FAA NextGen "Right Sizing"

- Evaluate the meteorological sensor network
- Ground-based, radar and lidar, airborne & satellite

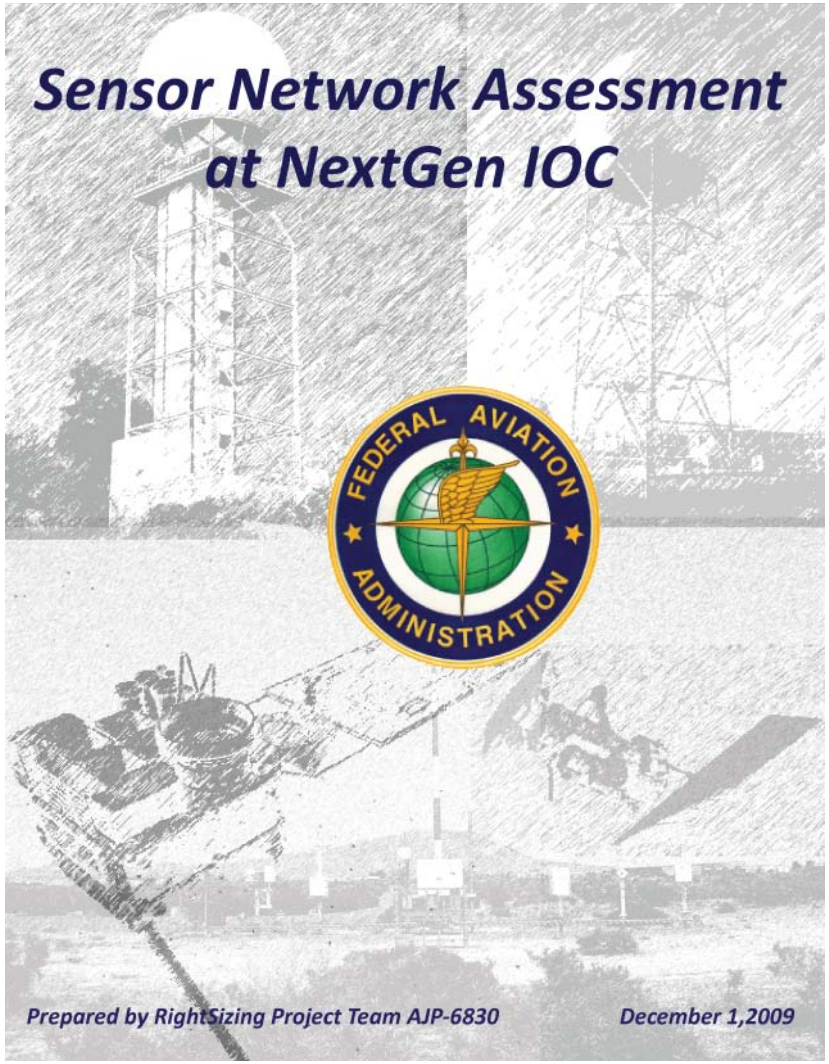

Table 4.3: Functional Gaps Associated with NAS Airborne/Spaceborne (AB) Sensors					
Gap #	Gap Description	Comments / Impacts	Term. Impact	En Route Impact	Global Impact
AB-1	Access to non-US Satellite Data: Current and potential restrictions prevent or limit real-time access to satellite observations required to support US aircraft operating in data-sparse oceanic and remote regions not covered by US satellites. Status: Oceanic/remote data products are in development and can be supported only where US satellites provide coverage. Real-time access to Meteosat and MTSAT (The Multifunctional Transport Satellites) data is needed to support operational use in broader oceanic/remote domains.	NOAA has real-time access to Meteosat data, but there are significant restrictions on the use and distribution of these data. The Japanese MTSAT data is freely available, but may require special arrangements for reception and retransmission for FAA operational use. Unavailability of non-US satellite data yields a negative impact on global flight safety and traffic capacity.	-	-	✓
AB-2	GOES data refresh frequency: GOES data over the CONUS are routinely updated every 15 minutes, adjacent areas are generally observed every half hour, and full disk imagery is only obtained once every three hours. These update rates are inadequate for many aviation applications. Status: Refresh frequency will be significantly improved with the GOES-R series of satellites available by 2015 or later.	✓ GOES-R The temporal gaps within routine GOES data today yield a negative impact on global flight safety and traffic capacity.	✓	✓	✓

AB-3	Polar-orbiting satellite data latency: POESS, US DMSP and European Metop satellites provide coverage that is critical over polar regions and strongly complementary to geostationary observations at lower latitudes. Due to high latency, data from polar-orbiters are generally unavailable for real-time operational use. Real-time access to these observations will require the installation of a number of direct-transmission receiving stations in the observing domains of greatest interest. Status: No plans are in place to establish these additional receiving stations.	? JPSS High latency prevents real-time use of polar-orbiter data for aviation products. Negative impact on global flight safety and traffic capacity.	✓	✓	✓

Table 4.3: Functional Gaps Associated with NAS Airborne/Spaceborne (AB) Sensors					
AB-4	Volcanic ash: Observe and track horizontal and vertical extent. Status: A variety of observational and numerical methods exist and achieve partial operational capability. Significant issues such as sensitivity of detection, obscuration by cloud, determination of plume height, and accuracy of trajectory modeling exist. Significant improvement using current approaches and new technologies is feasible.	Rapid response products to identify and track volcanic ash clouds are needed for aviation use and for other warning responsibilities carried by the international network of Volcanic Ash Advisory Centers (VAAC). Airborne FLIR devices can provide some capability. Under investigation by NASA. Negative impact on global, en route and terminal area flight safety and traffic capacity.	✓	✓	✓
AB-5	Volcanic ash: Characterize ash content and density. Status: Techniques for remote sensing of the characteristics of an ash cloud and estimation of its hazard to aircraft are extremely limited. Significant development is needed.	Beyond the problems of characterizing the properties of an ash cloud, there are significant unknowns in relating those observations to the severity of the hazard to aviation. Current practice is for aircraft to avoid any known ash clouds. Negative impact on global, en route and terminal area flight safety and traffic capacity.	✓	✓	✓

AB-6	Turbulence observations: Operational collection of EDR data for turbulence determination is in place, but many airborne platforms are not equipped with this capability, and new techniques (e.g., GPS occultation, airborne FLIR) need study to assess feasibility and utility. Status: EDR reporting from commercial aircraft is operational and in need of expansion, particularly over oceanic domains. EDR data should help the terminal area as well as enroute.	Negative impact on en route, and global flight safety and traffic capacity.	✓	✓	✓
AB-7	Cloud coverage and cloud type identification: Many operational products require satellite-based observations of cloud coverage and cloud type identification. While there are many different algorithms being used to classify clouds, there is no single, routinely available product for aviation use. Status: No approved products are available for operational use.	OPPORTUNITY Negative impact on global, en route, and terminal flight safety and traffic capacity.	✓	✓	✓

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AB-8	Sea surface winds: Wind speed and direction observations over the ocean are essential for forecasting storm development and motion, particularly tropical storms. The polar-orbiting QuikSCAT scatterometer is well past its design lifetime and needs replacement. Status: A number of replacements have been proposed, but none are currently scheduled for launch.	Negative impact on global, en route, and terminal flight safety and traffic capacity.	-	-	✓
AB-9	Cloud top height: High resolution cloud top height information is critical to many aviation applications. Current techniques give useful information, but require improvement. Status: Current product capabilities have not undergone approval for operational use. No new products are in preparation.	OPPORTUNITY Negative impact on global, en route, and terminal flight safety and traffic capacity.	✓	✓	✓

AB-10	Global situational awareness – flight deck products: Lack of approved products providing real-time situational awareness in the cockpit for operations in data-sparse regions outside the NAS. Status: Products are in development.	OPPORTUNITY Negative impact on global flight safety and traffic capacity.	-	-	✓
AB-11	Global situational awareness – communications: Limited operational communications bandwidth and systems required to uplink weather products to the cockpit of US aircraft operating in data-sparse oceanic regions outside the NAS. Status: Limited experimental uplink trials have been conducted.	OPPORTUNITY Negative impact on global flight safety and traffic capacity.	-	-	✓
AB-12	Satellite product research-to-operations: While there has been considerable development of experimental satellite-based products intended for aviation applications, there is uncertainty and limited support for transition of these products to operations.	CRITICAL NEED Negative impact on global, en route and terminal flight safety and traffic capacity.	✓	✓	✓