



# Inter-Site Data Reconciliation Report: Annual Timestamp Verification

**Distribution:** Site Coordinators, Archive Management, Technical Oversight

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**Date**

December 23, 2025

SRN Internal Audit IA-0034

**Classification**

Internal Operations

**Audit Team**

Data Integrity Division



# Executive summary

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This report summarizes findings from the 2025 annual inter-site data reconciliation effort conducted across all operational monitoring facilities. The audit focused on timestamp integrity, event sequencing accuracy, and synchronization consistency across distributed logging systems.

Routine timestamp verification identified minor discrepancies in event logging at Sites 3-A, 7-C, and 12-B. Discrepancies were consistent with known clock drift characteristics in legacy hardware systems and were corrected through NTP server updates and manual re-indexing procedures.

Three entries required re-indexing following correction procedures. Notably, corrected timestamps for these entries now precede the original deployment dates of the affected logging equipment by intervals ranging from 18 to 72 hours. This outcome is under review. Equipment procurement records and installation logs have been requested for secondary verification.

No operational impact identified. Standard monitoring protocols remain in effect.

## 1. Audit Scope and Methodology

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### ***1.1 Objective***

The annual data reconciliation audit verifies timestamp accuracy and event sequence integrity across all Static Research Network monitoring facilities. The audit ensures that distributed logging systems maintain consistent temporal references and that cross-site analysis efforts operate with reliable time-series data.

### ***1.2 Facilities Included***

- Site 3-A (Pacific Northwest)
- Site 7-C (Midwest)
- Site 12-B (Southwest)
- North Array (Multi-site coordination)

### ***1.3 Review Period***

1 January 2025 – 30 November 2025

## **1.4 Methodology**

Audit procedures included:

- Automated timestamp verification against external NTP reference sources
- Cross-site event correlation to identify sequence inconsistencies
- Manual review of flagged entries
- Hardware timing system diagnostics
- Log file integrity verification

## **2. Findings**

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### **2.1 Routine Discrepancies**

Timestamp verification identified minor discrepancies consistent with anticipated clock drift in legacy hardware systems:

#### **Site 3-A:**

- 47 entries with drift  $\pm 15$  seconds
- Average drift: +8.3 seconds
- Corrected via NTP synchronization

#### **Site 7-C:**

- 62 entries with drift  $\pm 20$  seconds
- Average drift: -11.7 seconds
- Corrected via NTP synchronization

#### **Site 12-B:**

- 31 entries with drift  $\pm 12$  seconds
- Average drift: +4.9 seconds
- Corrected via NTP synchronization

All routine discrepancies fall within expected parameters for aging timing hardware and were resolved through standard correction protocols.

## ***2.2 Re-indexing Requirements***

Three log entries required manual re-indexing following NTP correction procedures:

### **Entry 1:**

- Original timestamp: 17 March 2025, 14:22 UTC
- Corrected timestamp: 15 March 2025, 20:18 UTC
- Site: 7-C
- Event type: Equipment initialization

### **Entry 2:**

- Original timestamp: 3 August 2025, 09:45 UTC
- Corrected timestamp: 1 August 2025, 06:12 UTC
- Site: 12-B
- Event type: Calibration completion

### **Entry 3:**

- Original timestamp: 22 September 2025, 11:03 UTC
- Corrected timestamp: 19 September 2025, 16:47 UTC
- Site: 3-A
- Event type: Data logging activation

## ***2.3 Anomalous Outcome***

Following re-indexing procedures, corrected timestamps for all three entries now precede the documented deployment dates of the affected logging equipment:

- Entry 1 corrected timestamp: 15 March 2025, 20:18 UTC  
Equipment deployment (per procurement records): 17 March 2025, 08:00 UTC  
Discrepancy: -36 hours
- Entry 2 corrected timestamp: 1 August 2025, 06:12 UTC  
Equipment deployment (per installation logs): 2 August 2025, 13:30 UTC  
Discrepancy: -31 hours
- Entry 3 corrected timestamp: 19 September 2025, 16:47 UTC  
Equipment deployment (per facility records): 22 September 2025, 10:00 UTC  
Discrepancy: -65 hours

This outcome is inconsistent with expected system behavior. Logging equipment cannot generate event records prior to physical installation and network initialization.

## 3. Verification Steps Undertaken

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### ***3.1 Procurement Record Review***

Equipment procurement documentation was reviewed for all three affected items. Delivery dates, installation schedules, and activation timestamps are consistent with facility records. No discrepancies identified in procurement chain documentation.

### ***3.2 Installation Log Cross-Reference***

Physical installation logs confirm equipment deployment dates as documented. Personnel schedules and facility access records corroborate installation timelines. No anomalies detected.

### ***3.3 NTP Correction Algorithm Verification***

NTP correction algorithms were reviewed for potential systematic errors. Test cases using known reference timestamps returned expected results. No algorithmic faults identified.

### ***3.4 File System Metadata Analysis***

File system metadata for affected log entries shows creation timestamps consistent with the original (uncorrected) dates. Metadata does not reflect corrected timestamp values, indicating that corrections were applied at the data interpretation layer rather than file creation layer.

## 4. Ongoing Review

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The outcome described in Section 2.3 is under review by Technical Oversight. Additional verification steps have been requested:

1. Secondary procurement record audit
2. Facility surveillance footage review (where available)
3. Equipment serial number verification against manufacturing dates
4. Expanded temporal analysis of adjacent log entries

Results from these additional verification steps will be documented in a supplementary audit report scheduled for Q1 2026.

## 5. Operational Impact

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No operational impact has been identified. All monitoring systems continue to function within expected parameters. Data collection, storage, and analysis processes remain unaffected. Standard monitoring protocols remain in effect.

The temporal discrepancies documented in this report do not compromise ongoing research activities or data integrity for current observational programmes.

## 6. Recommendations

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1. Complete secondary verification steps outlined in Section 4
  2. Monitor for similar temporal anomalies during Q1 2026 reconciliation cycle
  3. Consider hardware timing system upgrades at affected sites
  4. Maintain enhanced logging for equipment deployment and initialization events
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### **Audit Team**

- Lead Auditor: Data Integrity Division
- Technical Review: Site Coordination Office
- Quality Assurance: Archive Management

### **Distribution:**

- Site Coordinators (3-A, 7-C, 12-B, North Array)
- Archive Management
- Technical Oversight
- Central Coordination