



SURVIVING THE STORM

Nathan Neal reveals how the military remains secure when operating in extreme weather

For the military, identifying and preparing for potential threats is essential, not just for the safety of the armed forces personnel, but also for the areas they serve. As meteorological conditions around the world continue to evolve and become more extreme, being able to monitor upcoming changes in atmospheric conditions is of pivotal importance.

In 2022 alone, the National Centres for Environmental Information reported that the United States experienced 18 extreme weather events, where the overall damages exceeded \$1-billion, resulting in over 470 deaths. And in July 2022, a lightning storm struck an army training post in Georgia, resulting in one fatality and nine soldiers left injured.

Through the deployment, maintenance and investment into thunderstorm detection technology, as well as other weather detection systems, the risks, damages and losses can be averted, allowing the military to be well-equipped for future meteorological uncertainty while still remaining secure.

Helicopters are frequently used by the military for the transportation of troops, reconnaissance information-gathering operations as well as for the safe extraction of soldiers and equipment from dangerous environments. These machines are built to be highly resilient, however in the face of the rising frequency of extreme weather events, it is essential that the risks to these aircraft are detected and measured accurately.

If a helicopter approaches a positively charged area in a thunderstorm cell there is great potential for a lightning strike, which can cause it immense damage

For helicopters that are in operation during a thunderstorm, the risks can be enormous. Helicopters generate a strong negative charge when they are flying due to static charging. This is typically released once the helicopter is back in contact with the Earth's surface. However, if an aircraft approaches a positively charged area in a thunderstorm cell then there is great potential for a lightning strike, which can cause immense damage to the aircraft. This is known as aircraft-induced lightning, where the aircraft initiates the creation of a lightning strike. A large majority of helicopter crashes are the result of extreme weather events and especially induced lightning strikes.

If an aircraft were to be struck by lightning, the damage can be severe. While these vehicles are very resistant by design, there is always the risk of the passengers being injured or worse. Moreover, any damage done to the helicopter would need to be repaired, which is highly costly, causing further disruption.

To avoid these complications, the use of helicopters during thunderstorms should be avoided wherever possible and the key to this risk management is knowing where and when a thunderstorm is developing. These helicopters are paramount to security across the globe, so it is essential that precautions and best practices are followed at all times.

Extreme weather events also pose a significant risk to outdoor training bases and additional military infrastructure. These meteorological phenomena, such as wildfires, flooding, high wind speeds and more, are all capable of generating enormous amounts of difficulty in the construction, maintenance and operation of army bases on an international level. As global conditions continue to become more extreme and unpredictable, these will have an ongoing impact that will only get worse unless action is taken to help minimise the risks while still operating securely.

The monitoring and tracking of variables such as temperature, humidity, precipitation and visibility each create their own potential threats and implications for military bases, which need to be as accurate and up to date as possible. These aspects of the weather can impact the training plans used by the military, the maintenance and infrastructure of the facilities themselves, the surveillance and security of army bases, as well as the safe transporting of people and equipment between sites and operations.

Weather detection systems enable the military to not only assess extreme weather events as they happen, but also allow users to take action on short-term changes in atmospheric conditions through the monitoring, analysis and forecasting of meteorological developments in real-time.

In a world that is so rapidly evolving, maximising the benefits of these systems can prove pivotal in combating regular atmospheric changes, bolstering the flexibility and reaction speeds of international security-focused organisations immensely, with the consistent collection, processing and analysis of atmospheric data that enhances the military's response to extreme weather.

Specialist weather detection technology allows the military to prepare for future periods of meteorological uncertainty, providing them with resources to get ahead of any extreme weather forecasts and minimise

disruption. This adds massive value when risk planning and, as this technology continues to develop and become more advanced, it will allow for more accurate and timely predictions, further increasing its value for the army.

In addition to the installation and maintenance of weather detection systems, the military also has a range of different processes and training procedures that play an instrumental role in protecting soldiers from approaching thunderstorms, such as the 30/30 rule. Lightning kills approximately 20-30 people in the United States alone, injuring hundreds more, so ensuring that the required steps are taken to mitigate this must be prioritised.

IT IS ESSENTIAL THAT THE RISKS TO HELICOPTERS ARE DETECTED AND MEASURED ACCURATELY

The 30/30 rule is based on the concept that when you see a lightning strike, you should count the time until you hear thunder. If that time is 30 seconds or less, then the thunderstorm is classed as being close enough to be considered dangerous, and it is advised that you should instantly seek shelter.

You should remain in the shelter until 30 minutes after the last clap of thunder when it is then safe to do so. Processes such as this play a crucial role in protecting members of the armed forces, who require access to outdoor training, during periods of extreme weather.

Amidst an ever-changing world, it can be incredibly difficult to keep up to date with the latest developments and processes on how to respond effectively to extreme weather events. The solution to this starts with education and awareness, followed by the implementation of secure strategies that help inform people of the best practices and the correct ways to respond in different situations.

The United States Army has released an annual Climate Strategy, created specifically for this purpose. The document helps address the increasing threats of climate change, providing readers with an insight into how meteorological conditions are developing across the world, the impact that this is having on us and the processes and rules that should be followed to help mitigate its risk on soldiers' lives.

In matters of international security, it is imperative that the armed forces are able to act in the most well-informed way as possible, being able to adapt their operations based on both current and future atmospheric conditions. Collating and maximising the value of additional training and resources can play an instrumental role in increasing the protection of both the armed forces as well as the countries and nations that they serve.

In addition to being greatly impacted by the ramifications and disruptions caused by climate change, the military contributes large volumes of greenhouse gases into the atmosphere. Although there is no agreed-upon number, a recent study estimated that the world's militaries contribute between one and five percent of global emissions.

This figure shows that although there are larger contributors, the military still has to play its part in reducing its impact on the environment.

The United Kingdom's Military of Defence actively recognises the importance of acting now to create a more sustainable future, with the Department of Defence Equipment and Support identifying three of its sites which aim to become carbon neutral by 2025. Lowering the usage of carbon in its operations is instrumental in reducing the military's carbon footprint, which can further help in the fight against climate change.

IT IS IMPERATIVE ARMED FORCES ARE ABLE TO ACT IN THE MOST WELL INFORMED WAY POSSIBLE

The United Kingdom's Armed Forces are also committed to reducing their environmental impact through investment in renewable energy. In May 2023, the opening of a brand-new solar farm at the Duke of Gloucester Barracks in South Cerney was announced as a part of 'Project Prometheus' – which is designed to increase the usage of renewable energy across the Defence industry.

The solar farm is one of four selected pilot sites for the project, which is estimated to create a combined £1-million in efficiency savings per year. The farms will also reduce emissions by approximately 2,000 tonnes of carbon dioxide equivalent per year, significantly helping it to realise its ambition of a Net

Zero carbon emitting estate by 2050. The final farm in this pilot run of Project Prometheus is expected to open in this summer at Rock Barracks in Suffolk, further helping to maximise the vision of the sustainable future of the UK's Armed Forces.

The above projects being undertaken by the United Kingdom's Armed Forces are but a few of the global efforts to shape a more sustainable and zero-carbon future. Global militaries have realised that while they are directly facing the impacts of climate change and the subsequent rise in extreme weather events, they too have their own parts to play.

The world is changing faster than ever before and with this comes an increase in the frequency of extreme weather events. For the military, it is essential that they are able to accurately track, monitor and predict these events ahead of time, providing them with ample time to react, minimising damage to aircraft and army bases, limiting the weather's impact on operations and maximising the security of soldiers at sites.

Weather detection systems hold the key to the military's response and are an invaluable piece of technology that prepares for both current and future periods of atmospheric uncertainty, providing them with ample time to adjust and alter their operations to eliminate the disruption caused.

The armed forces play an instrumental role in maintaining and residing over matters of international security. Amidst an often uncertain future, harnessing the value of this technology holds the key to successfully navigating through and surviving the storm. Decision-makers must continue to prioritise emerging technologies, using it to maximise both safety and efficiency now and in the future ●

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An Air Force Tech Sergeant uses a wind and weather meter during a dust storm

