

NEXRAD/WSR-88D HISTORY

NEXRAD

(As of March 12, 2012)

- 1971 - First Doppler radar installed (at National Severe Storms Laboratory (NSSL), OK) to study morphology of storms (June).
- 1973 - Second Doppler radar installed (at Cimarron Airport, OK) to study morphology of storms (May).
- 1976 - DOC, DOD, DOT (tri-agency) formed Joint Doppler Operational Project (JDOP) to explore benefits of Doppler radar observations.
- 1978 - JDOP report presented three basic findings:
 - .. 20 minute average lead time for detecting storm before occurrence;
 - .. Doppler able to detect gust fronts;
 - .. Doppler information can be processed for display in real time.
- 1979 - The US Air Force Geophysical Laboratory (AFGL) transferred 5 cm Doppler radar to Norman, OK to compare with NSSL radar (Spring).
 - April 10th storm (at Wichita Falls, TX) provided evidence that 5 cm radar had:
 - .. More attenuation;
 - .. More range folding;
 - .. More velocity aliasing.
 - The Office of the Federal Coordinator for Meteorological Services and Supporting Research (OFCM) approved concept document of NEXRAD (July).
 - OFCM established NEXRAD Program Council (NPC) (July).
 - NPC approved formation of Radar Test and Development Branch (RTDB) (Fall).
 - The Congressional Office of Management and Budget (OMB) directed OFCM to conduct a tri-agency crosscut study for NEXRAD (October).
 - The National Oceanic and Atmospheric Administration (NOAA) approved establishing of the Joint System Program Office (JSPO) (November).
- 1980 - NPC approved establishment of Interim Operational Test Facility (IOTF) (forerunner of Operational Support Facility) (OSF).
 - NPC formed NEXRAD Technical Advisory Committee (TAC) (Spring).
 - Congress appropriated first funding (1981) for NEXRAD (October).
- 1981 - RTDB name changed to Interim Operational Test Facility (IOTF).
 - NPC approved Joint Operational Requirements (JOR) (January).
 - NPC approved the NEXRAD Technical Requirements (NTR) (March).
 - NPC and Source Evaluation Board (SEB) approved release of System Definition Phase Request for Proposal (RFP) (July).

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- NEXRAD Research and Development Plan issued (December).

- 1982
 - Fixed price contract awarded to Raytheon Company, Sperry Corporation, and the team of Ford Aerospace and Westinghouse Corporation for concept development (February).
 - Interim Oral Reports conducted on design alternative (NTR, JOR, and optimum) and high cost drivers. Reports indicated JOR and optimum alternative not affordable (May).
 - NPC approved revisions to acquisition strategy to remove Full Scale Development Phase (May).
 - Agency Requirements Team met to review high cost drivers and to trim NTR (July).
 - NPC approved modifications to the NTR to address high cost drivers (July):
 - .. system reliability and maintainability;
 - .. range folding;
 - .. scan sequence;
 - .. clutter suppression.
 - Cooperative Institute for Mesoscale Meteorological Studies (CIMMS)/Doppler Workshop held (September).
 - NPC and SEB approved Validation Phase (September).
 - Validation Phase Request for Proposal (RFP) released (October)
 - System Definition Phase Final Reports submitted by Contractors (November).

- 1983
 - Source Selection Official selected Raytheon and Sperry for Validation Phase contracts (March).
 - Raytheon and Sperry awarded competitive, cost-plus-fixed-fee contracts for Validation Phase (April).
 - Demonstration of Prototype NEXRAD products in operational environment occurred (April-July).
 - Cost-plus-fixed-fee contract for site surveys awarded to SRI International (August).
 - Preliminary site surveys began (August).
 - Preliminary design review completed (October).
 - Boston area NEXRAD demonstration (BAND) began (November).

- 1984
 - Doppler/Lightning (DOPLIGHT) Project began in OKC (April).
 - Contractors conducted risk reduction demonstration of data processing, and display systems and Validation Phase, Part 1 completed (April).
 - Validation Phase Part 2 option exercised (May).
 - NPC approved revision to NTR to include;

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- .. Layer composition products;
 - .. Automated alerts;
 - .. Radar coded message;
 - .. Scan strategy for clear air.
 - Contract Modification issued (November).
 - Programmatic Environmental Impact Statement published (November).
- 1985
- DOC secretary established independent “Blue Ribbon” panel (Kammer Committee) to review, assess and validate NEXRAD requirements (April).
 - Critical Design Reviews completed (May).
 - Contract Modification issued for parallel system design and software development for Hydro-Precipitation Pre-processing Subsystem (May).
 - BAND report issued (May).
 - Development Test and Evaluation began (June).
 - In-depth site surveys began (August).
 - “Blue Ribbon” panel published findings that NTR was on target (September).
- 1986
- NPC and SEB approved Limited/Full Scale Production RFP (February).
 - Preliminary site surveys completed (May).
 - Limited/Full Scale Production Proposals received (June).
 - Initial Operation Test and Evaluation (IOT&E) Part 1A conducted by US Air Force Test and Evaluation Center (AFOTEC) (August-October).
 - Validation Phase contract option to perform First Article upgrade task exercised (December).
- 1987
- DOPLIGHT radar supported operations at OKC (at OUN) (March).
 - IOT&E Part 1B conducted April-May).
 - Validation Phase completed (June).
 - Unisys corporation awarded Limited Production Phase contract (December).
- 1988
- Operational Support Facility established (OSF) (May).
 - Unisys Prototype erected at OSF (Winter).
- 1989
- OSF Engineering and Configuration Management staffed to support IOT&E Part 2 (January)
 - Unisys conducts first software training class (February - March).
 - NEXRAD Training Unit established as part of WFSO Norman (July).
 - IOT&E Part 2 conducted (March-August).
 - WSR-88D Hotline planning and staffing began (August).
 - First System Requirements Evaluation Committee (SREC) meeting held to review and prioritize WSR-88D service reports (September).
 - Independent Evaluation Team Meeting held (September-October).

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- NEXRAD System Production Readiness Demonstration occurred (December).
- 1990
 - Exercised option to start Full Scale Production (FSP) (January).
 - OSF Engineering started working with external users to develop communications interfaces.
 - First Limited Production Unit delivered (to OKC) (May).
 - Software Build 5.0 deployment began (Summer).
 - First OPS course taught by UNISYS and NTU (September).
- 1991
 - Tri-agencies entered into comprehensive settlement with Unisys to resolve outstanding contract claims and deficiencies (Spring).
 - Real-time Operational Assessment performed at OKC/OSF (March-April).
 - OSF began its first formal operational assessment of WSR-88D software (Build 5.1B) (July).
 - NEXRAD Training Unit renamed to OTB and became part of OSF (Fall).
 - OSF Operations Course began (September).
 - National Weather Service Training Center (NWSTC) WSR-88D Maintenance Course began (September).
 - WSR-88D Hotline began operations coincident with first system utilization by field sites at Norman, Sterling, and Melbourne (November).
- 1992
 - First Full Scale Production (FSP) unit delivered (to NRC) (July).
 - WSR-88D Hotline began continuous 24x7 operations coincident with first formal government acceptance of field WSR-88D systems (July).
 - Started the conversion from circular polarization to linear polarization for the first six fielded radars (September).
- 1993
 - Tulsa Radar Accepted on Friday and killer tornados hit on Saturday (April).
 - First Micro5/VME system and Software Build 6.0 delivered (to Pittsburgh) (May).
 - Micro5/VME retrofit began (August).
 - OSF released first software with Government changes (Build 5.3) (August).
 - Lightning/grounding retrofit began (October).
 - DOD loaned three radars to FAA for Anchorage, Fairbanks, and Molokai (October - December 94).
- 1994
 - First NWS system commissioned (at OKC) (February).
 - OSF began coding first version of WSR-88D software (Build 8.0) (May).
 - Support Management Responsibility Transfer (SMRT) completed (June).
 - First Federal Aviation Administration (FAA) redundant system delivered to South Kauai (June).
 - First NWS redundant system delivered (to Reno) (July).

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- 1995
 - 100th NEXRAD system accepted by the Government (January).
 - OSF deployed WSR-88D Software Build 8.0 (March).
 - FAA returned the three borrowed DOD radars (Kunsan, Kadena, and Camp Humphreys) (May - August).

- 1996
 - OSF formed a team for the development of ORPG (January).
 - JSPO Began efforts for the installation of three additional systems (Fort Smith, aka Western Arkansas; North Webster, aka Northern Indiana; and Hytop, aka Northeast Alabama (Spring). A result of a DOC Secretary report to Congress (October 1995).
 - OSF deployed WSR-88D Software Build 9.0 (September).

- 1997
 - Last OSF Operations Course taught (April).
 - OSF deployed WSR-88D Software Build 9.1 (RPG) (April).
 - OSF deployed WSR-88D Software Build 9.2 (PUP) (May).
 - Fort Smith Radar installed (August).
 - Contract signed for the installation of a Rotary UPS for each NWS and DOD NEXRAD System (TPMS) (September).
 - First Distance Learning Operations Course taught (September).
 - Hytop radar installed (December).

- 1998
 - North Webster radar installed (March).
 - Tornado strikes NEXRAD tower at Charleston, WV (June).
 - OSF deployed RDA/RPG Remote Access Terminal (June).
 - OSF formed a team for the development of OPUP (August).
 - FAA deployed the Remote Monitoring Subsystem for the FAA WSR-88Ds (September)
 - OSF deployed WSR-88D Software Build 10.0 (October).

- 1999
 - The NWS requested an additional three pedestals (January).
 - OSF distributed Tornado warning guidance related to Build 10.0 and the Tornado Vortex Signature.
 - Modernization/Transition Committee confirmed a requirement for radar at Evansville, IN (June).
 - OSF plan for Evansville, IN installation formalized (August).
 - OSF deployed WSR-88D Software Build 10.1 for FAA sites only (November) (Build 10.2 internal OSF Software Build)

- 2000
 - NEXRAD Contract - Defense Contract Audit Agency completed two final audits. Both parties (Government and Contractor) agreed with results.
 - NEXRAD Contract - The contractor Estimate-at-Completion (EAC) settled.
 - Evansville, IN Interim Radar contract signed (February)

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- Stop Work Order issued for the installation of the Rotary UPS (TPMS) (April).
 - Interim Evansville, IN Radar became operational (April).
 - The contractor made the last delivery - three additional pedestals (June).
 - Received the last of the production line residual materials (June).
 - NWS reorganization resulted in name change -- from NEXRAD Operational Support Facility to the Radar Operations Center (October 8).
 - NWS reorganization resulted in administrative removal of OSF Operations Training Branch Re-designated Warning Decision Training Branch (October).
 - Contract Modification signed for the installation and retrofit of the Rotary UPS with a Static UPS (TPMS) (November).
 - Retrofit of the Rotary UPS with the Static UPS begins (TPMS) (December).
 - NEXRAD Contract closed out (December).
- 2001
- Central Product Collection switches from NIDS to Radar Product Central Collection and Dissemination Service (January).
 - Permanent Evansville, IN Radar RFP issued (May).
 - Restoration of Little Rock, AR – replace Azimuth Bull Gear (May).
 - Catastrophic loss of Radome at Laughlin AFB, TX (May).
 - Severe hail damage to Radome at Denver CO (June).
 - First Open RPG installed at ROC (June).
 - Contract for ORDA project signed (June).
 - Permanent Evansville, IN, Radar contract signed (September).
 - Last TPMS Retrofit site installed (94 total) (September).
 - First new TPMS Site accepted (September).
 - Change of TPMS COTR (November).
 - 50th Open RPG installed at Boston, MA (November).
 - ROC hosts SREC to define ORPG Build 2.0 and preliminary definition for Builds 3.0 and 4.0 (December).
- 2002
- 100th Open RPG installed (Wichita, KS) (March).
 - Build 1.2 S/W for ORPG released (March).
 - ROC hosts SREC to define ORPG Build 3.0 and preliminary definition for Builds 4.0 and 5.0 (April).
 - Change of TPMS COTR (May).
 - Transfer of Keesler AFB, MS, operational radar to NWS from DOD for use at Jackson MS radar move (May).
 - 150th Open RPG installed (Minot, ND) (June).
 - Last Open RPG installed (King Salmon, AK) (188) (July).
 - Third Generation (3G) Cellular Phone Interference Testing (July).
 - Integration of New Science into RPG Build 3.0 (August).
 - AWIPS Build 5.2.2 Interface Certification Testing (August).
 - Restoration of Beale AFB, CA - replace Azimuth Bull Gear (August).

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- ROC Deployed Redundant RDA/RPG Remote Access Terminal (August).
 - Build 10.3 Correction of RDA Attenuator (4A23) Calibration released (September).
 - Build 2.0 (RPG) released (September).
 - Removal of Keesler AFB, MS, radar (September).
 - Cooperative Agreement - between Federal Government and City of Brandon for the Jackson radar relocation site (September).
 - Ground breaking ceremony for the Evansville radar (September).
 - Ground breaking for Weather Center Building in Norman (November).
 - ROC hosts SREC to define ORPG Build 4.0 and preliminary definition for Builds 5.0 and 6.0 (November).
- 2003
- Permanent Evansville, IN Radar operational (January).
 - NWS Plans for Real-Time Level II Data Collection and Distribution Network (January).
 - Reinstall Keesler AFB radar in Jackson/Brandon, MS (February).
 - Software Build 3.0 (RPG) released (March).
 - Remove Jackson, MS radar (April).
 - Reinstall Jackson, MS radar at ROC as a test bed (May).
 - Software Build 4.0 (RPG) released (September).
 - Beta test installation (OPUP), Yokota AB JP, MCAS Futenma JP, and Buckley AFB, CO (November).
 - Restoration of Camp Humphreys, Korea – replace Azimuth Bull Gear (December).
- 2004
- OPUP Deployment begins including 4 AF Large, 3 AF Medium, 35 AF Small, and 35 Navy Small (January).
 - Software Build 5.0 (RPG) released (March).
 - First Frame Relay Communications Link installed Ft. Hood/Ft Worth (March).
 - Software Build 5.0 (OPUP) released (April).
 - ROC hosts SREC to define Build 7.0 (April).
 - Real-Time Level II Data Collection and Distribution Network reaches full operational capability (April).
 - Spiral 2 OPUP Deployment completed (July).
 - Software Build 6.0 (RPG) released (September).
 - Software Build 6.0 (OPUP) released (November).
- 2005
- Software Patch Release 6.1P (RPG) released (January).
 - ROC hosts SREC to define Build 8.0 (January).
 - ROC hosts SREC to define Build 9.0 and preliminary definition for Builds 10.0 through 12.0 (June).
 - Software Build 7.0 (RPG) released (June).

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- Software Build 7.0 (OPUP) released (July).
 - ORDA Maintenance Demonstration (July/August).
 - First ORDA site installed at Norman WFO (August)
 - Last Frame Relay installed Vance/Wichita (August).
 - Emergency OPUP deployment to Keesler AFB, MS for Hurricane Katrina support (September).
- 2006
- Additional OPUP Deployment (56) begins (January).
 - 50th ORDA site installed (Nashville, TN) (March).
 - Software Build 8.0 (OPUP) released (March).
 - Restoration of Eglin AFB, FL – replace Elevation Bull Gear (April).
 - Software Build 8.0 (ORDA/RPG) released (May).
 - 100th ORDA site installed (Cincinnati, OH) (May).
 - Radar Engineering Team moves to old Armory – starts ROC consolidation (September).
 - Weather Center Building in Norman commissioned (September).
 - System Documentation Team moves to old WFO space (October).
 - Last ORDA installed (Middleton Island, AK) (October).
- 2007
- Software Build 9.0 (ORDA & RPG) released (June).
 - Software Build 9.0 (OPUP) released (June).
 - First RPG Re-host deployed (June).
 - Restoration of Philadelphia (Mt Holly), PA – replace Azimuth Bull Gear (June).
 - Dual Polarization contract signed (September).
 - National Symposium on Multifunction Phased Array Radar (October).
 - The rest of Program and Engineering Branches move to old NSSL building (November).
 - Build 9.1 deployed (November).
 - Camp Humphrey radar relocation completed (November).
 - Last RPG Re-host deployed (December).
- 2008
- Restoration of Dover AFB, DE – replace Azimuth Bull Gear (January).
 - Relocated DoD training assets to a new location on Keesler AFB (March).
 - Software Build 10.0 (ORDA & RPG) released (May).
 - Restoration of New Braunfels (Austin/San Antonio), TX – replace Azimuth Bull Gear (May).
 - Software Build 10.0 (OPUP) released (June).
 - Sterling, VA radar relocation, due to runway expansion, completed (June).
 - Restoration of Missoula, MT – replace Azimuth Bull Gear (May).
 - Old Sterling pedestal refurbishment – replace Azimuth Bull Gear in preparation for the Evansville installation (June).
 - Restoration of Fort Rucker, AL – replace Azimuth Bull Gear (July).

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- Dual Polarization Critical Design Review held (October).
 - Old Sterling LPP system was relocated to Evansville, IN to replace the commercial EEC radar (November).
 - ROC collaborated with OST to initiate public distribution of TDWR/SPG products (November).
 - NEXRAD received 3 year Security Authorization to Operate (ATO) at the moderate risk level (December).
 - Catastrophic loss of Radome at Reno, NV; recovery effort started (December).
- 2009
- Reno, NV recovery effort completed and site restored to operation (February).
 - Initiated TDWR/SPG product data distribution and archive (February).
 - Based on FY09 appropriation for initial funding to add a weather radar along the Washington State coast, the ROC began project and acquisition planning to install a new radar (March).
 - Software Build 11.0 (RDA & RPG) released (May).
 - Dual Pol contractor modified NSSL Radar (KOUN) for Dual Pol testing (June).
 - Software Build 11.1 (RDA) released (June).
 - ESS/EA for Washington State Coast radar completed (July).
 - Software Build 11.1 (RPG) released (September).
 - Software Build 11.2 (RDA/RPG) released (November).
 - 2010 Consolidated Appropriations Act signed, contained funding for Washington Coast radar installation (December).
- 2010
- Software Build 11.0 (OPUP) released (January).
 - Software Build 11.2 (OPUP) released (January).
 - National Level II Initial Release (January).
 - Software Build 11.3 (RDA/RPG) released (February).
 - Software Build 3.2 (TDWR/SPG) released (February).
 - Initiated project for new Washington Radar (March).
 - Software Build 11.4 (RDA) released (April).
 - Software Build 3.3 (TDWR/SPG) released (April).
 - Dual Polarization System Test Readiness Review held (May).
 - Software Build 3.4 (TDWR/SPG) released (July).
 - Software Build 12.0 (RPG) released (August).
 - Software Build 11.5 (RDA) released (August).
 - Software Build 3.5 (TDWR/SPG) released (August).
 - Conducted Operational Assessment of Dual Pol data (August).
 - Dual Polarization Operational Test Readiness Review held (September).
 - DoD transferred two Keesler Maintenance Training assets to NWS. One was utilized for the new Western WA radar (KLGX) and the other was added to the ROC Test Bed (October).
 - Retrofit of RVP8 (Dual Pol Requirement) (October).

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- Installation of Pedestal Maintenance Hatch Toe Boards (Safety enhancement) (October).
 - Retrofit of Filament Power Supply (Dual Pol Requirement) (November).
 - Software Build 11.6 (RDA) released (November).
 - Software Build 12.1 (RPG) released (November).
 - Fielding of Ladder Stability Device (Safety enhancement) (November).
 - National Level II Initial Software Update 1.1 Released (November).
 - Dual Polarization Maintenance Demonstration #1 Conducted (December).
- 2011
- Software Build 3.6 (SPG) released (January).
 - Lease for Washington State Coast radar (KLGX) site completed (February).
 - First Dual Polarization site (Vance AFB) installed (February).
 - Software Build 1.2 (National Level II) released (March).
 - Dual Polarization Maintenance Demonstration #2 Conducted (April).
 - Restoration of Chicago, IL – replace Azimuth Bull Gear (April).
 - Software Build 12.0, Digital OPUP released (April).
 - Dual Polarization Beta Test Readiness Review held (May).
 - First Dual Polarization Beta Site accepted, Phoenix, AZ (May).
 - Okinawa radar hit by Hurricane, destroyed antenna and radome (May).
 - Software Build 12.2 (RPG) released (May).
 - Software Build 11.7 (RDA, all legacy sites) (May).
 - Software Build 12.1 OPUP) released (July).
 - Software Build 2.0 (National Level II) released (July).
 - Software Build 3.7 (SPG) released (July).
 - San Juan, PR replaced RMG with Static UPS (July).
 - Software Build 12.0 (RDA, Dual Polarization) (August).
 - Dual Polarization Deployment Readiness Review (September).
 - Langley Hill, WA (KLGX) installed with Dual Polarization (September).
 - Portland, OR (KRTX) dual Polarization system installed (September).
 - KLGX Dedication Ceremony: Sen Cantwell, Rep Dicks, Dr Hays and other dignitaries attended (September).
 - Restoration of King Salmon, AK – replace Azimuth Bull Gear (October).
 - Software Build 12.3 (RPG) released (October).
 - Software Build 11.8 (RDA) released (October).
 - Lower Elevation Test Started (November).
 - Software Build 2.1 (National Level II) released (November).
 - Kenai, AK replaced RMG with Static UPS (December).
- 2012
- Frame-Relay circuit upgrades for FAA Alaska radars to NWS WFOs, released (January).
 - Coordinated 1st signed wind farm Operational Curtailment agreement (Letter of Intent) between a WFO and a wind farm (Feb)

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- SPG Software Build 4.0 released (February).
 - Software Build 13.0 (OPUP) released (March).
 - Software Build 11.9 (RDA) released (April).
 - Software Build 13.0 (RPG) released (April).
 - RDA software preparations for DP (April).
 - Software Build 12.3 (RDA) released (April).
 - RPG procedures to support DP for RDA Build 12.3 released (April).
 - Software Build 13.1 and convert medium OPUP to Large OPUP, released (April).
 - Software Build 2.4 (National Level II) released (May).
 - RPG files to support RDA Build 13.0, released (June).
 - Software Build 13.0 (RDA) released (June).
 - SPG Software Update 4.1 released (July).
 - 1000th wind farm analysis completed since starting them in 2008 (August).
 - Software update 11.10 (RDA) released (September).
 - RDA Laptop software 1.3 released (September).
 - Software update 1.6 (level I) released (September).
 - Software update 2.5 (Level II) released (September).
 - Coordinated 1st signed wind farm data sharing agreement between an individual wind farm and a WFO (Oct).
 - Restoration of Brookhaven, NY – replace Azimuth/Elevation Bull Gears (November).
 - Software update 2.6 (Level II) released (December).
 - Revised NEXRAD Service Life Extension Plan (December).
- 2013
- Raised Melbourne, FL radar tower (January).
 - SPG Software Update 4.2 released (January).
 - Software Build 13.1 (RPG/RDA) released (January).
 - Deployed the first of 28 early production Servo Power Amps (February).
 - Software Build 13.2 (RPG/RDA) released (May).
 - Software Build 3.0 (National Level II) released (May).
 - ROC Technicians install Dual Pol on Kunsan, KO radar (May).
 - ROC Technicians install Dual Pol on Camp Humphreys, KO radar (June).
 - Last operational radar installed with Dual Pol (King Salmon, AK) (June).
 - Software Build 3.1 (National Level II) released (July).
 - Software Build 3.2 (National Level II) released (September).
 - Software Build 13.3 (RPG/RDA) released (October).
 - Restoration of Miami, FL – replace Azimuth/Elevation Bull Gears (December).