

NOTICE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Air Traffic Organization Policy

N JO 6315.43

Effective Date:
02/25/2008

Cancellation Date:
02/25/2009

SUBJ: Authorization and Conditions for Providing TDWR Base Data to the National Weather Service (NWS)

1. **PURPOSE.** This notice summarizes procedures and advises of the existence of a national Memorandum of Agreement (MOA) and related Configuration Control Decision (CCD) for providing Terminal Doppler Weather Radar (TDWR) base data to the local weather service forecast office. It is applicable to all TDWR facilities.

2. **DISTRIBUTION.**

a. This document is made available to sites with this Facility, Service, and Equipment Profile (FSEP): TDWR.

b. For electronic copies, use the Technical Library website at <http://nas.amc.faa.gov>.

c. For printed copies, national offices distribute to sites with an accurate inventory record in FSEP and a mailing address in the Direct Distribution System (DDS).

d. For help in updating inaccurate FSEP and/or DDS records, visit our website at http://nas.amc.faa.gov/technical_library/template.jsp?bodyPage=help.html&title=Help.

3. **CANCELLATION.** None.

4. **ACTION.** A national MOA became effective on October 24, 2007, that authorizes and establishes the conditions for providing TDWR base data to the National Weather Service. The following are the key principles and actions for operational coordination of the TDWR service to the NWS. The articles and pages in the MOA that contain these points are indicated for reference and are found in Appendix 1, NCP/CCD, N31626, Attachment C, of this notice.

a. The TDWR will be calibrated in accordance with standard FAA orders and repaired according to FAA normal maintenance and restoration schedules. All FAA activities associated with the use, maintenance, and test of the specific TDWR unit to support FAA operational requirements shall take precedence over the activities associated with providing the TDWR data service to the NWS (MOA, Page 7, Article 8, Liability Agreement).

b. The FAA assumes no liability for the accuracy or timeliness of the TDWR weather data transferred to the NWS (MOA, Page 7, Article 8, Liability Agreement). The FAA shall not be held responsible for or retain any legal obligation as to the accuracy, validity, or continued availability of the data (MOA, Pages 3 and 4, Article 4.1, Responsibilities).

Distribution: 55BB

Initiated By: AJW-144

c. The FAA will operate and maintain their TDWR equipment in accordance with the existing FAA procedures. NWS personnel will maintain the equipment owned or leased by the NWS that is present or terminates in the TDWR shelter. During routine maintenance visits to the TDWR site, FAA personnel will visually inspect the NWS equipment (MOA, Page 7, Article 7, Operations and Maintenance).

d. Service interruptions may occur due to operational necessity, safety and security concerns, and/or TDWR system or communications failure (MOA, Pages 3 and 4, Article 4.1, Responsibilities). The FAA is not responsible for providing a constant flow of data to the NWS under all circumstances (MOA, Page 6, Article 6, Data Use and Redistribution). FAA and NWS shall each monitor their respective portions of the equipment supporting the TDWR-NWS data link to ensure that the FAA TDWR primary mission services are not degraded. In the event degradation occurs, the TDWR-NWS data link will be disconnected until restorative actions are accomplished (MOA, Page 5, Article 4.3, Responsibilities).

e. FAA shall provide notification of unscheduled TDWR outages, scheduled TDWR downtime, and restoration activities whenever practical. Operations Control Center (OCC) personnel (see Appendix 1, Attachment F) should contact the NWS Radar Operations Center (ROC) Hotline at (800) 643-3363 to inform the NWS of a TDWR outage (MOA, Pages 3 and 4, Article 4.1, Responsibilities).

f. In the event of a disruption or loss of data from a given TDWR site, the NWS shall contact the OCC (see Appendix 1, Attachment F) that is responsible for that site and work jointly with that office to resolve the situation (MOA, Page 5, Article 4.2, Responsibilities).

g. The NWS is responsible for troubleshooting and repairing their telecommunications link and associated equipment (MOA, Page 5, Article 4.2, Responsibilities). In the event a failure in this equipment is suspected by the NWS, and upon being notified of such failure (paragraph f, above), the FAA will dispatch maintenance personnel to the site to provide site access for NWS restoration (i.e., troubleshooting and replacement) activities, and to provide TDWR support as required. The responsiveness (i.e., priority) of this on-site service will be negotiated by the NWS and the FAA in good faith on each occasion where access to the TDWR site or other FAA support is required. The negotiations shall take into account FAA staff workload, weather conditions, and other pertinent factors that exist at the time the service is requested (MOA, Page 7, Article 7, Operations and Maintenance).

h. The changes to the TDWR site drawings will be documented by the FAA using red line mark-ups provided by the NWS. During installation and activation of the NWS equipment, NWS personnel will mark up copies of the site drawings that local FAA personnel make available for that purpose. The FAA will then incorporate the changes into their master drawings and provide the updated drawings to the TDWR facilities (MOA, Pages 3-5, Articles 4.1 and 4.2, Responsibilities).

5. BACKGROUND. National Airspace System Change Proposal (NCP)/Configuration Control Decision (CCD), N31626, dated 10/30/2007, with its attachments, is contained in Appendix 1, NCP/CCD, N31626, for reference.

APPENDIX 1, NCP/CCD, N31626 is broken into attachments as follows:

Attachment A – Signal Connection with grounding

Attachment B – NWS AWIPS Ingest of TDWR data

Attachment C – MOA FAA NWS-TDWR 23 July 07

Attachment D – Read-only Ethernet Cable

Attachment E – Coordination request from NWS

Attachment F – TDWR connectivity to NWS WFOs



for Richard A. Thoma
Director, Safety and Operations Support

Appendix 1

APPENDIX 1. NCP/CCD, N31626

CASE FILE/NAS CHANGE PROPOSAL				Page 1 of 2	
(PLEASE TYPE OR PRINT NEATLY)					
1. Case File Number ATO0T-TDWR-1004		2. FOR CM USE	Case File Received Date 09/11/2007	NCP Issuance Date 09/13/2007	NCP Number 31626
3. Scope of Change <input type="checkbox"/> Local <input checked="" type="checkbox"/> National <input type="checkbox"/> Test		4. Reason For Change <input type="checkbox"/> Safety <input type="checkbox"/> Technical Upgrade <input type="checkbox"/> Systems Interface <input type="checkbox"/> Requirements Change <input type="checkbox"/> Design Error <input type="checkbox"/> Parts Unavailability <input type="checkbox"/> Baseline <input checked="" type="checkbox"/> Other Authorize TDWR access			
5. Priority <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Time-Critical <input type="checkbox"/> Urgent		6. Justification of Time Critical/Urgent Priority		7. Supplemental Change Form <input type="checkbox"/> ECR/ECP <input type="checkbox"/> TES <input type="checkbox"/> N/A 7a. Supplemental Change No. 7b. Supplemental Change Initiation Date	
8. Case File Originator Bumgarner, William		9. Originator's Organization ATO-TB0 - Terminal Weather		10. Telephone Number 202-385-8834	11. Case File Initiation Date 11/09/2006
12. Type of Document Affected <input type="checkbox"/> CPFS <input type="checkbox"/> SPEC <input type="checkbox"/> MTBK <input checked="" type="checkbox"/> Dwg <input type="checkbox"/> TI <input type="checkbox"/> DWG <input type="checkbox"/> IRD/ICD				13. Baseline Document Number(s) Local site interface dwg V: 1, R:1 (not baselined yet)	
14. CI Subsystem Designator TDWR		15. FA Type FA-10347		16. CI Component Designator	
17. Facility Identifier (FACID) N/A		18. Facility Code (FACCODE) N/A		19. Cost Center Code N/A	20. System Software Version N/A
21. Title Authorize National Weather Service (NWS) connectivity to all FAA TDWRs for access to base data for NWS use in support of tornado warnings, other severe weather warnings, and general forecasts.					
22. Description: (a) identification of problem, (b) proposed change, (c) interface impact, (d) cost estimate (e) funding source (f) benefits/risks, (g) Schedule (h) Other (e.g. logistics, quality, etc.)					
(a) See Attached					
(b) See Attached					
(c) See Attached					
(d) See Attached					
(e) See Attached					
(f) See Attached					
(g) Schedule. The NWS is now ingesting TDWR base data from 10 TDWRs and this will continue as authorized. The remaining connections will be accomplished beginning upon NCP approval through FY08.					
(h) See Attached					
Blocks 1 through 22 are to be completed by originator and/or the NCP coordinator. If a block is not applicable, write n/a. Attach additional sheets if necessary. See current revision of NAS-MD-001 for detailed completion instructions.					

APPENDIX 1. NCP/CCD, N31626

Case File Number ATOOT-TDWR-1004					NCP Number 31626					Page 2 of 2									
23. Name and Title of Originator's Immediate Supervisor (Type/Print Clearly) Hill, Jacqueline (ATO-T), User					Signature E-signature approved					Date 09/04/2007									
24. Facility/SMO Review (AT/AF)										25. Regional Review									
Name		Routing Symbol		Date		Concur		Non-Concur		Name		Routing Symbol		Date		Concur		Non-Concur	
										<input type="checkbox"/> Recommend Approval					<input type="checkbox"/> Disapprove				
										(Enter into CM/STAT, Forward to Prescreening)					(Return to Originator)				
Routing Symbol		Signature		Date		Routing Symbol		Signature		Routing Symbol		Signature		Date		Routing Symbol		Signature	
Date		Signature		Date		Routing Symbol		Signature		Date		Routing Symbol		Signature/Configuration Mgr/NCP Coordinator/ Reg Exec Sec		Date			
24a. Comments										25a. Comments									
(Attach additional sheets if necessary)																			
26. PRESCREENING																			
Prescreening Office _____																			
Prescreening Comments:																			
(Attach additional sheets if necessary)																			
Reviewers		Routing Symbol		Date		Concur		Non-Concur		<input type="checkbox"/> Recommend Approval					<input type="checkbox"/> Recommend Disapproval				
										<input type="checkbox"/> New Requirement					(Return original to originating office through the Regional NCP Coordinator)				
										Routing Symbol		Signature							
										Date									
Recommended Must Evaluators										27. For Internal Configuration Management Use Only									

APPENDIX 1. NCP/CCD, N31626

NAS CONFIGURATION CONTROL DECISION - CCD 1		Page 1 of 2
1. CCD No. N31626	2. Case File No. ATO0T-TDWR-1004	
3. NCP Title Authorize National Weather Service (NWS) connectivity to all FAA TDWRs for access to base data for NWS use in support of tornado warnings, other severe weather warnings, and general forecasts.		
4. Site Location(s) (Local or Test NCPs/CCDs only) N/A	5. Configuration Item Designator(s) TDWR	
6. Action Directed See Attached		
7. Remarks or Explanation of Disapproval		
8. Decision <input checked="" type="checkbox"/> Approval <input type="checkbox"/> Disapproval	9. Date 10/30/2007	10. Signature and Title Schlegel, Scott (ATO-T), ATO-T CM Lead (E-Signature Verified) <hr/> CCB Co-Chair Pritchard, James (ATO-W), Manager (E-Signature Verified) <hr/> CCB Co-Chair

APPENDIX 1. NCP/CCD, N31626

NAS CONFIGURATION CONTROL DECISION		
CCD ACTION COMPLETION VERIFICATION		
CCB Surveillance/Weather Terminal CCB		
NCP/CCD NO. N31626	CASE FILE NO. ATO0T-TDWR-1004	Page 2 of 2
11. ACTION OFFICE		
NAME	ROUTING SYMBOL	DATE
Ted Weyrauch	ATO-T: ATO-TB0 - Terminal Weather	Open
Ted Weyrauch	ATO-T: ATO-TB0 - Terminal Weather	Open
Ted Weyrauch	ATO-T: ATO-TB0 - Terminal Weather	Open
Ted Weyrauch	ATO-T: ATO-TB0 - Terminal Weather	Open
Not assigned	ATO-W: Documentation Control Center	Open
AUTHORIZING OFFICIAL: (E-Signature(s) Verified)		

APPENDIX 1. NCP/CCD, N31626

Case File/NCP Attachments			
Case File Number: ATOOT-TDWR-1004		NCP Number: 31626	Page 1 of 1
Name	Attaching User	Description	Date Attached
Attachment A - Signal Connection with grounding.pdf	Bumgarner, William (ATO-T)	Attachment A	6/06/2007
Attachment B - NWS AWIPS Ingest of TDWR data 2-16-05.pdf	Bumgarner, William (ATO-T)	Attachment B	6/06/2007
Attachment D - Read-only Ethernet Cable.pdf	Bumgarner, William (ATO-T)	Attachment D	6/06/2007
Attachment C - MOA FAA NWS-TDWR 23 July 07.pdf	Bumgarner, William (ATO-T)	Attachment C	8/30/2007
Attachment E - Coordination request from NWS.pdf	Bumgarner, William (ATO-T)	Attachment E	8/30/2007
Attachment F - TDWR connectivity to NWS WFOs.pdf	Bumgarner, William (ATO-T)	Attachment F	8/30/2007
TDWR-1004.pdf	Mullen, Connie (ATO-T)	Signed CNSRM document	9/12/2007
Worksheets for ATOOT-TDWR-1004.doc	Robins, Betty (ATO-W)	Worksheets for Case File ATOOT-TDWR-1004	10/10/2007

APPENDIX 1. NCP/CCD, N31626

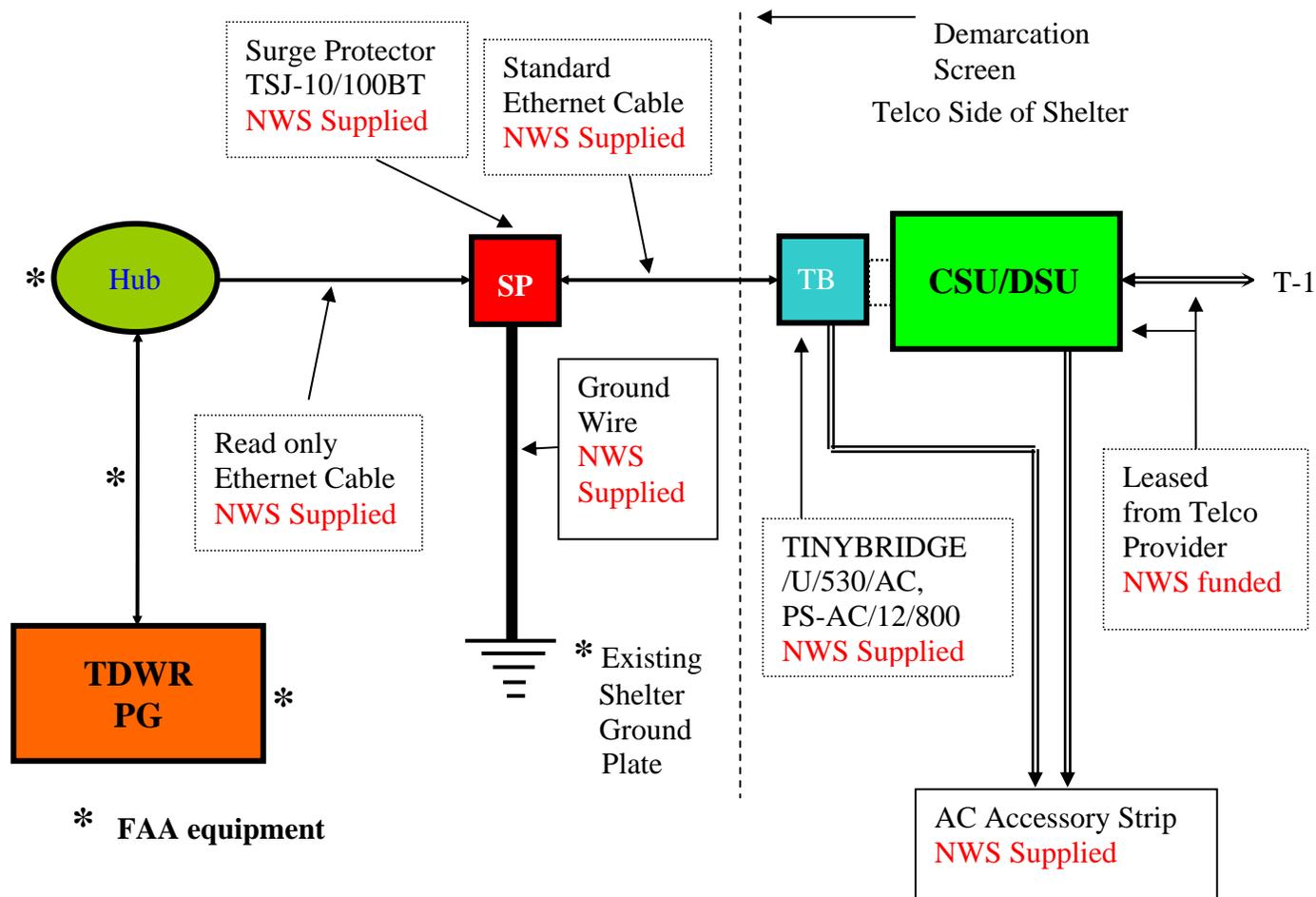
Case File/NCP Addendums		
Case File Number	NCP Number	Addendum 1/1
ATO0T-TDWR-1004	31626	
Case File 1, Box 22A:	<p>Identification of problem. Over the past 12 years, the NWS has conducted projects to demonstrate the effectiveness of using TDWR data to complement the weather radar coverage provided by the tri-agency long range NEXRAD weather radar. Using these data in varied climatological regions of the United States, the NWS has demonstrated TDWR value in assisting the forecaster with mission critical public warning responsibilities, including tornadoes and other severe storms. Now, the NWS is requesting a permanent connection to each of the FAA's 45 TDWRs throughout the United States and Puerto Rico. Presently the NWS has authorization under multiple local test NCPs to access base data at 11 TDWRs, viz., BWI, CLT, OKC, LAS, PHX, SLC, HOU, MSY, MCO, PBI, and TPA. It is now prudent and appropriate to obtain a permanent national approval for connections of this type and dispense with these local test NCPs. (See block 22.h, below, for test NCP results.) This NCP requests authorization for continuation of existing connections as well as authorization for additional connections by NWS.</p>	
Case File 1, Box 22B:	<p>Proposed Change: Under this NCP, the National Weather Service will provide and install a read-only Ethernet cable (attachment D); a surge protector with appropriate grounding meeting FAA-STD-019d (August 9, 2002) to protect FAA equipment from lightning and power surges; either purchased or leased communication equipment for connection to the leased external phone circuit; and any required protocol interface converter from the communication equipment to Ethernet at each TDWR site shelter (attachment A). The distant termination of each NWS T-1 circuit will be at a designated NWS location for data ingest into a dedicated computer for conversion to proper display format for use by NWS forecasters (attachment B). As allowed by the National MOA (a draft is provided as attachment C and cover letter attachment E are for reference only and not part of this NCP for evaluation purposes), the NWS may redistribute the reformatted data and/or derived products to the public and other government agencies in accordance with the NWS standard fair use policy. This method of interconnect has been used successfully in many previous TDWR data-ties with government sponsored researchers and with the NWS connections authorized by test NCPs. The NWS equipment being added to the TDWR facility will receive conditioned power (estimated at less than 100W) and has been shown by the many prior test NCPs to have no effect on the operation of the TDWR site-wide UPS or the TDWR system. A list of all 45 TDWRs with the 36 NWS termination points is provided in attachment F.</p>	
Case File 1, Box 22C:	<p>Interface Impact: None. There are sufficient unused ports available on each TDWR for these new connections. Each connection from the vendor leased communication circuit to the TDWR internal Ethernet hub will be accomplished using a read-only Ethernet cable that physically prevents the transfer of electrical signals sent from any NWS equipment located within the shelter or external to the shelter from back upstream toward the TDWR. If it is determined necessary, it will be possible for NWS to communicate with any NWS equipment within the shelter from a distant location but no off-site-originated communication can access the TDWR Ethernet hub because the return signal conductors in the interfacing Ethernet cable are physically removed.</p>	
Case File 1, Box 22D:	<p>Cost Estimate. There is no cost to the FAA because of this NCP. The cost to the National Weather Service for accessing the TDWR base data at each radar site includes a one-time circuit installation cost of about \$1000, plus a monthly phone line cost of approximately \$400-600 per site depending on NWS termination point and TDWR shelter location. Other items such as the special read-only Ethernet cable, surge protector, and protocol converter are approximately \$800 per installation.</p>	
Case File 1, Box 22E:	<p>Funding Source: The National Weather Service pays for all items associated with this NCP throughout its life. This includes communication circuit installations, all necessary communication equipment and cabling, and all recurring communication and maintenance costs as described in this NCP. There is no cost to the FAA under the terms of this NCP.</p>	
Case File 1, Box 22F:	<p>Benefits/Risks. NWS use of TDWR data will improve tornado and other severe storm warnings, and will thereby save lives and reduce property damage. The usefulness of TDWR data for severe weather warnings has been demonstrated through several tornado and hurricane seasons. Each TDWR is located near a major airport, and the use of the associated TDWR by the local Weather Forecast Office will benefit the issuance of Terminal Aerodrome Forecasts (TAF) routinely made four times per day plus amendments. The TDWR provides superior low-level detection of microbursts and tornadoes within the coverage area because of its aviation application and rapid scanning update. There is no technological risk in the data interface methodology because it has been used successfully at many TDWR sites for years with no impact on the FAA TDWR operations. There is no impact on FAA TDWR operations if any owned or leased NWS equipment as described in this NCP fails or malfunctions.</p>	
Case File 1, Box 22H:	<p>Other. Security: As described above in (22b) and (22c), the data connections will be one-way (transmit-only) so there is no possibility of outside interests sending any signal back into the TDWR system or to any of the downstream systems (e.g., ITWS and CIWS data connections) that use TDWR data. Numerous test NCPs using this same read-only cable have been reviewed by FAA security personnel and have passed the approach as meeting the FAA security requirements. Documentation: NWS will redline update the FAA local site drawings to show the interconnections and identify the NWS-provided telephone circuits and points of contact relating to those circuits. Copies of the drawings will be provided to NWS for that purpose. Logistics. NWS will maintain their equipment and arrange for troubleshooting and maintenance of the associated phone lines. NWS will supply the local site with point-of-contact information for maintenance and all similar needs. Maintenance coordination: The NWS shall contact the appropriate Operational Control Center (OCC), available 24 hours a day, to obtain information on the operational status of any TDWR facility in the OCC's jurisdiction. Test NCPs: The test NCPs listed below are being replaced by this national NCP. Via the experience in connecting to the TDWR via those NCPs, and utilizing the data obtained from those TDWR sites, the Weather Service has developed its current capability to ingest and employ TDWR base data as an aid in accomplishing its mission. Where the interface methodology employed by those early data remoting connections differs from that proposed in this present NCP, the site equipment and connections will be upgraded to conform with the methodology described in this NCP. NCP 20779 and 20779A: OKC TDWR to NSSL, Norman, OK, inactive, phone line connection removed. SLC TDWR to NWS, Salt Lake City, UT, with active use at local WFO. BWI TDWR to NWS, Silver Spring, MD with relay to Sterling, VA, with active use at local WFO. BOS TDWR to NWS, Taunton, MA, inactive, phone line connection removed. NCP 23885 and 23885A: PHX TDWR to NWS, Phoenix, AZ, with active use at local WFO. NCP 24991: LAS TDWR to NWS, Las Vegas, NV, with active use at local WFO. NCP 25204: CLT TDWR to NWS, Spartanburg-Greenville, SC, with active use at local WFO. NCP 30392: OKC TDWR to Radar Operations Center, Norman, OK, with relay to NSSL and WFO for active use. NCP 30275: HOU TDWR to Houston, TX, with active use at WFO. MSY TDWR to New Orleans, LA, with active use at WFO. TPA TDWR to Tampa, FL, with active use at WFO. MIA TDWR to Miami, FL, with active use at WFO. MCO TDWR to Orlando, FL, with active use at WFO.</p>	

APPENDIX 1. NCP/CCD, N31626

Case File/NCP Addendums		
Case File Number	NCP Number	Addendum 1/1
ATO0T-TDWR-1004	31626	
<p>CCD 1, Box 6:</p> <p>(Organization: ATO-T: ATO-TB0 - Terminal Weather) Action: Accomplish the actions described in NCP 31626 and as modified by resolution of comment. Action 1 of 5: Coordinate and schedule the implementation of this approved change as defined in NCP 31626. Details: Action Type:</p> <p>(Organization: ATO-T: ATO-TB0 - Terminal Weather) Action: Action 2 of 5: Update associated documentation as defined by NCP 31626: - Local Site Interface Drawing, Ver. 1, Rev. 1 In addition, update any additional training, maintenance and support documentation affected by this change, if required. Coordinate the publication and distribution of subject documentation when updated. Ensure a copy of the updated documentation is provided to the Document Control Center (DCC). Details: Action Type:</p> <p>(Organization: ATO-T: ATO-TB0 - Terminal Weather) Action: Action 3 of 5: Ensure that a copy of this CCD is retained on site with the equipment records. Details: Action Type:</p> <p>(Organization: ATO-T: ATO-TB0 - Terminal Weather) Action: Action 4 of 5: Update the SCAP and the annual 800-26 Security Self Assessment to reflect system changes from this NCP and any other prior changes during the regularly scheduled update. Details: Action Type:</p> <p>(Organization: ATO-W: Documentation Control Center) Action: Action 5 of 5: DCC: Create/update records in DOCCON for the document(s) cited above in accordance with the CCD. Details: Action Type:</p>		

APPENDIX 1. NCP/CCD, N31626 - Attachment A

**NWS – TDWR Signal Interconnect
Approved by the FAA 9/20/2005**



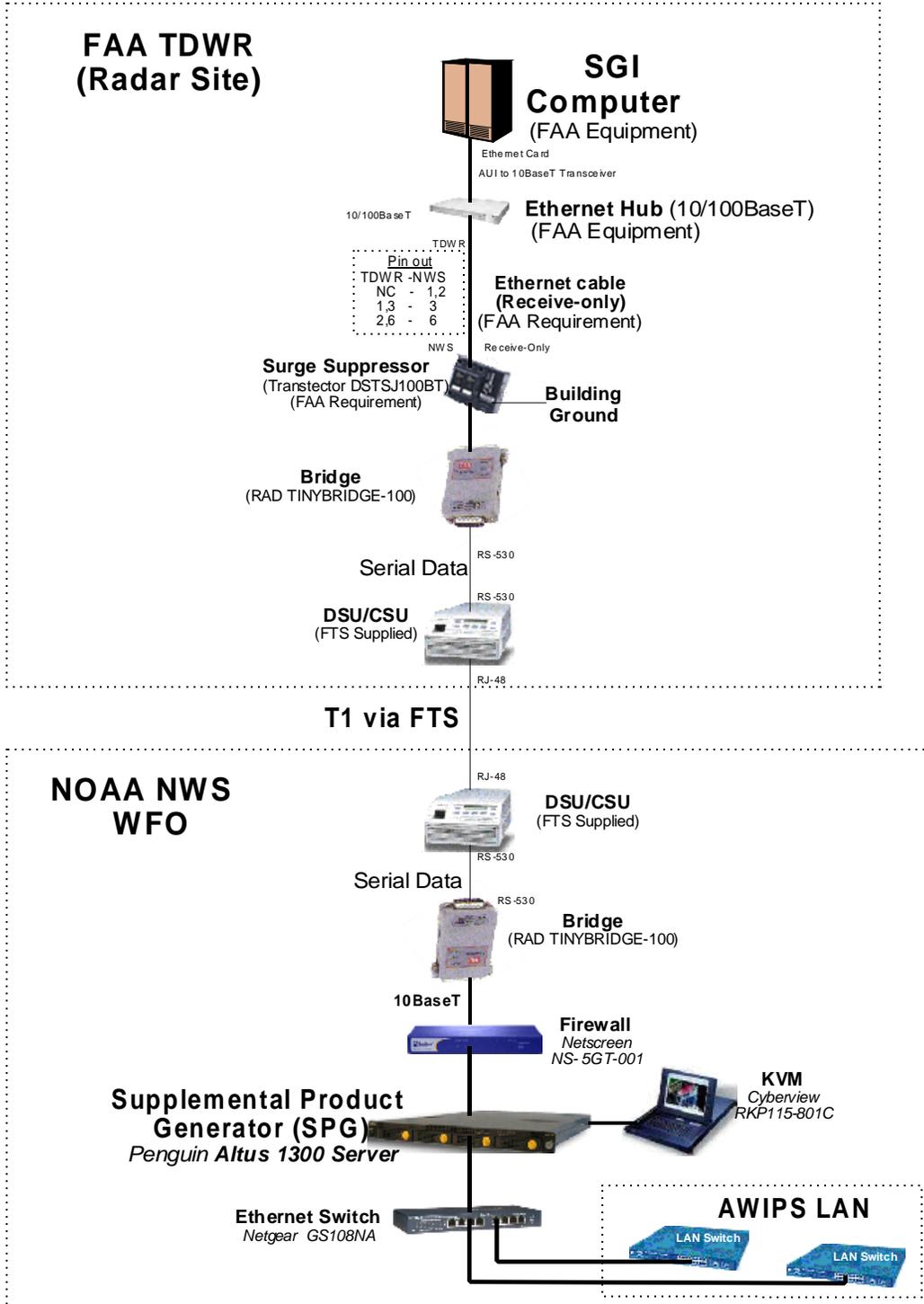
Items supplied by the NWS:

- | | |
|-----------------------------|---|
| 1. CSU/DSU | Leased from Telco Provider |
| 2. T-1 Telephone Line | Leased from Telco Provider |
| 3. TINYBRIDGE | Powered interface converter (RS-530 to 10/100BT) |
| 4. Ethernet Cable | Straight through Ethernet Cable (length 5 feet) |
| 5. Surge Protector | Transtector TSJ-10/100BT Ethernet connector (8 lines protected) |
| 6. Read only Ethernet Cable | Custom read only Ethernet cable 14 feet (Black Box #CBCC299390) |
| 7. Accessory Strip | AC accessory strip 110 volts with at least two receptacles |
| 8. Ground Wire | 6 AWG stranded copper conductor (short as possible) with crimped lugs on each end |

APPENDIX 1. NCP/CCD, N31626 - Attachment B

TDWR Radar Data Ingest into AWIPS

TDWR T1
6/29/2007



APPENDIX 1. NCP/CCD, N31626 - Attachment C

MEMORANDUM OF AGREEMENT

Between the
Federal Aviation Administration
of the
Department of Transportation
and the
National Oceanic and Atmospheric Administration
National Weather Service
of the
Department of Commerce
for

**Terminal Doppler Weather Radar (TDWR)
Shared Weather Products**

July 23, 2007

APPENDIX 1. NCP/CCD, N31626 - Attachment C - continued

1. INTRODUCTION

1.1 Purpose

This Memorandum of Agreement (MOA) between the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) and the Federal Aviation Administration (FAA) prescribes the coordinated efforts between the two agencies to provide weather data from FAA Terminal Doppler Weather Radar (TDWR) systems to designated NWS Weather Forecast Offices (WFOs). The NWS will generate weather radar products from the TDWR data to complement products from Weather Surveillance Radar – 1988 Doppler (WSR-88D) units. The weather products derived from TDWR basedata will improve the NWS capability for warning on tornadoes and other severe weather. The weather products derived from TDWR basedata will be available to NWS, FAA, other government agencies and in the future to the general public. Any costs to either the FAA or to NWS involved in implementing this MOA are the sole responsibility of that agency and, as such, are outside of the scope of this agreement. This agreement does not authorize the transfer of funds or other resources between the parties.

1.2 Background

The FAA TDWR radar system is a high quality, dedicated meteorological surveillance radar deployed near many of the larger airports in the U.S. As such, the TDWR is usually located close to large population centers in the country. Although the TDWR has different engineering characteristics from the WSR-88D, the NWS can use the TDWR radar data to complement WSR-88D coverage for:

- WSR-88D cone of silence,
- Low-level phenomena at long range from WSR-88D units,
- Different perspective angles on storms to better sample radial velocity maxima and morphology,
- Potential mitigation of obscuration of storms due to range folded echoes,
- Data in areas of incomplete WSR-88D coverage,
- Backup data during WSR-88D outages,
- Multiple Doppler analysis to provide rectilinear wind fields,
- Improved “best information” mosaics of radar data over WFO County Warning Area, and
- Improved quality control of WSR-88D data for problems such as anomalous propagation and beam blockage.

2. AUTHORITY

NWS is authorized to enter into this Agreement pursuant to:

- Title 15 USC Section 313;
- Title 49 USC Section 44720(b); and

(MOA Page 2)

APPENDIX 1. NCP/CCD, N31626 - Attachment C - continued

- 49 U.S.C. Section 106(m), which authorizes the head of any Federal agency to receive services from the FAA with or without reimbursement to the FAA.

FAA is authorized to enter into this Agreement pursuant to:

- Title 49 USC 106(l) (6) authorizes the Administrator to enter into and perform such contracts, leases, cooperative agreements, or other transactions as may be necessary to carry out the functions of the Administrator and the Administration. The Administrator may enter into such contracts, leases, cooperative agreements, and other transactions with any Federal agency; and
- Title 49 USC 106(m) allows the Administrator, with the consent of appropriate officials, to use or accept the services, equipment, personnel, and facilities of any other Federal agency and any other public or private entity, with or without reimbursement. The Administrator may also cooperate with appropriate officials of other public and private agencies and instrumentalities concerning the use of services, equipment, personnel, and facilities.

3. WORK SCOPE

This Agreement covers the following work:

- Implementation of telecommunications links between TDWR units and NWS sites.
- Internal FAA coordination of approvals for releasing TDWR data to the NWS links.
- NWS coordination of installation of TDWR-NWS telecommunications links and all unique data communications equipment needed to implement those communication links.
- FAA technician assistance to NWS in maintaining NWS telecommunications equipment at TDWR sites.
- Informal sharing of information between FAA and NWS contacts for TDWR outages and other issues.
- NWS use and re-distribution of TDWR weather data.

As FAA modifies its telecommunications infrastructure, the NWS will work with the FAA to determine whether to modify any TDWR-NWS links. Any such actions will be the subject of future work, and, if necessary, will be covered in the work scope of modifications to this MOA.

4. RESPONSIBILITIES

4.1 FAA shall provide:

- For each TDWR-NWS connection implementation:
 - Authorization in an approved National Airspace Change Proposal (NCP) to make the connection. The NCP will address technical details pertaining to the installation, including a demarcation location for the NWS' dedicated telecommunications link from the TDWR system (or a high-

(MOA Page 3)

APPENDIX 1. NCP/CCD, N31626 - Attachment C - continued

- impedance tap to its ITWS-required basedata communications link) to the designated WFO, Radar Operations Center (ROC) or NWS Headquarters (NWSH). The NCP will also identify an FAA point of contact staffed 24/7 for sharing information with the NWS on outages and other issues concerning the TDWR.
- Coordination with telecommunications vendor(s) for installation of the telecommunications link.
- Whenever practical, notification to the NWS principal point of contact (see Section 5, below) of TDWR outages, scheduled TDWR downtime and restoration activities; such notification will follow standard FAA policy. Service interruptions may occur due to operational necessity, safety and security concerns and/or TDWR system or communications failure.
- Authority to deny the NWS access to TDWR data in accordance with the terms of this Agreement shall reside with the Vice President of Technical Operations Services. The FAA shall not be held responsible for or retain any legal obligation as to the accuracy, validity or continued availability of the data.
- Notification to the NWS principal point of contact (see Section 5, below) of changes to scanning strategies or other basedata changes at any TDWR site, with as much lead time as practical so as to enable NWS to modify WFO (or ROC) software.
- Information required by the NWS for them or their contractors (e.g., telco) to set up their routers that will bridge and isolate weather and status data from the TDWR to the designated WFO, ROC or NWSH dedicated telecommunications link.
- Updating of the official TDWR site interconnection and facility drawings to show the new user connections and equipment, such updates to be based on information provided by the NWS marking up (see Section 4.2, below) of FAA-supplied site drawings.

4.2 NWS shall provide:

- A capability for displaying weather products from the TDWR radars at NWS WFOs.
- Installation and operation of all telecommunication equipment and links.
- All required administrative and contractual support necessary to accomplish those tasks.
- For each TDWR-WFO, TDWR-ROC and TDWR-NWSH connection:
 - A local WFO, ROC or NWSH point of contact for liaison with FAA.
 - Initiation and coordination of tasking to telecommunications vendor(s) for installation of the TDWR-WFO, TDWR-ROC or TDWR-NWSH telecommunications link.
 - The communications link operation and failure restoration, as well as the NWS use of TDWR data, shall be accomplished without interfering with the FAA's operational use of the TDWR.

APPENDIX 1. NCP/CCD, N31626 - Attachment C – continued

- The communications link shall permit only one direction of TDWR base data flow, from the TDWR site to the NWS site.
- The communications link and all NWS equipment installed in the TDWR radar shelter shall be grounded and protected against lightning surges in accordance with current FAA standards.
- Monitoring of the data received from the TDWR site. In the event of a disruption or loss of data, the NWS shall contact the FAA point of contact specified in Section 4.1 and work jointly with that person or a designated associate to resolve the situation.
- Troubleshooting of the telecommunications link and associated equipment through notification of the telecommunications vendor(s) and replacement or repair of NWS-supplied components.
- Redline markups of the official TDWR site interconnection and facility drawings to show the new user connections and equipment, such redlines to be made on hard copy drawings supplied by the FAA (see Section 4.1, above).

4.3 FAA and NWS shall jointly provide:

- Monitoring of their respective portions of the equipment supporting the TDWR-NWS data link operations to ensure that FAA TDWR primary mission services are not degraded. In the event of any such services degradation, the TDWR-NWS data link will be disconnected until restorative actions are accomplished.

5. PRINCIPAL POINTS OF CONTACT

Each of the parties will designate a principal point of contact responsible to their senior management for efficient execution of this Agreement. These points of contact will maintain accurate records of requirements and status. The parties will conduct an annual review of this Agreement and procedures, and prepare reports to NOAA and FAA management as required. These individuals are as follows:

NOAA

Roger W. Hall
Systems Engineering Center
W/OST32
120 David L. Boren Blvd.
Norman, OK 73072

Federal Aviation Administration

Ted Weyrauch
ATO-T Terminal Weather
AJT-1200, FOB10B
800 Independence Avenue, S.W.
Washington, DC, 20591

The parties will meet as necessary to resolve issues and make modifications to this Agreement to accommodate changes in technology or mission requirements. All meeting minutes will be published and distributed to both parties.

APPENDIX 1. NCP/CCD, N31626 - Attachment C - continued**6. DATA USE AND REDISTRIBUTION**

Unless required by law or a court order, the NWS shall not distribute TDWR basedata in its native format to any entity outside of the federal government without official approval of the FAA Data Release Review Committee (DRRC). All retransmission, archiving and redistribution of TDWR data outside the federal government shall be limited to reformatted and/or processed weather data and products derived from TDWR basedata. This derived data shall be handled and processed in accordance with normal NWS procedures and regulations that are applicable to and used for its own radar (e.g., WSR-88D) data.

The NWS intends to use TDWR weather data to complement WSR-88D data to support public forecasts and severe weather warnings. If the NWS determines at a later date that it would serve the public good, and it determines that it is advantageous to distribute reformatted/processed weather data and weather products derived from TDWR basedata to other agencies, firms, companies, associations, educational institutions and/or to the public via other specific venues, the NWS shall control any such redistribution by existing NWS fair use policy. The NWS will lead any redistribution efforts and will coordinate with the FAA to maximize benefits for the two agencies and other users.

The FAA's principal point of contact (Section 5) shall be informed in writing (electronic mail is not acceptable for this purpose) of any request for distribution of TDWR basedata in its native format outside the federal government at least 60 days before any contemplated activation date. The FAA's DRRC has the rights under this Agreement to (1) reject that release of information and (2) to inform the public about such decisions. Should the NWS disagree with any decision by the FAA DRRC to not approve a contemplated redistribution of TDWR basedata in its native format, the NWS may appeal that decision to the FAA Administrator, whose decision will be final.

The FAA is not responsible for:

- Providing any support for interpretation or decoding of TDWR weather data distributed to or by the NWS.
- Providing a constant flow of data to the NWS, and hence to its customers, other than that already established by this Agreement.
- Providing weather data that supports any mission other than the TDWR's primary functions, as they have been established via means other than this agreement.

The NWS shall be responsible for:

- Providing information to other agencies and its customers for decoding or interpretation of TDWR weather data consistent with similar services provided for other meteorological data use.
- Providing the FAA with a copy of its fair-use policy.
- Complying with the conditions and limitations of FAA Order 1200.22C.

APPENDIX 1. NCP/CCD, N31626 - Attachment C - continued

- Accounting for obligations associated with any redistribution of TDWR basedata in its native format to a third party that may be authorized by the DRRC.

7. OPERATIONS AND MAINTENANCE

The FAA will operate and maintain their TDWR equipment in accordance with the existing FAA procedures. This MOA will not require any changes in maintenance procedures for FAA technicians. The NWS personnel will maintain NWS owned or leased equipment that is present or terminates in the TDWR shelter.

During routine maintenance visits to the TDWR site, FAA maintenance personnel will visually inspect the equipment added per this Agreement. In the event a failure in this equipment is suspected by the NWS, and upon being notified of such failure, the FAA will dispatch maintenance personnel to the site to provide site access for NWS restoration (i.e., troubleshooting and replacement) activities as covered by Section 4.2, and to provide TDWR support as required. The responsiveness (i.e., priority) of this on-site service will be negotiated by NWS and FAA in good faith on each individual occasion where access to the TDWR site or other FAA support is required. The negotiations shall take into account FAA staff workload, weather conditions and other pertinent factors that exist at the time the service is requested.

8. LIABILITY AGREEMENT

The FAA assumes no liability for the accuracy or timeliness of the TDWR weather data transferred to the NWS. NOAA agrees to promptly consider and adjudicate any and all claims which may arise out of actions it takes pursuant to the provisions of this agreement, and to pay for any damage or injury as may be required by Federal law. Such adjudication will be pursued under the Federal Tort Claims Act, 28 USC 2671 - 2680, or under such other legal authority as may be pertinent. The TDWR will be calibrated in accordance with standard FAA orders and repaired according to FAA normal maintenance and restoration schedules. All FAA activities associated with the use, maintenance, and test of the specific TDWR unit to support FAA operational requirements shall take precedence over the activities associated with this MOA.

Each party to this Agreement does hereby expressly waive all claims against the other party for compensation for any loss, damage, personal injury or death occurring in consequence of the performance of this Agreement.

9. EFFECTIVE DATE, PERIODIC REVIEW AND TERMINATION

This MOA shall become effective on the date of the last approval signature. It shall remain effective for five years. This MOA may be amended or renewed upon the mutual agreement of the parties.

This MOA shall be reviewed by both agencies at least every three years for determining whether to modify, terminate, or extend its force.

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APPENDIX 1. NCP/CCD, N31626 - Attachment C - continued

Either of the parties may terminate their participation in this Agreement by providing 60 days written notice to the other participants.

10. RESOLUTION OF DISAGREEMENTS

Nothing herein is intended to conflict with current Department of Commerce (DOC) or FAA directives. If any of the terms of this Agreement are inconsistent with existing directives of either of the agencies entering into this Agreement, then those portions of this Agreement shall be invalid, but the remaining terms and conditions not affected by the inconsistency shall remain in full force and effect. At the first opportunity for review of the Agreement, all changes necessary to remove that inconsistency will be accomplished either by an amendment to this Agreement or by entering into a new Agreement whichever is deemed expedient to the interest of both parties.

Should disagreement arise on the interpretation of the provisions of this Agreement, or amendments and/or revisions thereto, that cannot be resolved at the operating level, the area(s) of disagreement shall be stated in writing (e-mail is not acceptable) by each party and presented to the other party's principal point of contact (Section 5) for consideration. If agreement on interpretation is not reached within thirty days, the parties shall forward the written presentation of the disagreement to respective higher officials for appropriate resolution. Subject to the availability of funds, the status quo shall be maintained and supported until the resolution is accomplished.

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APPENDIX 1. NCP/CCD, N31626 - Attachment C - continued

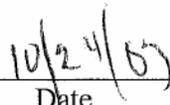
**Memorandum of Agreement between the
Federal Aviation Administration and the National Weather Service
for TDWR Shared Weather Products**

APPROVED:

For National Weather Service:



Gregory A. Mandt
Director, Office of Science and Technology



Date

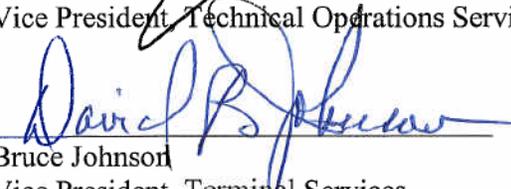
For the Federal Aviation Administration:



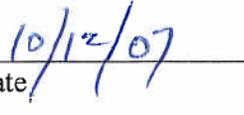
Steve Zaidman
Vice President, Technical Operations Services



Date



Bruce Johnson
Vice President, Terminal Services

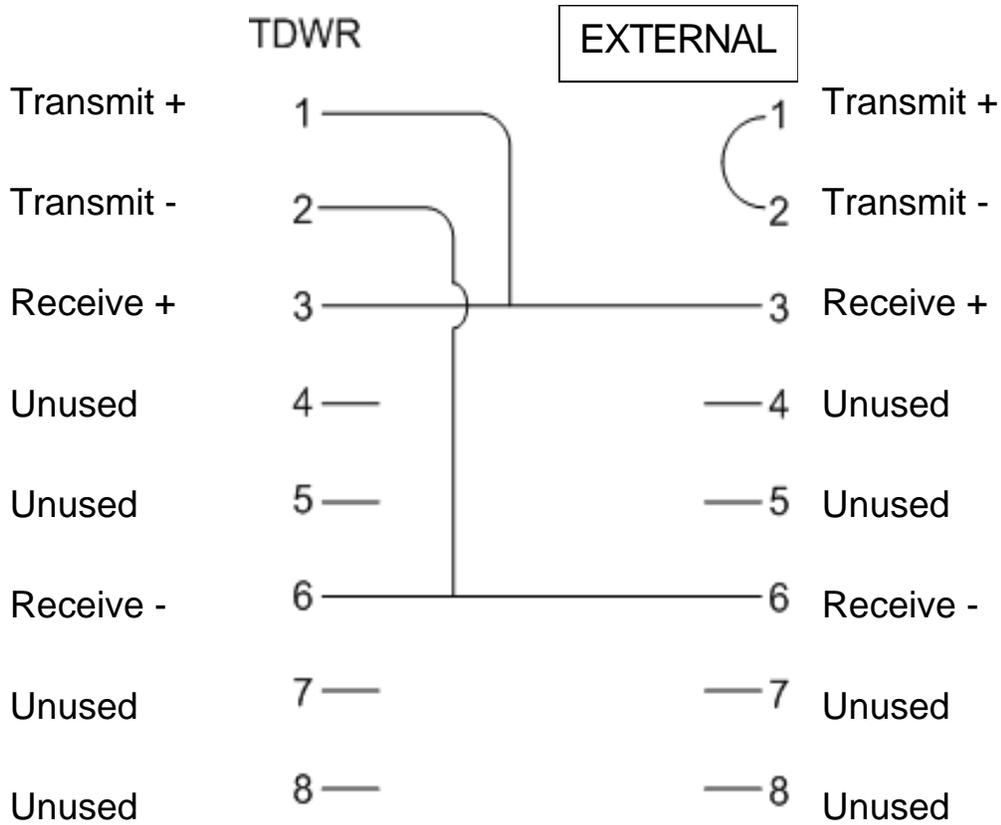


Date

(MOA Page 9)

APPENDIX 1. NCP/CCD, N31626 - Attachment D

Read Only Ethernet Cable

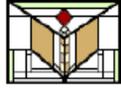


02/25/2008

N JO 6315.43
Appendix 1

APPENDIX 1. NCP/CCD, N31626 - Attachment E

Coordinaton Request from NWS



Bill Bumgarner/AWA/FAA
08/09/2007 02:44 PM
To
cc
bcc
Subject

William Hall/AWA/FAA

----- Forwarded by Carmine Primeggia/AWA/FAA on 08/06/2007 02:44 PM -----



Greg Mandt
<Greg.Mandt@noaa.gov>
08/06/2007 12:06 PM
To Carmine Primeggia/AWA/FAA@FAA
cc Daria Webb <Daria.Webb@noaa.gov>, Gregory S Ca
<Gregory.S.Cate@noaa.gov>
Subject ACTION: TDWR MOA

Carmine,

I am requesting your support coordinating the TDWR Shared Weather Products MOA with the appropriate parties in your organization.

As you are aware, the FAA and the NWS have cooperated on an initial implementation of the Terminal Doppler Weather Radar (TDWR) Data Ingest capability, providing weather data from FAA TDWR systems to designated NWS Weather Forecast Offices (WFOs). The NWS generates weather radar products from the TDWR data to complement products from NEXRAD units. The NWS is currently connected to 10 TDWR systems, and we would like to connect to the remaining 35 operational TDWRs.

There has been extensive coordination among our staff on the implementation of TDWR Data Ingest, and a draft Memorandum-of-Agreement (MOA) has been generated to formalize the roles and responsibilities of our organizations. The MOA is attached for your coordination. Please send us any comments or corrections that you may have. If the FAA is satisfied, please sign the approval page, scan it and email it back. We will sign it and return a signed copy to you.

Thanks,
Greg

APPENDIX 1. NCP/CCD, N31626 - Attachment F**TDWR to WFO Associations**

TDWR	TDWR Location	WFO	Primary WFO to receive data	OCC
1	Atlanta (ATL)		Atlanta (FFC)	AOCC
2	Andrews Air Force Base (ADW)	2a	Baltimore/Washington (LWX)	AOCC
3a	Baltimore/Wash (BWI)	2b	Baltimore/Washington (LWX)	AOCC
3b	Baltimore/Wash (BWI)	NWS HQ	NWS HQ/Silver Spring, MD	AOCC
4	Dulles (IAD)	2c	Baltimore/Washington (LWX)	AOCC
5	Washington National (DCA)	2d	Baltimore/Washington (LWX)	AOCC
6	Boston (BOS)		Boston (BOX)	AOCC
7	Chicago Midway (MDW)	4a	Chicago (LOT)	ESOC
8	Chicago O'Hare (ORD)	4b	Chicago (LOT)	ESOC
9	Cleveland, OH (CLE)		Cleveland (CLE)	MOCC
10	Dallas Love Field (DAL)	6a	Dallas/Ft. Worth (FWD)	DSOC
11	Dallas/Ft. Worth (DFW)	6b	Dallas/Ft. Worth (FWD)	DSOC
12	Denver (DEN)		Denver/Boulder (BOU)	POCC
13	Detroit (DTW)		Detroit (DTX)	MOCC
14	Charlotte (CLT)		Greenville-Spartanburg (GSP)	AOCC
15	Houston Hobby (HOU)	10a	Houston (HGX)	MOCC
16	Houston International (IAH)	10b	Houston (HGX)	MOCC
17	Indianapolis (IND)		Indianapolis (IND)	MOCC
18	Kansas City (MCI)		Kansas City/Pleasant Hill (EAX)	MOCC
19	Las Vegas (LAS)		Las Vegas (VEF)	POCC
20	Louisville, KY (SDF)		Louisville (LMK)	AOCC
21	Orlando International (MCO)		Melbourne (MLB)	AOCC
22	Memphis (MEM)		Memphis (MEG)	AOCC
23	Fort Lauderdale (FLL)	17a	Miami (MFL)	AOCC
24	Miami (MIA)	17b	Miami (MFL)	AOCC
25	West Palm Beach (PBI)	17c	Miami (MFL)	AOCC
26	Milwaukee (MKE)		Milwaukee (MKX)	MOCC
27	Minneapolis (MSP)		Minneapolis/Chanhassen (MPX)	MOCC
28	Philadelphia (PHL)		Mt Holly (PHI)	AOCC
29	Nashville (BNA)		Nashville (OHX)	AOCC
30	New Orleans (MSY)		New Orleans (LIX)	MOCC
31	Newark (EWR)	23a	New York City/Upton (OKX)	AOCC
32	New York City (JFK)	23b	New York City/Upton (OKX)	AOCC
33a	Oklahoma City (OKC)		Oklahoma City (OUN)	MOCC
33b	Oklahoma City (OKC)	ROC	Radar Operations Center (ROC)	MOCC
34	Phoenix (PHX)		Phoenix (PSR)	POCC
35	Pittsburgh (PIT)		Pittsburgh (PBZ)	AOCC
36	San Juan (SJU)		Puerto Rico/V.I. (JSJ)	AOCC
37	Raleigh Durham (RDU)		Raleigh/Durham (RAH)	AOCC
38	Salt Lake City (SLC)		Salt Lake City (SLC)	POCC
39	St. Louis (STL)		St. Louis (LSX)	MOCC
40	Tampa Bay (TPA)		Tampa Bay Area (TBW)	AOCC
41	Tulsa (TUL)		Tulsa (TSA)	MOCC
42	Wichita (ICT)		Wichita (ICT)	MOCC
43	Columbus, OH (CMH)	34a	Wilmington (ILN)	MOCC
44	Covington (CVG)	34b	Wilmington (ILN)	AOCC
45	Dayton (DAY)	34c	Wilmington (ILN)	MOCC

AOCC Contact Numbers

Primary: 770-210-7800

Alternate #1: 866-432-2622 (Toll Free - Calling within the Eastern Service Area)

Alternate #2: 877-434-1182 (Toll Free - Calling outside the Eastern Service Area)

MOCC Contact Numbers

Primary: 913-254-8175

Alternate #1: 866-432-2622 (Toll Free - Calling within the Central Service Area)

Alternate #2: 800-322-8879 (Toll Free - Calling outside the Central Service Area)

POCC Contact Numbers

Primary: 866-432-2622 (Toll Free)

Alternate: 800-269-6665 (Toll Free - Calling outside the Western Service Area)

ESOC Contact Number

Primary: 847-608-5878

DSOC Contact Number

Primary: 877-782-7622 (Toll Free)

TDWR to WFO associations provided by Mike Istok, NWS 07/27/2007
OCC association information provided by Ted Weyrauch, FAA 10/25/2007
OCC correction provided by Amy Birlingmair, FAA 03/12/2008