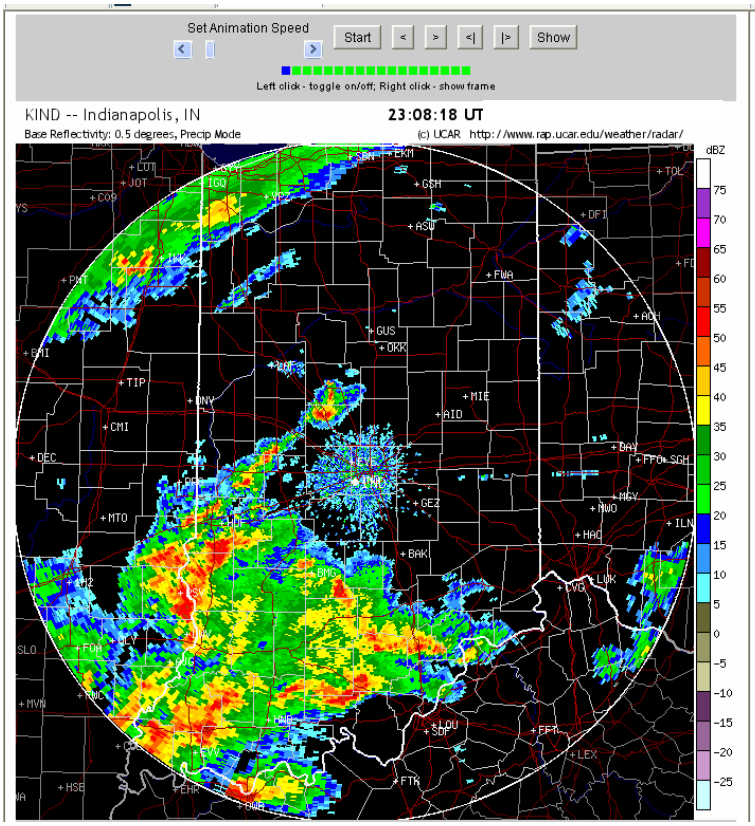
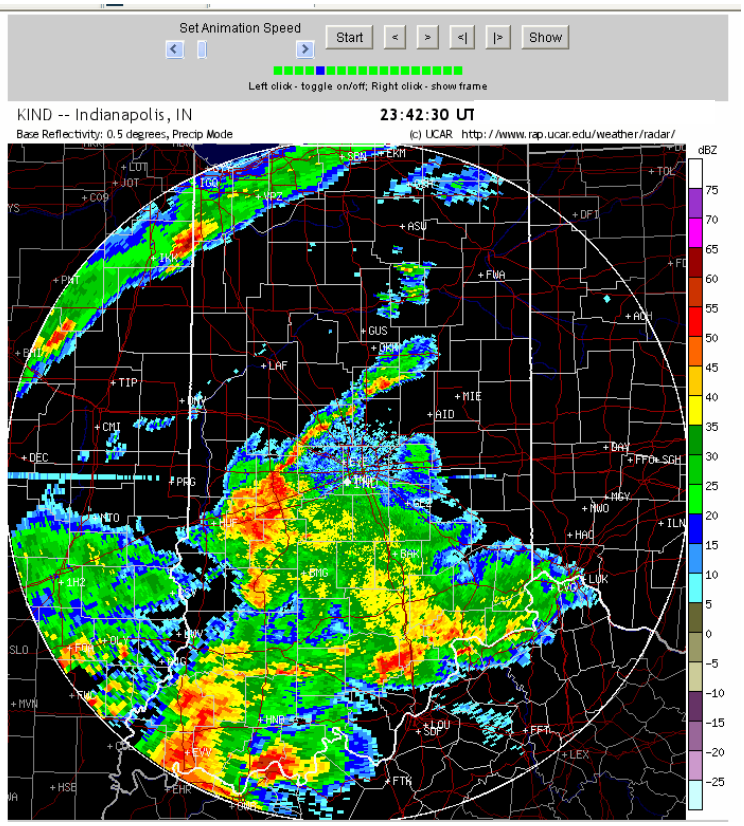
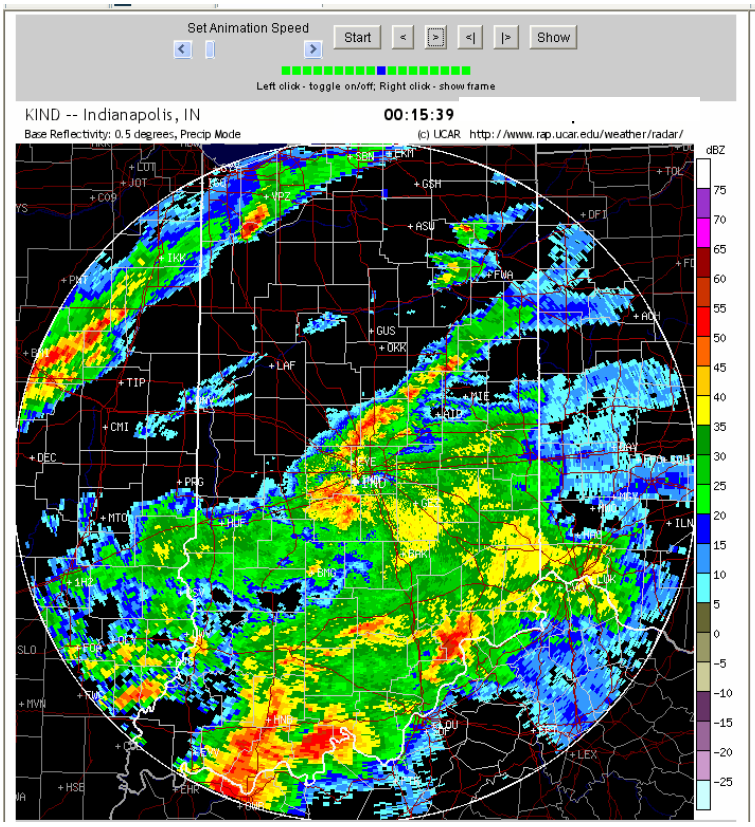


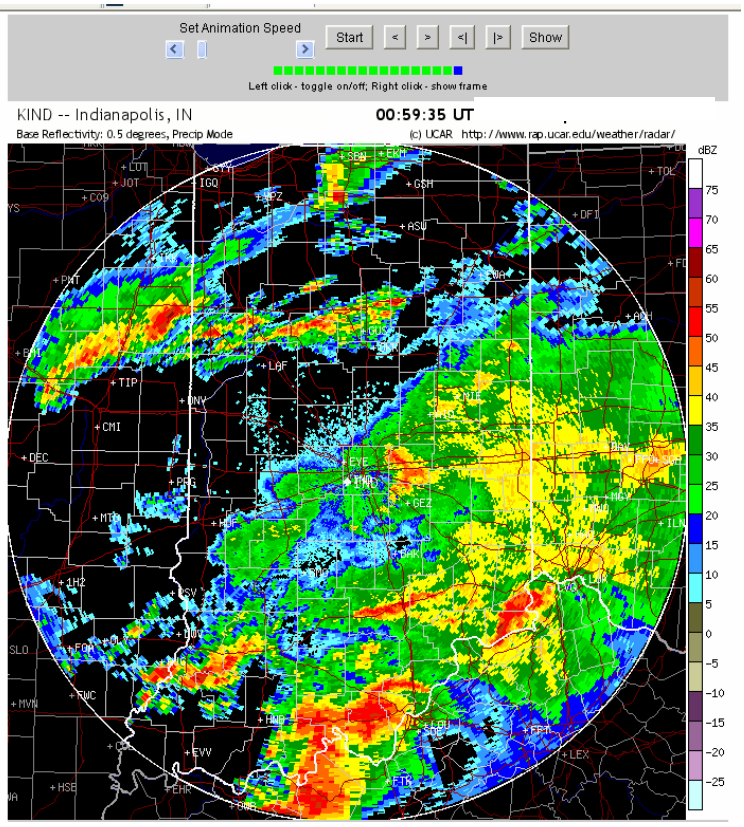
2308Z radar image (approx. 15 min prior to TAF issuance)
Storm motion is to the north east



2342Z – approx. 7 min prior to TAF AMD
Storm motion is to the north east



0015Z – TSRA over the KIND terminal
Storm motion is to the north east



0059Z – approx. 8 min prior to TSE in the KIND observation
Storm motion is to the north east

KIND TAF:

```
KIND XX2323Z XX0024 17012KT P6SM VCTS SCT014 OVC040CB
      TEMPO 0002 3SM -SHRA BKN010
     FM0200 17012KT 5SM -SHRA BR OVC012
      TEMPO 0205 1 1/2SM -TSRA BR OVC008CB
     FM0500 18010KT P6SM VCTS OVC012CB
      TEMPO 0508 4SM -SHRA BR
     FM0800 19010KT 4SM BR VCTS BKN012 OVC030CB
     FM1500 21012G22KT P6SM VCTS SCT015 BKN040CB=

TAF AMD
KIND XX2349Z XX0024 17012KT 5SM -SHRA SCT014 OVC024
      TEMPO 0002 2SM -TSRA BKN014CB
     FM0200 17012KT 5SM -SHRA BR VCTS OVC012CB
     FM0500 18010KT P6SM VCTS OVC012CB
      TEMPO 0508 4SM -SHRA BR
     FM0800 19010KT 4SM BR VCTS BKN012 OVC030CB
   FM1500 21012G22KT P6SM VCTS SCT015 BKN040CB=
```

KIND METAR observations are attached. In the ob, TSB 2350Z and TSE 0107Z.

Thunderstorms were clearly moving north east toward the KIND terminal. Neither the initial issuance nor the subsequent AMD had thunder in the prevailing group. In this example, the AWIPS "Time of arrival/lead time" tool would have been most helpful in determining correct timing.

A TEMPO group was used, recognizing impending thunderstorm activity. However, as the radar loop showed, these storms showed no signs of dissipating before arriving at the terminal and should have been placed in the prevailing group.

Climatology suggests that thunderstorms at the KIND airport usually last no more than 2 hours. While the TEMPO group timing was limited to 2 hours, a prevailing mention would have been more appropriate.

Air traffic control at KIND can see (on their radar display) the line of thunderstorms approaching the terminal. Giving them as much advanced notice as possible will help them more efficiently divert aircraft while the thunderstorm is ongoing.

According to the TAF Directive, (NWSI 10-813, Appendix C 1.2.9.1) we are no longer limited to timing various weather occurrences in 30 minute increments. Precise timing (as precise as scientifically possible) is encouraged. Specific text from the Directive is as follows:

"While the use of a four-digit time in whole hours (e.g. 2100Z) is acceptable, if a forecaster can predict changes and/or events with higher resolution, then more precise timing of the change to the minute should be indicated."

Also, the AAFD was issued 2 hours late.

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AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE INDIANAPOLIS IN
1030 PM EDT XXX XXXXXX 2006

.AVIATION...DISCUSSION FOR THE 00Z TAFS
A STRONG LOW PRESSURE SYSTEM WILL MOVE THROUGH THE GREAT LAKES ON SATURDAY. VERY STRONG FLOW OF
MOIST AND UNSTABLE AIR WAS MOVING UP AHEAD OF THE LOW. A WARM FRONT EXTENDED SOUTHEAST FROM THE
LOW INTO EXTREME SOUTHWEST INDIANA. MVFR CONDITIONS WILL OCCUR WITH SCATTERED TO NUMEROUS SHOWERS
AND THUNDERSTORMS. THESE MAY GIVE IFR CONDITIONS. A COLD FRONT WILL MOVE THROUGH INDIANA SATURDAY
AFTERNOON. THIS WILL PROVIDE THE FOCUS OF ANOTHER ROUND OF THUNDERSTORMS. SOME OF THESE STORMS
MAY BE SEVERE WITH HAIL...WIND GUSTS OVER 40 KTS AND POSSIBLE TORNADOES.
```

18:51:27 SPECI KIND XX2350Z 15013KT 9SM -TSRA BKN012 OVC060 19/17 A2968 RMK AO2 TSB50RAB41 FRQ LTGICCC VC SW-W TS VC SW-W MOV NE P0000 FIBI

18:52:08 METAR KIND XX2351Z 15013KT 9SM -TSRA BKN012 OVC060 19/17 A2968 RMK AO2 TSB50RAB41 SLP048 FRQ LTGICCC VC SW-W TS VC SW-W MOV NE P0000 60001 T01890172 10194 20183 55027

19:26:56 SPECI KIND XX0025Z 26008KT 1 3/4SM +TSRA BR BKN012 OVC017 18/18 A2976 RMK AO2 FRQ LTGICCCCG OHD-SW TS OHD-SW MOV NE P0011

19:38:57 SPECI KIND XX0037Z VRB04KT 3/4SM +TSRA BR SCT007 BKN012 OVC020 18/18 A2973 RMK AO2 FRQ LTGICCCCG OHD-SW TS OHD-SW MOV NE P0035 RVRNO

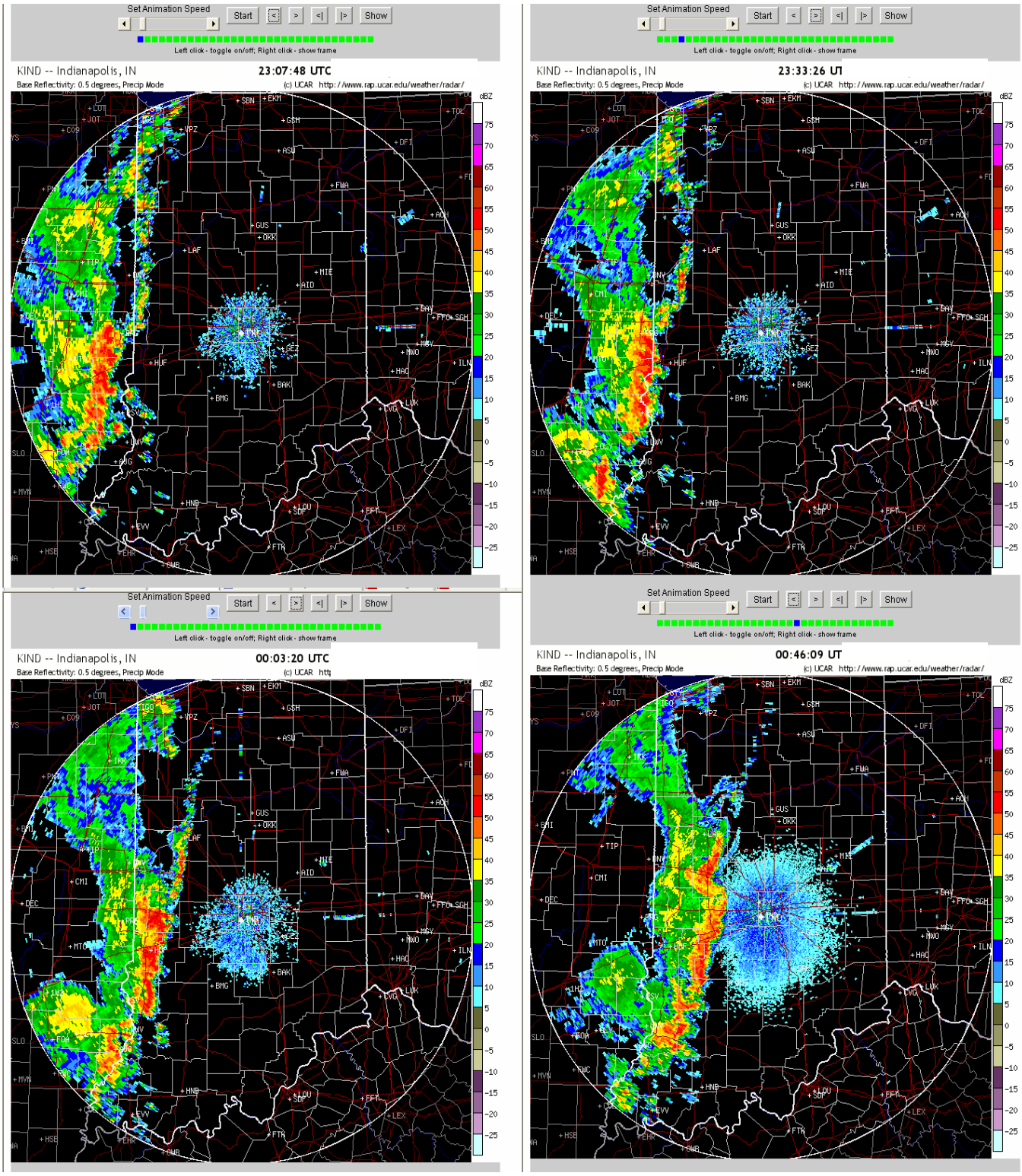
19:46:56 SPECI KIND XX0045Z 13011KT 3SM TSRA BR BKN012 OVC023 18/18 A2971 RMK AO2 FRQ LTGICCC OHD-E TS OHD-E MOV NE P0055

19:53:21 SPECI KIND XX0052Z 13009KT 6SM -TSRA BR BKN016 BKN027 OVC032 18/18 A2971 RMK AO2 FRQ LTGICCC VC E TS VC E MOV NE P0056 FIBI

19:55:55 METAR KIND XX0054Z 12008KT 6SM -TSRA BR BKN016 BKN025 OVC032 18/18 A2971 RMK AO2 SLP058 FRQ LTGICCC VC E TS VC E MOV NE P0056 T01830178

20:09:03 SPECI KIND XX0107Z 13008KT 8SM -RA FEW003 SCT019 BKN024 18/18 A2970 RMK AO2 TSE07 OCNL LTGICCC DSNT E CB DSNT E MOV NE TS MOVD NE P0001

20:30:08 SPECI KIND XX0129Z 14012KT 8SM -RA FEW003 BKN013 BKN027 OVC130 18/18 A2969 RMK AO2 TSE07 CB DSNT E MOV NE P0002 CNCL



Line of thunderstorms approaching all terminals and radar indicates movement to the northeast. The KIND 2330Z initial issuance has no mention of thunder. Why not try to time thunder into the KIND TAF at initial issuance using the distance/speed tool or the Time of Arrival/Lead Time tool in AWIPS? KIND AMD was not issued until 0048Z. *Once timing was used, it was done well* (using more precise minute timing as the directives encourage NWSI 10-813, Appendix C 1.2.9.1), but should have been attempted at the initial issuance.

The same thing holds true for KBMG. There was no mention of thunder in the initial issuance yet the line will be over the terminal within hours. An amendment was issued approximately 23 minutes before thunder was in the observation. Again, use of the distance/speed tool or the Time of Arrival/Lead Time tool in AWIPS could help with timing into the terminals.

Air traffic control at KIND can see (on their radar display) the line at the Indiana border at 2307Z. When looking at the KIND TAF (and KBMG) and there is no thunder mentioned, it creates confusion as the line appears to be driving right toward the airport. A 1.5 hour window (from issuance) to plan for diverting aircraft would have been helpful to them. The text of the TAF follows:

Initial 00Z issuance:

```
KBMG XXXXXX XX0024 18008KT P6SM SCT100 BKN250
     FM0300 19009KT P6SM SCT050CB BKN100 OVC200
     FM0600 19009KT P6SM –SHRA VCTS SCT015 BKN050CB OVC100
      TEMPO 0610 3SM TSRA BR BKN015 OVC050CB
     FM1000 24010KT 3SM SHRA VCTS BKN012CB OVC020
     FM1300 27008KT 2SM RA BR OVC008
     FM1900 33009KT 3SM –SHRA OVC015
     FM2300 33009KT 6SM BR VCSH BKN025 OVC040
       AMD LTD TO CLD VIS AND WIND 01Z-13Z=
```

Amendment:

```
KBMG XXXXXX XX0124 18008KT P6SM SCT100 BKN250
     FM0200 24020G30KT 3SM TSRA SCT015 OVC030CB
      TEMPO 0203 1 1/2SM TSRA OVC010CB
     FM0600 19009KT P6SM –SHRA VCTS SCT015 BKN050CB OVC100
      TEMPO 0610 3SM TSRA BR BKN015 OVC050CB
     FM1000 24010KT 3SM SHRA VCTS BKN012CB OVC020
     FM1300 27008KT 2SM RA BR OVC008
     FM1900 33009KT 3SM –SHRA OVC015
     FM2300 33009KT 6SM BR VCSH BKN025 OVC040
       AMD LTD TO CLD VIS AND WIND 01Z-13Z=
```

The KBMG observation recorded TSB(reported as VCTS): 0035Z and TSE: 0241Z. TSRA in the main ob at 0153Z.

Great timing in the amendment!

Initial 00Z issuance:

```
KIND XXXXXX XX0024 19011KT P6SM SCT100 BKN250
     FM0300 19011KT P6SM SCT050CB BKN100 OVC200
     FM0600 19010KT P6SM –SHRA VCTS SCT015 BKN050CB OVC100
      TEMPO 0610 3SM TSRA BR BKN015 OVC050CB
     FM1000 24010KT 3SM SHRA VCTS BKN012CB OVC020
     FM1300 31008KT 2SM RA BR OVC008
     FM1900 33009KT 5SM –SHRA OVC015
     FM2200 33009KT 6SM BR VCSH BKN025 OVC040=
```

Amendment:

```
KIND XXXXXX XX0124 18010KT P6SM SCT100 BKN250
     FM0145 24020G30KT 3SM TSRA SCT015 OVC030CB
      TEMPO 0203 1 1/2SM TSRA OVC010CB
     FM0300 19011KT P6SM SCT050CB BKN100 OVC200
     FM0600 19010KT P6SM –SHRA VCTS SCT015 BKN050CB OVC100
      TEMPO 0610 3SM TSRA BR BKN015 OVC050CB
     FM1000 24010KT 3SM SHRA VCTS BKN012CB OVC020
     FM1300 31008KT 2SM RA BR OVC008
     FM1900 33009KT 5SM –SHRA OVC015
     FM2200 33009KT 6SM BR VCSH BKN025 OVC040=
```

Great use of timing in the amendment! The KIND observation recorded TSB: 0134, TSE: 0259

Initial 00Z issuance:

```
KLAF XXXXXX XX0024 20010KT P6SM SCT050CB BKN100 OVC250
     FM0130 20009KT 4SM –TSRA BKN030CB OVC050
     FM0400 20009KT 4SM –SHRA VCTS BKN030CB OVC050
     FM0600 22007KT 3SM –RA BR VCTS SCT006 BKN015 OVC050CB
     FM0900 30007KT 2SM RA BR BKN008 OVC015CB
     FM1500 34008KT 5SM -RA BR BKN008 OVC015
     FM1700 32008KT P6SM VCSH BKN025 OVC050
     FM2000 31009KT P6SM SCT035 BKN250
      AMD LTD TO CLD VIS AND WIND 01Z-13Z=
```

Great timing! TSRA in ob at 0134Z