NEXRAD Program Update

(Informational Briefing)

Terry Clark
Acting Director, Radar Operations Center

1 March 2012
NEXRAD Technical Advisory Committee Meeting
Norman, OK
Keep Operational Systems Running

- 820 Hotline Assists per month
- 65 trips annually to field sites for depot-level support
  - Includes pedestal bull gears: 1–CY06; 1–CY07, 5–CY08, 1-CY09, 0-CY10, 2-CY11
  - Preparation for restoration of Kadena WSR-88D; Typhoon Songda
- Depot-level tower and radome maintenance via contractor
  - Replaced Molakai, HI tower
  - Radome and tower inspection program continued; radome panels replaced at 28 sites
Keep Operational Systems Running

WSR-88D AVAILABILITY
LAST 11 YEARS

Average A(s)

94.3% 95.7% 95.8% 96.3% 96.7% 96.9% 96.1% 96.6% 97.0% 96.8% 98.3% 98.5% 98.8% 99.1% 99.2% 99.4% 99.4%


Redundant Thread 98.9%
Single Thread 96%

NEXRAD/ROC Update, 3/1/12 TAC
Sustain Baseline Operational Radar System Capabilities

- Technology Refreshment Modifications
  - Deployment of RDA RVP8 Motherboard/Processor upgrade to support Dual Pol processing continued
    - Deployment began 1FY11
- Software releases
  - Eleven RPG, RDA, SPG, OPUP, National Level II software builds
  - RDA Full Load Performance Test results (Build 13, with Dual Pol)
    - RDA: 28.4% (CS waveform); 20.2% (CD waveform)
    - RPG: 14%
- Frequency spectrum/Interference/
  - Loss of all/partial S-band spectrum still a threat
  - Interference challenges continue; making progress on 4G
Sustain Baseline Operational Radar System Capabilities

- ROC Wind farm – WSR-88D Interaction efforts
  - Completed 153 case-by-case analyses since last TAC; 950+ total
  - Completed first signing of operational curtailment LOI
    - “Feathering” turbine blades in critical SVR WX warning situations; reduces wind turbine clutter/potential impacts on warning operations
  - More developers considering potential weather radar impacts; some making changes
  - Sharing wind turbine location GIS data; ROC-NSSL collaboration
    - AWIPS Program; AF NORTHCOM; other federal agencies
  - Developing ESRI (industry-std) GIS software analysis capabilities
  - Working more closely with TDWR Program on wind farm issues
  - Continuing collaboration with DHS, DoD, FAA on DHS-funded radar/wind turbine interaction model development contract
Improve Radar System Reliability And Integrate New Capabilities....Dual Polarization

• Dual Pol deployment well underway: 44 of 160 operational sites installed and operating
  • Operator feedback is positive, enthusiastic
  • Check WDTB web site for training modules and Storm of the Month follow-on training
• End of deployment scheduled for May 2013
• ROC/NSSL Data Quality Team reviewing data from sites
• ROC web site (www.roc.noaa.gov/radar) has deployment status updates and schedule
Improve Radar Reliability
And Integrate New Capabilities

• New WSR-88D (KLGX) in Grays Harbor County, WA
  – Dedication ceremony 9/29/11
  – Dual Pol installed prior
• 1-year Field test of lower (0.176°) elevation angle
  – Started 11/1/2011
  – Goals: develop cost/benefit information
    • Costs/impacts on user systems
    • Benefits to forecast/warning operations
Improve Radar System Reliability And Integrate New Capabilities

(Continued)

- RDA 11.8 (October 2011 release) enabled AVSET at all non-Dual Pol (DP) sites
- RPG Build 13.0, target July 2012 release
  - DP algorithm improvements and fixes; Enhanced VWP algorithm
  - 2D Velocity Dealiasing, Storm-based PRF selection (both non op)
- RDA Build 13.0, target July 2012 release
  - Hybrid Spectrum width
  - Re-enable CMD, using DP data
  - Re-enable AVSET
Improve Radar System Reliability And Integrate New Capabilities
(Continued)

• RPG Build 13.1, target December 2012 release
  • Several DP algorithm corrections/adaptation
  • Reduce velocity dealiasing errors; 2-D Velocity Dealiasing
• RDA Build 13.1, target December 2012 release
  • Merges Dual Pol redundant changes (12.3) with single channel (13)
    • RDA goes back to single software baseline!!!
• National Level II changes completing new architecture
  – Terminate server at the U. of MD MAX
  – Unidata elevated to “top tier” status
    • Will send Level II data to the three MAX recipients
Improve Radar System Reliability And Integrate New Capabilities
(Continued)

- Build 14 SREC, 15 Feb, Recommended major changes
  - Correct IOC DP software applications
  - SAILS (operational or non operational TBD)
  - Staggered PRT VCP(s)
  - Clean AP
  - Radial-by radial noise estimation
  - Storm-based/Cell-based PRF Selection
  - Manual/automatic PRF selection for SZ2 VCPs
  - Lincoln Lab/FAA
    - Icing Hazard Levels Algorithm
    - Hail Hazard Layers Algorithm
- Build 14 recommended deployment start: July 2013
Support Pre-Planned Product Improvement

- Assisting Dual Polarization Program -- 21,500 staff hours since last TAC
- Funding supporting NSSL, SEC, and NCAR work – ends in FY12, seeking opportunities to fund continued support
Other Major Events Since Last TAC

- “CASA” DFW Urban Experiment
  - ROC exploring requests for participation
    - Lower scan angle for Dallas/Ft Worth WSR-88D
    - Enable real-time TDWR Level 2 data collection
- Technology Refresh and Service Life Extension Program (SLEP) investments
  - ROC provided triagencies with draft SLEP plan in December 2011 for review
- Interaction with FAA on NexGen Surveillance & Weather Radar Capability (NSWRC)
  - FAA seeking NOAA commitment in FY14 in preparation for their Final Investment Decision for NSWRC in FY17
Other Major Events Since Last TAC

- FY12 and beyond budget challenges
  - NEXRAD O&M
  - SLEP
  - Unless current budget situation changes
    - NSSL's capacity to provide technology infusion and/or reach-back scientific and engineering support for NEXRAD will be virtually eliminated on September 30, 2012
    - OS&T's capacity to repair the existing dual pol software and to provide functionality for winter weather will be greatly diminished; ROC resources will be applied as best resources allow
Summary

• Dual Pol deployment: 44 of 160 op sites installed/operating
• ROC proceeding with SLEP investment planning
• Budget outlook increasingly challenging
  • New initiatives and improvements/enhancements are going to be few and far between
  • Software builds to continue, albeit likely to be at slower pace
  • Technology transfer funding to be very sparse
Backup Slides/Notes
Annual Requests for WSR-88D Level 2 and 3 Data NCDC Filled
Keep Operational Systems Running

TRIAGENCY WSR-88D AVAILABILITY
LAST 12 MONTHS

NEXRAD/ROC Update, 3/1/12 TAC
Radar Life Cycle Decision Tree

Notional Timeframe
FAA’s Final Investment Decision (FID) for NSWRC

Decision Point
Replace WSR-88D w/ Conventional Radar

2017
- WSR-88D Maint/Refresh
- FAA’s Final Investment Decision (FID) for NSWRC

2020
- WSR-88D Maint/Refresh
- WSR-88D SLEP
- MPAR Development
- Min. WSR-88D Maint/Refresh

2024
- WSR-88D Maint/Refresh & MPAR Development
- MPAR Deployment
- Min. WSR-88D Maint/Refresh

2030
- WSR-88D Maint/Refresh
- MPAR Maintain/Refresh

NextGen Surveillance & Weather Radar Capability (NSWRC)
- Cost Study – 5 Options (Enroute vs Terminal) (10-15-20 year decommissioning & implementation schedules)
- Concept & Rqmt Def, Dec 2012
- Investment Analysis Readiness Decision, Dec 2014
- Alternatives Analysis
- Production Prototype

Spectrum Change ??  Gap Filling ??