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Drone Usage & the Positive Impact on the Environment

Oct 2023

Exelon's 1st UAS Team

- **Manager UAS**: Leads the development and execution of utility UAS strategy
- **Supervisor:** Leads field operations
- **Engineer:** Quantify impact of use-cases; oversee metrics; research emerging technical trends
- **Engineering Tech**: Performs UAS Inspections, collects data, and performs data analysis

1. Andy McCauley – Manager
2. Mike Finn – Supervisor Ops
3. Brea Skinner – Sr. Engineer
4. Princess Macklin – Engineer
5. Blake Alexander – ETS
6. Clancy Richardson – AETS
7. Hakeem Bailey – AETS
8. Darren Rehm – AETS
9. Boone Hawley – Staff Aug
10. Justin Collins – Staff Aug
11. William Outten – Staff Aug

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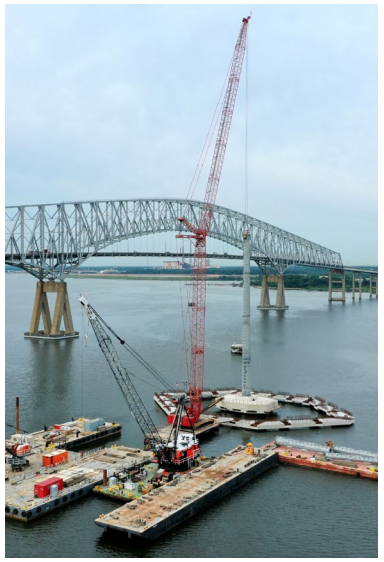
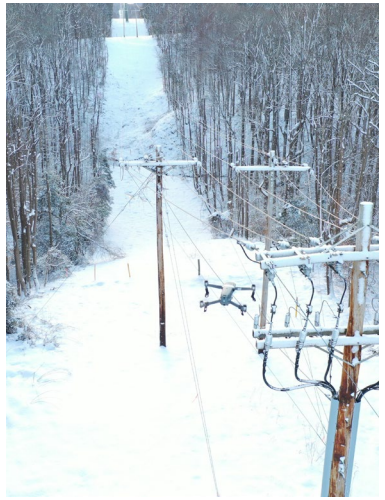
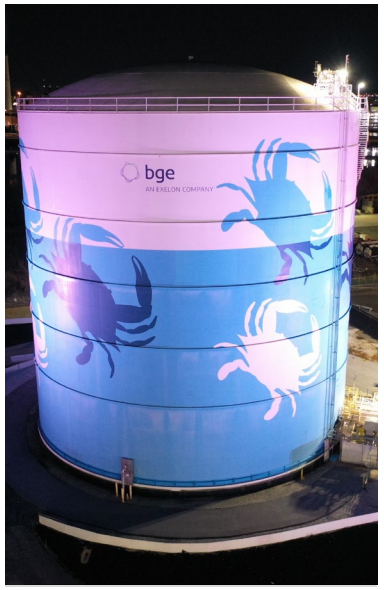
BGE UAS by the Numbers…We are growing!

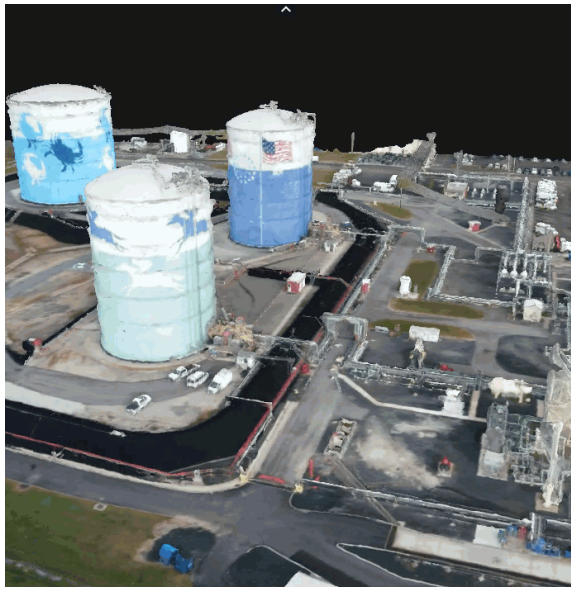
DQEs: 62





Approved Use Cases: **44**





Number of Drones: **175**

Number of Flight Hours: **1198 YTD**

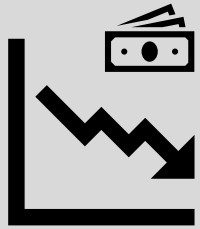
Why use drones?

Increased Safety

- UAS helps to remove employees from Line-of-Fire
- Ability to safely reach assets in hazardous and/or inaccessible locations
- Less risk when compared to helicopters

Improved Data Quality

- Multiple sensor capabilities including RGB, IR, & Multispectral
- More defects identified from the aerial point of view
- Data has many downstream benefits



Reduced O&M

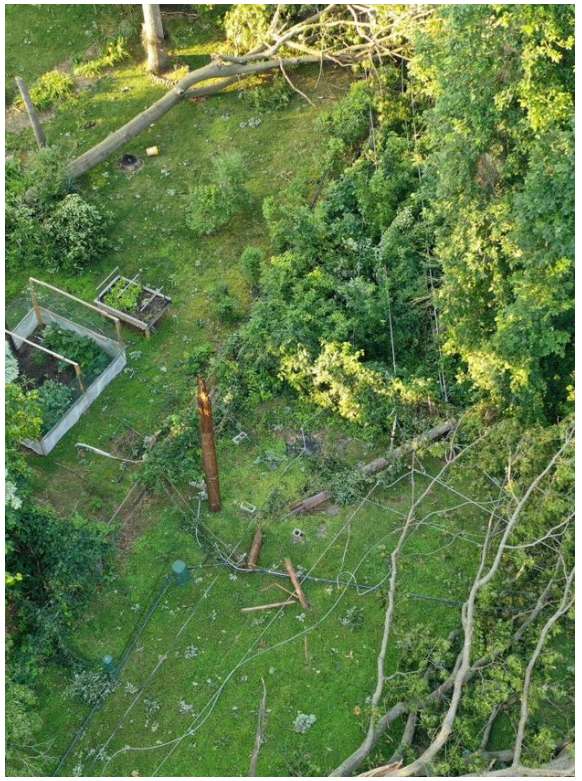
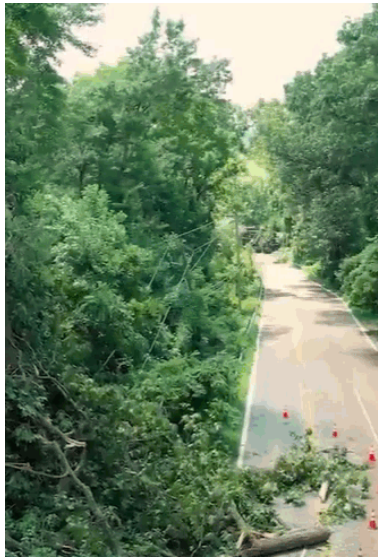
- Greater efficiencies when compared to traditional inspection methods
- Low dollar per avoided customer interruption ($/ACI)
- Transition inspection cost (O&M) to CapEx

UAS for BGE Storm Response

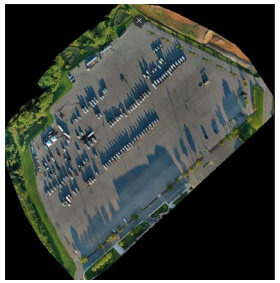
- **Advance BGE's storm restoration efforts through more thorough, faster, and safer assessments!**
- **Benefits:**

EP	•Better understanding of SOW before dispatching crews •Less exposure to risk of downed live conductors (less walking along circuits)
OCC	•Better match resources to field conditions
Engineering	•Better data to support the post storm asset inspections for next preventive maintenance cycle
Comms	•High-quality pictures to illustrate the challenges of safely restoring power quickly



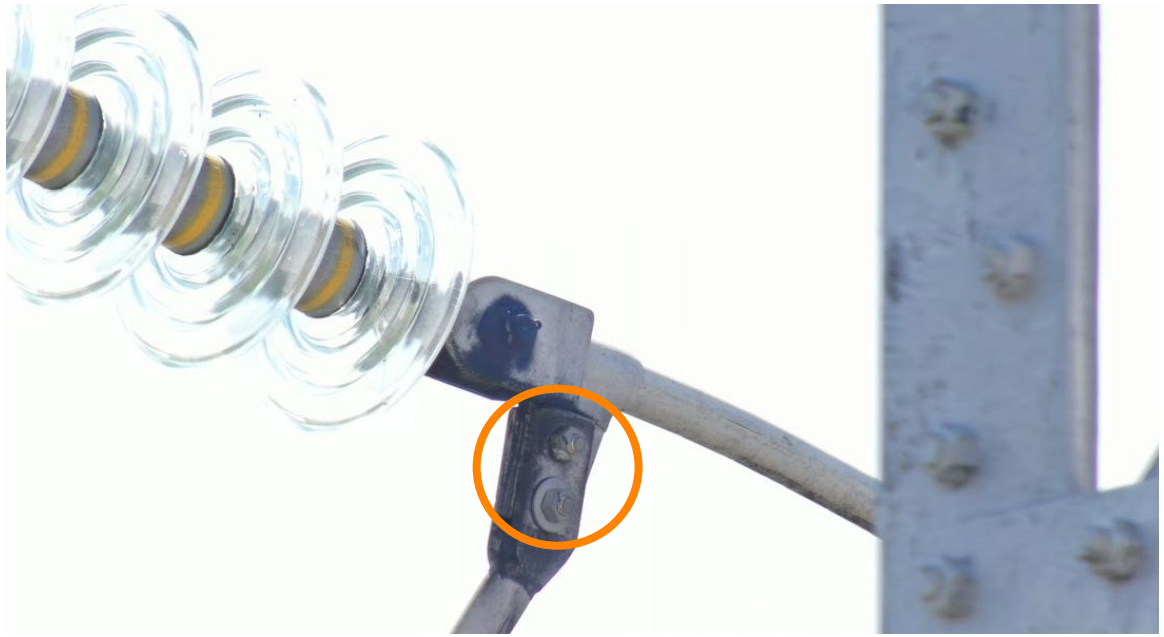








UAS for Transmission CVI



Utilizing drones to inspect Transmission structures allows for high quality inspection with less risk and a 60% reduction to O&M cost (~$260k per year.)

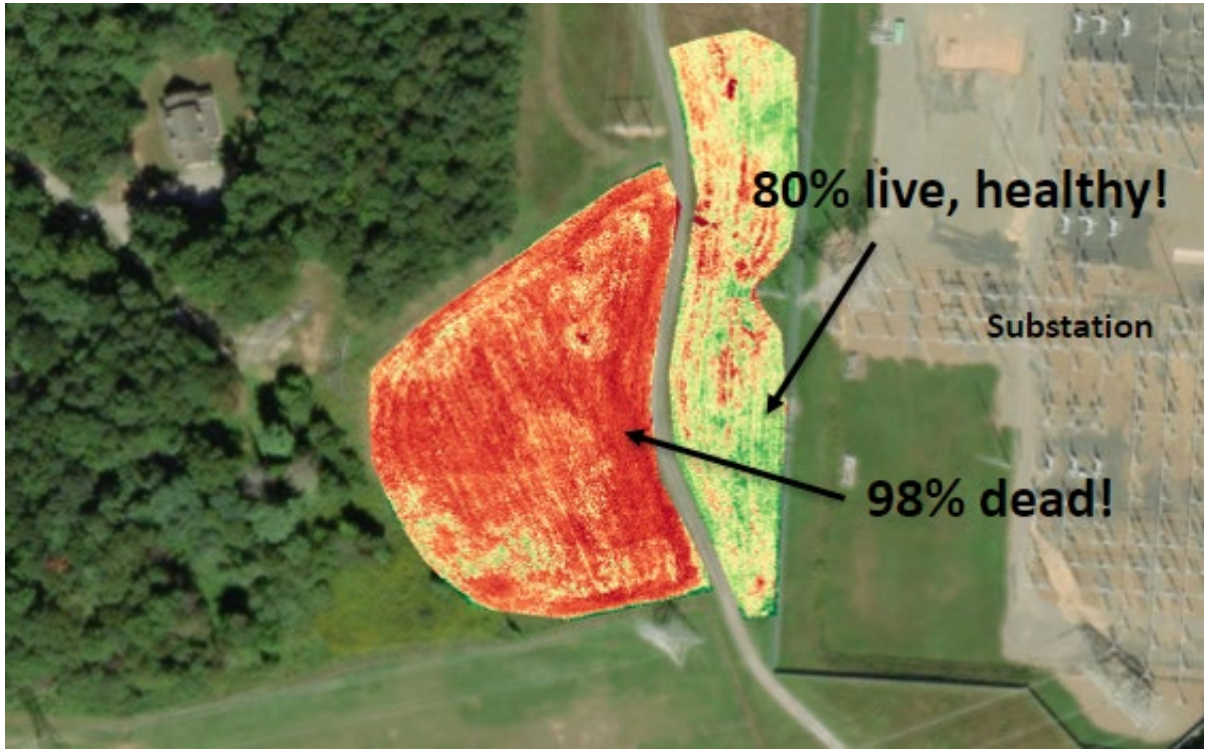
UAS - Emergent Transmission

Owings Mills Wildfire

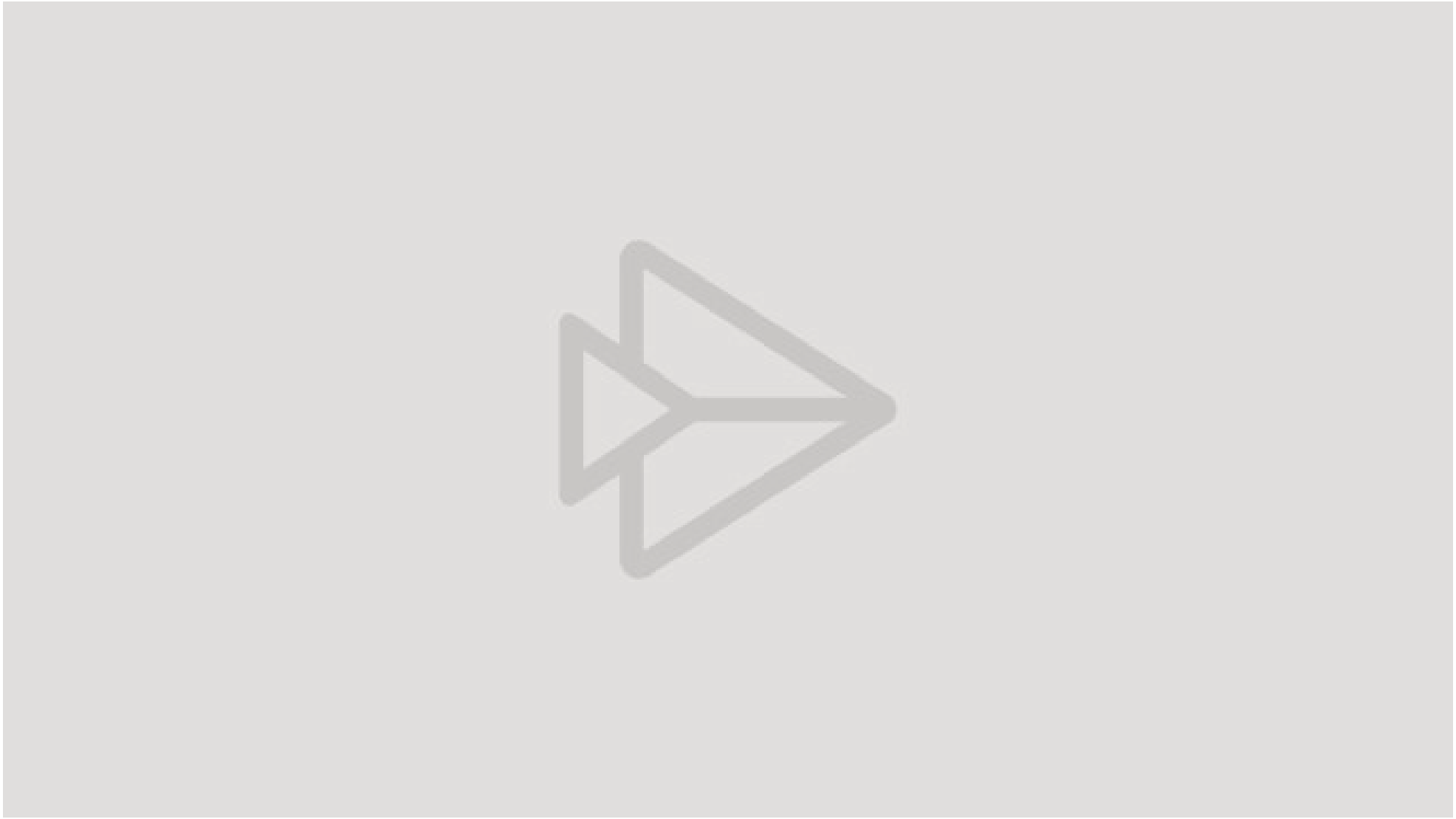
BGE along with Local FD and National Guard responded to a wildfire that had crossed over a Transmission ROW in Owings Mills and came in direct contact with tx structures and conductors. TEDS had requested the assistance of the Drone Team to assess any damage that may have occurred as a result of the fire & smoke.

Drone Based Vegetation Analysis

- NDVI stands for Normalized Difference Vegetation Index, and it provided an indirect measure of vegetation health
- **Healthy leaves reflect a lot of near-infrared light, which we can't detect but multispectral sensors can. So, this (red to NIR) part of the spectrum is key to tracking plant health.**

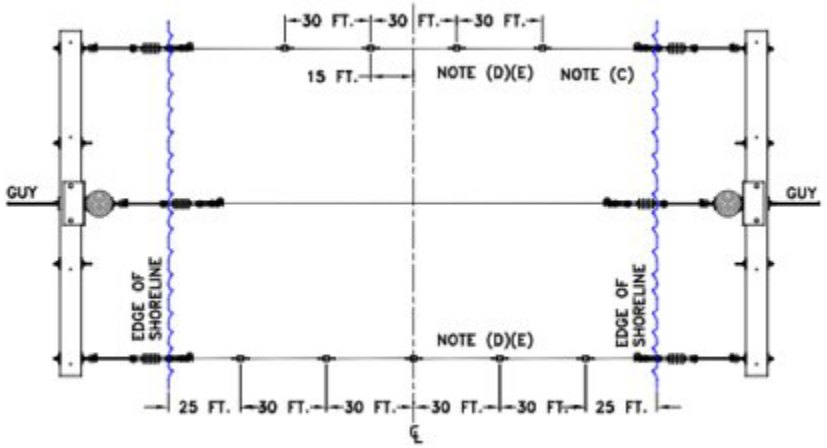


Drone-installed Waterway Markers



https://web.microsoftstream.com/video/b7a11b62-c344-4610-97f6-764efa2bf8c5

Drone-installed Waterway Markers



Project Automate: Drone-in-a-Box

Utilizing drones and robotics to perform *autonomous* inspections of gas and electric equipment

- **Use Cases**
  - Storm Damage Assessment
  - Warehouse Inventory Management (Indoor & Outdoor)
  - LNG Tank Inspection (including Thermal)
  - Gate Station Visual Inspection
  - Security Fence Inspection
  - Solar Panel Inspection
  - Transmission and Distribution Equipment Inspection
  - Substation Inspection
  - Stormwater Management Inspection
  - Construction Site Inspection
  - Diesel Tank Inspection
  - Avian Inspection

BGE drone team receives Beyond Visual Line of Sight waiver from FAA

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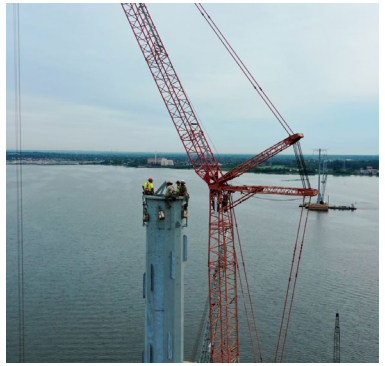
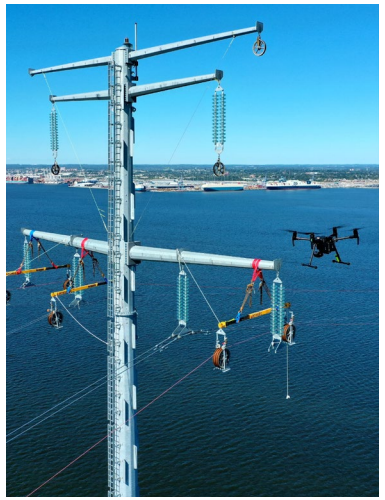
August 24, 2023

Remote, autonomous drone operations reduces maintenance costs overall and makes UAS pilots available for more critical drone tasks that require line of site.

Skydio Dock

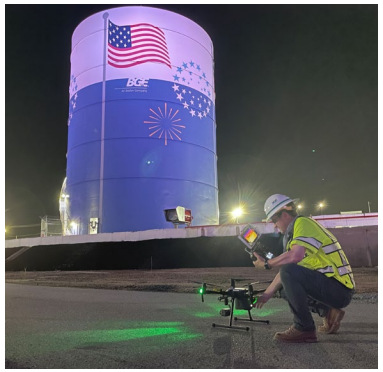



FAA Certified
Commercial
Drone Pilot
Do Not Disturb







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Thank you