

**BY ORDER OF THE COMMANDER  
AIR FORCE TECHNICAL  
APPLICATIONS CENTER**

**AIR FORCE TECHNICAL  
APPLICATIONS CENTER  
INSTRUCTION 61-301**



**18 JULY 2025**

**Scientific, Research and Development**

**FIELDING PROCESS FOR  
NEW/UPGRADED GEOPHYSICAL  
STATIONS**

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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This publication implements AFI 63-101. This Air Force Technical Applications Center Instruction (AFTACI) shall be used as guidance by a technical Project Officer (PO). It describes the coordination necessary to integrate new or upgraded seismic, hydroacoustic and infrasonic stations after receipt of a valid and documented requirement. Roles and responsibilities for the Air Force Technical Applications Center (AFTAC) offices are identified in this document. It also describes relationships between offices responsible for defining and satisfying technical requirements, system acquisition, system sustainment, station and communications monitoring and control. This publication identifies procedures and Points of Contact (POCs) responsible for the efficient implementation of the entire process including appropriate configuration management and security controls. In the event of conflict between the provisions of this instruction and other Operating Instructions or publications, use the latest dated publication and inform the Offices of Primary Responsibility (OPRs) of the respective documents of the conflict. This publication does not apply to the United States Space Force (USSF), Air Force Reserve (AFR), and Air National Guard (ANG), except where noted. Ensure all records generated because of processes prescribed in this publication adhere to AFI 33-322, *Records Management and Information Governance Program*, and are disposed in accordance with the Air Force Records Disposition Schedule, which is located in the Air Force Records Information Management System. Refer recommended changes and questions about this publication to the OPR, AFTAC/SDB, using the DAF Form 847, *Recommendation for Change of Publication*;

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***SUMMARY OF CHANGES***

Major re-write to reflect changes in AFTAC's organizational structure, incorporate lessons learned from successful installations, and include stations outside of the United States National Data Center (US NDC) network. Consequently, the title of the instruction has changed from Integration of New/Upgraded Stations into the US NDC to Fielding Process for New/Upgraded Geophysical Stations.

## 1. Background.

1.1. AFTAC requires a systematic process for managing the addition and/or upgrade to seismic, infrasonic or hydroacoustic stations. AFTAC also requires a robust process for ensuring the continued acquisition and archiving of quality data from these stations.

1.2. When AFTAC makes this commitment, the center must accomplish specific steps. This instruction codifies important steps that must be adhered to for successful implementation. Each directorate and group involved in the acquisition, maintenance, and sustainment of a new station will develop, document, and coordinate specific procedures to perform their tasks effectively and efficiently.

## 2. Roles and Responsibilities.

2.1. Office of the Political Advisor, (POLAD) shall:

2.1.1. Work across AFTAC to secure and maintain a Memorandum of Agreement (MOA) and/or Memorandum of Understanding (MOU) with the host operator or foreign government, if applicable. Actions include coordinating with the station installation host country and US agencies and updating agreements.

2.1.2. Provide guidance on special handling controls when AFTAC is engaged in negotiations or discussions with foreign governments.

2.1.3. Ensure stations are added to the AFTAC Security Classification Guide (SCG).

2.1.4. Assist with coordinating shipping and personnel visas with the host nations.

2.1.5. Support host nation training requirements.

2.2. Nuclear Materials Systems Division, Systems Development Directorate (SDB) shall:

2.2.1. Assign a PO to ensure the accomplishment of all steps necessary for the success of the project in accordance with the Geophysical Field Systems (GFS) Project Management Standard Operating Procedure (SOP). The SOP outlines the process to properly manage the project from concept to close out.

2.2.2. Draft and maintain the Project Plan. Project Plans document the requirement analysis, project scope, steps to address integrated product support elements, cost, and risks. Update the Project Plan template as needed based on lessons learned.

2.2.3. Draft and maintain the Materiel Fielding Plan (MFP) which includes fielding methodology, system overview, logistics, and fielding checklists. Ensure the fielding checklists includes pre-fielding, trans-fielding and post-fielding tasks as determined by the fielding team. The checklists at a minimum must identify tasks to be accomplished, assigned POCs, date to accomplish tasks, and status updates.

2.2.4. Serve as the Contracting Officer's Representative (COR) for contracts in support of new and upgraded stations to include borehole drilling and infrastructure requirements. Infrastructure includes boreholes, buildings, power poles and lines, foundations, ground systems and long-haul communication.

- 2.2.5. Ensure documentation of all hardware, software, communication, and host specific requirements unique to each station. Upon completion of the modification/upgrade, update the GFS Life Cycle Sustainment Plan (LCSP).
- 2.2.6. Consolidate and submit test results and evaluations to 709 SAG/23ANS.
- 2.3. Engineering Division, SD Directorate (SDE) shall:
  - 2.3.1. Work with 709 SPTG to perform a site survey to determine infrastructure and communications requirements.
  - 2.3.2. Develop and design the hardware and software in coordination with 709 SPTG and with the concurrence of the 709 SAG.
  - 2.3.3. Work with 709 SPTG and/or the host contractor to install and field test equipment.
  - 2.3.4. Assist 709 SAG and 709 SPTG with oversight of the site's hardware and software testing.
  - 2.3.5. Oversee all technical aspects of the acquisition of data from the stations.
  - 2.3.6. Develops and design systems, system upgrades, and associated spares support kit.
- 2.4. 709th Surveillance and Analysis Group (709 SAG) shall:
  - 2.4.1. Determine or respond to higher headquarters requirement and location for a new or upgraded station. Coordinate planning and installation with applicable offices through AFTAC's established requirements process. An outcome of the process is a documented and vetted requirement for a new or upgraded station. This documentation is required before proceeding with implementation. AFTACI 10-601 provides further details pertaining to AFTAC's Corporate Capability Development Process.
  - 2.4.2. Coordinate with POLAD to identify potential host countries and secure an MOA and/or MOU with the host operator or government as appropriate.
  - 2.4.3. Concur and coordinate with SD and 709 SPTG's development and design of hardware and software.
  - 2.4.4. Assist 709 SPTG and SDE with oversight of the site's hardware and software testing.
  - 2.4.5. Combine and document results from all field tests, evaluations and assessments (i.e., MCE, OCA, OCE).
- 2.5. 23rd Analysis Squadron (23 ANS) shall:
  - 2.5.1. Conduct the Operational Capabilities Evaluation (OCE) and provide results to 709 SAG. This evaluation consists of evaluating the data over a longer period (usually 30 days but as determined by the 23ANS) to ensure the data is acceptable.
  - 2.5.2. Issue Change Requests (CRs) for promotion to the US NDC Testbed after completion of all testing when applicable.

2.5.3. For unclassified stations, coordinate with host country POCs to ensure the station name is registered with the international Federation of Digital Seismograph Networks (FDSN). Registration ensures exclusive use of the unique name.

2.6. 709th Support Group (709 SPTG) shall:

2.6.1. Work with SDE to develop and design the hardware and software with 709 SAG's concurrence and coordination.

2.6.2. Work with SDE or the host contractor to install and field test equipment.

2.7. 709th Cyberspace Squadron (709 CYS) shall:

2.7.1. Work with SDE to perform a site survey to determine intrasite communications requirements/capabilities at the approved location.

2.7.2. Bridge the physical interface between the external communications from the field and the data acquisition system on the DEVUDM and/or the US NDC.

2.7.3. Conduct end-to-end communications test for any new circuit.

2.8. 709<sup>th</sup> Technical Maintenance Squadron (709 TMXS) shall:

2.8.1. Assist in all technical aspects of site design for a new field site or upgrades at existing stations.

2.8.2. Monitor and ensure maintenance of all required systems and communications networks circuits.

2.8.3. Install, field test, and maintain equipment as described in applicable MOAs/MOUs.

2.8.4. Send data to the DEVUDM system for testing purposes.

2.8.5. Conduct the Operational Capabilities Assessment (OCA) and Maintenance Capability Evaluation (MCE) to ensure a station is maintainable and provide results to 709 SAG. The OCA ensures the data is reliably being transmitted to AFTAC through calibration acceptance, data quality, and latency acceptance. It consists of several tests that verify and validate seismometer calibrations and backfill capability of the array. The MCE ensures a station is maintainable once the installation is complete and the personnel responsible are trained to operate and maintain the station.

2.8.6. Verify/test the CRs for the site to be promoted to the US NDC.

2.8.7. Verify contingency switching capability to the Alternate US NDC.

2.8.8. Evaluate and promote any non-radionuclide station to the AFTAC monitoring mission reporting network. [Note: 709 SAG is responsible for initial data analysis and for providing stations operations status information to the AFTAC/CC.]

2.9. 709th Support Squadron (709 SPTS) shall:

2.9.1. Ship successfully tested equipment to the appropriate location.

2.9.2. Publish documentation of all hardware, software, communication, and host specific requirements unique to each station.

### 3. New/Upgraded Stations.

3.1. Station Affiliation. New stations that are installed as the result of an AFTAC project must be properly evaluated and require AFTAC to address various responsibilities such as configuration management, communications and power infrastructure, and long-term Operations and Maintenance (O&M). For non-AFTAC stations (e.g., International Monitoring System (IMS), US Geological Survey (USGS), etc.) most of these responsibilities fall to the host organization. AFTAC will select which of these stations to acquire and will utilize them according to the intended purpose, which will vary on a case-by-case basis. This AFTACI is intended to apply only to AFTAC-installed stations.

3.1.1. Requirements for AFTAC-installed Stations.

3.1.1.1. An MOA and/or MOU has been secured with the host operator or foreign government.

3.1.1.2. An MCE has been successfully performed.

3.1.1.3. An OCA has been successfully performed.

3.1.1.4. An OCE has been successfully performed.

3.1.1.5. A dedicated AFTAC communication and control network exists. Intrasite communications between boreholes and the station is functional. Long haul connectivity between the station and AFTAC is functional.

3.1.1.6. A Maintenance support infrastructure is in place.

3.1.1.7. The US NDC Configuration Management Process is complete. This allows the station to be added to the network of stations whose data is analyzed and reported in performance of the US nuclear treaty monitoring mission and will ensure station parameters are identical across all operational, alternate, and testbed subsystems of the US NDC.

**4. Top-Level Summary of Actions to Establish a New AFTAC Field Station.**

4.1. Initial Requirement. 709 SAG determines or responds to higher headquarters requirement and location for a new station and coordinates planning and installation with POLAD. The requirement must include an estimate for the life cycle costs and associated funding.

4.2. Noise Survey. 709 SAG/DDZ completes noise surveys and determines optimal locations for boreholes and stations.

4.3. Checklist. SDB PO completes the Pre-fielding, Trans-fielding and Post-fielding Checklists and coordinates with 709 SPTG/TMXS.

4.4. Site Survey. 709 SPTG and SDE conduct a site survey to determine infrastructure and communications requirements.

4.5. Acquisition of Equipment. SD develops and designs hardware and software in coordination with 709 SAG and 709 SPTG.

4.6. Infrastructure. Host drills boreholes and constructs infrastructure with SD oversight.

4.7. Testing:

- 4.7.1. Hardware subject matter experts conduct hardware and software tests with SDE and 709 SPTG with 709 SAG oversight.
- 4.7.2. 709 TMXS or a designated SD contractor sends data to DEVUDM for testing purposes.
- 4.7.3. Once tests are passed, the SD PO ships equipment to the appropriate location in conjunction with 709 SPTS.
- 4.8. Installation and Field Tests. 709 SPTG, SDE, or host contractor conduct and/or support installation and field tests.
  - 4.8.1. 709 TMXS performs the OCA (calibration acceptance, data quality, and latency acceptance) and performs the MCE. For the OCA, data can be reviewed on the DEVUDM or US NDC Testbed.
  - 4.8.2. 23 ANS issues CRs for promotion to the US NDC Testbed after calibration, data quality, and data latency acceptance. Once 709 TMXS finalizes and verifies the CRs , the data stream is promoted to the US NDC. The data-feed is then changed at the site from sending data to the DEVUDM to sending data to the US NDC.
  - 4.8.3. 709 TMXS pre-tests data transfer procedures and routes to verify contingency switching capability to the Alternate US NDC.
  - 4.8.4. Once installation is complete, the OCE begins and 23 ANS reviews the data on the US NDC.
  - 4.8.5. The SD PO consolidates and submits test results and evaluations to 23 ANS.
- 4.9. Declaring Site Operational. 709 SAG combines results from field tests and provides results to AFTAC/CC who declares the site operational.

## **5. Information Collections, Records, and Forms.**

- 5.1. Information Collections. No information collections are created by this publication.

CREIGHTON A. MULLINS, Colonel, USAF  
Commander

## Attachment 1

### GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

#### *References*

DoDI 5000.91, *Product Support Management for the Adaptive Acquisition Framework*, 04 November 2021  
 AFI 33-322, *Records Management and Information Governance Program*, 23 March 2020  
 AFI 61-301, *The Domestic Technology Transfer Process and the Offices of Research and Technology Applications Cooperative Research and Development Agreements*, 16 September 2019  
 DAFI 63-101\_20-101, *Integrated Life Cycle Management*, 16 February 2024  
 AFTACI 10-601, *Capabilities Development*, 05 Nov 2021  
 Geophysical Field Systems Project Management Standard Operating Procedure, 6 April 2018

#### *Prescribed Forms*

None

#### *Adopted Forms*

DAF Form 847, *Recommendation for Change of Publication*

#### *Abbreviations and Acronyms*

**AFR**—Air Force Reserve  
**AFTAC**—Air Force Technical Applications Center  
**AFTACI**—AFTAC Instruction  
**ANG**—Air National Guard  
**COR**—Contracting Officer’s Representative  
**CR**—Change Request  
**FDSN**—Federation of Digital Seismograph Networks  
**GFS**—Geophysical Field Systems  
**IMS**—International Monitoring System  
**LAN**—Local Area Network  
**LCSP**—Life Cycle Sustainment Plan  
**MCE**—Maintenance Capability Evaluation  
**MFP**—Materiel Fielding Plan  
**MOA**—Memorandum of Agreement  
**MOU**—Memorandum of Understanding  
**O&M**—Operations and Maintenance  
**OCA**—Operational Capabilities Assessment  
**OCE**—Operational Capabilities Evaluation  
**OPR**—Office of Primary Responsibility  
**PO**—Project Officer  
**POC**—Point of Contact  
**SCG**—Security Classification Guide  
**SOP**—Standard Operating Procedure

US NDC—United States National Data Center  
USGS—United States Geological Survey

### *Office Symbols*

**23 ANS**—23rd Analysis Squadron  
**709 CYS**—709th Cyberspace Squadron  
**709 SAG**—709th Surveillance and Analysis Group  
**709 SPTG**—709th Support Group  
**709 SPTS**—709th Support Squadron  
**709 TMXS**—709th Technical Maintenance Squadron  
**A6X**—Publications and Forms Office  
**AFTAC/CC**—AFTAC Commander  
**AFR**—Air Force Reserve  
**ANG**—Air National Guard  
**DDZ**—Special Programs, 709 Support Group  
**POLAD**—Office of the Political Advisor, Directorate of Plans and Programs  
**SD**—Systems Development Directorate  
**SDB**—Nuclear Materials Systems Division, Systems Development Directorate  
**SDE**—Engineering Division, Systems Development Directorate  
**USSF**—United States Space Force

### *Terms*

**Alternate US NDC**—A 24/7 operational system that provides for continuous data backup and for continuity of operations in the event of a planned or unplanned outage.

**Department of Defense (DoD) Issuance**—DoD directives, instructions, publications, and their changes.

**DEVUDM**—The virtual LAN where data is sent when new stations are initially being acquired and tested. This allows data and station configuration to be verified prior to being transmitted to the US NDC.

**LANs**—The US NDC Testbed, DEVUDM, US NDC and Alternate US NDC should be interpreted as virtual local area networks (LANs) operating on the AFTAC infrastructure.

**Publication**—An officially produced, published, and distributed document issued for public use, i.e., for compliance, implementation, and or information.

**US NDC**—The virtual LAN which comprises the operational mission system.

**US NDC Testbed**—The virtual LAN used to test all configuration changes prior to introducing them to operations. The US NDC Testbed is continually under configuration so that its hardware and software duplicate the operation system to as near a degree as is possible.