



ASPECT

Airborne Spectral Photometric Environmental Collection Technology

Nation's only 24/7 Airborne Stand-off Chemical and Radiological Detection, Infrared and Photographic Imagery Platform



Aircraft

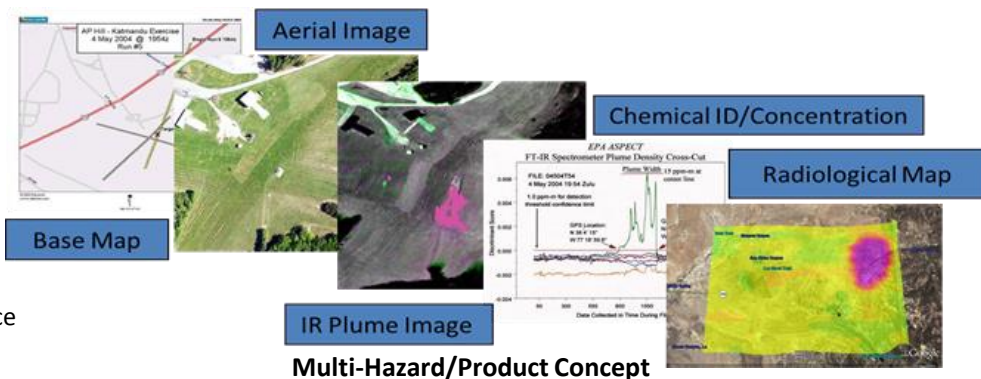
- Cessna 208B Super Cargo Master Platform based in Addison, Texas
- Aircraft Crew: Two Pilots, One Operator, All Commercial/ATP Rated
- Speeds: Data Collection at 100 kts; Cruise at 170 kts
- Range/Aloft Time: Range 1,200 NM; Aloft Time 4 – 6 hours
- Range: Can be anywhere CONUS collecting data within 9 hours
- Coverage: 4-hour coverage within a 800 mile radius
- Service Altitude: Data Collection at 300 to 5,000 ft AGL
- Ground Needs: Standard FBO, ISP with high speed internet

ASPECT Team

- Scientists and engineers all with advanced degrees with over 75 years of collective airborne remote chemical and radiological detection experience
- Derived from collaborative research, development, testing and implementation with the interagency, academia, states, and the private sector
- Provides onsite support to first responders, performs data analyses, and makes adjustments and repairs to the system and/or data products per the customer needs
- Provides time critical information while maintaining a budget conscious response
- Designs the chemical detection hardware and develops software applications; commercially available hardware is used for the radiological applications

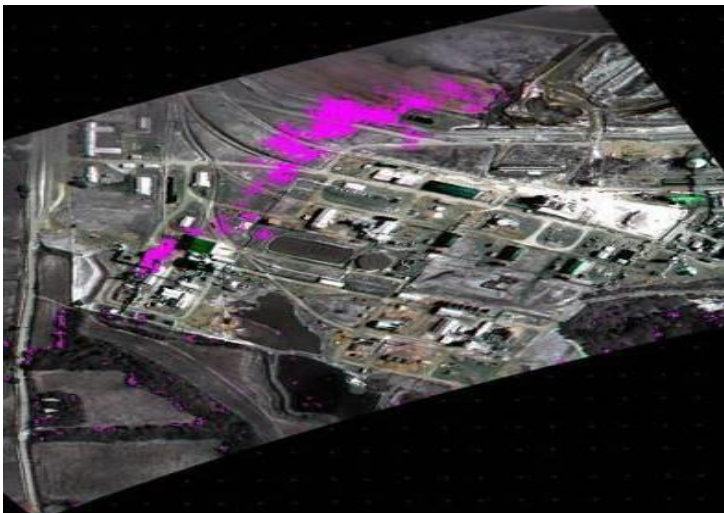
ASPECT Program

- **24/7/365 Readiness** with 1 hour wheels up capability
- Provides secure information to the **First Responder / Incident Commander** that is **timely, useful, and compatible** with numerous software applications
- **Promotes coordination and communication** with all stakeholders regarding operational data and products
- **Multi-role responses** (homeland security, emergency response, and environmental characterization)
- Provides **infrared & photographic images** with **geospatial chemical and radiological information**
- Products and data formats are **customer driven and** can be **provided to the customer within minutes** to hours depending on the mission



ASPECT Technologies:

- An **Infrared Line Scanner** to image chemical plumes
- A **High Speed Infrared Spectrometer** to identify and quantify the composition of the chemical plume in the ppb to ppm range
- **Gamma-Ray Spectrometer** for radiation detection and isotope identification
- **Neutron Detection System** for enhanced radiological detection
- **High resolution digital cameras** (aerial & oblique) with ability to rectify for inclusion into GIS
- **Broadband Satellite Data System (SatCom)**



Methane Plume IR image



Radiation Exposure Contour Map

Chemical Capabilities

- ASPECT uses the principles of remote passive infrared detection via a Fourier Transform Infrared Spectrometer (FTS) to detect and quantify gaseous constituents present in the air column between the aircraft and the ground
- Chemical detection software is designed to filter out common atmospheric constituents as it automatically searches for 78 chemical compounds in near real-time (5 in the air column below the aircraft)
- Hundreds of other chemicals can be processed by the team post survey

Deployment History

- Over **170** responses and deployments since 2001
- National Special Security Events (NSSE) and Special Event Assessment Rating (SEAR) level events (e.g., DNC, RNC, Inauguration, Super Bowl)
- Natural Disasters (e.g., Hurricanes Katrina, Rita, Gustav, and Sandy)
- Environmental Emergencies (e.g., Deepwater Horizon/BP Oil, West Fertilizer, Gold King Mine, site characterizations for Superfund sites)

Radiological Capabilities

- The only airborne remote sensing system in the country that provides NaI & LaBr and neutron detectors
- Improves the US EPA airborne **gamma-screening and mapping** capability of ground-based commercially available state-of-the-art hardware
- Applies IAEA, DOE, and EPA processing algorithms
- Near real-time product development based on customer input
- Possess NRC licensed gamma and neutron sources for use in exercises and training activities

Photography

- High resolution geo/orthorectified visible digital aerial images
- Geo/orthrectified infrared images
- Georeferenced oblique images
- Customizable display engines (ESRI, Google)

Website: <http://www2.epa.gov/emergency-response/aspect>

Primary Contacts

Mark Thomas (Program Manager) - 513-675-4753; Thomas.markj@epa.gov
 John Cardarelli (Radiation POC Contact) - 513-675-4745; Cardarelli.john@epa.gov
 ASPECT 24 Hour Access via EPA HQ EOC – 202-564-3850