Challenges presented in Workshop 1

How are we doing?

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Date: Sep 3, 2014

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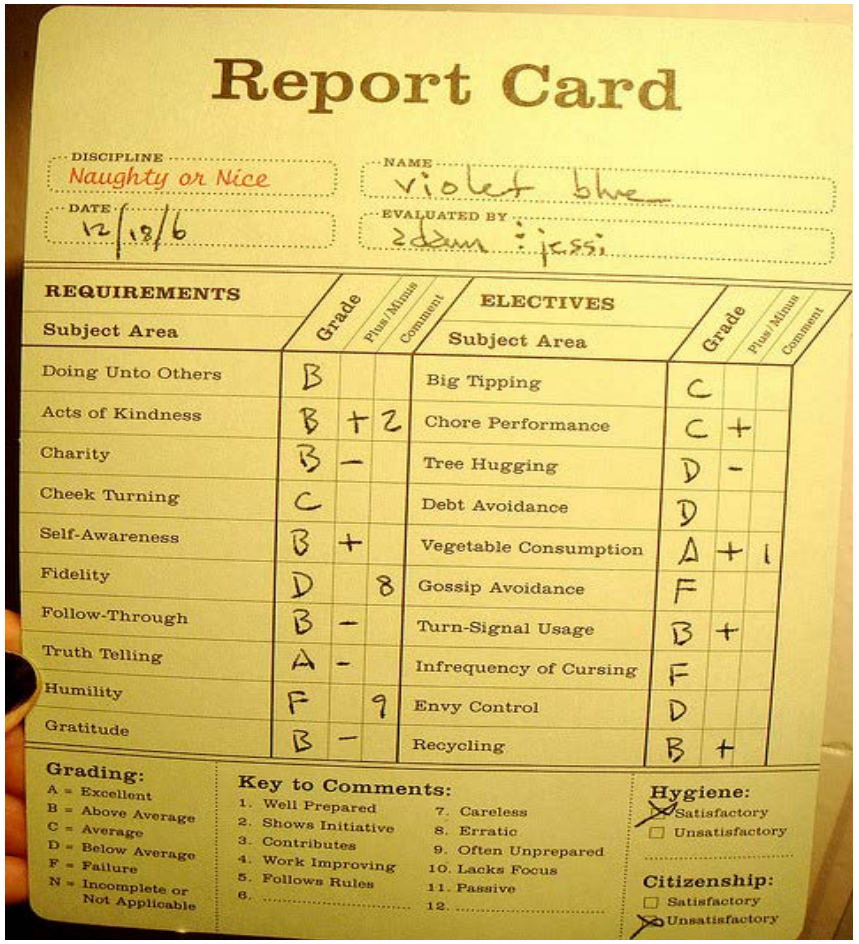
Overview

- During the last workshop, a series of “considerations” and/or “challenges” were presented and limited detail was provided for each topic
- Let’s look at several of these slides again and ask the question “How are we doing?”



Report Card

DISCIPLINE: Naughty or Nice
NAME: violet blue
DATE: 12/18/6
EVALUATED BY: adam : jessi

REQUIREMENTS Subject Area	Grade	Plus/Minus	Comment	ELECTIVES Subject Area	Grade	Plus/Minus	Comment
Doing Unto Others	B			Big Tipping	C		
Acts of Kindness	B	+	2	Chore Performance	C	+	
Charity	B	–		Tree Hugging	D	–	
Cheek Turning	C			Debt Avoidance	D		
Self-Awareness	B	+		Vegetable Consumption	A	+	1
Fidelity	D		8	Gossip Avoidance	F		
Follow-Through	B	–		Turn-Signal Usage	B	+	
Truth Telling	A	–		Infrequency of Cursing	F		
Humility	F		9	Envy Control	D		
Gratitude	B	–		Recycling	B	+	

Grading:
A = Excellent
B = Above Average
C = Average
D = Below Average
F = Failure
N = Incomplete or Not Applicable

Key to Comments:
1. Well Prepared
2. Shows Initiative
3. Contributes
4. Work Improving
5. Follows Rules
6. .....
7. Careless
8. Erratic
9. Often Unprepared
10. Lacks Focus
11. Passive
12. .....

Hygiene:
☒ Satisfactory
☐ Unsatisfactory

Citizenship:
☐ Satisfactory
☒ Unsatisfactory

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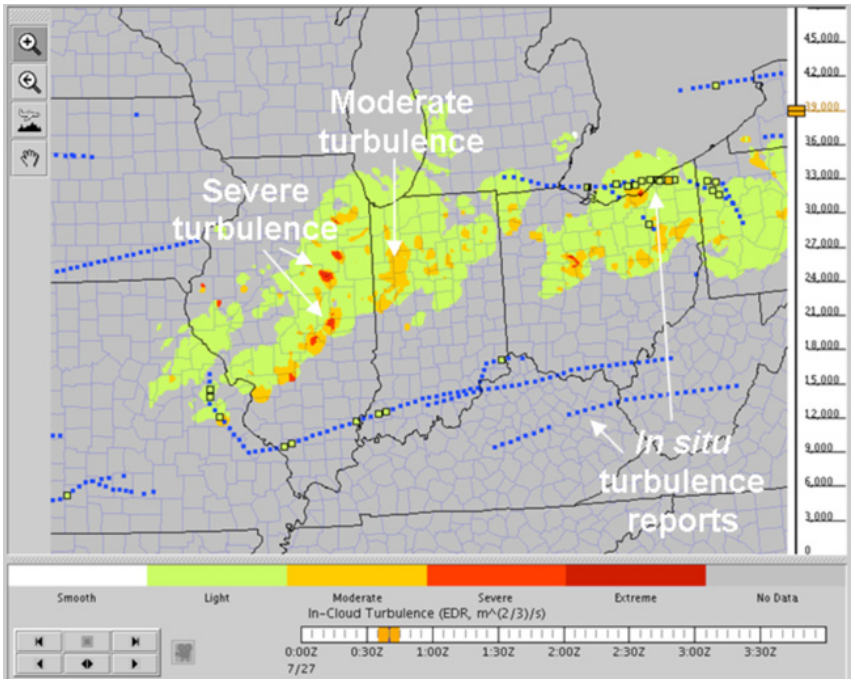
Overview

- A few more thoughts before we get started:
  - AWRP fully supports the idea that we identify a couple of key issues at this workshop and establish working groups to address. Let's make this more than a whine session, but keep our expectations realistic
  - The grades given in each report card solely represent my personal opinion and I apologize right now if I am excluding key initiatives, unintentionally insulting a project leader, etc…
  - More often than not, the report will grade FAA progress, but when available, other progress will be considered

Strategic vs. Tactical

- Products designed for more tactical applications don't have a clear path to tactical exploitation
- Do products designed for strategic planning make a difference in tactical operations?
- What are the implications of making data available in the cockpit that is not available in ATC or to dispatch (and vice versa)?



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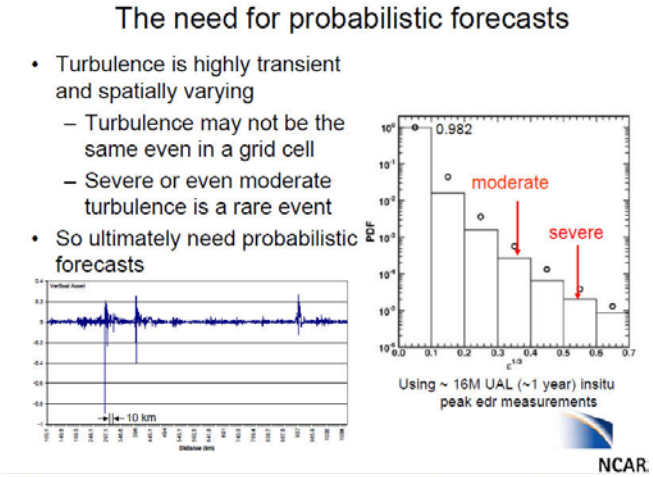
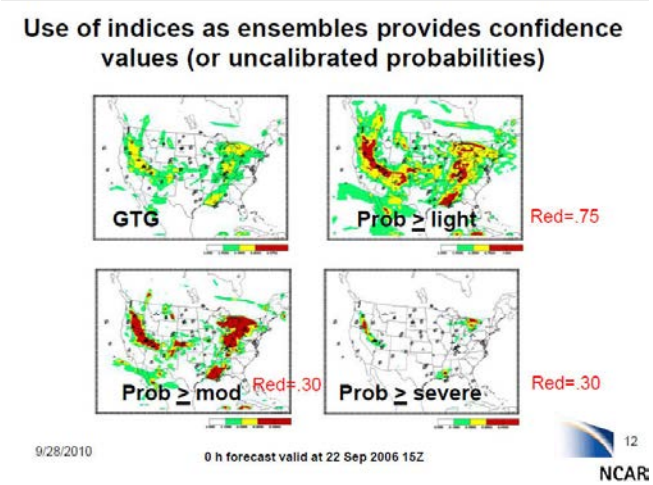
Report Card

- Overall Grade : C+
- FAA Weather Technology in the Cockpit (WTIC) program sponsoring several initiatives:
  - Delta EDR
  - “Minimum Weather Service” concept to quantify what the “right” information is
- Not enough work to quantify benefits of “common situational awareness”
- Vocal support from 121 pilots (e.g. Rocky!) has to be helping
- Some researchers still not thinking enough about operational platforms and who the users are

Probabilistic Turbulence Products

- Users want “deterministic” turbulence products, but all turbulence forecasts are loaded with uncertainty
- So how do craft probabilistic products that relay uncertainty effectively





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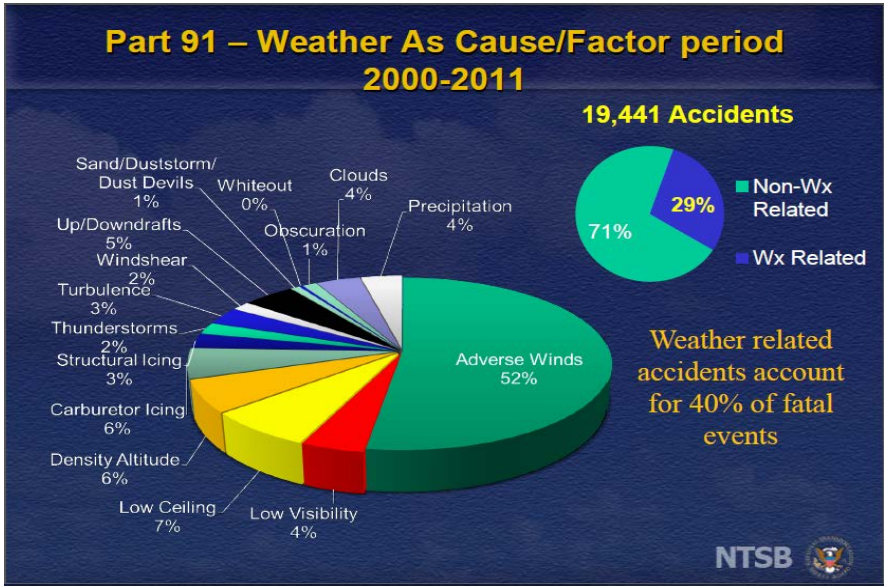
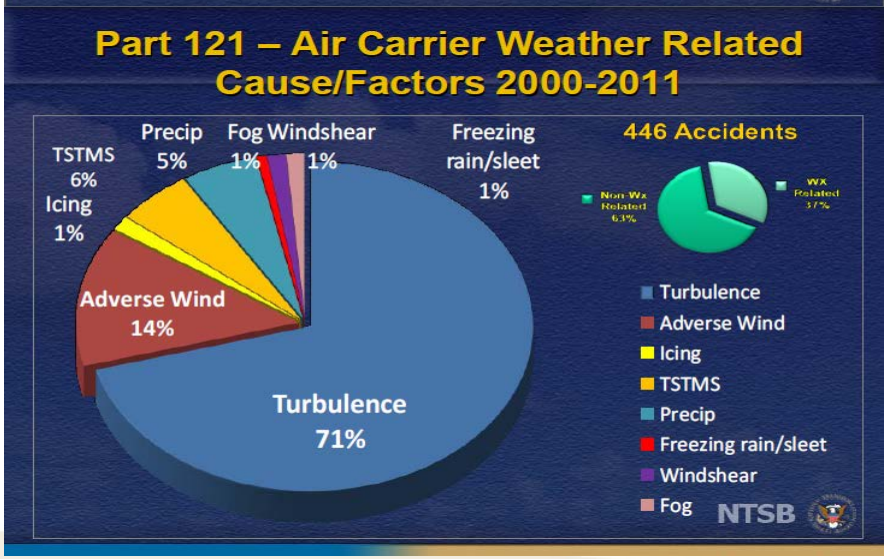
- Overall Grade : D
  - Still not really able to visualize or quantify the benefit of a probabilistic turbulence forecast (though not just a turbulence problem)
  - Are we trying to forecast probabilities at a specific point, in a general geographic area?
  - Considering the remote chance of actively encountering severe turbulence, how do we relay this information to our users
  - FAA/NCAR well aware of this issue for GTG upgrades and have pledged to bring in users before developing a “probabilistic” GTG

Commercial Carriers vs. GA

- Clearly one size turbulence product does not fit all (note that transition to EDR should help this issue)
- NTSB statistics indicate the relative differences in turbulence “incidents” between Part 91 and Part 121 carriers





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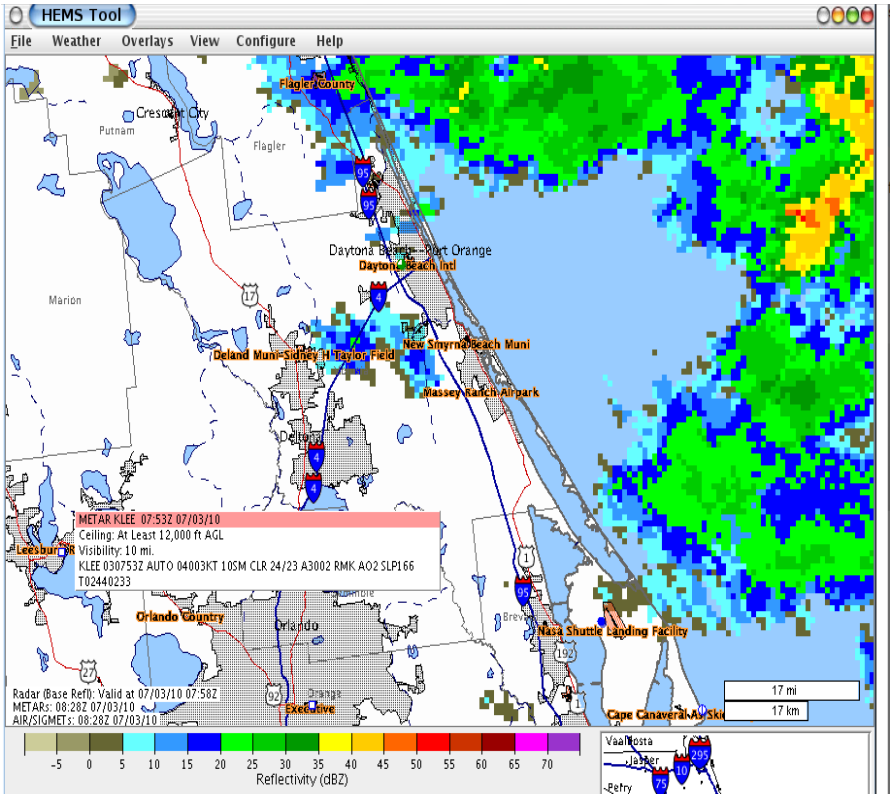
Report Card

- Overall Grade : B
  - As several presentations over the next 2 days will show, the use of EDR (and other objective turbulence measures) is becoming a reality (though not as fast as Bill Watts would like!)
  - Research community and FAA understands the need to:
    - Link EDR to aircraft type
    - Promote education in the user community
    - Relate EDR to existing severity types in the interim
  - Airlines concern about flight attendant and passenger industries is promoting research partnerships and data exchange

Limits of the Science

- Products like HEMS have been very helpful to the GA community, but can we ever realistically forecast turbulence at a resolution good enough to overlay on google maps?
- If indeed we have the compute power and resources to produce high resolution, rapidly updating products, will they be exploited operationally
- Can we educate users to understand the transient nature of turbulence?



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Report Card

- Overall Grade : C
  - Maybe several other speakers will address this, but I still feel that the combination of observed turbulence and short term turbulence forecasts is not well applied in the user community
    - Are we too reliant on PIREPs, including EDR reports?
    - Are we not relying enough on short term forecasts from NWS, from industry, and from automation?
  - We have better validation and verification techniques, but there is room for improvement
  - Our approach to approving modeling must include the short term (mostly HRRR?), strategic planning (SREF?), and global modeling

Role of the Human in/over the Loop

- We regularly underestimate the role of the human in the integration of weather information into NAS decision-making
- The confidence and situational knowledge available by the aviation meteorologist is clearly still valued (well, maybe not this guy!)
- However as higher resolution, rapidly updating models continue to be developed, the role of the human “over the loop” needs to evolve

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Report Card

- Overall Grade : C+
  - Progress has been made, especially in the FAA, to better comprehend the decision support role of the human
  - Increasing role of National Aviation Meteorologists (NAMs) a success story here
  - Still not enough collaborative research between FAA and NWS to improve consistency in turbulence forecast for NAS users
  - Airline met staffs and industry met providers continue to provide proprietary products to a variety of users
  - As mentioned earlier, the role of human over the loop in regards to strategic vs. tactical still not clear

Policy/Proprietary Issues

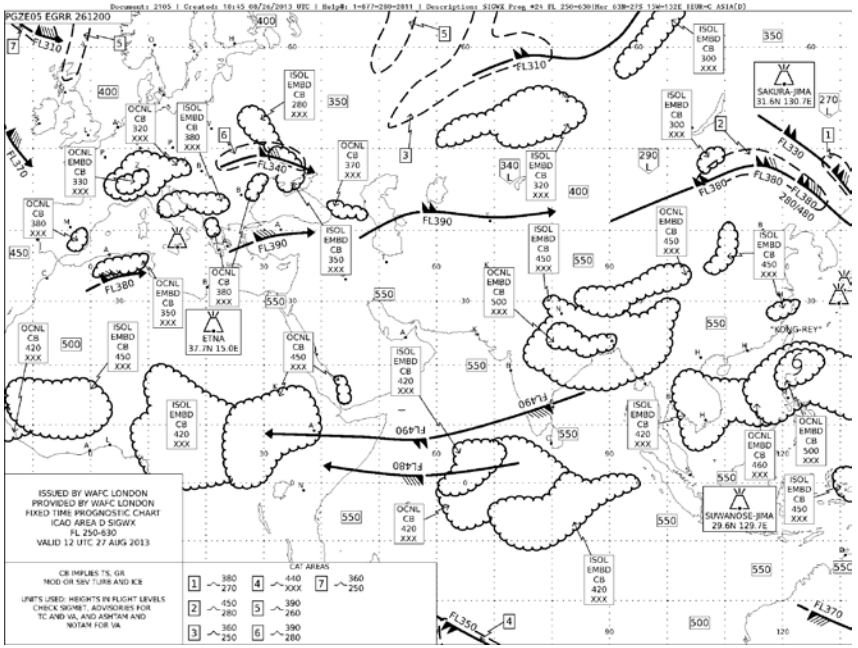
- While there seems to be general agreement that ATM leveraging a common weather picture (e.g. the same turbulence forecast for strategic planning) is beneficial, industry produces products and forecasts that airlines and others believe give a competitive advantage
- Clearly there is no interest in Government to dispute or challenge
- Can we share data between airlines and countries to maximize the availability of raw data for various applications

Report Card

- Overall Grade : ??
  - This is a good discussion topic during the next two days
  - I don’t believe much progress is being made here and I would tend to rate this really low…but I would rather hear from you all.

Global Harmonization

- As the U.S. and many other countries develop higher resolution, more accurate forecasts, oceanic flights are looking for consistent forecasts on a global scale.
- Global models from different countries often produce conflicting forecasts.



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Report Card

- Overall Grade : B
  - Recent efforts to bring the WAFC community together with the research community lead me to believe we are aggressively tacking the issues
  - Still challenging issues between International “states” regarding the best data, consolidating the data, and more…
  - Pleased that Matt Strahan from NWS is presenting at this meeting

It’s All About Metrics

- The ability to quantify NAS efficiency, environmental and even safety benefits (often the hardest to measure!) must improve
- While assessments and validations of science are important (the forecast is better by XX%), operational benefit assessments are a must these days
- What are the benefits of “common situational awareness”?
- The process of service analysis starts with quantification of a problem

Report Card

- Overall Grade : B-
  - FAA leading effort to quantify EDR study with Delta. Looking for both safety (avoiding significant turbulence areas) and efficiency (excessive avoidance of airspace). Neither easy, but think latter has best chance for success
  - Airlines and industry continue to develop metrics, but turbulence not at top of the list yet
  - Will we ever be able to obtain a quality sampling of turbulence reports to validate the forecasts of significant turbulence outbreaks

Random thoughts from day 1 (of 2013 meeting)

- There are outdated turbulence regulations that need to evaluated
- The user will have a very difficult time differentiating CAT from CIT and maybe we haven't thought enough about that
- There was very little reference to existing turbulence products today and how research will improve/enhance operations.


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FAA Aviation Weather Research Program (AWRP) Turbulence Goals

- Enhance NAS safety and increase capacity/efficiency through improved observation and forecasting of turbulence for strategic and tactical use by traffic flow managers, flight crews, and airline dispatch operators.
- To quantify the benefits of providing such data in order to determine the most cost effective and optimal solutions for integrating turbulence data into flight operations.
- AWRP-funded efforts
  - Improve and expand on current turbulence forecast capabilities
  - Support the development of the operational capability to remotely sense turbulence (i.e., satellites and radar)