WEATHER TO FLY

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The Pilot Weather Briefing

Over the last year, we have explored and explained atmospheric processes that result in upward air movement (lift): ridge, thermal, mountain wave, and various forms of convergence or shear lines. A good soaring pilot not only understands and observes these processes as a meteorologist, but is able to take that knowledge and apply it to accomplish soaring flight. However, having spent the effort to instruct about lift processes, I would be negligent if I didn't remind aviators that familiarity with weather and weather products constitutes one of the first steps in consideration for safety-of-flight issues.

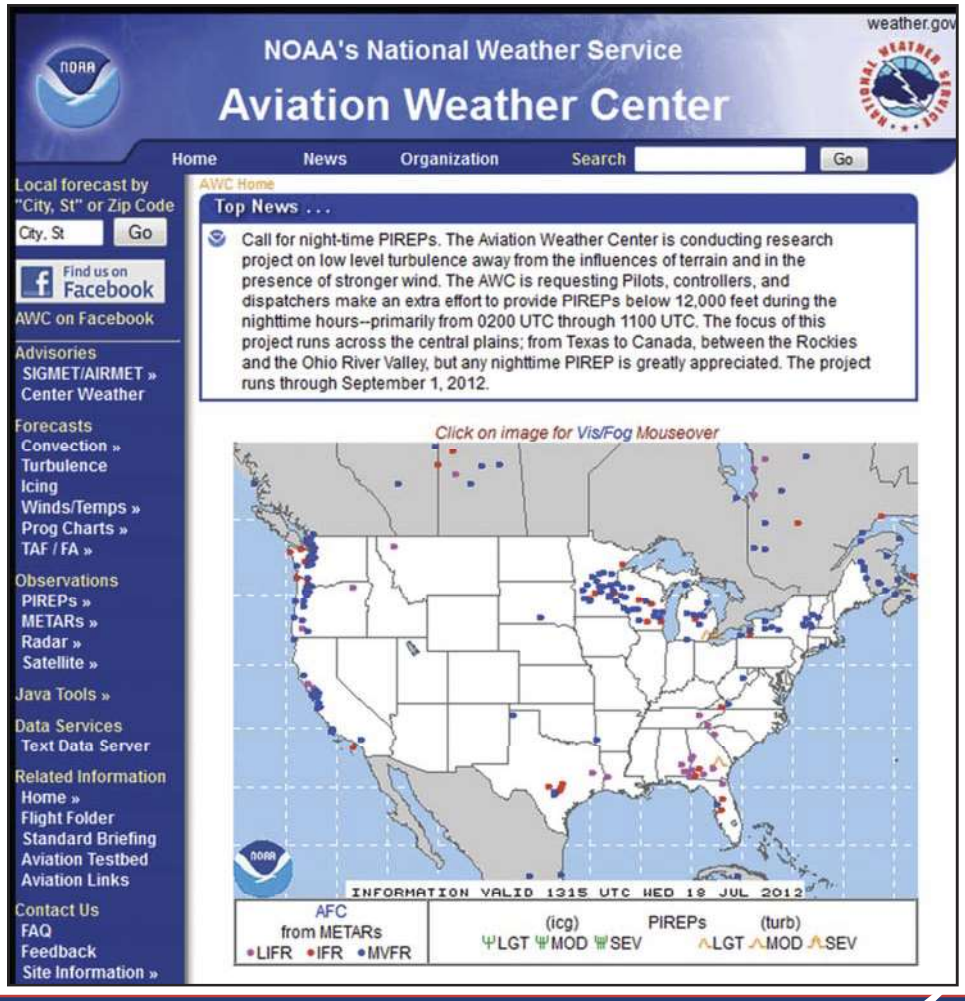
Initial meteorology instruction for aviators of all categories of aircraft has, for decades past (and currently) centered on basic meteorological concepts, observed weather and graphics, and forecast weather products and graphics. During those meteorology lessons, the formal pilot weather briefing (PWB) is introduced, and much of the instruction on various weather products is subsequently introduced, explained, and interpreted in conjunction with the PWB process. While successful cross-country soaring depends on a pilot using his/her evaluation of the current weather, existing weather threats or the potential for inclement weather provided within the PWB must be fully understood by a pilot to make a good risk assessment given that pilot's skill and aircraft capabilities.

Recognizing the important connection between weather forecasting and aviation, on May 20, 1926, Congress passed the Air Commerce Act. This Act included legislation directing the Weather Bureau (forerunner to the current *National Weather Service* – NWS) to "furnish weather reports, forecasts, warnings...to promote the safety and efficiency of air navigation in the United States." From the late 1920s through the 1940s, the United States military developed a briefing format advising pilots of adverse weather regarding safety-of-flight as well as mission requirements. By the late 1950s, with the development of the Federal Aviation Administration's (FAA) Flight Service Station (FSS) System and the staffs of U.S. Weather Bureau (USWB) Offices, a formal PWB format was instituted to brief the civilian aviation communities. The main components of that format are still in place, along with a few extra-meteorological additions given present-day concerns (*See* ***Text Box: "Pilot Weather Briefing"***).

As a young meteorologist in the early 1970s, one of the first professional certificates I acquired within the National Weather Service was that of the "Pilot Weather Briefing Certificate." To be allowed to brief a pilot who called the NWS for weather information under the auspices of regulatory preflight knowledge requirements, I was trained, drilled, and then tested by a Weather Service Evaluations Officer to demonstrate proficiency in providing the necessary weather information. Having received the provided information from a weather briefing, a pilot could then make the proper "go" or "no-go" decision

PILOT WEATHER BRIEFING

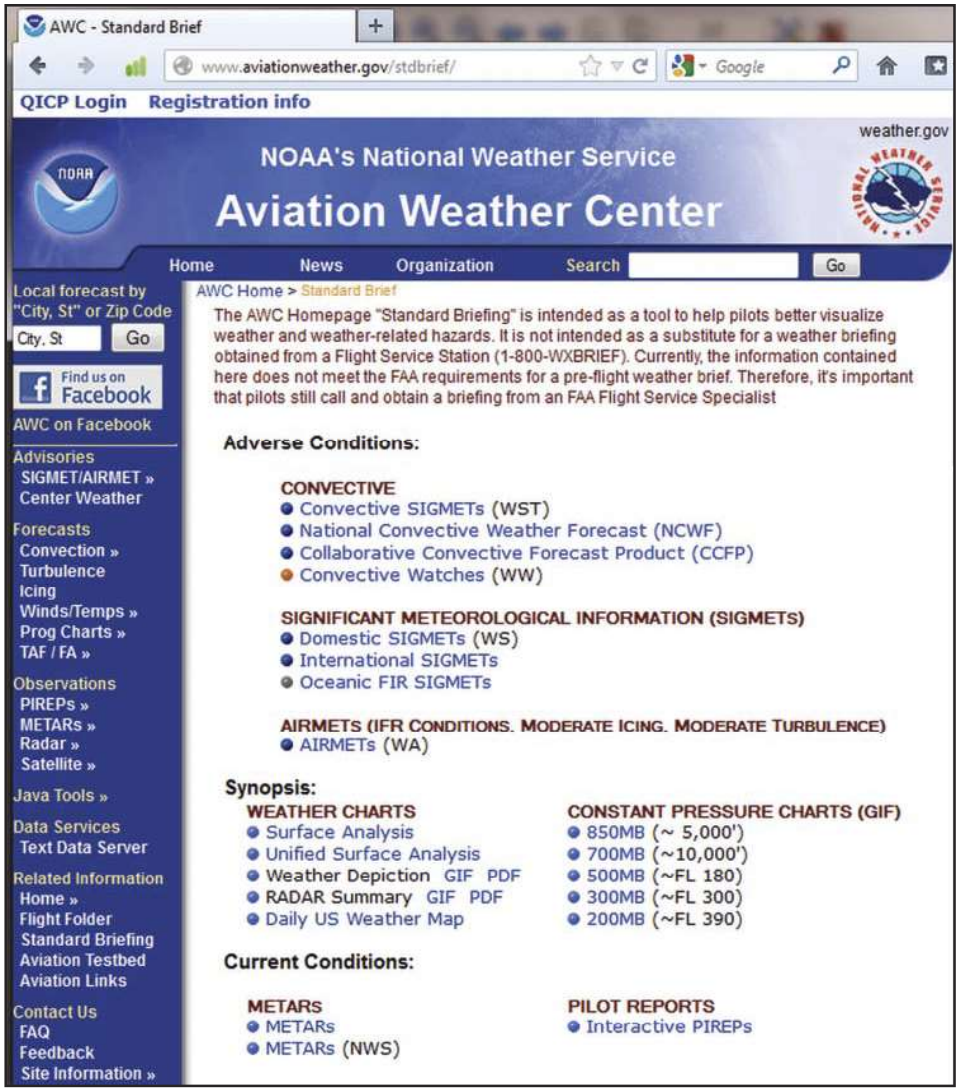
- BACKGROUND INFORMATION
- ADVERSE CONDITIONS
- SYNOPSIS
- CURRENT CONDITIONS
- EN ROUTE FORECAST
- DESTINATION FORECAST
- WINDS & TEMPERATURES ALOFT
- NOTICES TO AIRMEN (NOTAMS)



for safe flight in consideration of their personal and aircraft capabilities.

The main components of the formal PWB provides information on meteorological flight hazards, forecast weather conditions, and observed weather in a specified order. In using the Internet, and specifically the NWS's Aviation Weather Center (AWC) Homepage (See ***Web Page #1: AWC Home***), various formal and experimental weather products are available for pilot weather information. The left menu on the AWC site has a specific header for "*Standard Briefing*" which is the formal PWB format with one exception. This exception is the acquisition of "background information" by a weather briefer (See ***Web Page #2: AWC Standard Briefing Page***). Background information provided by a pilot enabled the FAA FSS or USWB briefer to more fully understand the pilot and aircraft capabilities thereby custom fitting the briefing within the limitation of the pilot and plane in an efficient manner. This pilot-furnished information included the type of aircraft, flight limitations (Visual Flight Rules or Instrument Flight Rules), departure and arrival airports, route and altitude of the flight, and the time of departure and estimated time en route.

After the background information was obtained, the pilot weather briefer then continued to progress through the PWB format using a variety of weather products appropriate to the requesting pilot's flight parameters. All the sections comprising the PWB utilize knowledge of weather codes and products that were acquired through ground and flight training (See ***References: AC00-45G, Aviation Weather Services***).



Obviously, telephone briefings had the briefer using text weather products to a large extent. Any information gleaned by the briefer from graphical products or charts had to be orally described and conveyed to the pilot. The weather information and products pilots were required to study to pass their knowledge and practical tests for their airmen certificate was to be applied toward safety-of-flight decision-making.

One of my favorite instruction stories is reminding pilots that we have witnessed a ***"full circle in weather briefings."*** In the 1950s and 1960s, pilots could call for a weather briefing or had the option of visiting an FAA FSS and/or USWB Office for a "One Call – One Stop" briefing. Pilots began to use primarily only the FAA FSS System for briefings by the early 1970s, but FAA FSS Offices co-located with USWB (now NWS) Offices had the ability to pass briefed pilots through to the neighboring NWS Office. This "pass-over" to the NWS from the FAA FSS for additional insight into occurring or forecasted weather was

REFERENCES

1) ***"AC00-45G, Aviation Weather Services"***; FAA/Gov't Printing Office, 2010. Available on-line:
< http://www.faa.gov/documentLibrary/media/Advisory_Circular/AC-0045G_chg1_fullDocument.pdf >

Aviation Weather Services, Advisory Circular 00-45G, is published jointly by the National Weather Service (NWS) and the Federal Aviation Administration (FAA). This publication supplements its companion manual Aviation Weather, Advisory Circular 00-6A, which documents weather theory and its application to the aviation community. AC00-45 explains U.S. aviation weather products and services. It details the interpretation and application of advisories, coded weather reports, forecasts, observed and prognostic weather charts, and radar and satellite imagery. Product examples and explanations within the publication are taken primarily from the Aviation Weather Center's Aviation Digital Data Service.

2) ***NWS Aviation Weather Center Website***
< www.aviationweather.gov >

3) ***NWS Aviation Weather Center "Standard Briefing":***
< http://www.aviationweather.gov/stdbrief/>

---Go to the NWS Aviation Center Website (reference point #2 above)
*---On the Left Side Menu: Click "**Standard Brief**"*
---Note the components of the PWB and various weather products and graphics

known as the "one call" briefing option.

Pilots who physically visited FSS and NWS Offices could review posted facsimile charts and teletype text-based weather products in their encoded form on PWB boards and office map displays. The developmental pinnacle of FAA FSS and NWS Offices during the 1970s and early 1980s, along with the convenience of the "One Call – One Stop" weather briefing service led to most civilian weather briefings being conducted by telephone.

The late 1980s saw the beginning of FSS and NWS Office closures and centralization of service locations, thereby making it most inconvenient for pilots to visit FSS and NWS Offices. Pilots then depended almost exclusively on telephone weather briefings. Familiarity and proficiency in reading encoded weather text products and weather charts to gather weather information for a flight seemed superfluous except for successfully passing the airmen knowledge tests.

The centralization of the FAA FSS System and the restructuring of the NWS Offices by the mid-1990s pretty much eliminated the pilot "walk-in" self-briefing capability. But then, even with weather services centralization, the development and expansion of Internet capabilities accessible by pilots after the late 1990s now provide for better weather product dissemination than that seen on any map displays and PWB Boards of the 1960s. Therefore, the need for pilots to not only grasp meteorological concepts but be able to personally read and interpret weather products is again operationally very useful … a ***"full circle"*** in a pilot's weather briefing knowledge over the years!

Without going into great detail within this article concerning specific weather products that make up a PWB, I would like to point to a purposeful redundancy within the briefing format. The first weather products referenced in the briefing format are those concerning "Adverse Conditions," i.e., conditions that may be deemed hazardous to flight. Examples of weather products comprising this section might be AIRMETs and SIGMETs. And yet, these same hazardous conditions will again be briefed within the "En Route Forecast" section in conjunction with the Area Forecast (FA). This redundancy is meant to insure that the inclement weather information has been adequately conveyed to the pilot.

Since the attack on the United States in 2001, the NOTAM section has a much more robust and comprehensive Temporary Flight Restriction (TFR) bullet within the Notices to Airmen (NOTAM) section. Additionally, due to Internet capabilities, the FAA can make available other types of information directly to pilots who would not have been possible in decades past.

In summary, it behooves the soaring pilot to understand meteorological processes that provide upward air motion. But primarily a soaring pilot needs to have basic knowledge of weather services and products that assure him/her that inclement or hazardous weather does not compromise a safe flight…no matter how strong the atmospheric lifting mechanisms. Future articles can address some of these useful products. In the meantime, before any soaring flight is undertaken some form of weather briefing needs to be received. To quote cross-country pilot extraordinaire Jim Payne…"Have Fun and Fly Safe," and (author's addition) ***Get a thorough pilot weather brief!***)