34.1 PRODUCT DESCRIPTION

1. The Graphical Turbulence Guidance (GTG-2) product suite provides a color-coded, four-dimensional diagnosis and forecast of Clear Air Turbulence (CAT) potential between 10,000 feet MSL and FL450.
   a. This product only depicts CAT associated with upper level fronts and jet streams. It is not intended to depict turbulence associated with convection, thunderstorms, and/or breaking mountain waves.
   b. The GTG-2 is created using a combination of computer model output, turbulence observations, upper air and satellite soundings, and surface weather reports.

2. When turbulence PIREPs exist and are valid for the selected time period, they are plotted on the GTG-2 analysis charts for comparative reference.

3. The GTG-2 product suite is automatically generated, with no human modifications.
   a. This product may be used as a supplement to AIRMETs and SIGMETs but is not a substitute for them.
   b. It is authorized for operational use only by meteorologists and dispatchers.
   c. The GTG-2 product does not have the capability to be amended or corrected once released.

4. The GTG-2 is available for the 48 contiguous states, much of Canada and Mexico, and their respective coastal waters.

34.2 ISSUANCE

1. The GTG-2 analysis is issued hourly.

2. The 3-, 6-, 9-, and 12-hour forecasts are issued every 3 hours beginning at 00Z.
   a. EXAMPLE: A forecast suite issued at 0600Z would have valid times at 0900Z, 1200Z, 1500Z, and 1800Z, respectively.

3. The GTG-2 product is issued by the Aviation Weather Center (AWC) and is available through the Aviation Digital Data Service (ADDS) website at http://aviationweather.gov/adds/turbulence/turb_nav.php.

34.3 PLOTTED DATA

1. GTG-2 Analysis and Forecast
   a. The GTG-2 Analysis and Forecast graphics depict the location and intensity of potential Clear Air Turbulence (CAT).
      1) Standard turbulence intensity terminology is used in the legend, but the only categories displayed are “light” and “moderate or greater.”
b. The GTG-2 output is available for 1,000-foot vertical intervals between 10,000 feet MSL and FL450.
   1) The ADDS turbulence page displays 2,000-foot increments starting at 11,000 feet MSL, while the ADDS Flight Path Tool provides access to all levels.

2. **GTG-2 Maximum Analysis and Forecast**
   a. The GTG-2 Composite product displays the maximum, cumulative intensity of potential turbulence between 10,000 feet MSL and FL450. It is loaded by default when you visit the product’s main page. It is labeled “max” in the altitude drop-down box.
      1) At any given location, the displayed value represents the maximum potential turbulence between 10,000 feet MSL and FL450.
      2) Single altitude graphics must be examined to determine the altitude of the potential turbulence.
   b. The coloration on this chart is the same as each single altitude graphic.

34.4 **USING THE CHART**
   1. The GTG-2 provides an hourly, high-resolution analysis and forecast of clear-air turbulence potential between 10,000 feet MSL and FL450.
      a. However, the product is only for turbulence associated with upper level fronts and jet streams, while other known causes of turbulence (e.g., convection, thunderstorms, and mountain waves) are not forecast.

2. **Strengths**
   a. The product is issued hourly.
   b. Turbulence is plotted at a higher resolution than that found in AIRMETs and SIGMETs.

3. **Limitations**
   a. The products are only as accurate as the computer model output used to create them.
      1) The accuracy of the analysis is augmented by the number of PIREPs available.
         a) Typically at night, fewer pilot reports are received, so the accuracy decreases.
      b. The product only displays clear air turbulence (CAT) for upper-level fronts and the jet stream. Other known causes of turbulence are not included in the product.
      c. Data and forecasts are only available for altitudes between 10,000 feet MSL and FL450.
      d. It is only approved for use by meteorologists and dispatchers.

4. The Composite product can provide a quick method to determine what the greatest potential of current or forecast turbulence is at a given location.
   a. To determine the turbulence potential at any given altitude, the individual altitude products must be viewed.

5. The ADDS website overlays turbulence PIREPs on the 00-hour single altitude and composite graphics to make it easy to reconcile the forecast turbulence potential with what pilots are actually experiencing in-flight.
   a. For the PIREP to be plotted on the single altitude product, it must be located within 1,000 feet vertically of the altitude and have been reported within 90 minutes of the chart time.
      1) EXAMPLE: If a user viewed the FL240 GTG-2 product with a valid time of 1400Z, the displayed PIREPs could be located between FL230 and FL250 and
reported between 1230Z and 1400Z.

6. Users should be aware that turbulence is a highly dynamic phenomenon, and in a case of rapidly changing conditions, the product may not accurately convey a significant threat.

END OF STUDY UNIT