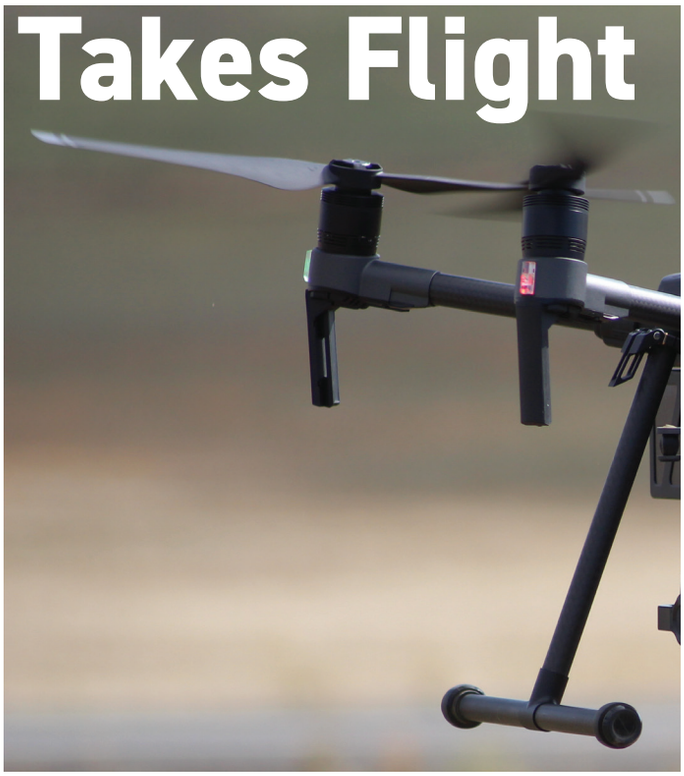
Drone Program Takes Flight



Klickitat PUD launches UAV program to aid in infrastructure maintenance and employee safety

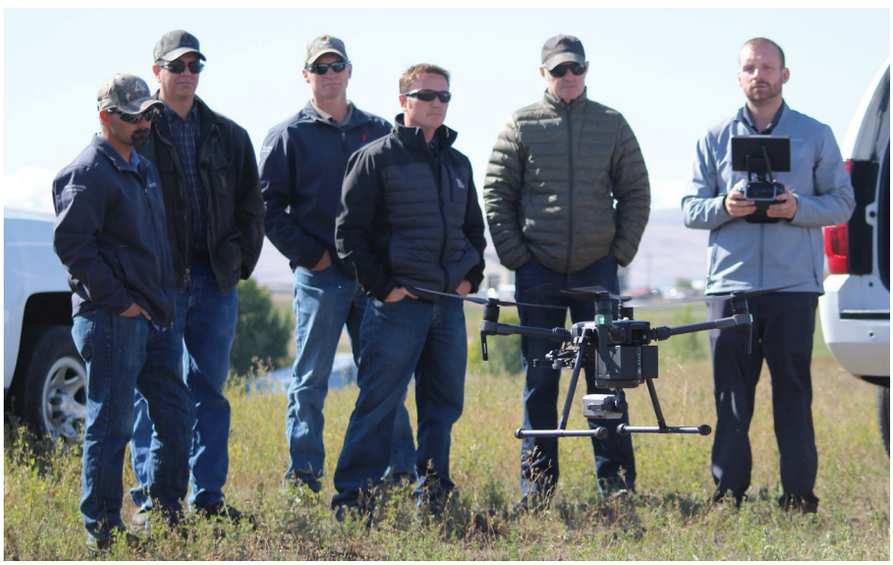
By Beth Schroder and Brandon Johnson

As new technologies emerge, Klickitat PUD evaluates them and determines if they will benefit customers and the utility. Such is the case with unmanned aerial vehicles—more commonly known as drones. Beginning in early 2019, KPUD staff began looking at what, if any, benefits this technology could provide.

Risk reduction, cost control, and efficiency and reliability improvement were the main areas evaluated. Each of these was important to staff in deciding to develop a drone program at Klickitat PUD.

An immediate use staff saw in the new technology was the ability to perform high-quality inspections while providing safety to workers in the field. A portion of Klickitat PUD's work involves operating and maintaining approximately 50 miles of high-voltage transmission lines. These lines transport the electricity that is produced by many of the wind generation sites and delivers it to the power grid. The remote locations of the lines and size of the structures makes it challenging to get close inspections of the critical hardware. Using drones allows Klickitat PUD to get more detailed information, which helps staff plan and prioritize work and develop a proactive maintenance plan.

During storm outages, crews often have to walk power lines to find the exact location of damage to repair it. By using drones, trained and Federal Aviation Association certified pilots (KPUD engineering staff) can access these same remote areas in a safer manner. Staff have the ability to avoid potential injury during storms or in rugged terrain by accessing and assessing infrastructure with a drone.

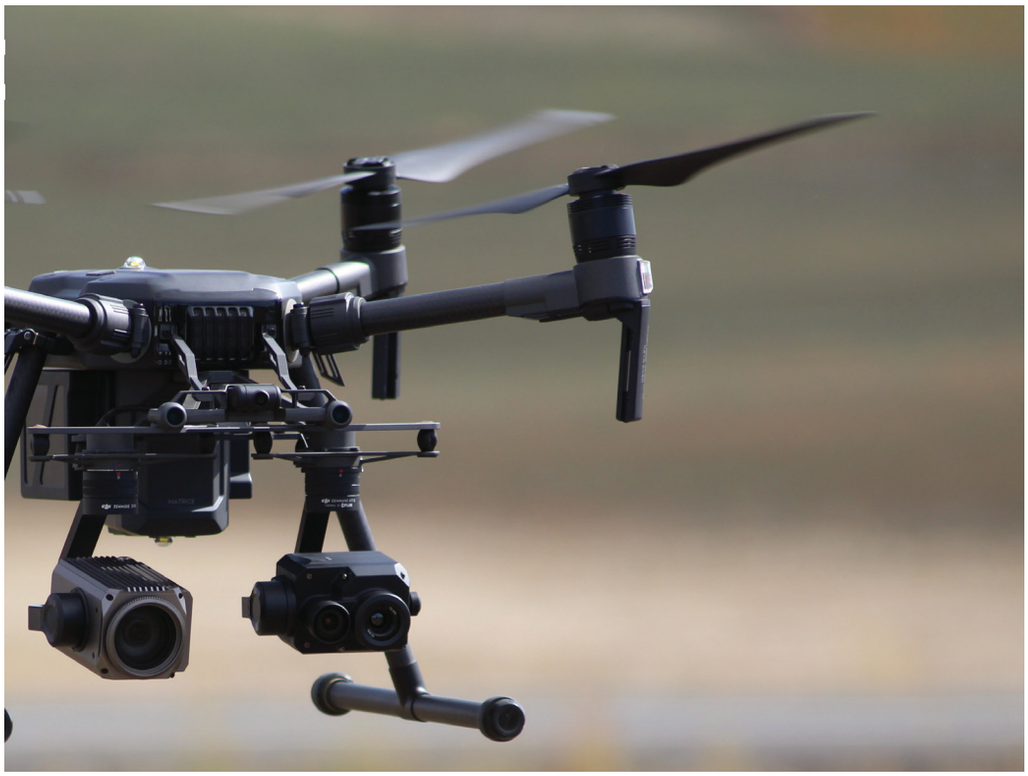


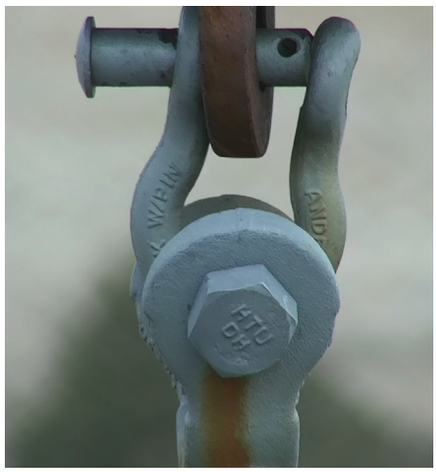
Klickitat PUD employees Greg Fahlenkamp, Aaron Estey, Justin Beierle, Brandon Johnson and Mark Garner get a look at one of General Pacific's drone options from Aerial Operations Manager Aaron Lambert. PHOTO BY BETH SCHRODER

While crews are capable of doing structure inspections, the ability to gather the amount of detail offered by a drone would not be feasible. With a drone, many inspections can be done in a much shorter time frame. The requirement of physically accessing miles of power line is removed. Inspections on high-voltage lines can be done without requiring power to be shut off.

Additionally, crews no longer need to set up lane closures or restrict the flow of traffic while inspecting infrastructure near busy roadways. Following a storm, KPUD can dispatch a drone crew to more efficiently pinpoint the location of damage on a line. This allows KPUD to more quickly identify the issue and restore power to customers.

Using traditional methods of infrastructure inspection, some items were able to be identified as issues and repaired. In traditional inspections, the data collected was often based on what the crews could see from their single vantage point. Without multiple vantage points on





ABOVE: Klickitat PUD's inspection drone. PHOTO BY BETH SCHRODER
RIGHT: This image, taken using Klickitat PUD's drone, shows attachment failure on a high voltage transmission conductor. This issue was easily identified using drone inspection methods.

each structure, some issues could not be identified and had the potential to lead to an unexpected power outage. Drone use helps operators obtain data from many different vantage points. They are able to take close-up, high-resolution images of each structure being inspected. The images are then reviewed by engineering staff.

Klickitat PUD is able to perform more frequent detailed inspections, which help maximize the life of assets. Issues are identified that can be repaired before they become an outage that unexpectedly impacts customers. Using this technology, inspection crews have already identified several issues that were quickly repaired. If these items had not been found, an interruption of service may have resulted.

Inspection of infrastructure is a necessity for Klickitat PUD. In order to provide reliable service to customers it is very important to ensure everything providing power is maintained.

KPUD's timing in evaluating the new technology was instrumental in moving forward with new inspection methods. The cost of drone technology has decreased and made them a cost effective tool.

The annual cost of the in-house drone inspection program is expected to be about half the cost of a traditional inspection program.

Not only does the program provide a significant cost savings, it provides more detailed data for line crews to work with. Drone operators have assisted with vegetation management and planning for line extensions in timbered areas. Data has been used to provide visual aids to crews. This allows crews to discuss where work needs to be completed without having to go to a remote site.

Klickitat PUD staff has partnered with Aero Drone Corp., based in Tygh Valley, Oregon. Staff from both entities worked together to develop procedures, training programs and utility specific software. The partnership reduced KPUD costs and allowed engineering staff to develop necessary skills.

KPUD's drone pilot qualifications include more than 15 hours of flight training and flight evaluations. Each pilot is trained and certified with the FAA's rigorous safety protocol for drone pilots. All pilots must follow KPUD procedures for operation of drones. Seven members of the engineering staff are FAA certified for drone operation.

Klickitat PUD drone operators will soon be out inspecting the critical infrastructure that provides power to customers. Inspections may take place in rural and incorporated areas of Klickitat County. If KPUD operators are inspecting in incorporated areas, notification will be provided to customers that could be impacted by the inspection as well as to the governing authority in those areas.

KPUD's drone inspection team will continue to mitigate risk and improve efficiencies and reliability in day-to-day operations. Staff is using the technology to proactively assess the electrical system and implement work plans. ■