WRITTEN STATEMENT

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REAUTHORIZING THE WEATHER ACT:

DATA AND INNOVATION FOR PREDICTIONS

SUBCOMMITTEE ON ENVIRONMENT

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

U.S. HOUSE OF REPRESENTATIVES

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Chairman Miller, Ranking Member Ross, and Members of the Subcommittee, thank you for inviting FLYHT to testify today before the Subcommittee on Environment to discuss the innovative products and services provided by the commercial sector and how they partner with the National Oceanic and Atmospheric Administration (NOAA). I am Meredith Bell, an Atmospheric Scientist and Atmospheric Program Manager at FLYHT Inc. In my role, I work closely with NOAA and the World Meteorological Organization (WMO) to ensure the community is receiving and decoding our aircraft data properly. We also provide monthly reports to NOAA regarding data quantity, location, and quality. Prior to working at FLYHT, I worked at both Panasonic Weather Solutions, and AirDat LLC, both of which provided aircraft-based observations to NOAA through our Tropospheric Airborne Meteorological Data Reporting (TAMDAR) system.

FLYHT provides the airline industry with innovative data solutions to enable our partners to make smart decisions based on actionable intelligence to improve operational efficiency and sustainability through our extensive hardware, software, weather sensors, and services.

In addition to the weather sensor technology we're talking about today, FLYHT has been providing data solutions to the aviation community for twenty-five years, including our AFIRS™ 228 Satcom solution and, most recently, the industry's first 5G AFIRS Edge™ wireless flight recorder solution, providing powerful situational awareness through real-time data, including an Aircraft Interface Device (AID) to connect portable devices like Electronic Flight Bags (EFBs) to aircraft data, and an Iridium Certus® broadband satellite connection. Connecting the aircraft to the ground in real-time. Our software solutions provide our partners with actionable intelligence that not only solves current problems but prepares them for the future in multiple areas, such as Aircraft Health Monitoring (AHMS), Fuel and Auxiliary Power Unit (APU) usage, Fleet and Turn management and situational awareness.

Specifically for weather, FLYHT provides Aircraft Meteorological Data Reports (AMDAR) data through our Automated Flight Information Reporting System (AFIRS) system, this includes temperature, wind speed and direction as well as two solutions that include relative humidity: the TAMDAR sensor and the FLYHT Water Vapor Sensing System (WVSS-II) sensor:

- The TAMDAR sensor provides in-situ measurements of temperature, wind speed and direction, relative humidity, icing, and turbulence, as well as location and time information from approximately 130 aircraft across the globe. FLYHT's TAMDAR system delivers in real-time a critical and unique, high resolution data stream to provide improved atmospheric analysis and weather observations. Due to aging systems, the number of TAMDAR soundings are decreasing, which will have detrimental impacts on NOAA's weather models.

- The FLYHT WVSS-II sensor merges the aircraft AMDAR with the relative humidity data from the sensor to provide a complete profile of the atmosphere. The sensor is fully automated with high accuracy measurements and reliability for long term performance. The product produces no drag through its aerodynamic design, and does not require external heating, with zero icing risk. It is compact in size and weight yet highly durable, and requires low power usage and low maintenance, all of which contributes to its low cost of operation. The cost of AMDAR with FLYHT WVSS-II is less than 10% the cost of a traditional radiosonde sounding (ex. NOAA's weather balloon launch program) over a 10-year period.

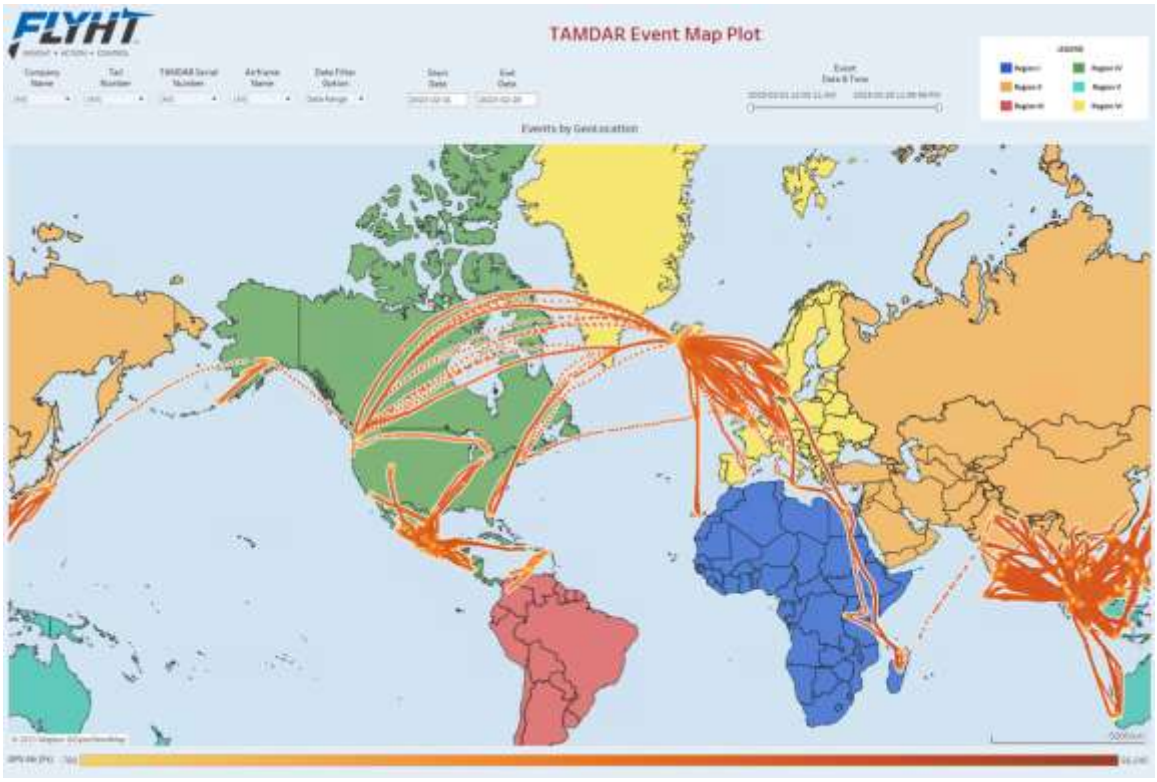
In aviation, weather is one of the biggest risks to airline operations — fog, high winds, turbulence, thunderstorms, ice and snow are all routine weather occurrences that can impact flights as well as ground-crew operations and maintenance tasks. Weather volatility is also a constant threat, creating scheduling and planning issues and safety risks. FLYHT weather observations are a solution that leverages our patented TAMDAR sensor system, AMDAR-over-AFIRS and the FLYHT WVSS-II to provide critical real-time observations to meteorologists and airlines.

The WVSS technology meets the demanding needs of upper air meteorological data collection from commercial aircraft, providing accurate atmospheric water vapor data with extremely low cost of operations leading to sustainable support to weather forecasting and aviation operations. FLYHT WVSS-II uses Tunable Diode Laser Absorption Spectroscopy (TDLAS) technology and internationally accepted standards to enable meteorological data collection from commercial aircraft, in support of the global WMO AMDAR program, enhancing meteorological operations and aviation weather support. The effectiveness of this data is independently validated and is proven for a wide use in meteorological operations. FLYHT observations compliment NOAA's radiosonde network and new weather drone initiatives through in-situ data gathering on a global scale.

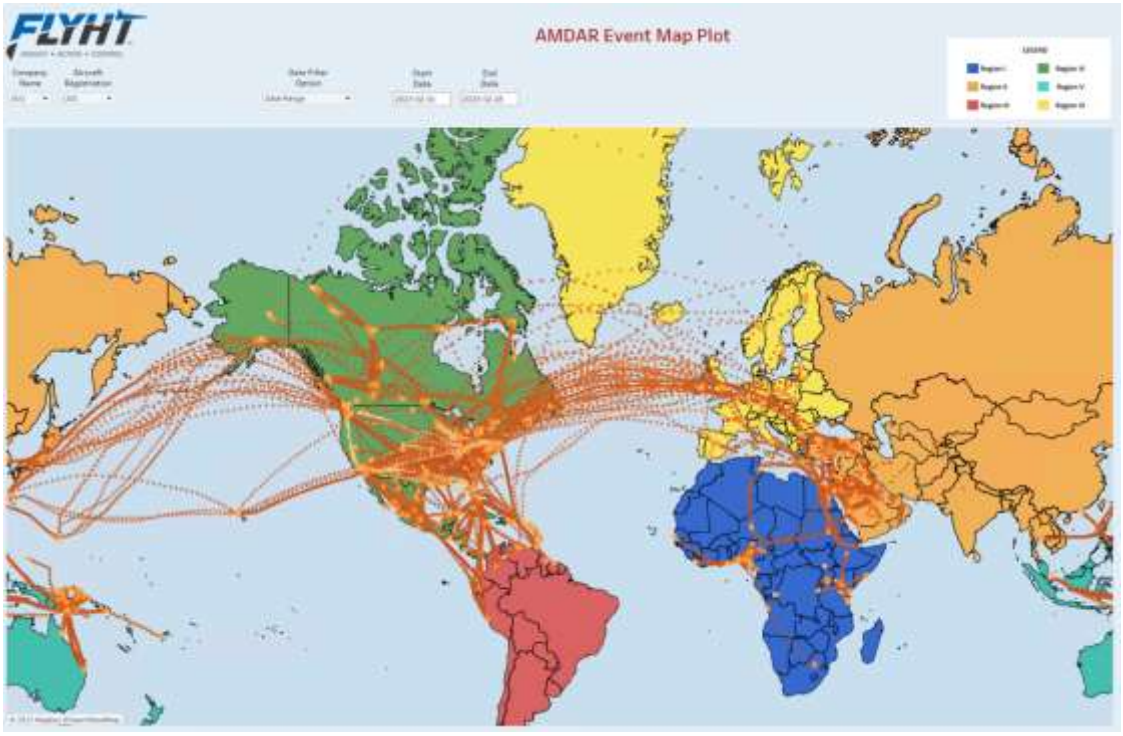
In addition to FLYHT's current technology products, we are now actively working on next-generation environmental data collection technologies from aircraft. As part of the global focus on NON-CO2 environmental impacts of aviation, FLYHT is set to improve the FLYHT WVSS-II instrument sensitivity to allow better environmental vapor detection and provide a valuable source of data for aircraft contrail avoidance. In addition to this the detection and measurement of key environment greenhouse gases is also being reviewed.

FLYHT provides critical weather data operationally to NOAA to improve its numerical weather prediction skill through its National Mesonet Program (NMP). FLYHT first began working with NOAA (as AirDat) and its partners in 2006 and joined the NMP program in 2017 through Synoptic Data PBC (Synoptic), which aggregates various sources of observations and datasets to feed into NOAA weather models. Through Synoptic, FLYHT provides TAMDAR and AMDAR-over-AFIRS observations from approximately 260 aircraft across the globe, this provides over 28 thousand soundings per month to the NOAA program. This represents less then 1% of the total commercial global aircraft fleet.

The map below shows where the TAMDAR observations are located:



The map below shows where the AFIRS observations are located.



In addition to the NMP, NOAA has also previously operated a program to deploy more aviation-based environmental sensors on aircraft. In fiscal year 2023, Congress provided NOAA with funds to again partner with commercial technology providers and airlines to deploy more sensors on aircraft. FLYHT looks forward to participating in this forthcoming program and seeks to partner with the agency to provide our critical datasets for improving forecast skill. FLYHT is expanding our aircraft observations globally over data sparse regions and sees this as a great opportunity to expand within the United States.

Over the course of the last 17 years, FLYHT has had a strong and productive relationship with NOAA. Given our partnerships with NOAA on multiple programs over the years, FLYHT is uniquely positioned to comment on the working relationship with NOAA.

NOAA is a strong advocate for increasing observations both domestically and internationally. The WMO has also been advocating for the global weather community to recognize the importance of this data and advocating for other countries to participate in a water vapor program, like FLYHT WVSS-II and share this information with the global weather community. Aircraft data with relative humidity remains one of the most critical observation types for rapidly updating short-range weather models. FLYHT continues to work closely with the WMO and NOAA so we can provide the most useful dataset possible to the weather community. NOAA understands its needs on an observational level, and strives to provide clear guidance externally to private sector stakeholders, Congress, and the public. FLYHT's global airline partners gives us the unique ability to easily approach airlines regarding expanding our network of weather sensors over both the U.S. and data sparse regions world-wide. We intend to continue to work with NOAA to expand our networks in regions they feel will bring the most value to both their global and mesoscale weather models.

One area of partnership with the Federal government that could benefit from greater coordination is the mission of aviation turbulence forecasting, specifically turbulence and relative humidity measurements. While NOAA's Aviation Weather Center does provide products and services around turbulence and forecasting. Adding in-situ relative humidity measurements to these services improves fog, convection, ceiling and visibility forecasts. Unfortunately, participation in this program is optional, which can create incomplete data and less than ideal services to the public. An enhanced government mission and focus on turbulence forecasting could aid NOAA's mission of protecting lives and property, especially since turbulence is so inherently interwoven with weather phenomena. In the future, greater collaboration between NOAA and the Federal Aviation Administration (FAA), and in partnership with the expertise of private industry, our turbulence forecasts could be greatly improved and in doing so aviation safety would be improved.

Mr. Chairman, Ranking Member, and Members of the Subcommittee, thank you for the opportunity to testify before you today. I would be pleased to answer any questions you may have.