Turbulence

Moving to the Jet Age

Solution Components

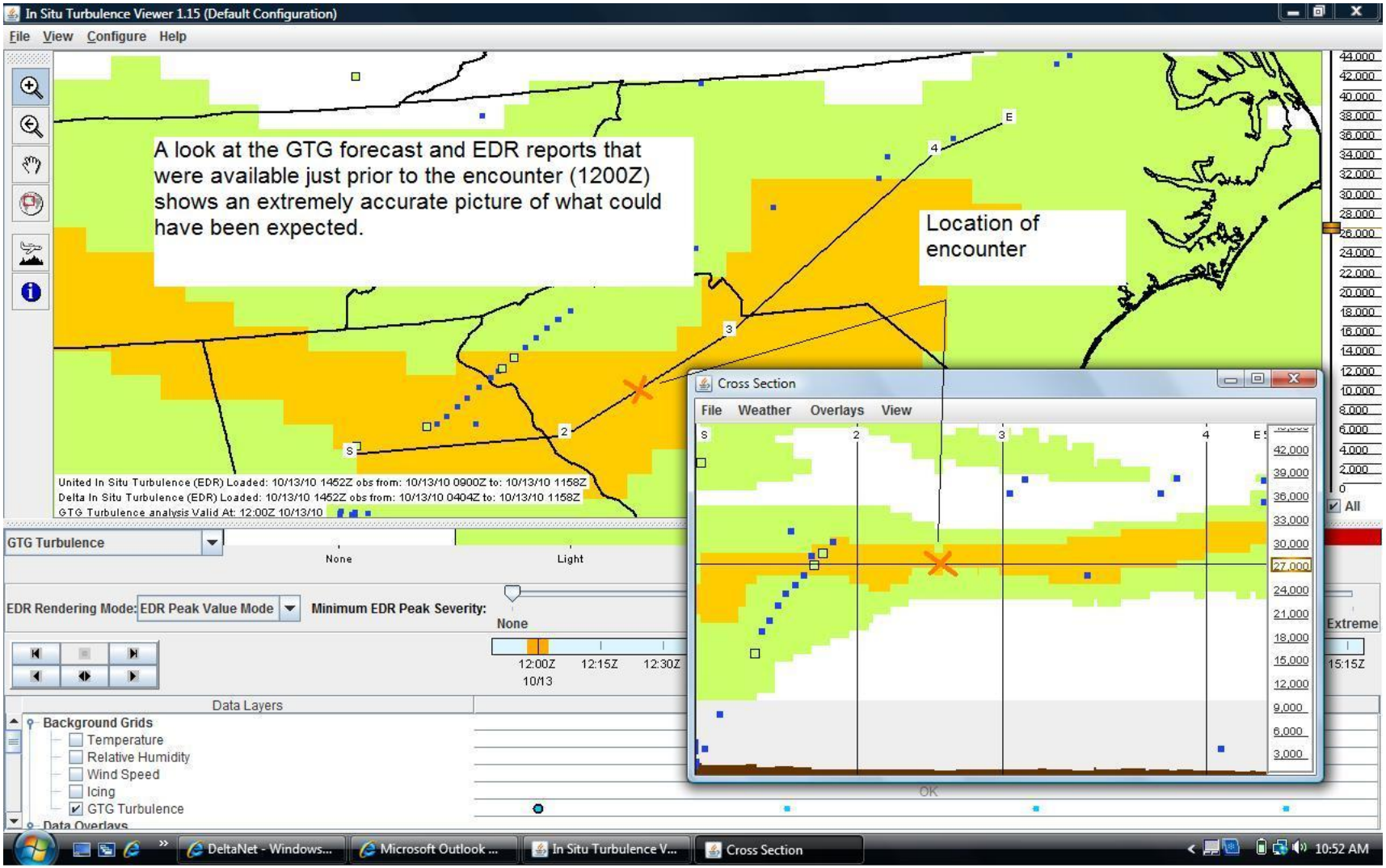
- Forecast
  - GTG2
  - Turbulence Plots, others
- Nowcast
  - New A/C Radars with better turbulence detection
  - Nexrad Turbulence Detection Algorithm (NTDA)
- Reporting
  - Aircraft sensors
  - Eddy Dissipation Rate (EDR)

What is EDR Demo?

- Initial Planning – Source, Cultural, Background
- Enroute – Crew, ATC Chat, Dispatcher, PIREPS
- Hazards vs. Tools for various states (CAT, CVT, MV)
- EDR Viewer – Forecast & Reports Overlay

Why do we need it?

- Safety, Efficiency, Capacity
- Pilot Drivers – Passengers vs. LCA
- PIREPS - Outdated (Invented by the Wrights)
  - Subjective, Sparse, Misplaced, Misunderstood
  - Drives BAD Decisions
- Chat room (ATC Sector) Errors & Results
  - Subjective, Location error, A/C Response
  - Off altitude fuel costs, Capacity loss


In Situ Turbulence Viewer 1.15 (Default Configuration)
File View Configure Help
A look at the GTG forecast and EDR reports that were available just prior to the encounter (1200Z) shows an extremely accurate picture of what could have been expected.
Location of encounter
Cross Section
File Weather Overlays View
United In Situ Turbulence (EDR) Loaded: 10/13/10 1452Z obs from: 10/13/10 0900Z to: 10/13/10 1158Z
Delta In Situ Turbulence (EDR) Loaded: 10/13/10 1452Z obs from: 10/13/10 0404Z to: 10/13/10 1158Z
GTG Turbulence analysis Valid At: 12:00Z 10/13/10
GTG Turbulence
None
Light
EDR Rendering Mode:
EDR Peak Value Mode
Minimum EDR Peak Severity:
None
Extreme
12:00Z
12:15Z
12:30Z
15:15Z
10/13
Data Layers
Background Grids
Temperature
Relative Humidity
Wind Speed
Icing
GTG Turbulence
Data Overlays
All
OK
DeltaNet - Windows...
Microsoft Outlook ...
In Situ Turbulence V...
Cross Section
10:52 AM

Potential Benefits

- Safety – "IF EVERYONE IS STRAPPED IN WITH CARTS STOWED, NO ONE GETS HURT." VS. "CRY WOLF"
- Efficiency
  - Savings Assumptions
  - Savings Range
- Capacity – FAA ATC FOCUS
- Overall - The solutions for all 3 drivers appear to conflict, but BETTER TURBULENCE KNOWLEDGE CAN DRIVE BETTER SOLUTIONS FOR ALL 3.