



## Unmanned Aerial Vehicle System for Critical Infrastructure Inspections Improving Safety at Transmission Lines, Cell Tower, Railroad Bridges and Facilities



**David Culler, Jr, CAPT USN (ret)**  
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**Interview conducted by:**  
**Lynn Fosse, Senior Editor**  
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**CEOCFO: *Mr. Culler, what is that is the focus for HAZON Solutions today?***

**Mr. Culler:** Providing the most professional services to our customers every day and improving tomorrow. We conduct critical infrastructure inspections utilizing unmanned systems. We are working with several Fortune 500 companies providing inspection services on transmission lines, cell towers, railroad bridges, facilities and supporting crisis response. Critical infrastructure inspections is a big part of what we do at HAZON, along with delivering actionable information back to our customers once the

inspections are complete. We also have training capability; providing companies and individuals with basic and advanced UAV (Unmanned Aerial Vehicle) training, as well as helping them design and develop their own UAV capability from the ground up. We just designed and developed a UAV program for a Fortune 500 energy company with great results; they now have the ability to do basic spot inspections, a new competence that will enhance system reliability across the enterprise.

**CEOCFO: *Are these areas that could not be inspected before or that required eighty foot ladders? What are you replacing and how are you expanding what is available?***

**Mr. Culler:** Transmission line inspections for example are usually conducted utilizing helicopters and having linemen climb the structures. Obviously, both options don't come without risk. Unmanned systems provide a safer and more effective way of accomplishing inspections, along with being more environmentally friendly. We've had great results with meeting and most times exceeding inspection requirements, more so than what helicopters are currently able to do. The unique vantage points you can get with UAVs has helped ensure these improved results. Improving safety and providing more actionable information at an affordable cost is reaping great benefits for the utility industry and other companies utilizing this technology.

**CEOCFO: *What might you be able to find that are not found otherwise or are unlikely to be found?***

**Mr. Culler:** It's impressive what we're able to find and provide back to our customers. For example, we're capturing small cotter keys backing out of insulators, loose nuts, missing lock washers, stripped bolt threads, small chips or corrosion on the underside of structure components; most of which is very hard to see from the ground or even for someone climbing the structure. On cell towers, we're reading bar codes on equipment from 15 to 20 feet away – again, utilizing this technology improves safety by preventing a tower climber from ascending over 200 feet to capture this type of information. Utilizing infrared sensors, we can capture imagery that is not visible to the human eye, and provide temperature readings to better understand the health of components being inspected. The proximity and unique vantage points you can get utilizing unmanned systems is opening up a level of fidelity and imagery we haven't seen before.

**CEOCFO: *How does the UAV know what to look for? How does it know what to report on?***

**Mr. Culler:** We operate with two-person team. One of the team members is the pilot in command, responsible for safely operating the UAV and flying a specific flight profile around the structure. The other team member is the sensor operator, responsible for operating the sensors, for example, a high definition or infrared camera. The sensor operator is capturing

the inspection requirements, which often requires zooming into components on the structure to ensure the right data is collected. When we first started working with the energy companies, we had a qualified lineman supporting our inspections and teaching our crews what to look for, on the job training. Some of our customers have provided schools for our crews to attend to learn inspection requirements. The captured inspection data is delivered back to our customers with our findings while also allowing our customers to review and assimilate the information.

**CEOCFO: *Is it well accepted today that this is what unmanned vehicles should be used for? Is it still somewhat of an education process?***

**Mr. Culler:** It's definitely an education process, some companies still don't quite understand the technology and what value it brings. That's been the fun part for HAZON, getting to demonstrate this capability to our potential customers and showing them the value of how it can be utilized to improve inspection requirements. Even during some of our first demonstrations back in 2014, our customers could not believe the fidelity we were collecting from several different vantage points, they quickly realized the value and few months later we were out conducting inspections utilizing UAVs. Even tower climbers, who were initially skeptical and looked at UAVs as a threat to their jobs, converted and are now asking for UAVs to support a number of different task. It is still going to require more time and education, but I'm confident more and more will get excited about UAVs and how they can be leveraged to improve the way job requirements are being completed. I'm very confident over the next couple of years it is going to be embraced by most in the industry.

**"100% of our leadership have served in the military conducting complex missions and leading people in the most challenging environments; I believe this gives us a clear advantage as we now protect our nation's critical infrastructure. We have the highest quality people across the board that strive to make themselves and HAZON better every day. We've been working with several Fortune 500 companies since 2015, which has proved invaluable for gaining experience and expertise in this new industry; very few UAV companies can say the same. I believe we've established a great reputation in the industry – it's been key for winning new business. This is what sets HAZON apart and ensures we remain a leader in the industry."** - David Culler, Jr, CAPT USN (ret)

**CEOCFO: *So many people have started to get involved with making drones. How do you stand out?***

**Mr. Culler:** I will start with the leadership backgrounds at HAZON Solutions; myself and the president of the company, Sean Cushing are retired Naval Aviators. We served a combined 50 years flying high performance jet aircraft off and on aircraft carriers, as well as flying in combat and leading large operational commands. To ensure mission success in this unforgiving environment, you had to have the right safety, standards, and training in place. We continue to adopt this belief and mindset and have folded these same traits into the fabric of HAZON Solutions. We adhere to the highest standards, training requirements and safety protocols to ensure all UAV missions are conducted with precision; our goal is to over-deliver to our customers. It's all about mission success.

I've witnessed a number of UAV companies that don't have the same focus on attention to detail, specifically, ensuring the right process and procedures are in place; most lack the experience and expertise. Many of our customers are receiving phone calls from UAV companies requesting to provide services for them. Due to working with HAZON and seeing our high standards and by the book approach, our customers quickly realize the potential shortfalls of many of these vendors. Unfortunately, there are many companies that do not know any better and are potentially at risk hiring a UAV company with little knowledge and experience, especially inspecting critical infrastructure. This is too important of a mission to not get it right every time, which is why we strive to improve our processes and procedures every day.

**CEOCFO: *What industries are not embracing what you offer that really should? Where is it falling short?***

**Mr. Culler:** I can't really say there is an industry that is not embracing it. What I would say it some are not embracing it fast enough in my opinion. Government Transportation as an example could greatly benefit from using this technology, yet they seem to be moving very slowly in understanding the benefits. It's not so much which industry; it is more the companies inside those industries. Some companies that we work with are utilizing it every day, while others are much more sporadic and taking a much more cautious approach. We understand most in the industry are trying to determine its utility while also looking at it from a cost vs. benefit.

**CEOCFO: *Do you constantly build more drones. Are there constant improvements? Is it mostly the software that gets updated? Would you tell us about your inventory? Is it a fleet?***

**Mr. Culler:** HAZON has a number of different UAVs and sensors and is platform agnostics, we're not building UAVs, but rather determining and purchasing the best UAVs and sensor packages to support customer requirements. Both hardware and software is often updated to ensure we have the best tool for the job.

We do have a small research and development department focused on finding solutions to new requirements. Flying in confined spaces would be an example of an inspection requirement that is difficult to do effectively. GPS denial and magnetic compass interference can make it challenging for even the most skilled and experienced UAV pilots. The good news is UAVs and sensors are constantly changing and getting more capable. These rapid advancements further validate the need for drone professionals to keep up with the latest capabilities and how to integrate them for better results. We work very hard at HAZON to understand the latest UAV technologies and how they might be applied to our current and future missions – it's critical for staying ahead of the competition.

**CEOCFO: *How is business?***

**Mr. Culler:** It is really good. I believe 2017 is going to be a very interesting year for many companies in this exciting space. HAZON is in a very good position to see exponential growth while continuing to be a leader in the industry. We are working with several Fortune 500 companies, gaining vital experience and expertise. Providing inspection services along with capability development and training has greatly expanded our market in the UAV space. Our #1 priority is providing an exceptional product to our customers every time. This mindset has been critical to our success – our customers have become our best marketing voice to others in the industry seeking UAV services and/or looking to build their own capability.

**CEOCFO: *What surprised you as HAZON has grown and evolved?***

**Mr. Culler:** Probably how rapidly the technology is changing and advancing. We work hard to stay up with the latest advancements and how best to integrate them into our operations – the goal is to be more effective, efficient and reduce cost for our customers. But, despite the advancements, there are still many inspection requirements that have not been solved. For example, consistently getting the right 3D photogrammetry fidelity of complex structures. The good news is HAZON is in a good position to understand the challenges and push the UAV industry to find solutions, we're truly leading the efforts on several different fronts. I'm confident the advancements will only accelerate as the technology continues to evolve, and so what seemed impossible today will be routine in the very near future. Bottom-line, we're helping create the future, which is an exciting place to be.

**CEOCFO: *There seems to be collaboration, maybe more so than in other industries. Does your staff need people skills; a certain personality to interact with your clients along with the technical?***

**Mr. Culler:** We have a very selective hiring process to ensure we employ the right talent. For every new employee, I personally sit down with them and discuss our vision, core values and expectations on day 1. Our core values start with Customer First, it's our principal focus. Our motto is Customer First, Safety Always. Interacting with our clients is a part of the job, we expect our employees to demonstrate the highest professionalism while ensuring all mission requirements have been safely and effectively accomplished. HAZON UAV teams are also required to have solid technical skills, a requirement to operate a variety of different UAVs, sensors, software, while developing best practices and delivering on new requirements. We expect a lot from our professionals; I'm very proud of them and what they do for HAZON every day.

**CEOCFO: *Why should people choose HAZON Solutions, LLC? What sets the company apart?***

**Mr. Culler:** What makes HAZON unique is our leadership; our people; our mission success mindset; our experience and expertise. 100% of our leadership have served in the military conducting complex missions and leading people in the most challenging environments; I believe this gives us a clear advantage as we now protect our nation's critical infrastructure. We have the highest quality people across the board that strive to make themselves and HAZON better every day. We've been working with several Fortune 500 companies since 2015, which has proved invaluable for gaining experience and expertise in this new industry; very few UAV companies can say the same. I believe we've established a great reputation in the industry – it's been key for winning new business. This is what sets HAZON apart and ensures we remain a leader in the industry.



**HAZON Solutions**  
Unmanned Systems at Work