



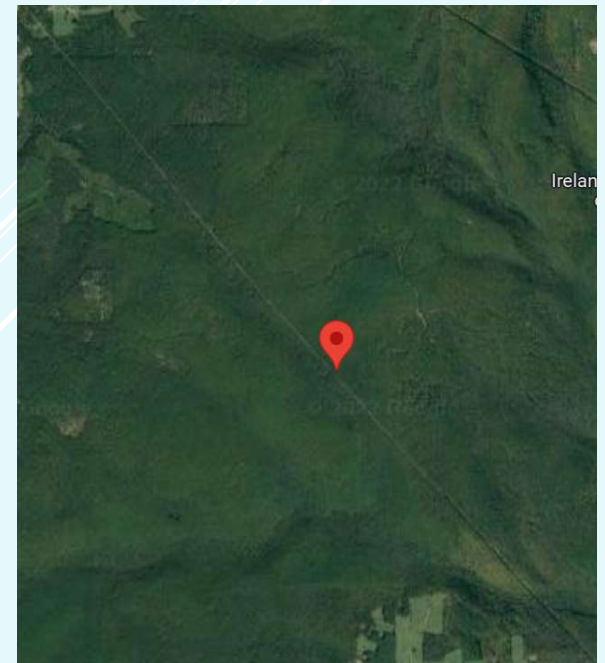
# WEST PENN POWER DRONE INSPECTION PROGRAM

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# WEST PENN HISTORY

- Used helicopters for subtransmission patrol in 2017 and prior
  - No UTV/ATV use
  - Used due to cross-country nature of system
    - Substation to substation ~ direct route
  - As of 2018 only used for Transmission patrols (safety)
- Drone program expanding in same timeframe
  - Two West Penn employees trained as pilots in 2019
  - Increasing patrol use year to year
    - Will complete ~300 miles via drone in 2022 (of 627)
  - Use in storm response



# WHY DRONES?

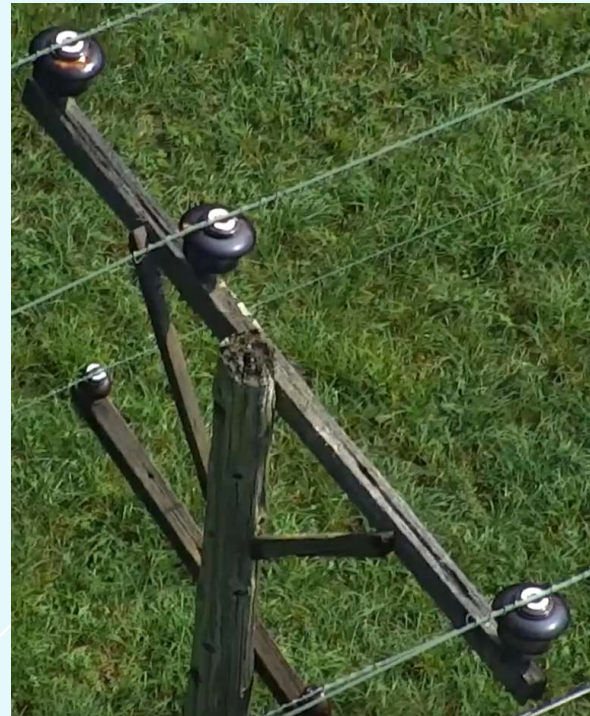
- Aerial perspective superior to ground patrol (mostly)
  - Rotten crossarms (canoed) and pole tops
  - Broken/chipped insulators
  - Line tie issues
- Safer approach
  - Prevents employees from walking Right-of-Ways
    - Slips/trips
    - Animals/insects
    - Heat/cold
    - Customers/property access



# WHY DRONES?



OR



# WHY DRONES?

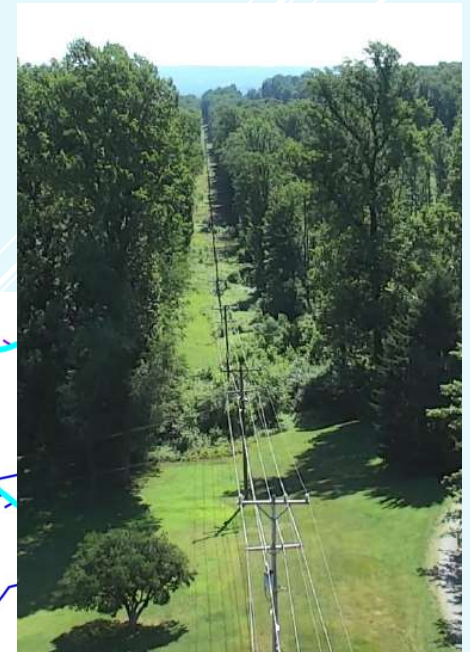


OR



# FIELD CONSIDERATIONS

- Must maintain line of sight to drone
  - Long/straight line sections more practical
  - Elevated launch points generally best
  - Weather/sky conditions big factor
    - Sunny days are not ideal for pilot (or senso)
- Camera is as important as drone
  - Zenmuse 30X zoom, gyro-stabilized



# FIELD CONSIDERATIONS

- Inspection speed is critical for efficiency
  - Battery life/# of batteries can be limiting factor
  - DJI M210 airborne ~20 minutes
    - Big leap from M100
  - Target ~5 seconds of video per structure
    - Video reviewed in “office”
  - 6-8 miles of inspection per day (including travel)
    - Can approach 2 miles on an ideal flight
- Drone can attract attention (good and bad)



# DRONES IN USE

- DJI Matrice 100
- DJI Matrice 210
- DJI Matrice 600

