ASPECT

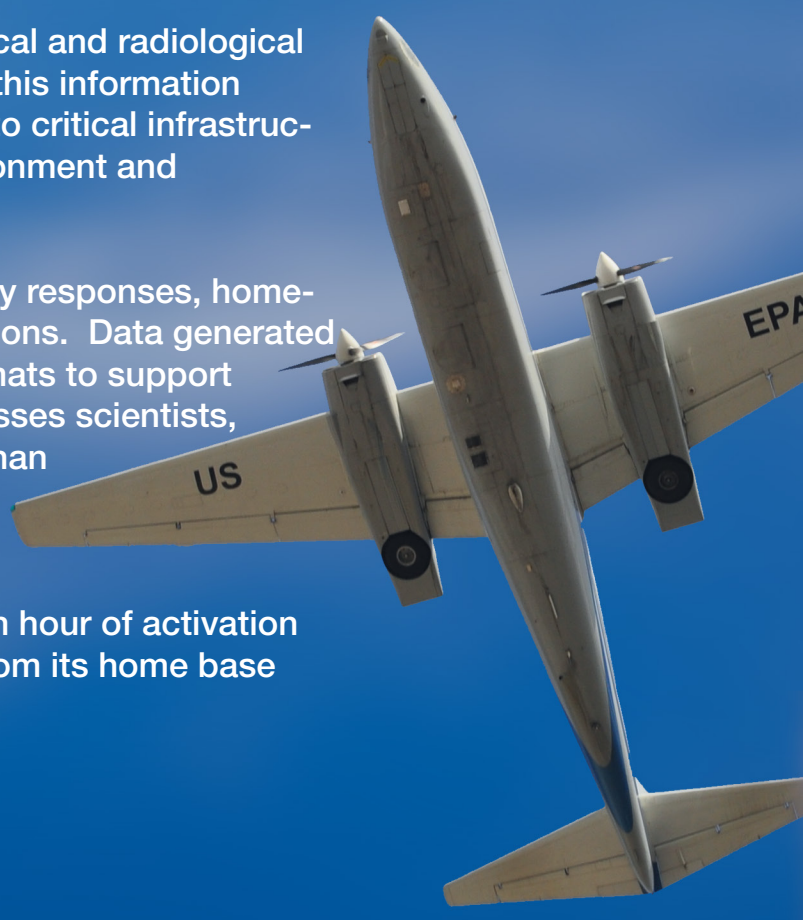
Airborne Spectral Photometric Environmental Collection Technology

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

ASPECT provides infrared and photographic images with geospatial, chemical and radiological information within minutes to the first responder. The speed of transmitting this information permits a more efficient assessment of the extent and severity of damages to critical infrastructure during emergencies to minimize impacts to the American people, environment and the economy.

ASPECT is a screening tool that uses multiple sensors to support emergency responses, homeland security missions, environmental surveys, and climate monitoring missions. Data generated from these missions produce scientifically-valid products in a variety of formats to support the local, state, and federal operation centers. The ASPECT Team encompasses scientists, engineers, and public health experts all with advanced degrees, and more than 75 years of collective experience in airborne remote chemical or radiological detection and emergency response operations.

ASPECT is a 24/7/365 response-ready asset that can be wheels up within an hour of activation and be on station, collecting data, anywhere in CONUS within nine hours from its home base near Dallas, TX.



ASPECT CONTACTS

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ASPECT

AIRBORNE SPECTRAL PHOTOMETRIC ENVIRONMENTAL COLLECTION TECHNOLOGY

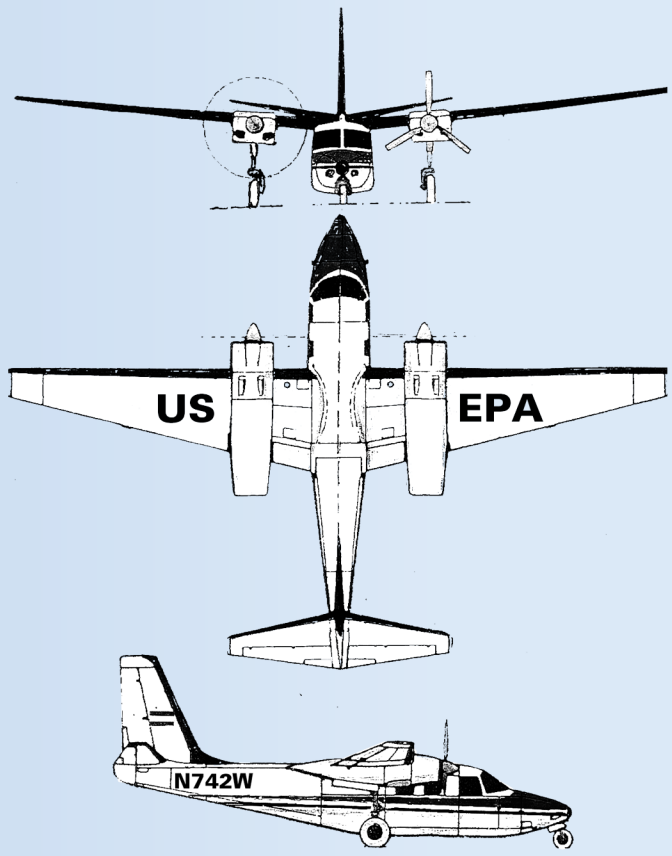
Nation's only 24/7 Airborne Stand-off Chemical and Radiological Detection, Infrared and Photographic Imagery Platform

ASPECT TECHNOLOGIES:

- **Infrared line scanner** (IRLS) to image chemical plumes
- **High-speed infrared spectrometer** to identify and quantify the composition of the chemical plume in the ppb to ppm range
- **Gamma-ray spectrometer** systems for radiological detection
- **High resolution digital cameras** (aerial & oblique) with ability to rectify for inclusion into geographical information system (GIS)
- **Central platform integrates** all sensor data and processes it through customized scientifically-validated software, producing data and images within minutes while in flight
- **Broadband satellite data system** (SatComm) for communications with and data transfer to the ground team

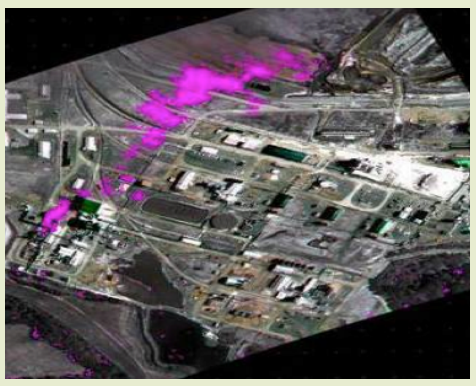
AIRCRAFT

- **Plane:** 1968 Aero Commander 680 FL/G Platform (near Dallas, Texas)
- **Range:** 1,100 nautical miles; aloft time 4 – 6 hours
- **Coverage:** 4-hour coverage within a 700 mile radius
- **Service Altitude:** Data collection at 300 to 5,000 feet above ground level
- **Speeds:** Data collection at ~110 knots; cruise at 180 – 200 knots
- **Ground Needs:** Standard FBO and high speed internet
- **Aircraft Crew:** 2 commercial/ATP rated pilots and 1 operator

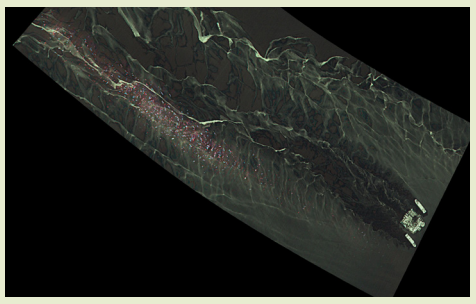


ASPECT PROGRAM AND TEAM

- Multi-role response experience with environmental emergencies, natural disasters and pre-deployments to National Special Security Events (NSSE) and Special Event Assesment Rating (SEAR) level events
- Increased coordination and communication with all stakeholders regarding operational data
- Customer-driven products and data formats that can be provided within time critical minutes, while maintaining a budget conscious response
  - Derived from interagency collaboration, academia, states, and the private sector
  - The team designs the chemical sensors and develops software in-house and commercial available applications for the radiological program
  - Provides onsite support to the first responders, performs data analyses, and makes adjustments and repairs to the system and/or data products per the customer needs



Infrared Image of Methane Plume release



Infrared Image of Oil on Water at the BP Oil Spill

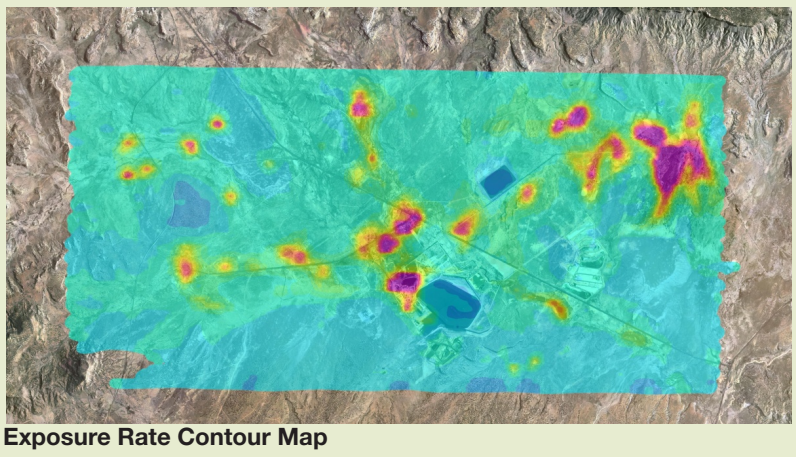
CHEMICAL CAPABILITIES

- ASPECT can detect and quantify gaseous constituents present in the air column between the aircraft and the ground using 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
- ASPECT's chemical detection software filters out common atmospheric constituents as it automatically searches for 78 chemical compounds, near real-time, in the air column below the aircraft

QUALITY ASSURANCE

- Post flight, data is examined by the ASPECT Team to quality assure performance and reprocess data to search for the presence of hundreds of additional possible chemical compounds

GAMMA EMERGENCY MAPPING (GEM)



Exposure Rate Contour Map

- Improves the nation's airborne gamma-screening and mapping capability of ground-based gamma contamination following a wide-area radiological dispersal device (RDD), improvised nuclear detonation (IND), or nuclear power plant (NPP) accidents
- Utilizes commercially available state-of-the-art hardware and software
- Provides the only airborne remote sensing system in the country with a versatile NaI and LaBr crystal detection setup
- Applies IAEA, DOE, and EPA processing algorithms
- Offers near real-time product development based on customer input

Google Earth Base Map

Overlayed Mosaic of Georectified Aerial Images

IMAGERY

- Available infrared and photographic images with geospatial chemical and radiological information
- All imagery is geo-rectified using both aircraft attitude correction (pitch, yaw, and roll) and GPS positional information
- Georeferenced high resolution oblique images
- Image processing is composed of two primary steps including image enhancement and geo-registration
- If requested, aerial photography (and IR imagery) can be stitched into a wide area mosaic
- All displayed and easily access via Google Earth or a secure FTP site; Google and GIS compatible formats