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Airport Fuel System Design Large Systems

2025 Aviation Fuel Handling Training Symposium

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Things to Consider with Large Airport Fuel System Design

- Layout of New Hydrant Systems
- Instrumentation and Data Collection
- ATA 103 – Lay Flat Lids

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Layout of New Hydrant Systems

- Looped Systems to allow Flushing
  - Jan. 2023 edition of ATA103 states hydrant systems “should” perform a maintenance flush
    - Every 5 yrs
    - After 2 flushes, with historical data, frequency may be adjusted
  - Piping Configuration
    - Redundant distribution mains (70%)
    - Line sizing important for fuel quality and pressure losses
    - Isolation and manifolding important to allow for looping
    - Inbound Filtration at Fuel Facility or dedicated tank
- Isolating gates to minimize disruptions in an EFSO event

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Segmenting of Hydrant Systems

- Addressable EFSO
- Use motor operated valves
- EFSO shutdown minimize affected gates – backfeed capabilities
- Isolate every 7 or 8 gates generally

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Issues with underground vaults

- Confined space entry
- Water intrusion
- Higher Maintenance
- Reduced lifespan of equipment
- Failures of fiberglass isolation valve pits

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Isolation Valve Station

- Petitioned NFPA 415 to change the definition of a “probable fuel spill point” to exclude high point vents
- Allowed isolation valves to be placed near terminal buildings
- Eliminate below grade structures
- Reduce Maintenance

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Fuel Storage Facilities

- Cable Tray in lieu of ductbanks
- Remote I/O Cabinets

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- Remote I/O Cabinets
- Flourine Free Foam for Fire Protection
- VFDs
  - Install where they make sense
  - Increased cooling load

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Instrumentation and Data Collection

- Installing more sensors for data collection and predictive maintenance

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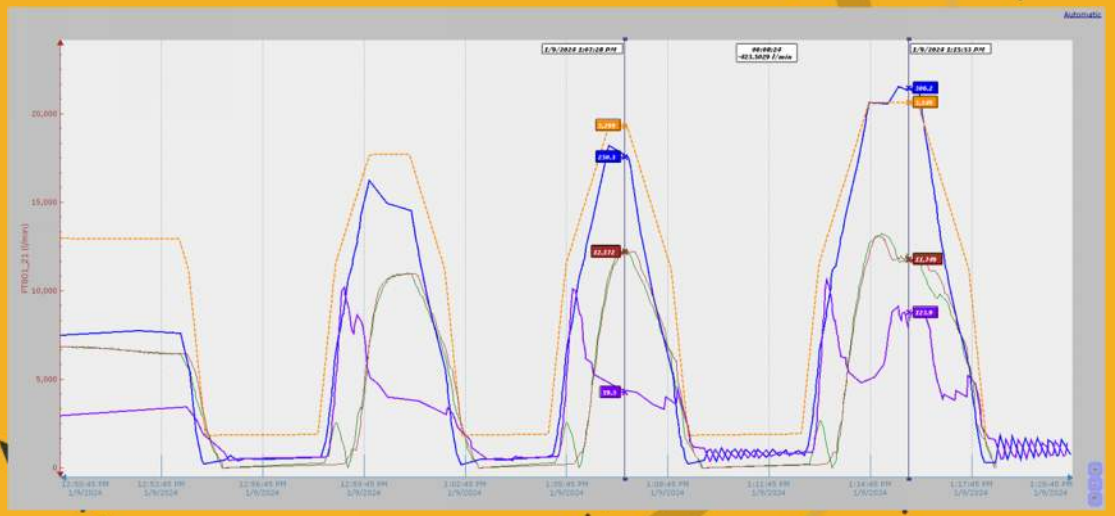
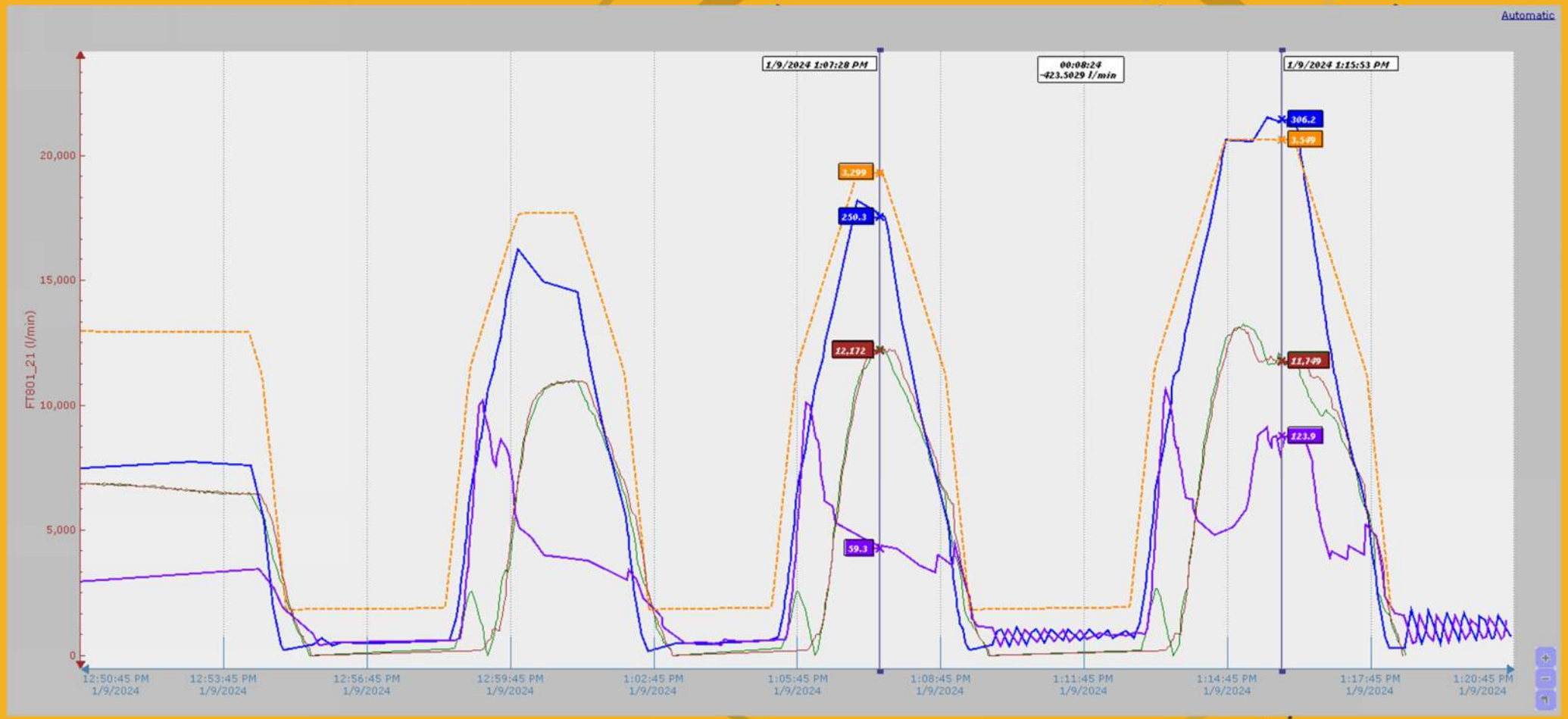
  - Differential Pressure Indicating Transmitters
  - Flow Transmitters
  - Pressure Indicating Transmitters
  - Vibration and Bearing Temperature Sensors
  - Electrical Signal Analysis – sensors in the MCC

Data Uses

- Filter separator – corrected DP based upon actual flow, predict when filter media needs changed out
- Commissioning
- Operations

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- Asset Integrity

Data Uses

- Feed data to our sister company – SAIM
  - Integrate into Digital Twin
  - Dashboards
  - Maintenance Module
  - Predictive maintenance through data analysis
  - Informed Decision Making
    - Capital Programs
    - Engineering Decisions

Lay Flat Hydrant Pits

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  - Little movement on actual replacement
  - Used on all new installations

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- Options in the market
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  - Kinley ownership developed their own pit being installed at HOU and IAH

Thank You

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