacy concerns; most reinsurers would prefer this to be an exclusion due to lack of precedence in terms of claims data and market statistics for these claims.

UAS risks are currently being written world- wide by Lloyds and Company markets. Major (re)insurers are also known to develop their own policy wordings and provide capacity to specialist Managing Agencies and / or professional Brokers who then underwrite such risks on their behalf for a fee, thus ensuring a volume of business for the (re)insurers.

Nevertheless, despite a lack of data and understanding of the drone operations, reinsurers are eager to support this industry and are using their expertise of the manned class to assess the risk and/or limit their exposures by selection against size, uses and values of the UAV or the type of coverage offered.



Chapter 8 - Claims Landscape

8.1 Introduction

When anything mechanical is operated by humans there is always opportunity for errors, injuries and property damage and so is the case with drones which brings us to the topic of losses resulting in claims: from the loss or damage to the drone itself and /or to third parties (bodily injury and property damage).

The use of drones or UAV's raises two safety concerns: Mid-Air Collisions and the Loss of Control²⁶

- A collision can occur if the pilot cannot see and avoid manned aircraft which fly below 550 ft such as Agri planes, helicopters and aircrafts landing and departing from airports.
- Loss of Control can result from system failure or flying beyond signal range resulting in frequency interruption.

Drone crashes are the most frequent type of Insurance claims. These crashes can be of different types, including bird hit, lightning strike, any mid-flight physical damage (e.g. overhead wire hit).

8.2 Claims Procedure:

As in other Lines of Business insured to:

1. Give immediate notice of any event likely to give rise to a Claim under this policy.
2. Furnish full particular in writing of such event and forward immediately letters or documents related thereto
3. Give notice of any impending prosecution or copy of the FIR where applicable
4. Provide intimation of any Incident / Accident involving the Drone to the appropriate authority at DGCA.
5. In case the Drone is damaged and cannot be returned to original condition the same shall be notified to DGCA by the owner/operator for cancellation of UIN.
6. Should not attempt to dismantle or repair the UAV without the consent of the insurer except whatever is necessary in the interest of safety or to prevent further damage or to comply with the appropriate authority.

(the above is indicative and not an exhaustive list and would be applicable as per each Companies Claims procedural policy)

²⁶ AGCS Report- Rise of the Drone



8.3 Requirement for the purpose of claims assessment:

1. Basic Information Required:

Commercial Drones	Recreational (Personal) Drones
<ul style="list-style-type: none"> ➤ Pre-flight and on-site survey. ➤ Photos or videos of the incident. ➤ Copy 'Ops' manual. ➤ Copy of permission for aerial work from the relevant aviation authority. ➤ Proof of purchase/ownership. ➤ Flight path / Telemetric data (where available). 	<ul style="list-style-type: none"> ➤ Proof of purchase/ownership. ➤ Photos or videos of the incident. ➤ Flight data (where available).

2. Claim Form

- Background of policy holder.
- Incident details.
- Loss and damage details.
- Final details, before survey / inspection can be scheduled.

3. Survey / Inspection is scheduled of the drone, and if possible, visit is also scheduled to the accident site to ascertain any Liability damage.

- a. For loss values below a certain amount to be decided as per individual insurers level of comfort (i.e mainly in Recreational drones), and with no Liability damage; self-inspection could be allowed via Video call.
- b. Surveyors: Preferably Aviation Surveyors though Property Surveyors can also be utilized depending upon location of the accident /incident and the urgency of each case.
- c. The Insurers may take the UAV together with the documents that only being used to specify the economic value of the UAV as Salvage (except telemetry data and any pay load data which are recorded on the UAV and/or payload. Insured will have right to erase such data before delivery).



Specimen Policy Wording (Drone Insurance)

Definitions

The following words or terms shall have the meaning ascribed to them wherever they appear in this Policy, and references to the singular or to the masculine shall include references to the plural and to the feminine wherever the context so permits:

1. **Accident** means
 - i) a sudden, unforeseen event caused by external visible and violent means, whilst the Drone is in Flight for Insured Use, and which is neither expected nor intended by the Insured/Authorized Operator.
 - ii) An event caused due to existence of any integral condition in a Drone, and due to which the Drone has ceased to be in the possession or under the control of the Authorized Operator whilst the Drone is in Flight for Insured Use
2. **Authorized Operator**
 - a) For Nano Drones (operating below 50 feet/15 metres) and Micro Drones (operating below 200 feet/60 metres) shall be any individual above 18 years of age named in the Policy Schedule.
 - b) For all other categories of Drones including but not limited to Small, Medium and Large Drones, shall be the person who is operating, controlling or piloting the Drone and who is properly trained and qualified to do so and holds a valid Unmanned Aircraft Operator Permit (UAOP) issued by Director General of Civil Aviation (DGCA)
Note: (Drones shall be categorized into Nano, Micro, Small, Medium, Large as defined under DGCA guidelines F. No. 05-13/2014-AED Vol. IV and subsequent amendments thereof)
3. **Bodily Injury** means physical bodily harm, excluding illness or disease, solely and directly caused by an Accident which is verified and certified by a Medical Practitioner.
4. **Business Use** means Flying for business or professional purposes but not for hire or reward.
5. **Constructive Total Loss [CTL]:** The Drone will be considered to be a constructive total loss if the cost of repair of the Drone exceeds 75% of the Sum Insured of the Drone.
6. **Damages** means monetary sums (including claimant's costs) payable pursuant to judgments or awards and/or settlements negotiated by or on behalf of the Insured,



- but shall not include interest, fines, penalties, punitive damages, exemplary damages, non-pecuniary relief, taxes, or any other amount for which an Insured is not financially liable, or which is without legal recourse to the Insured, or any matter that may be or be deemed to be uninsurable under Indian law.
7. **Deductible** means the amount which shall be borne by the Insured in respect of each and every claim made under this Policy. The Company's liability to make any payment under the Policy is in excess of the Deductible.
 8. **Doctor / Medical Practitioner:** Doctor/ Medical Practitioner means a person who holds a valid registration from the Medical Council of any State or Medical Council of India or Council for Indian Medicine or for Homeopathy set up by the Government of India or a State Government and is thereby entitled to practice medicine within its jurisdiction; and is acting within its scope and jurisdiction of license.
 9. **Drone** means an Unmanned Aircraft System mentioned in the Policy Schedule and covered under this policy (bearing a valid Unique Identification Number [UIN] if applicable as per DGCA Guidelines) including any Payload. However, Payload should not contain any dispensable load.
 10. **Flying/Flight** means from the time the Drone is switched on, moves forward in taking off or attempting to take off, whilst in the air, and until the Drone completes its landing run and is being operated by an Authorized Operator only. A rotary-wing Drone shall be deemed to be in Flight when the Drone is switched on and the rotors are in motion as a result of engine power, the momentum generated therefrom, or autorotation.
 11. **Hospital:** A hospital means any institution established for *in-patient care* and *day care treatment* of illness and/or injuries and which has been registered as a hospital with the local authorities under Clinical Establishments (Registration and Regulation) Act 2010 or under enactments specified under the Schedule of Section 56(1) and the said act **Or** complies with all minimum criteria as under:
 - i. has qualified nursing staff under its employment round the clock;
 - ii. has at least 10 in-patient beds in towns having a population of less than 10,00,000 and at least 15 in-patient beds in all other places;
 - iii. has qualified medical practitioner(s) in charge round the clock;
 - iv. has a fully equipped operation theatre of its own where surgical procedures are carried out;
 - v. maintains daily records of patients and makes these accessible to the insurance company's authorized personnel;
 12. **Hospitalization** means admission in a Hospital for a minimum period of 24 consecutive '*In-patient Care*' hours except for specified procedures/ treatments, where such admission could be for a period of less than 24 consecutive hours.



13. **In-patient Care:** Inpatient care means treatment for which the insured person has to stay in a hospital for more than 24 hours for a covered event.
14. **Insured, You, Your, Yourself** means the individual, firm, company, organization, entity, association, partnership, limited liability partnership, government state or agency of a state, cooperative society named in the Policy Schedule including any Authorised Operator of the Drone
15. **Insurer, We, Our, Us, Ours, Company** means the Insurance Company Limited.
16. **Insured Use** means intended Business/Recreational/Rental Use of the Drone mentioned in the **Policy Schedule**.
17. **Sum Insured** means the Section wise Value as per the Policy Schedule but subject to the Maximum Insured Value. The Maximum insured value is the amount this policy will pay under any one section and in the aggregate.
18. **Policy** means the proposal, the schedule, the policy document and any endorsements / annexures attaching to or forming part thereof either on the effective date or during the Policy Period.
19. **Policy Period** means the period between and including the Risk Inception Date and Risk end dates shown in the Policy Schedule.
20. **Policy Schedule** means the schedule and any annexure to it.
21. **Payload** means any removable equipment (hired or otherwise) as stated in the Policy Schedule that can be attached to the insured Drone for Work carried out under Insured Use.
22. **Dispensable load** means cargo configured to be dispensed from a DRONE in flight.
23. **Property Damage** means actual physical damage to tangible material property belonging to a third person.
24. **Recreational Use** means Flying for enjoyment and private pleasure outside of the **Insureds** business or profession. It is not covered under the policy unless specifically declared to insurers.
25. **Rental Use** means rental, lease, charter or hire by the Insured to any person, company or organisation for Business Use only, where the operation of the Drone is not under the control of the Insured. Rental for any other purpose is NOT insured under this Policy unless specifically declared to Insurers and the detail of such use(s) are stated in the Policy Schedule.
26. **Terrorism:** An act of terrorism means an act or series of acts, including but not limited to the use of force or violence and/or the threat thereof, of any person or group(s) of persons, whether acting alone or on behalf of or in connection with any organisation(s) or government(s), or unlawful associations, recognized under Unlawful Activities (Prevention) Amendment Act, 2008 or any other related and applicable national or state legislation formulated to combat unlawful and terrorist activities in the nation for the time being in force, committed for political, religious,



- ideological or similar purposes including the intention to influence any government and/or to put the public or any section of the public in fear for such purposes.
27. **Theft** as defined in Section 378 of Indian Penal Code shall mean whoever, intending to take dishonestly any movable Insured Property out of the possession of any person without that person's consent, moves that Insured Property in order to such taking, is said to commit theft.
 28. **Unmanned Aircraft** means a powered, aerial vehicle which does not have a human pilot on board, flies autonomously or is piloted remotely, uses aerodynamic forces to provide vehicle lift, is not classified as a guided weapon or similar one-shot device designed for the delivery of munitions.
 29. **Unmanned Aircraft System** means an Unmanned Aircraft including any article forming part thereof, or supplied for installation in, or for use in connection with, including ground handling tools and equipment used in connection therewith.
 30. **Spare Engine: Spare engines** means propulsion engines which have been or which are intended to be installed in a **scheduled aircraft** and which are not included in the definition of **unmanned aircraft**.
 31. **Spare parts:** Spare parts means parts or accessories intended to be installed in a scheduled aircraft and which are not included in the definition of **unmanned aircraft**, but does not include payload.
 32. **Work** means use for activities including but not limited to agriculture, construction, photography, surveying, observation and patrol, search and rescue, aerial advertisement.



POLICY COVERAGE

Section 1: – Legal Liabilities to Third Party

SCOPE OF COVER

INDEMNITY

The Company will indemnify the Insured against its legal liability (including Defence Costs) to pay Damages, for third party civil claims arising out of Bodily Injury or death or Property Damage, by an accident or an handling error on part of the Authorized Operator, if notified during the Policy Period by the Insured in accordance with the terms of this Policy.

DEFENSE COST

The Company will, subject to the Sum Insured, pay all costs, fees and expenses incurred with their prior written consent in the investigation, defence or settlement of any Claim and the Insured's costs of representation at any civil Inquest, inquiry, or other proceedings in respect of matters which have a direct relevance to an actual or anticipated claim against the Insured falling within the terms of this Policy.

EXCLUSIONS APPLICABLE TO SECTION 1

In addition to the exclusions contained in GENERAL POLICY EXCLUSIONS, the Company is not liable for and no indemnity will be provided in respect of any loss arising out of, caused by, occasioned by, attributable to or howsoever connected to:

1. Any agreed assumption of risk by the Insured, save to the extent that liability would have attached in the absence of such agreement.
2. Any liability arising out of the deliberate, wilful or intentional non-compliance with any statutory provision.
3. Any Bodily Injury of any person under a contract of employment or apprenticeship with the Insured, or the Insured's contractors or sub-contractors, if such Bodily Injury was contracted and/or arose out of and in the course of his employment.
4. Any obligations for which the insured is obligated to pay damages by reason of assumption of liability in a contract or agreement.



5. The Insured's consequential losses of any kind, be they by way of loss of profit, loss of opportunity, business interruption, market loss or otherwise, or any claims arising out of loss of a pure financial nature such as loss of goodwill.
6. The infringement of plans, copyrights, patents, trade names, trademarks or registered designs.
7. Libel, slander, false arrest, wrongful eviction, wrongful detention, defamation including mental injury, agony, anguish or shock resulting therefrom.
8. Damage to property belonging to third parties handled by the Insured by way of his trade or worked upon by or in the care, custody or control of the Insured or any person employed by or working for the Insured.
9. The deliberate, conscious or intentional disregard by the Insured's management of the need to take all reasonable steps to prevent Bodily Injury and/or Property Damage.
10. Pollution of any kind.
11. Any Claim made, threatened or intimated against the Insured prior to the Policy Period.
12. Any Claim directly or indirectly arising out of, or in any way involving any fact or circumstance of which written notice has been given, or ought reasonably to have been given, under any previous policy (whether insured by the Company or not); or of which the Insured first became aware prior to the Policy Period and which the Insured knew or ought reasonably to have known had the potential to give rise to a Claim.
13. Liability more specifically insured elsewhere.
14. Any Claim made where the circumstances that exist are materially different to the circumstances represented by the Insured in the proposal.
15. Bodily injury or property damage resulting from the release of a dispensable load from the aircraft component of an unmanned aircraft system. Provided no part of the dispensable load consists of munitions, this exclusion (15) shall not apply to any claim or suit caused by or resulting in an aircraft crash, fire, explosion, or collision or a recorded in flight emergency causing abnormal aircraft operation.
16. Cyber Liability risk.



Section 2: Drone Hull Cover

SCOPE OF COVER

The Company will indemnify the Insured in respect of repair/replacement cost of the Insured Drone arising out of:

- i) An Accident (Including loss of possession of Drone as a result of an Accident),
- ii) Theft

provided that the liability of the Company will not individually or in the aggregate exceed the Sum Insured mentioned in the Policy Schedule.

EXCLUSIONS APPLICABLE TO SECTION 2

In addition to the exclusions contained in GENERAL POLICY EXCLUSIONS, , the Company is not liable for and no indemnity will be provided in respect of any loss arising out of, caused by, occasioned by, attributable to or howsoever connected to:

1. The deductible of first 5% of each and every claim amount subject to a minimum of INR 2500, unless specifically revised and altered by the Insurer and mentioned in the Policy Schedule. The deductible shall apply for each and every partial loss claim arising out of the perils in respect of which the Insured is indemnified by this section. The deductible shall apply per event.
2. Wear and tear, deterioration, depreciation and freezing.
3. Theft of the Drone from anywhere within India or any vehicle, without any force and violent or forcible entry/means.
4. Any damage arising out of Electrical and mechanical breakdown.
5. Damage to aerial cameras, scanners etc used as Payload (other than as a result of an Accidental Damage) due to scratching, fogging or misting of lens.
6. Any damage to the Drone if the lifting weight recommended by the Manufacturer for the insured Drone make and model is exceeded when any Payload is attached.
7. Confiscation, nationalisation, seizure, restraint, detention, appropriation,
 - i) under the order of any Government (whether civil military or de facto) or
 - ii) public or local authority or
 - iii) on account of wrongful entry or intentional invasion of privacy.
8. Mysterious disappearance or unexplained losses.
9. The Insured's consequential losses of any kind, be they by way of loss of profit, loss of opportunity, business interruption, market loss or otherwise, or any claims arising out of loss of a pure financial nature such as loss of goodwill.
10. Superficial and inconsequential aspects such as noises, vibrations, warpage, that do not lead to dismal performance of the Drone including the Payload.



Section 3: Personal Accident Cover To Operator

COVERAGE

In the event of any Bodily Injury sustained by the Insured/ Authorised Operator anywhere in India while operating drones during the Policy Period and arising out of an Accident, the Company will make payment as provided for below.

A) Death

- i. The Company shall pay the Sum Assured in the event of Bodily Injury resulting in Death of the Insured Beneficiary within 12 months of such Bodily Injury being sustained, whereupon this Coverage under Section 3 insofar as it relates to that Insured/ Authorised Operator shall expire.
- ii. The Company will also, in addition to the Sum Assured, pay up to 2% of the Sum Assured or Rs.5,000/- (whichever is lower) towards the cost of transporting the mortal remains of the Insured/Authorised Operator from the place of death to the hospital/ residence and/or cremation and/or burial ground.

B) Permanent Total Disability

- i. In the event of Bodily Injury resulting in Permanent Total Disability of the Insured/ Authorized Operator within 12 months of such Injury being sustained, the Company will pay 125% of the Sum Assured, whereupon this Coverage under Section 3 insofar as it relates to that Insured/ Authorised Operator shall expire.
- ii. If the Insured/ Authorised Operator was suffering from any permanent disability prior to the date upon which Bodily Injury was sustained, then the Company's liability to make payment hereunder shall be reduced by the extent of such pre-existing, as advised by the concerned Government Medical Authority.

EXCLUSIONS APPLICABLE TO SECTION 3

No indemnity is available hereunder and no payment will be made by the Company for any claim directly or indirectly caused by, based on, arising out of or howsoever attributable to any of the following:

- 1) suicide, attempted suicide or self-inflicted injury or illness;
- 2) any mental dysfunction or disorder, or psychosomatic dysfunction or disorder;
- 3) the use or misuse of any drugs, alcohol, intoxicants or hallucinogens;



- 4) stroke, epileptic fit or other cramp like attacks or convulsions unless caused by an insured event under this Cover;
- 5) deliberate or intentional criminal act of the Insured/ Authorised Operator;
- 6) any accident resulting from war (whether declared or not), civil war, invasion, act of foreign enemies, rebellion, revolution, insurrection, mutiny, military or usurped power, seizure, capture, arrest, restraint or detainment, confiscation or nationalisation or requisition of or damage by or under the order of any government or public local authority;
- 7) any consequential losses of any kind, and/or any actual or alleged legal liability of the Insured/ Authorised Operator;
- 8) whilst engaging in adventure sports or ballooning, whilst mounting into, dismounting from or travelling in any balloon or aircraft other than as a passenger (fare paying or otherwise) in any duly licensed standard type of aircraft anywhere in the world;
- 9) any accident suffered by the Insured/ Authorised Operator on account of his participation as the driver, co-driver or passenger of a motor vehicle during motor racing or trial runs;
- 10) any accident caused either directly or indirectly by nuclear energy, radiation;
- 11) curative treatments or interventions that the Insured/ Authorised Operator performs or has had performed on his body;
- 12) venereal or sexually transmitted disease;
- 13) HIV (Human Immunodeficiency Virus) and/or any HIV related illness including AIDS (Acquired Immune Deficiency Syndrome) and/or mutant derivatives or variations thereof however caused;
- 14) Including treatment thereof pregnancy, resulting childbirth, miscarriage, abortion, or complication arising out of any of the foregoing;

Note: In the event of Insured being an organization/entity/firm this cover shall be available only to the Authorised Operator.



Section 4: Accidental Medical Expenses Cover To Operator

COVERAGE

It is hereby agreed and declared that if Insured/ Authorised Operator are Hospitalized on advice of a Doctor because of a Bodily Injury sustained during the Policy Period and arising out of Flight of the covered Drone for Insured Use, then the Company shall reimburse reasonable and customary medical expenses incurred up to a maximum Sum Insured as shown in the Schedule for this cover aggregate in any one Policy Period. The medical expenses reimbursable would include:

- i) The reasonable charges that the Insured/ Authorised Operator necessarily incur on the advice of a Doctor for In-patient Care in a Hospital for accommodation; nursing care; the attention of medically qualified staff; undergoing medically necessary procedures and medical consumables.
- ii) Ambulance charges for carrying the Insured/ Authorised Operator from the site of accident to the nearest hospital, subject to a limit of Rs. 1000 per claim.

EXCLUSIONS APPLICABLE TO SECTION 4

We will not be liable to indemnify the Insured/Authorised Operator for the following events:

1. Accidental Bodily Injury that is sustained by the Insured/Authorised Operator:
 - a) Through suicide, attempted suicide or self-inflicted injury or illness
 - b) While under the influence of liquor or drugs
 - c) Arising or resulting from Insured/Authorised Operator committing any breach of law with criminal intent
 - d) Whilst engaging in aviation or ballooning, whilst mounting into, dismounting from or travelling in any balloon or aircraft other than as a passenger (fare paying or otherwise) in any duly licensed standard type of aircraft anywhere in the world.
 - e) Whilst participating as the driver, co-driver or passenger of a motor vehicle during motor racing or trial runs
 - f) As a result of any curative treatments or interventions that Insured/Authorised Operator carry out or have carried out on your body



- g) Arising out of participation in any naval, military or air force operations whether in the form of military exercises or war games or actual engagement with the enemy, whether foreign or domestic
- 2. Consequential losses of any kind, be they by way of loss of profit, loss of opportunity, loss of gain, business interruption, market loss or otherwise, or any claims arising out of loss of a pure financial nature such as loss of goodwill or any legal liability of any kind whatsoever
- 3. Any injury/disablement/death directly or indirectly arising out of or contributed to any pre-existing condition.
- 4. Venereal or sexually transmitted diseases.
- 5. HIV (Human Immunodeficiency Virus) and/or any HIV related illness including AIDS (Acquired Immune Deficiency Syndrome) and/or mutant derivatives or variations thereof however caused.
- 6. Pregnancy, resulting childbirth, miscarriage, abortion, or complications arising out of any of these.
- 7. War (whether declared or not), civil war, invasion, act of foreign enemies, rebellion, revolution, insurrection, mutiny, military or usurped power, seizure, capture, arrest, restraint or detainment, confiscation or nationalisation or requisition of or damage by or under the order of any government or public local authority
- 8. Nuclear energy, radiation

If You do not agree whether any of these exclusions apply to Your claim, You agree to accept the burden of proving that they do not apply.

Note: In the event of Insured being an organization/entity/firm this cover shall be available only to the Authorised Operator.



General Exclusions Applicable To All Sections

No indemnity is available hereunder and no payment will be made by the Company for any claim directly or indirectly caused by, based on, arising out of or howsoever attributable to any of the following:

1) **WAR, HIJACKING AND OTHER PERILS EXCLUSION CLAUSE. AVN 48B (amended for Drones)**

This Policy does not apply to Claims caused by: -

- a) War, invasion, acts of foreign enemies, hostilities (whether war be declared or not), civil war, rebellion, revolution, insurrection, martial law, military or usurped power or attempts at usurpation of power.
- b) Any hostile detonation of any weapon of war employing atomic or nuclear fission and/or fusion or other like reaction or radioactive force or matter.
- c) Strikes, riots, civil commotions or labour disturbances.
- d) Any act of one or more persons, whether or not agents of a sovereign Power, for political or terrorist purposes and whether the loss or damage resulting therefrom is accidental or intentional.
- e) Any malicious act or act of sabotage.
- f) Confiscation, nationalisation, seizure, restraint, detention, appropriation, requisition for title or use by or under the order of any Government (whether civil military or de facto) or public or local authority.
- g) Hi-jacking or any unlawful seizure or wrongful exercise of control of the Drone in Flight (including any attempt at such seizure or control) of the Drone acting without Your consent.

Furthermore, this Policy does not cover Claims arising whilst the Drone is outside Your control by reason of any of the above perils.

The Drone shall be deemed to have been restored to Your control on the safe return of the Drone to You at a location not excluded by the geographical limits of this Policy, and entirely suitable for the operation of the Drone (such safe return shall require that the Drone be parked with engines shut down and under no duress).



- 2) Drone(s) and/or Associated Equipment is outside the geographical limits stated in schedule.
- 3) Night Flying Operations.
- 4) Beyond Visual line of sight (BVOLS) operations.
- 5) Loss of earnings, loss by delay, loss of market or other consequential or indirect loss or damage of any kind or description whatsoever.
- 6) Loss or damage by spoilage resulting from the retardation or interruption or cessation of any process or operation caused by operation of any of the perils covered.
- 7) Loss, destruction or damage directly or indirectly caused to the property insured by
 - a) ionising radiations or contamination by radioactivity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel.
 - b) the radioactive toxic, explosives or other hazardous properties of any explosive nuclear assembly or nuclear component there of.
- 8) Loss, damage, cost or expense of whatsoever nature directly or indirectly caused by, resulting from or in connection with any act of terrorism regardless of any other cause or event contributing concurrently or in any other sequence to the loss unless specifically insured.
- 9) Drone(s) and/or Associated Equipment is landing on or taking off or attempting to do so from a place which does not comply with the recommendations laid down by the manufacturer of the Drone(s) and/or Associated Equipment except as a result of force majeure.
- 10) Any discharge or release of munitions whether intentional or unintentional.

11) ELECTRONIC DATE RECOGNITION:

- A. The failure or inability to correctly recognize, process, distinguish, interpret or accept any change of year, date or time, including but not limited to:
 - The change of year from 1999 to 2000; or
 - The change of date from August 21, 1999 to August 22, 1999;

By any computer system, hardware, program or software, microprocessor, integrated circuit or similar device, whether in computer equipment or non-computer equipment, whether the property of any insured or of others; or

- B. The failure or inability to correctly recognize, process, distinguish, interpret or accept any change of year, date or time, including but not limited to:

- 12) Asbestos exclusion : This policy does not cover any claim, damage, injury, loss, cost, expense or liability of any nature whatsoever arising from, occasioned by or in consequence of (whether directly or indirectly and whether wholly or partly):



- i. The actual, alleged or threatened presence of asbestos in any form whatsoever, or any material or product containing, or alleged to contain, asbestos; or
- ii. Any obligation, request, demand, order, or statutory or regulatory requirement that any insured or others test for, monitor, clean up, remove, contain, treat, neutralize, protect against or in any other way respond to the actual, alleged or threatened presence of asbestos or any material or product containing, or alleged to contain, asbestos.

However, this exclusion shall not apply to any claim or suit caused by or resulting in an aircraft crash, fire, explosion, or collision or a recorded in flight emergency causing abnormal drone operation.

Notwithstanding any other provisions of this policy, we will have no duty to investigate, defend or pay defense costs in respect of:

- a) Any claim or suit excluded under Paragraphs (i) or (ii) above; or
- b) Any such obligation, request, demand, order, or statutory or regulatory requirement described in Paragraph (ii) above.

13) NOISE, POLLUTION AND OTHER PERILS exclusion : This policy does not cover any claim, damage, injury, loss, cost, expense or liability of any nature whatsoever arising from, occasioned by or in consequence of (whether directly or indirectly and whether wholly or partly): **AVN.46B 01.10.96 (amended for Drones)**

- I. Noise (whether audible to the human ear or not) or vibration, sonic boom, and any phenomena associated therewith,
- II. Pollution and contamination of any kind whatsoever,
- III. Electrical and electromagnetic interference, or
- IV. Interference with the use of property,

unless caused by or resulting in an aircraft crash, fire, explosion, or collision or a recorded in flight emergency causing abnormal drone operation.

Nothing in this exclusion shall override any radioactive contamination or other exclusion clause made part of this policy.



14)Sanction & Embargo clause. (AVN 111)

Notwithstanding anything to the contrary in the Policy the following shall apply:

- a) If, by virtue of any law or regulation which is applicable to an Insurer at the inception of this Policy or becomes applicable at any time thereafter, providing coverage to the Insured is or would be unlawful because it breaches an embargo or sanction, that Insurer shall provide no coverage and have no liability whatsoever nor provide any defence to the Insured or make any payment of defence costs or provide any form of security on behalf of the Insured, to the extent that it would be in breach of such law or regulation.
- b) In circumstances where it is lawful for an Insurer to provide coverage under the Policy, but the payment of a valid and otherwise collectable claim may breach an embargo or sanction, then the Insurer will take all reasonable measures to obtain the necessary authorisation to make such payment.
- c) In the event of any law or regulation becoming applicable during the Policy period which will restrict the ability of an Insurer to provide coverage as specified in paragraph 1, then both the Insured and the Insurer shall have the right to cancel its participation on this Policy in accordance with the laws and regulations applicable to the Policy provided that in respect of cancellation by the Insurer a minimum of 30 days notice in writing be given.

In the event of cancellation by either the Insured or the Insurer, the Insurer shall retain the pro rata proportion of the premium for the period that the Policy has been in force. However, in the event that the incurred claims at the effective date of cancellation exceed the earned or pro rata premium (as applicable) due to the Insurer, and in the absence of a more specific provision in the Policy relating to the return of premium, any return premium shall be subject to mutual agreement. Notice of cancellation by the Insurer shall be effective even though the Insurer makes no payment or tender of return premium.



General Conditions

1. Due Observance

The due observance of and compliance with the terms, provisions, warranties and conditions of this Policy insofar as they relate to anything to be done or complied with by the Insured shall be a condition precedent to any liability of the Company under this Policy. The Insurers liability to make payments under this Policy will be strictly conditional upon compliance with the terms and conditions of this Policy. Failure by the Insured to disclose all material circumstances and to ensure that all representations of fact (including the assumptions on which this Policy is issued) are correct may invalidate the Policy or lead to additional terms or conditions being applied to the Policy or to any payment due under the Policy being reduced.

2. Reasonable Care

The Insured shall:

- a. Take all reasonable steps to safeguard the Drone against any Covered Insured Risk(s).
- b. Take all reasonable steps to prevent a claim from arising under this Policy
- c. If a claim is made then the Insured must not do or fail to do anything which will increase the amount of the claim.
- d. If the Insured does or fails to do anything which may adversely affect the right to recover any sum from person for any matter covered by this Policy the Insurer may deduct from any payment otherwise due to the Insured under this Policy the amount by which the value of the right is reduced or the Insurer may recover that amount from the Insured if the Insurer has previously made a payment in respect of that matter

3. Non-Disclosure

The existence of this Policy or any related information shall not be disclosed to any third party other than bona fide purchasers and tenants, their lenders and respective advisors without the prior written consent of the Insurer.

4. Duties and Obligations after Occurrence of Covered Insured Event:

Save as more specifically provided for elsewhere in the Policy, it is a condition precedent to the Company's liability under this Policy that, upon the happening of any event giving rise to or likely to give rise to a claim under this Policy:

- a. The Insured shall immediately and in any event within 15 days give written notice about any matter which may lead to a loss liability or claim under this



Policy to the Company or any of its representatives and appointees, at the address shown in the Schedule for this purpose, and in case of Notification of an event likely to give rise to a claim to specify the grounds for such belief, and

- b. The Insured shall not abandon the Drone, nor take any steps to rectify/remedy the damage before the same has been approved by the Company or any of its representatives and appointees, and
- c. The Insured shall within 90 days deliver to the Company its completed claim form detailing the damage that has occurred and an estimate of the quantum of any claim along with all documentation required to support and substantiate the amount of Indemnification sought from the Company, and
- d. The Insured shall at its own expense provide information and assistance to the Insurer's representatives and appointees all the information, assistance, records and documentation in relation to the defence of a claim or conduct of any proceedings which the Insurer considers necessary or desirable to prevent or reduce loss or damage to the Insured or to obtain relief indemnity or contribution from any other party to which the Insurer is or may be entitled to by subrogated rights or otherwise.
- e. The Insured shall allow the Company and its representatives and appointees to inspect the Drone or any other material items, as per 'the Right to Inspect' Clause.
- f. No admission offer promise payment or indemnity shall be made or given by or on behalf of the Insured without the prior written consent of the Insurer

*Note: Waiver of conditions (a) and (c) may be considered by the Company at its absolute discretion, in extreme cases of hardship where it is proved to the satisfaction of the Company that under the circumstances in which the Insured was placed, it was not possible for the Insured or any other person claiming on his/her behalf to give notice or file claim within the prescribed time limit. The decision of the Company shall be final and binding on the Insured.

5. **Claims**

In the event of a claim:

- A. If any Person makes a claim against the Insured that the Insured thinks is covered by this Policy the Insured must not make any admissions or pay any money to the Person making the claim. The Insured must not spend any money in connection with that claim before notifying the Insurer
- B. The Insurer may at its discretion pursue any litigation (including appeals) to final determination by a court of competent jurisdiction and the Insurer shall



- not be liable to indemnify the Insured in respect of Loss prior to such final determination.
- C. The Insurer has the right to select the legal representative to act in any matter in connection with this Policy. Once such legal representative is appointed the Insurer will not be liable for costs, expenses or fees associated with any other legal representative
 - D. For any occurrence for which there may be liability under this Policy the Insurer may at its discretion and at its own cost pursue or defend any action at law or otherwise or make an application to a court of competent jurisdiction in default of which the Insurer will indemnify the Insured as per the terms and conditions of the Policy
 - E. The Insurer shall have full discretion in the conduct of any proceedings and may cease any said action or application or defence at any time by:
 - i. paying to the Insured an amount up to the Sum Insured (after deduction of any sum already paid under this Policy) or any lesser amount for which a claim can be settled
 - ii. making a settlement out of court in the name of or on behalf of the Insured
 - iii. paying or otherwise settling with the Insured the amount of Loss provided for under this Policy whereupon the Insurer shall relinquish control of such claim and shall be under no further liabilityto the Insured in connection therewith except for costs and expenses relating to matters arising prior to the date of such payment or settlement and for which the Insurer is responsible in accordance with this Policy
 - F. The Insurer may at its discretion and at its own cost make settlement with parties other than the Insured and may take any other action which the Insurer considers necessary to prevent or minimise its Loss whether or not it is liable in the terms of this Policy and by so doing the Insurer will not be taken to have conceded any liability or waived any of the terms or conditions of this Policy
 - G. The Insured must at the expense of the Insurer do and concur in doing and permit to be done all things reasonably practicable to minimise loss to the Insurer and will permit the Insurer at its discretion to use the Insured's name for the purposes of any action or proceedings in connection with a claim under this Policy provided that the Insurer will keep the Insured informed of such actions or proceedings and will ensure that in doing so it complies with the Insured's regulatory obligations any policies and procedures of the Insured of which it is informed
 - H. Irrespective of the number of claims made under this Policy, the total liability of the Insurer including shall not exceed in the aggregate the sectional Sum



- Insured. Any payments the Insurer makes to the Insured under this Policy will reduce the sectional Sum Insured by an equivalent amount.
- I. If the Insured does or fails to do anything which may adversely affect the right to recover any sum from any Person for any matter covered by this Policy the Insurer may deduct from any payment otherwise due to the Insured under this Policy the amount by which the value of the right is reduced or the Insurer may recover that amount from the Insured if the Insurer has previously made a payment in respect of that matter.
 - J. After the Insurer has made a payment to the Insured under this Policy if the Insurer is able to recover any money from any third party the Insurer can keep this money. The Insurer will repay to the Insured any amount received in excess of the sums incurred by the Insurer but only to the extent that the Insurer is required to repay to the Insured in order to comply with regulatory or statutory obligations. If the Insured receives from any other Person any payment in respect of the same matter the Insured must immediately pay to the Insurer the sum received from that other Person.
 - K. On receipt of all required information/ documents that are relevant and necessary for the claim, the Company shall, within a period of 30 days offer a settlement of the claim to the insured. If the Company, for any reasons, decides to reject a claim under the Certificate of Insurance read with Policy, it shall do so within a period of 30 days from the receipt of last relevant and necessary document.
 - L. In the event the claim is not settled within 30 days as stipulated above, the insurer shall be liable to pay interest at a rate, which is 2% above the bank rate from the date of receipt of last relevant and necessary document from the insured/claimant by insurer till the date of actual payment

CLAIM SETTLEMENT for DRONES COVERED UNDER SECTION 2:

In the event of a loss or damage, the basis of loss or damage settlement will be as follows:

- A. Where the Drone can reasonably be repaired or reinstated at a cost less than the replacement cost, the Company will indemnify the Insured the cost of such repairs or reinstatement not exceeding the Insured Value less



the applicable excess as stated in the policy schedule. The cost of any alterations or overhaul shall not be recoverable under this policy.

No deduction shall be made for depreciation in respect of parts replaced except those with limited life, but the value of any salvage will be taken into account.

- B. In the case of a total loss/Constructive Total Loss [CTL] the Company shall indemnify the Insured in respect of the restoration or replacement costs not exceeding the Insured Value less any applicable excess as specified in the policy schedule. The replacement shall be of the same make and type and in reasonably like condition unless otherwise agreed.
- C. Should the Insurer exercise its option to pay for or replace the Drone the Insurer will take the drone together with all documents of record, registration and title thereto as Salvage.
- D. In case of all physical damage to spare engine and spare parts resulting from one accident, the company shall indemnify least of:
 - i. Insured financial interest in property
 - ii. The replacement cost of the property as of the time of physical damage, less depreciation and any unrepaired damage,
 - iii. The cost to repair the property, or
 - iv. The spare engines and spare parts Limit mention in the policy schedule.

Less policy deductible.

- E. The Company may at its option and sole discretion repair, reinstate, refurbish or replace the Drone damaged or destroyed, or any part thereof through any repairer/dealer or the manufacturer of respective Drone instead of paying the amount of loss or damage
- F. The Company shall be entitled to retain any defective part replaced under the Policy.

6. **Non Invalidation**

The Insured's interest in this Policy shall not be prejudiced by any act omission or default of any other party unless such party acted on behalf of the Insured or with the knowledge and consent of the Insured or if the Insured was aware of the act omission or default but did not inform the Insurer.



7. Right to Inspect

If required by the Company, its representatives and appointees, including a loss assessor or a surveyor appointed in that behalf, shall in case of any loss /damage or any circumstances that have given rise to a claim under the Policy be permitted at all reasonable times to examine into the circumstances of such loss /damage. The Insured shall, on being required so to do by the Company, produce all books of accounts, receipts, documents relating to or containing entries relating to the loss or such circumstance in his possession and furnish copies of or extracts from them as may be required by the Company so far as they relate to such claims or will in any way assist the Company to ascertain in the correctness thereof or the liability of the Company under the Policy.

8. Contribution

If, at the time of any claim, there is, or but for the existence of this Policy, would be any other policy of indemnity or insurance in favour of or effected by or on behalf of the Insured applicable to such claim, then the Company shall not be liable to pay or contribute more than its rateable proportion of any loss or damage.

9. Subrogation

The Insured shall at the expense of the Company do or concur in doing or permit to be done all such acts and things that may be necessary or reasonably required by the Company for the purpose of enforcing any civil or criminal rights and remedies or obtaining relief or indemnity from other parties to which the Company shall be or would become entitled or subrogated upon the Company paying for or making good any loss or damage under the Policy whether such acts and things shall be or become necessary or required before or after the Insured (s) indemnification by the Company.

10. Fraud

If the Insured or any one acting on his behalf shall make or advance any claim be in any respect fraudulent, or if any false declaration be made or used in support thereof or if any fraudulent means or devices are used to obtain any benefits under the Policy or if the Loss or damage be occasioned by the wilful act, or with the connivance of the Insured, all benefits under the Policy shall be void and all claims or payments thereunder shall be forfeited.



11. Cancellation

This policy may be cancelled by the Insured at any time by giving at least 7 days written notice to the Insurer. The Insurer will refund premium according to the Insurer’s Short Period Rates set out below:

Table of Short Period Rates	
Period of Risk	Amount of Premium To be Retained by the insurer.
Upto1month	20 % of the Annual Premium.
1 month and above, up to 2 months	30 % of the Annual Premium.
2 months and above, up to 3 months	40 % of the Annual Premium.
3 months and above, up to 4 months	50 % of the Annual Premium.
4 months and above, up to 5 months	60 % of the Annual Premium.
5 months and above, up to 6 months	70 % of the Annual Premium.
6 months and above, up to 7 months	75 % of the Annual premium.
7 months and above, up to 8 months	80 % of the Annual Premium.
8 months and above, up to 9 months	85 % of the Annual Premium.
9 months and above	Full Annual Premium.

The above is applicable provided the Insured has not made any Claim under the Policy during the Policy Period. No refund of premium shall be due if the Insured has made a Claim under this policy.

Insurer may cancel this insurance by giving insured, at least 15 days written notice, and if no claim has been made then we shall refund a pro-rata premium for unexpired policy period. Under normal circumstances, Policy will not be cancelled except for reasons of mis-representation, fraud, non-disclosure of material facts or Insured’s non-cooperation. If the Policy is cancelled by the Company on grounds of fraud by the Insured, the Company shall not be liable to pay any refund to the Insured.

12. Automatic Termination

The cover for the Insured shall terminate immediately in the event of admissible claim and settlement of 100% of Sum Insured mentioned against respective section in the Policy Schedule.



13. **Dispute Resolution**

- a. If any dispute or difference shall arise as to the quantum of claim to be paid under this Policy (liability/claim being otherwise admitted by the Company), such difference shall independently of all other question be referred to the decision of a sole arbitrator to be appointed in writing by the Company and the respective Insured or if they cannot agree upon a single arbitrator within 30 days of any party [the Company or the respective Insured] invoking arbitration, the same shall be referred to a panel of three arbitrators, comprising of two arbitrators one to be appointed by each of who are the parties to the dispute/difference and the third arbitrator to be appointed by such two arbitrators and arbitration shall be conducted under and in accordance with the provisions of the Arbitration and Conciliation Act, 1996 as amended from time to time. The law of the arbitration will be Indian law, and the seat of arbitration and venue for all hearings shall be within India.
- b. It is clearly agreed and understood that no difference or dispute shall be referable to arbitration as herein before provided if the Company has disputed or not accepted/admitted the liability/claim under the Policy.
- c. It is hereby expressly stipulated and declared that it shall be a condition precedent to any right of action or suit read with this Policy that the award by such arbitrator/ arbitrators of the amount of the loss or damage shall be first obtained.
- d. It is also hereby further expressly agreed and declared that if the Company shall disclaim/repudiate the liability to the respective Insured for any claim under the Policy, and such claim shall not, within 12 calendar months from the date of such disclaimer have been made the subject matter of a suit in a court of law, then all benefits under the Policy shall be forfeited and the rights of Insured shall stand extinguished and the liability of the company shall also stand discharged.
- e. In the event that these arbitration provisions shall be held to be invalid then all such disputes or differences shall be referred to the exclusive jurisdiction of the Indian Courts subject to other clauses herein.

14. **Notices**

- a. Any and all notices and declarations for the attention of the Company shall be submitted in writing and shall be delivered to the address specified in the Policy Schedule.
- b. Any and all notices and declarations for the attention of the Insured shall be posted to the Insured's address stated in the Policy Schedule.



15. Governing Law

The construction, interpretation and meaning of the provisions of this Policy shall be determined in accordance with Indian law. The section headings of this Policy are included for descriptive purposes only and do not form part of this Policy for the purpose of its construction or interpretation. Subject to Condition 14 (Dispute Resolution) above, for any dispute under this policy the courts of India will have exclusive jurisdiction to hear and determine any such dispute.

16. Entire Contract

This Policy constitutes the complete contract of insurance for the Insured. No change or alteration in this Policy shall be valid or effective unless approved in writing by the Company, which approval shall be evidenced by an endorsement on the Policy.

17. Two or more schedule drones

When the insurance afforded by this policy applies to two or more scheduled drones, the terms of this policy shall apply separately to each.

18. Territorial Limits

This Policy covers Insured Risk of concerned Insured arising after the policy commencement date and during the Policy Period within India. The Company's liability to make any payment under admissible claims shall be to make payment to the Insured within India and in Indian Rupees only.



Optional Covers

Alternate Hire Charges

It is hereby agreed and declared that on payment of additional premium, the Section 2 of the Policy is extended to cover reasonable cost of renting temporary replacement Drone, in the event of covered damage to the insured Drone can be economically repaired or replaced, to enable the **Insured** to continue with his business or operation whilst repairs are being made.

CONDITIONS :

- 1) The cover may be granted only for Insured Drones used for Business/Rental Use.
- 2) The alternate hire charges recoverable under the policy may be actual charges incurred by the Insured to hire a Drone of similar make, model and capacity for Insured Use as mentioned in the Policy Schedule.
- 3) Alternate hire charges payable under the policy are exclusive of any import charges or custom duty

Cover limit: For a maximum period of 30 days or hire cost reach Rs. _____ any one occurrence, which ever occur first



Drone War Liabilities

(AVN 52E 12.12.01 (amended for Drones))

1. WHEREAS the Policy of which this Endorsement forms part includes the War, Hi-Jacking and Other Perils Exclusion Clause (Clause AVN 48B), it is hereby understood and agreed that with effect from inception, all sub-paragraphs other than (b) of Clause AVN 48B forming part of this Policy are deleted SUBJECT TO all terms and conditions of this Endorsement.
2. EXCLUSION applicable only to any cover extended in respect of the deletion of sub-paragraph (a) of Clause AVN 48B.

Cover shall not include liability for damage to any form of property on the ground situated outside Canada and the United States of America unless caused by or arising out of the use of Drones.

3. LIMITATION OF LIABILITY

The limit of Our liability in respect of the coverage provided by this Endorsement shall be as per schedule any one occurrence and in the annual aggregate (the “sub-limit”). This sub-limit shall apply within the full Policy limit and not in addition thereto.

4. AUTOMATIC TERMINATION

To the extent provided below, cover extended by this Endorsement shall TERMINATE AUTOMATICALLY in the following circumstances:

- i. All cover - upon the outbreak of war (whether there be a declaration of war or not) between any two or more of the following States, namely, France, the People’s Republic of China, the Russian Federation, the United Kingdom, the United States of America.
- ii. Any cover extended in respect of the deletion of sub-paragraph (a) of Clause AVN 48B -upon the hostile detonation of any weapon of war employing atomic or nuclear fission and/or fusion or other like reaction or radioactive force or matter wheresoever or whensoever such detonation may occur and whether or not the Insured Drone may be involved.
- iii. All cover in respect of any of the Insured Drone requisitioned for either title or use – upon such requisition PROVIDED THAT if an Insured Drone is in the air when (i), (ii) or (iii) occurs, then the cover provided by this Endorsement (unless



otherwise cancelled, terminated or suspended) shall continue in respect of such a Drone until completion of its first landing thereafter.

5. REVIEW AND CANCELLATION

- a) Review of Premium and/or Geographical Limits (7 days) We may give notice to review premium and/or geographical limits - such notice to become effective on the expiry of seven days from 23.59 hours GMT on the day on which notice is given.
- b) Limited Cancellation (48 hours)
- c) Following a hostile detonation as specified in 3 (ii) above, We may give notice of cancellation of one or more parts of the cover provided by paragraph 1 of this Endorsement by reference to sub-paragraphs (c), (d), (e), (f) and/ or (g) of Clause AVN 48B - such notice to become effective on the expiry of forty-eight hours from 23.59 hours GMT on the day on which notice is given.
- d) Cancellation (7 days)
- e) The cover provided by this Endorsement may be cancelled by either Us or You giving notice to become effective on the expiry of seven days from 23.59 hours GMT on the day on which such notice is given.
- f) Notices

All notices referred to herein shall be in writing.

All other Policy terms, conditions, limitations and exclusions remained unaltered.



Cyber Liability Cover

It is hereby agreed and declared that on payment of additional premium, the section 1 of the policy is extended to cover compensatory damages (including costs awarded against You) in respect of Bodily Injury (fatal or otherwise) and Property Damage following the unlawful interference of any computer system, software programme, computer code, computer process or any other electronic system that enables a third party to seize control of Your Drone whilst in-Flight with the intention of inflicting harm.

The limit of our liability in respect of the coverage provided by this Endorsement shall be as per schedule any one occurrence and in the annual aggregate.

Subject to the Policy terms, conditions, limitations and exclusions.



Invasion Of Privacy Cover

It is hereby agreed and declared that on payment of additional premium, the policy is extended to cover invasion of privacy committed by you, whilst operating a Drone in accordance with the terms and conditions of this Policy, during the Period of Insurance. Insurer will indemnify you against the sums that you are legally liable to pay as compensation subject to maximum amount mentioned in schedule, any one offence and in the annual aggregate.

For the purposes of this endorsement an "invasion of privacy" shall mean an invasion of any rights of privacy or any nuisance, trespass or interference with any easement or right of air, light, water or way.

Subject to the Policy terms, conditions, limitations and exclusions.



Night Flying Endorsement

It is hereby agreed and declared that on payment of additional premium, the policy is extended to cover Night Flying. Any authorised pilot operating a Drone, insured under this policy, during the hours of darkness, must hold a valid permit and/or authorisation from the relevant governing Aviation Authority.

All other Policy terms, conditions, limitations and exclusions remained unaltered.



BVLOS Endorsement

It is hereby agreed and declared that on payment of additional premium, the policy is extended to cover BVLOS operations. Any authorised pilot operating a Drone, insured under this policy, beyond visual line of sight, must hold a valid permit and/or authorisation from the relevant governing Aviation Authority.



Drone In Transit Endorsement

The Policy is extended to insure the Drone(s) and/or Associated Equipment detailed in the insurance Schedule of the Policy to which this Endorsement is attached against Loss, Theft, Disappearance or Accidental Damage occurring while in transit by any means within the Geographical Limits stated in the Insurance Schedule.

We shall only be liable to the extent that any other valid insurance has not been issued.

Exclusions: This coverage does not insure:

- 1) Loss or damage occurring to an insured Drone(s) while in Flight.
- 2) the cost of making good wear and tear, gradual deterioration, inherent defect, rust or oxidation, moth or vermin damage, warping or shrinkage.
- 3) loss or damage caused by or resulting from:
 - 4) maintenance, repair, renovation, restoration, modification or any similar process;
 - 5) aridity, humidity, exposure to light or extremes of temperature unless such loss or damage caused by storm or fire.
- 6) loss from or damage in or on unattended vehicles.
- 7) electrical or mechanical fault or breakdown.
- 8) depreciation.
- 9) any loss other than the direct cost of repairing or replacing the insured Drone(s) in accordance with the basis of settlement.
- 10) loss of or damage to an insured Drone(s) which is subject to any lease, conditional sale, charge or other encumbrance.
- 11) increased cost or expense due to compliance with any airworthiness directives.
- 12) accessories and/or spare parts.

Conditions:

We shall not be liable to pay any Claim under this insurance unless insured comply with all the requirements in the following conditions.

1) Transit

Insured property is packed and unpacked for transit by competent professional packers and in accordance with manufacturers guidelines.

2) Security and protections

Insured must ensure that all fire alarm and security systems, locks and all other physical protections are fully engaged whenever **Your Drone(s)** is/are left unattended.

Subject to the **Policy** terms, conditions, limitations and exclusions.



Liability For Damage To UAS That You Do Not Own

It is hereby agreed and declared that on payment of additional premium for this policy, it is agreed:

1. The provisions of Exclusion (8) applicable to SECTION 1 shall not apply to property damage to any unmanned aircraft system shown in the Schedule below while such unmanned aircraft system is in your care, custody or control.
2. Insurer will pay for damages because of property damage to any unmanned aircraft system shown in the Schedule below is the limit shown in the Schedule below, which shall be part of and not in addition to the "Each Occurrence" limit shown in the Declarations.

The insurance afforded by this endorsement does not apply to property damage to any unmanned aircraft system owned in whole or in part or leased for more than thirty (30) days by any insured;



Personal & Advertising Injury Liability

In consideration of the payment of the premium for this policy, and subject to the following provisions which are applicable only to the insurance afforded by this endorsement and which shall be in addition to all other applicable provisions not amended in this endorsement, it is agreed that:

1. Insuring Agreement.

A. We will pay those sums that the insured becomes legally obligated to pay as damages because of personal and advertising injury to which this insurance applies. We will have the right and duty to defend the insured against any suit seeking those damages. However, we will have no duty to defend the insured against any suit seeking damages for personal and advertising injury to which this insurance does not apply or when this insurance is excess. We may at our discretion investigate any offense and settle any claim or suit that may result. But:

- i. The amount we will pay for damages is limited as described in paragraph 4 of this endorsement, and
- ii. Our right and duty to defend end when we have used up the applicable limit of insurance in the payment of judgments or settlements under section 1-Liability.

B. This insurance applies to personal and advertising injury caused by an offense arising out of use of any unmanned aircraft system by you or on your behalf, but only if the offense was committed in the coverage territory and during the policy period.

2. Definition: The following definitions are added to the policy:

Advertisement means a notice that is broadcast or published to the general public or specific market segments about your goods, products or services for the purpose of attracting customers or supporters.



For the purposes of this definition:

- a) Notices that are published include material placed on the Internet or on similar electronic means of communication; and
- b) Regarding web-sites, only that part of a web-site that is about your goods, products or services for the purposes of attracting customers or supporters is considered an advertisement.

Personal and advertising injury means injury, including consequential bodily injury, arising out of one or more of the following offenses:

- a) False arrest, detention or imprisonment;
- b) Malicious prosecution;
- c) The wrongful eviction from, wrongful entry into, or invasion of the right of private occupancy of a room, dwelling or premises that a person occupies, committed by or on behalf of its owner, landlord or lessor;
- d) Oral or written publication, in any manner, of material that slanders or libels a person or organization or disparages a person's or organization's goods, products or services;
- e) Oral or written publication, in any manner, of material that violates a person's right of privacy;
- f) The use of another's advertising idea in your advertisement; or
- g) Infringing upon another's copyright, trade dress or slogan in your advertisement.

3. Exclusions.

In addition to the exclusions contained in GENERAL POLICY EXCLUSIONS applicable to all sections, including those applicable to Section 1 - LIABILITY ONLY, the insurance afforded by this endorsement does not apply to:

(a) KNOWING VIOLATION OF RIGHTS OF ANOTHER

Personal and advertising injury caused by or at the direction of the insured with the knowledge that the act would violate the rights of another and would inflict personal and advertising injury.



(b) MATERIAL PUBLISHED WITH KNOWLEDGE OF FALSITY

Personal and advertising injury arising out of oral or written publication, in any manner, of material, if done by or at the direction of the insured with knowledge of its falsity.

(c) MATERIAL PUBLISHED PRIOR TO POLICY PERIOD

Personal and advertising injury arising out of oral or written publication, in any manner, of material whose first publication took place before the beginning of the policy period.

(d) CRIMINAL ACTS

Personal and advertising injury arising out of a criminal act committed by or at the direction of the insured.

(e) CONTRACTUAL LIABILITY

Personal and advertising injury for which the insured has assumed liability in a contract or agreement. This exclusion (e) does not apply to liability for damages that the insured would have in the absence of the contract or agreement.

(f) BREACH OF CONTRACT

Personal and advertising injury arising out of a breach of contract, except an implied contract to use another's advertising idea in your advertisement.

(g) QUALITY OR PERFORMANCE OF GOODS – FAILURE TO CONFORM TO STATEMENTS

Personal and advertising injury arising out of the failure of goods, products or services to conform with any statement of quality or performance made in your advertisement.

(h) WRONG DESCRIPTION OF PRICES

Personal and advertising injury arising out of the wrong description of the price of goods, products or services stated in your advertisement.



(i) INFRINGEMENT OF COPYRIGHT, PATENT, TRADEMARK OR TRADE SECRET

Personal and advertising injury arising out of the infringement of copyright, patent, trademark, trade secret or other intellectual property rights. This exclusion (i) does not apply to infringement, in your advertisement, of copyright, trade dress or slogan.

(j) INSUREDS IN MEDIA AND INTERNET TYPE BUSINESSES

Personal and advertising injury committed by an insured whose business is:

- (1) Advertising, broadcasting, publishing or telecasting;
- (2) Designing or determining content of web-sites for others; or
- (3) An Internet search, access, content or service provider.

This exclusion (j) does not apply to Paragraphs (a), (b) and (c) of the definition of personal and advertising injury.

For the purposes of this exclusion (j), the placing of frames, borders or links, or advertising, for you or others anywhere on the Internet is not, by itself, considered the business of advertising, broadcasting, publishing or telecasting.

(k) ELECTRONIC CHATROOMS OR BULLETIN BOARDS

Personal and advertising injury arising out of an electronic chatroom or bulletin board the insured hosts, owns, or over which the insured exercises control.

(l) UNAUTHORIZED USE OF ANOTHER'S NAME OR PRODUCT

Personal and advertising injury arising out of the unauthorized use of another's name or product in your e-mail address, domain name or metatag, or any other similar tactics to mislead another's potential customers.

(m) RECORDING AND DISTRIBUTION OF MATERIAL OR INFORMATION IN VIOLATION OF LAW



4. Limits of our Liability.

Regardless of the number of:

- (a) persons or organizations who are Insureds,
- (b) persons or organizations who sustain personal and advertising injury, or
- (c) claims made or suits brought on account of personal and advertising injury,

our liability is limited as follows:

(i) the PERSONAL AND ADVERTISING INJURY AGGREGATE LIMIT shown in the schedule of this endorsement shall be a part of and not in addition to the Each Occurrence limit of liability for Section 1, set forth in the Declarations. Our Each Occurrence limit of liability for Section I is the most we will pay for the sum of damages under Section I because of all bodily injury and property damage arising out of any one occurrence and damages because of personal and advertising injury, if damages because of personal and advertising injury are also sought in any claim or suit seeking damages because of bodily injury or property damage.

(ii) subject to (i) above, the PERSONAL AND ADVERTISING INJURY AGGREGATE LIMIT shown in the schedule of this endorsement is the most we will pay for damages because of all personal and advertising injury.

Aggregate limits described in this policy apply separately to each consecutive annual period and to any remaining period of less than 12 months, starting with the beginning of the policy period shown in the Declarations, unless the policy period is extended after issuance for an additional period of less than 12 months. In that case the additional period will be deemed part of the last preceding period for purposes of determining the Limit of Insurance or deductible. No aggregate limit shall be increased by successive claims or suits or from offense to offense.

5. GENERAL CONDITIONS, paragraph 4 is amended to read as follows:

4. Duties in the Event of Occurrence, Offense, Physical Damage, Claim or Suit.

A. You must see to it that the Policy Issuing Office shown in the Declarations is notified as soon as practicable of an occurrence or offense that may result in a claim or suit, or of any physical damage sustained that may result in a claim. In the event of theft, robbery or pilferage you shall also give notice to the police. To the extent possible, notice should include:



- I. How, when and where the occurrence, offense or physical damage took place;
- II. The names and addresses of any injured persons and witnesses; and
- III. The nature and location of any injury or damage arising out of the occurrence, offense or physical damage.

B. If a claim is made or suit is brought against any insured, you and any other involved insured must immediately:

- i. Record the specifics of the claim or suit and the date received; and
- ii. Send copies of any demands, notices, summonses or legal papers received in connection with the claim or suit to the Policy Issuing Office shown in the Declarations.

C. You and any other involved insured must:

- i. Authorize the Policy Issuing Office shown in the Declarations to obtain records and other information;
- ii. Cooperate with the Policy Issuing Office shown in the Declarations in the investigation or settlement of the claim or defense against the suit; and
- iii. Assist the Policy Issuing Office shown in the Declarations, upon its request, in the enforcement of any right against any person or organization that may be liable to the insured because of injury or damage to which this insurance may also apply.
- iv. No insured will, except at that insured's own cost, voluntarily make any payment, assume any obligation, or incur any expense, other than for first aid, without the consent of the Policy Issuing Office shown in the Declarations.

Schedule of limit: PERSONAL AND ADVERTISING INJURY AGGREGATE LIMIT as mentioned in policy schedule.