Nov 2009 TAC Summary

NEXRAD TAC SUMMARY MEETING MINUTES:

- NEXRAD TAC was convened on the 19-20th November, 2009 at the National Weather Center on the University of Oklahoma campus
- Briefings covered many topics (see Appendix A for the final agenda) ranging from an overview to the WSR-88D program, to the calibration of the proto-type Dual Polarization radar to the various algorithms in development to improve the radar

- There were two scheduled ***decisional briefs*** in this TAC and these are discussed below:

AVSET (Automated Volume Scan Evaluation & Termination)

  - Designed to meet field requests for faster VCP completion rates in order to provide more frequent low level elevation updates
  - Accomplished via "smart" dynamic volume sampling techniques e.g. radar instructed avoid all un-necessary scans above 5 degrees
  - Test results show that in "best case" scenarios, VCP completion rate was reduced to ~ three minutes
  - Despite positive test results, three concerns: Level II bandwidth impacts, cone-of-silence concerns, and subsequent negative effects on user systems
    - Bandwidth: for single sites, the load increase could approach 25-30%. Worst case scenario, impact to the entire network should never approach these percentages. Results from focused testing during a widespread convective event yielded an increase in bandwidth traffic of about 10%.
    - Cone-of-Silence: AVSET will always scan at least through the 6.2 degree elevation slice, which translates to a smaller cone-of-silence when compared to what forecasters already accept with clear air mode VCPs. A prescribed threshold (e.g., < 80 km^2 of 18 dBZ) is used to assess the likelihood for realizing a meaningful meteorological return two elevation angles above the processed elevation. More so, to address rapidly developing convection very close to the radar AVSET checks to see if the areal coverage of reflectivity increases by 12 km^2 since the last volume scan. If so, the volume scan continues.
  - Presenter asked AVSET be approved and forwarded for NEXRAD SREC consideration for Build 13 implementation. The TAC provided conditional approval provided the contingency for additional testing at selected sites (see notes on Executive Session)

Hybrid Spectrum Width Estimator (HSW)

  - HSW is an improvement to the legacy NEXRAD spectrum width estimator
  - Requirement came from NCAR work in developing a turbulence algorithm using spectrum width (SW)
  - NEXRAD SW values when compared to aircraft turbulence observations showed:
    - In weak signal areas, legacy width estimator frequently returned large unrealistic values
    - Over-estimation causes turbulence values to be very large and unrealistic
    - Result: NCAR forced to threshold out weak signals, missing weak to moderate turbulence under certain conditions

Nov 2009 TAC Summary

        - Using simulations, NCAR developed HSW that uses multiple time domain lags and a selection algorithm to select the best combination of algorithm output
    - Presenter asked approval of technique
    - ROC indicated NCAR already delivered the HSW algorithm description in FY09 and NCAR would be available in FY10 to assist implementation/testing phases
    - Main issue is limited resources in ROC engineering due to Dual Pol contract support
    - By Summer 2010, resources may be available to start HSW implementation

- **TAC Executive Session:** was convened on the 20th and below is a short synopsis:

AVSET

- The TAC recommends AVSET in ORPG Build 13 pending the results of an operations field test conducted at sites in a variety of climatological regions to include either Sterling, VA or State College, PA to determine the impact on air routes and ITWS
- The ROC will work with the FAA to determine the best locations for the field test
- Melbourne, FL or similar radar should also be utilized to determine AVSET performance during rapidly developing convective events

Hybrid SW (HSW) Estimator

- TAC members agreed HSW technique was scientifically ready
- Noted operational utility of better SW estimates based on the SW informational briefing
- Based on the level of maturity of the HSW technique the TAC recommends its implementation as soon as practical

CLEAN-AP

- Originally scheduled as an informational briefing on a technique under-development for improving ground clutter mitigation, CLEAN-A was presented at the TAC as an decisional brief
- TAC agreed the technique appeared to show potential utility but were not satisfied that they were shown the scientific details behind the algorithm
- Members agreed on the following statement: The TAC is encouraged by early results and encourages further development work to include additional work on case comparisons with CMD
- TAC looks forward to future meetings when a more complete explanation of the science behind CLEAN-AP can be provided

Statement on WTC Mitigation:

- The TAC believed it is very important and relevant for researchers to continue research work on developing algorithms to detect Wind Turbine Clutter.
- The TAC encourages researchers to bring these algorithms to maturity and test them on a variety of data cases.

Nov 2009 TAC Summary

ACTION ITEMS AND MISCELLANEOUS COMMENTS:

Comments and Action Items that arose either from the open or the executive session:

- **ACTION ITEM:** Rich Vogt, ROC Director, is looking for a recommendation letter from the TAC
  -- Recommendation should be: "To get the full value and leverage out of our investment in DP, the TAC recommends continued enhancement of DP hardware and software."
  -- Greg Cate could also use such a recommendation letter in terms of bringing it before his management
  - Lt Col Cocks will work with Mr. Vogt and Dr. Snow to draft a letter fulfilling this request
- **ACTION ITEM**: Members believed a TAC statement on WTC work should be made and that mitigation research should continue
  - The statement should encourage researchers to bring the detection algorithm to maturity and ensure it is tested on a variety of data cases
- **COMMENT**: Some members believed TAC Chairman should write a letter stating need and benefits of Level II data from TDWR and that allocation of bandwidth to support this should be encouraged
- **COMMENT:** Bill Bumgarner advocated for a TAC letter recommending return to CMD functionality as soon as possible after DP implementation
  - Letter should state desire to continue compatibility of CMD with RPG Build 12 until DP implementation
- **COMMENT:** Don Burgess would like to see more DP data used during DQ analysis (this is occurring at this time)

Nov 2009 TAC Summary

APPENDIX A: FINAL AGENDA

Agenda for NEXRAD Technical Advisory Committee (TAC) Meeting
November 19-20, 2009 (**DRAFT as of 17 November 2009**)

GoToMeeting Available at www.gotomeeting.com
19 November 2009 gotoMeeting ID: 182-421-488; telecon 1-888-469-1385 pascode: 55063
20 November 2009 gotoMeeting ID: 920-067-000; telecon 1-888-469-1385 pascode: 55063

Location: **National Weather Center, Suite 3910**
120 David L Boren Blvd.
Norman, OK 73072

Thursday, November 19, 2009; Room 3910
https://www1.gotomeeting.com/join/182421488

0800: TAC Executive Session (TAC members only)
- Assignments for briefing write-ups

0815: Convene Open Session with introductions and opening remarks.

John Snow, TAC Chairman

0820: WSR-88D PROGRAM OVERVIEW UPDATE [20 Minutes – Informational]

ROC Director Rich Vogt will provide an update to the WSR-88D program overview.

0840: **CLUTTER MITIGATION DECISION (CMD) BRIEF** [25 Minutes – Informational Brief]

Richard Ice, ROC Engineering Branch, will provide an overview of the Clutter Mitigation Decision algorithm recently implemented into the NEXRAD baseline

0905: **SPRT UPDATE** [25 Minutes – Informational]

Darcy Saxion, ROC Engineering Branch, will provide an update to the Staggered PRT plans and progress.

0930: **2-D VELOCITY DEALIASING TECHNIQUE** [30 Minutes – Informational]

Zack Jing, ROC Engineering Branch, will provide a description of a proposed technique for dealiasing.

1000: Coffee Break

Nov 2009 TAC Summary

1020: **NWS OFFICE OF SCIENCE AND TECHNOLOGY NEXRAD PRODUCT IMPROVEMENT** [25 Minutes - Informational]

Greg Cate, OS&T, will update the status and schedule of the dual polarization project.

1045: DUAL-POLARIZATION DATA QUALITY UPDATE [20 Minutes – Informational]

Robert Lee, ROC Applications Branch will provide an update on the latest quality of the data from the first dual-polarization retrofit of a WSR-88D.

1105: **NEXRAD DUAL-POLARIZATION CALIBRATION TECHNIQUE** [30 Minutes – Informational Brief]

Richard Ice will provide an overview of the calibration technique the WSR-88D fleet will utilize upon the dual-polarization modification.

1135: **Lunch**

1300: **AUTMATED VOLUME SCAN EVALUATION AND TERMINATION (AVSET)** [45 Minutes – Decisional]

Joe Chrisman, ROC Engineering Branch, will provide a decision brief on the AVSET.

1345: **HYBRID SPECTRUM WIDTH ESTIMATOR** [45 Minutes – Decisional]

Greg Meymaris, NCAR, will provide a decision brief on the hybrid spectrum width estimator seeking concurrence of the scientific technique and recommendation to move forward.

1430: **Break**

1445: MODIFICATION OF THE QUANTITATIVE PRECIPITATION ESTIMATION (QPE) ALGORITHM TO ACCOUNT FOR PARTIAL BEAM FILLING [45 Minutes – Informational Brief]

Alexander Ryzhkov, NSSL will provide an informational brief on a partial beam blockage improvement for the dual-pol QPE algorithm and his recent results from TiMREX data.

1530: **CLUTTER ENVIRONMENT ANALYSIS USING ADAPTIVE PROCESSING (CLEAN-AP)** [30 Minutes - Informational]

Sebastian Torres and Dave Warde, NSSL, will brief a new clutter identification and filtering technique.

1600: TAC Executive Session (TAC members only)

Nov 2009 TAC Summary

1830: Dinner at Sooner Legends

Friday, November 20, 2009; Room 3910
https://www1.gotomeeting.com/join/920067000

0730: Conference Room Open.

0800: Convene Open Session

0800: **DUAL POLARIZATION CROSS-COUPLING IMPACTS** [20 Minutes - Informational]

Dusan Zrnic, NSSL, will provide a briefing on cross-coupling impacts of simultaneous transmission polarimetric radars.

0820: **DUAL POLARIZATION CROSS-COUPLING IMPACTS** [20 Minutes - Informational]

John Hubbert will provide a briefing on cross-coupling impacts of simultaneous transmission polarimetric radars.

0840: **CROSS-COUPLING DISCUSSION** [30 Minutes]

0910: **OPERATIONAL UTILITY OF SPECTRUM WIDTH** [30 Minutes – Informational]

Clark Payne of the Warning Decision Training Branch will provide insight into the operational uses of improved spectrum width estimates.

0940: Coffee Break

1000: **WIND TURBINE CLUTTER (WTC) DETECTION/MITIGATION** [30 Minutes – Informational]

Robert Palmer from University of Oklahoma's Atmospheric Radar Research Center will provide an update to their efforts to automatically detect and mitigate wind turbine clutter.

1030: Open Discussion Time

1100: Executive Session – if needed (TAC members only)

1130: Adjourn

Nov 2009 TAC Summary