

CALLBACK

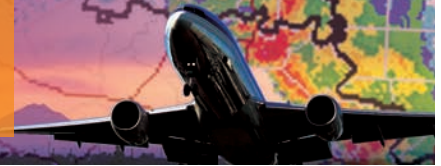
From NASA's Aviation Safety Reporting System



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Weather and Aeronautical Information Services Data Link Issues



In cooperation with the Federal Aviation Administration (FAA), the Aviation Safety Reporting System (ASRS) initiated a study of meteorological (MET) and aeronautical information services (AIS) received via data link. The purpose of the study was to analyze information from users of data link technologies as reported in ASRS incident reports. Qualitative assessments of available records provided valuable insight on data link user interface and actual cockpit experiences related to data link weather or AIS information. The preliminary findings in the Study included:

- The incident reports within the study group were almost equally divided between air carrier operations and general aviation
- The majority of reporters' comments regarding MET data link usage were positive and indicated that the technology was a valued tool in the mitigation of adverse weather encounters
- The problems most often cited in regard to MET data link information were related to the timeliness of the data

The following ASRS report excerpts were taken from the data set that was used for the Meteorological and Aeronautical Information Services Data Link Study.

A Dangerous Dilemma

A PA-32 Pilot experienced hazardous weather conditions after relying upon data link weather for a "real time" picture of enroute conditions.

■ *While in cruise flight, it became necessary to deviate due to existing and building thunderstorms. ATC had advised me of the largest storm which I had visually.... The storm was to the north. I was also using XM downloaded weather for information. When the XM indicated it was safe to turn more northerly, I advised ATC that I was starting my turn and he agreed that the turn looked "good to him." I went IMC momentarily and when I broke out there was a large buildup at my twelve o'clock position. The main storm was still off to my right. I could see several breaks around the buildup. I requested and was approved for a climb to 10,000 feet in an attempt to remain visual on the buildup. I was unable to do so and encountered IMC. While IMC, I flew into an area of fast building weather that was joining up with the known*

cell to my right. I advised ATC of my dilemma and he was very surprised to see how quickly the cell was developing. He vectored me through the safest part of it. I was forced to use every method from my training by turning the autopilot off, slowing, and keeping the wings level. At one time with [climb power] I was descending at 1500 feet per minute. I eventually exited the weather.... ATC advised that the area had completely closed up. Only then did the XM weather update to reflect the actual conditions that existed.

The great guy at ATC was almost as nervous as I was. The delay of the update with the speed of the buildup of these air mass thunderstorms resulted in an inaccurate pictorial that I was using to determine my route of flight.

"I Thought I Would Have an Uneventful Arrival"

When fast moving convective activity is present, more than a good preflight briefing and onboard NEXRAD information may be needed to keep up with current conditions. After enduring an unexpected "flight" on the ramp, this M-20 Pilot recognized that a false sense of security was a factor in his not getting real time data from Flight Watch.

■ *Just prior to departure I received a full VFR weather briefing which contained no SIGMETs. The forecast was VMC for the entire route. Mention was made of some convective activity, but it was not expected to affect my route of flight. Enroute, I had access to XM weather and SkyRadar. One hour prior to my ETA, I noticed a large cell with Level 6 activity within.... I made some preliminary plans for an alternate, but as I approached within 20 minutes of my destination, I thought I would have an uneventful arrival. ATIS was reporting winds 280 degrees at 10 knots gusting to 14 knots with a broken ceiling at 5,500 feet. Approach Control and Tower casually mentioned the weather, but there was no sense of urgency concerning the developing situation.*

On a two mile final, lightning struck the field. As I flared to land, a large microburst was observed on the airport and wind gusted to 40 knots. By this point I landed and started to taxi to the ramp. Rain and wind became torrential and the aircraft started to weather vane on the taxiway. I maintained appropriate control inputs and made it to the ramp where

I turned the aircraft into the wind, kept the engine running and maintained full forward yoke and full nose down trim. At times the wind gusted to 55 knots. The NEXRAD display was displaying Level 6 returns over the field. The rainwater on the ramp had whitecaps.

Tower did a great job of keeping me informed of wind direction and speed. I “flew” on the ramp for 20 minutes before the winds let up....

I have always considered myself cautious and not a risk taker. I have not hesitated to deviate in the past when weather was dangerous. I am ashamed of my judgment during the conclusion of this flight. There were several factors that led to my decision....

I had a false sense of security about the weather that led me to make an inappropriate decision. I could not believe a convective cell could move that fast.... I should have been talking to Flight Watch to get real time data about the direction and velocity of the cell.

A Turn for the Worse

After losing their onboard radar, a C650 Flight Crew attempted to avoid turbulent weather by using the NEXRAD display. What the Crew encountered was decidedly different from the NEXRAD presentation of a gap between two lines of thunderstorms.

■ *We were...flying toward a rapidly developing line of weather.... Our aircraft was equipped with both onboard weather radar as well as NEXRAD radar imagery provided via XM through a Garmin GPS. Our weather briefing before takeoff showed the tops of the weather at around FL250, an altitude that we could easily top. By the time we reached the area..., convective SIGMETs had been issued reporting the tops approaching FL450. As we approached the line, we were able to visually see tops of the individual cells. Comparing our visual analysis, both radars, and suggestions from ATC, we came up with our plan for getting to the east side of the weather. The southern line of weather was several miles behind the southwest line, so we decided the safest plan was to fly east, past the southern line, then turn to the south-southwest to pass through the gap between the two lines. While we were flying east, the onboard radar showed a gap between two cells directly ahead. We could see both cells visually as well.... About that time we entered the undercast and visibility became nil. We requested FL430 multiple times, but were unable to climb due to traffic. Neither the NEXRAD nor ATC radar showed the gap we had seen, so we decided to continue with our original plan and began a turn to the southwest. As we took up our southwesterly*

heading, the onboard weather radar failed. During the next few minutes we flew west-southwest to get to the gap based on the NEXRAD and ATC advice. We requested a climb to FL430 or FL450, but were denied again due to traffic....

As we approached the gap on the NEXRAD, we began a turn back to the south. Suddenly we encountered increasing turbulence with three to four hard jolts.... The autopilot disconnected and I hand flew the aircraft throughout the remainder of the event. We encountered severe turbulence and began an uncommanded, uncontrolled climb. We advised ATC and declared an emergency due to our inability to control altitude. We were cleared... to FL450, but immediately encountered a downdraft and were cleared to a lower altitude. The turbulence continued to be moderate, verging on severe....

There were several circumstances that contributed to our weather encounter. The most obvious was the failure of the onboard radar, the best source of information about the location of storm cells.... NEXRAD lag was also a factor. Knowing that NEXRAD data is not current, we had to make our best guess as to where the gap showing on the NEXRAD actually was located.... The NEXRAD showing the solid line contributed to our decision to turn.

TFR Troubles

The ASRS Data Link Study noted that a number of incident reports cited missing, inadequate or late AIS data. This PA-28 Pilot’s experience was an example of how delayed TFR information can “pop up,” after it is too late.

■ *I departed...and flew direct...on a VFR flight. I thought I was departing just prior to the Presidential TFR, which I believed to be starting in 15 minutes.... Unfortunately I was mistaken on the TFR start time either due to a change or an error on my part, but the TFR went into effect two minutes before I departed. I was asked upon landing to call the FAA, which I did.... The AWOS that I checked via phone prior to departure did not have any special NOTAMs for the TFR.... In addition, my Garmin 496 must have been delayed with the data feed because I only saw the TFR pop up on my display as I was leaving the TFR.*

The preliminary report on the NASA ASRS Meteorological and Aeronautical Information Services Data Link Study can be seen at: http://asrs.arc.nasa.gov/docs/rs/64_ASRS_Meteorological_AIS_DataLinkStudy.pdf

The NTSB Safety Alert: *In-Cockpit NEXRAD Data Can Differ Significantly from Age Indicated on Display* can be found at: http://www.nts.gov/doclib/safetyalerts/SA_017.pdf

ASRS Alerts Issued in March 2013	
Subject of Alert	No. of Alerts
Aircraft or Aircraft Equipment	8
Airport Facility or Procedure	2
TOTAL	10

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March 2013 Report Intake	
Air Carrier/Air Taxi Pilots	4,050
General Aviation Pilots	1,030
Air Traffic Controllers	767
Cabin	403
Mechanics	170
Dispatcher	115
Military/Other	28
TOTAL	6,563