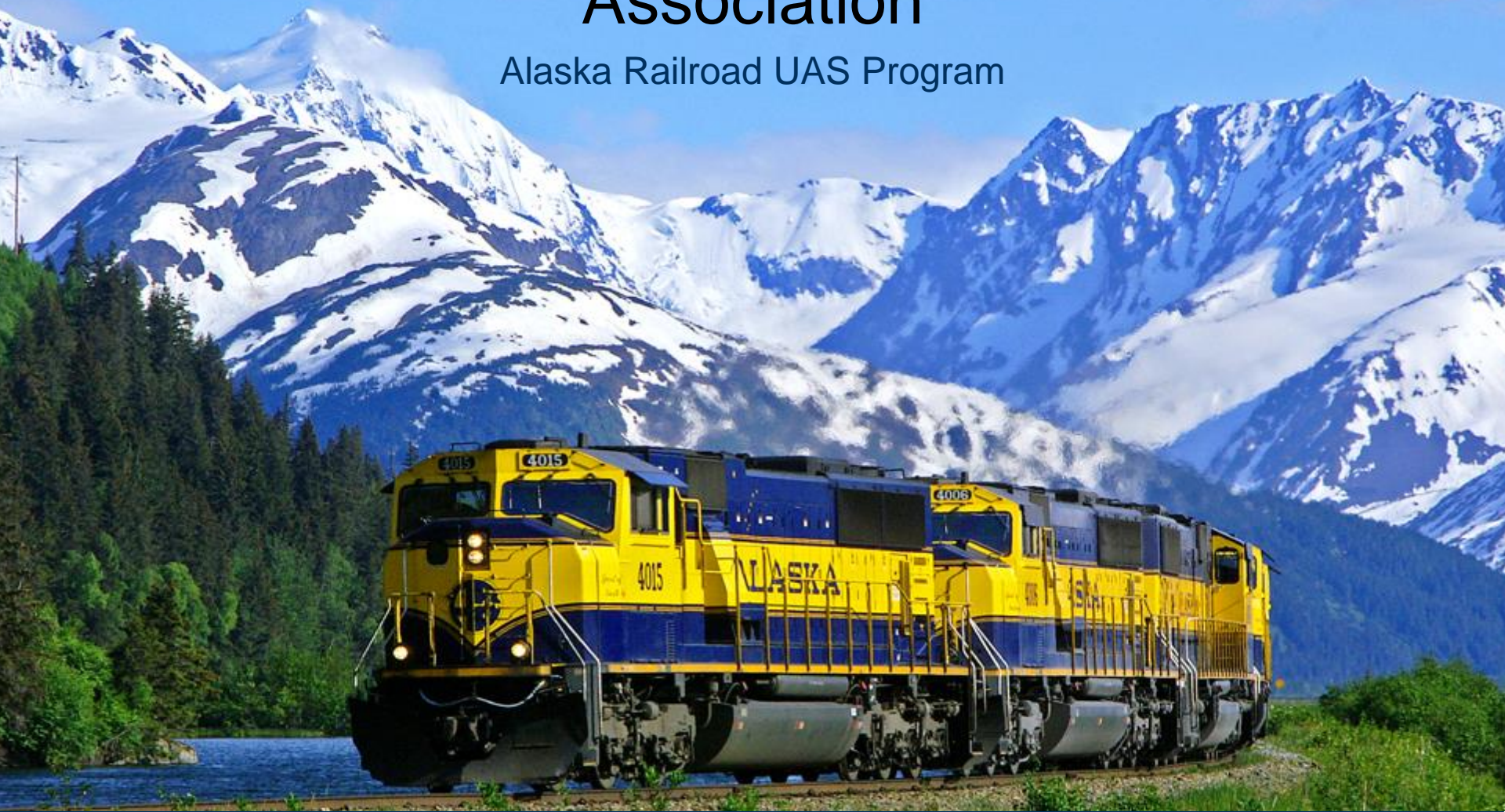




# American Short Line and Railroad Association

Alaska Railroad UAS Program



# Topics

- Brief history of ARRCs SUAS Program
- UAS Use Cases
- UAS 101
- How to Build a Drone Program
- UAS Fleet
- Challenges
- Future Plans/Projects

# Brief History

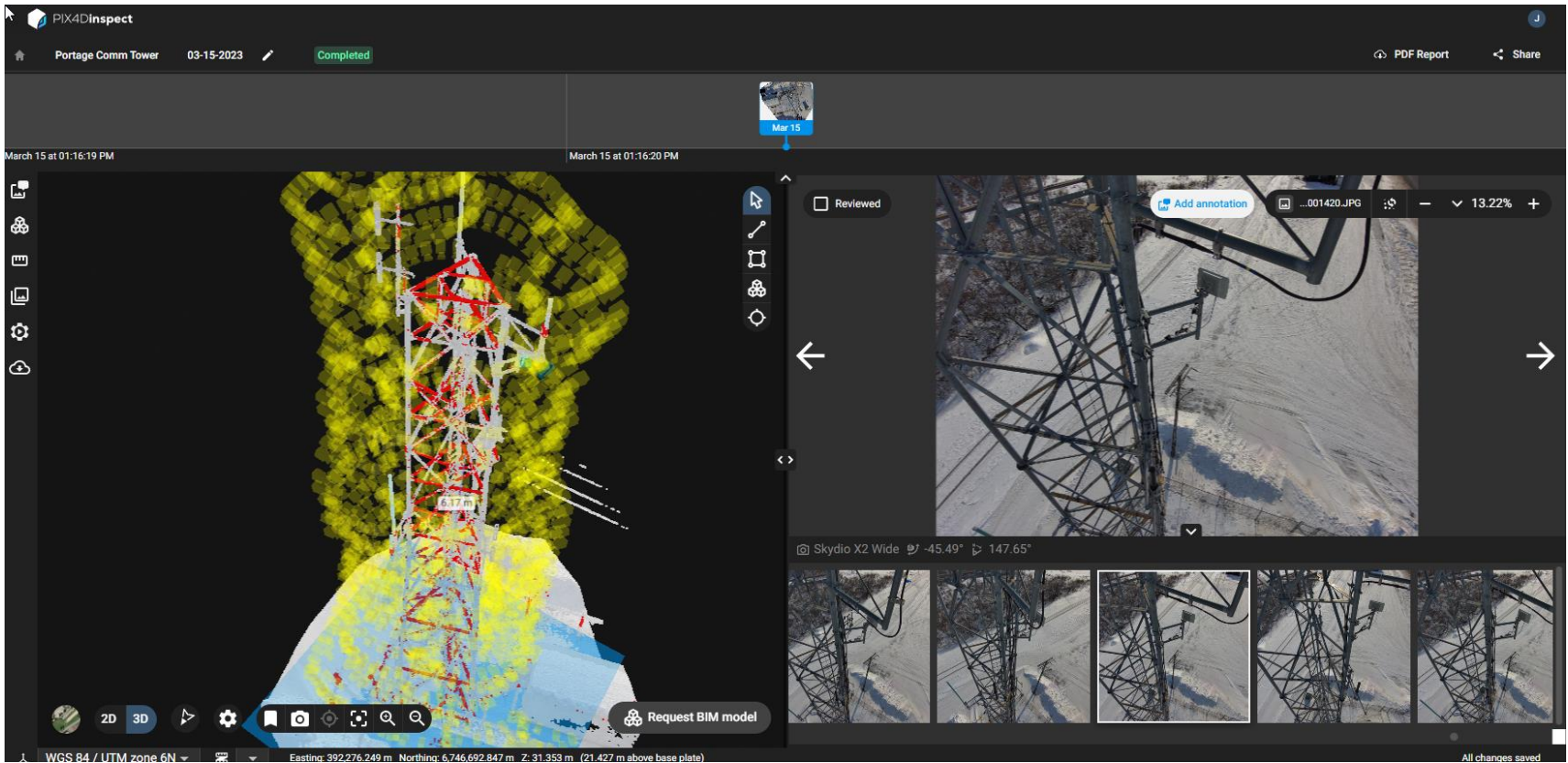
- Started program with a few test drones
- Determine ROI
- Presentation to CEO and senior executives
- Created a UAS Steering Committee
- Submitted budget requests to train personnel and begin building the fleet
- Train pilots to obtain FAA Part 107 certification and basic UAS flight training
- Specialized training for tower mapping, surveying, LIDAR

# UAS Use Cases

- Mapping/Surveys
  - Bridges
  - Track
  - Waysides
  - Facilities
  - Railroad properties
- Infrastructure Inspections
  - Bridges
  - Communications Towers
  - Culverts
  - Track
  - Facilities
- Videography/photography

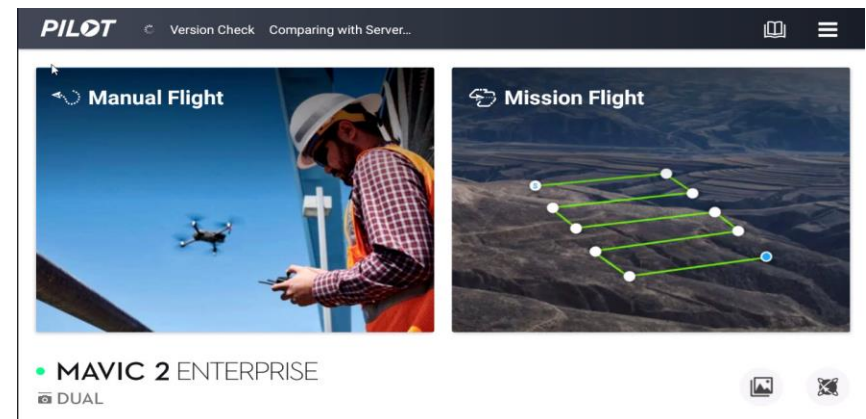


# Use Cases



# UAS Use Cases

- Police & Security
  - Trespass Mitigation
  - Suspect Location
  - Crime/theft prevention in yards
  - Search & Rescue
- Incident Command
  - Natural event damage assessments
    - Floods/washouts
    - Earthquakes
    - Avalanche/rockslides
    - Forest fires



# Use Cases – Avalanche Control

- Alaska Railroad and Alaska DOT Partnership
  - Current approach is to use 155mm Howitzer to trigger avalanches
- The Army is not going to support the cannons so new methods must be used.
- Alta X UAS with a Sentinel 6000 remote activated explosive delivery system.
- ARRC and SOA DOT are working through all steps necessary, permitting, safety plans, etc

# Use Cases – Avalanche Control





# UAS 101



- Small remotely controlled aircraft
  - Rotor or fixed wing
  - Battery powered
  - Ground control station (remote control)
  - Regulated by FAA
  - Some are weather resistant
- FAA Part 107 Pilot Certification
  - Required when operating a UAS for profit or in support of business operations.
- Certification of Authorization (COA)
  - Primarily used for emergency operations to allow faster waivers of FAA rules.

# How to Build a UAS Program

- Identify use cases
  - What missions will you fly?
- Determine requirements
  - Flight durations
  - Weather resistance
  - Camera
  - LIDAR
- Figure out return on investment
- Sell it to leadership

# How to Build a UAS Program

- Things to consider for a UAS Program
  - Training
    - FAA Part 107
    - Drone operations (how to fly)
    - Specialty systems – LIDAR, Thermal, Drop Systems
    - Software applications
  - Fleet and Pilot Management
    - Online applications
  - Legal aspects
    - Imagery/PII
    - Where you can operate

# ARRC SUAS Fleet

- 36 Drones
- DJI Matrice 300
- DJI Matrice 30 and 30T
- DJI Mavic 2 and 3 Enterprise
- Skydio X2 and S2+ Enterprise versions
- Parrot Anafi AI



# Challenges

- Pilot Resources
- Winter/Extreme Weather Operations
- Training
- Budget
- Military Restrictions
- Potential Restrictions/Banning of Manufacturers

# Future Plans/Projects



- Explore new software applications and AI imagery review tools
- LIDAR
- Integration with ArcGIS tools
  - RTK based imagery collection

# Future Plans/Projects

- Autonomous Infrastructure Inspections
  - Using drone docks in various locations for
    - Remote Track Inspections
    - Remote Bridge Inspections
  - Process imagery through AI tools comparing against baseline imagery
- Post Natural Event Automated Assessments
  - Post Earthquake
    - Drones can be remotely activated to perform preplanned infrastructure inspections.
    - Process imagery through AI tools comparing against baseline imagery.



# Future Plans/Projects

- Post Avalanche/Rockslide Assessment
  - Launch drone upon avalanche alarm
    - Trip sensors
    - Radar
    - Future fiber optic acoustic detection
  - Drone will fly preplanned mission collecting imagery of known slide zones.
  - Imagery will be processed through AI tools comparing against baseline imagery.









# Questions