

ENV-ES-MAQ-405.0

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2016**Environment, Safety, Health Directorate****Environmental Protection – Environmental Stewardship
Quality Procedure****Meteorology Tower Site Inspections****Reviewers:**

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| Meteorology Tower Site Inspections | No. ENV-ES-MAQ-405.0 | Page 2 of 8 |
| Effective Date: | | |

History of Revisions

| Document Number <i>[Include revision number, beginning with Revision 0]</i> | Effective Date <i>[Document Control Coordinator inserts effective date]</i> | Description of Changes <i>[List specific changes made since the previous revision]</i> |
|---|---|--|
| 0 | 03/13 | New Document. |

Table of Contents

| | | |
|------------|---|----------|
| 1.0 | PURPOSE | 4 |
| 2.0 | SCOPE | 4 |
| 2.1 | Hazard review | 4 |
| 3.0 | RESPONSIBILITIES | 4 |
| 3.1 | Prerequisites..... | 4 |
| 4.0 | DOCUMENT CONTROL/RECORDS MANAGEMENT | 5 |
| 5.0 | WORK PROCESSES | 5 |
| 5.1 | Monthly Inspections | 5 |
| 5.2 | Annual Monitoring Site Inspection | 5 |
| 6.0 | REFERENCES | 6 |
| 7.0 | DEFINITIONS | 6 |
| 8.0 | ATTACHMENTS | 6 |
| | Attachment 1- Meteorology Tower Site Monthly Inspection Checklist | 7 |
| | Attachment 2- Meteorology Tower Site Annual Inspection Checklist | 8 |

| | | |
|------------------------------------|----------------------|-------------|
| Meteorology Tower Site Inspections | No. ENV-ES-MAQ-405.0 | Page 4 of 8 |
| | Effective Date: | |

1.0 PURPOSE

This Environmental Stewardship Group (ES) procedure describes the routine inspection of meteorology monitoring sites and equipment required to assure representative monitoring of meteorological conditions. Annual site inspection is recommended by ANSI/ANS-3.11-2005 (ANS 2010) and EPA (EPA 1999) for conformance to siting requirements. Trees and shrubs can grow over time to impact measurements. More frequent inspection is recommended by EPA (EPA 1999) and based on ENV-ES operating experience to identify signs of instrument or tower damage and wear and to perform routine cleaning of selected instruments.

2.0 SCOPE

This document applies to ENV-ES personnel doing work on the meteorology monitoring network.

2.1 HAZARD REVIEW

The work described in this procedure is office work only and has a **LOW hazard** rating as documented by submittal of a completed [ENV Low Hazard Verification form](#) to the Quality Assurance Specialist.

Work is performed in a field environment with the typical outdoor environmental weather hazards including trip, slip, and fall hazards. The hazard assessment has confirmed there are no biosafety, radiological or electrical energy hazards specific to the activities called out in this procedure.

3.0 RESPONSIBILITIES

The following personnel require training before implementing this procedure:

- ENV-ES meteorology instrument technician
- ENV-ES identified meteorology support personnel
- ENV-ES meteorologist

The training method for this procedure is documented in accordance with [ENV-DO-QP-115, Personnel Training](#). Annual retraining is required and will be by self-study (“reading”) training.

Actions specified within this procedure, unless proceeded with “should” or “may,” are to be considered mandatory (i.e., “shall”, “will”, “must”).

3.1 PREREQUISITES

None

4.0 DOCUMENT CONTROL/RECORDS MANAGEMENT

The following records are maintained in accordance with [ENV-DO-QP-110, Records Management Program](#):

- Completed monthly and annual inspection checklists

5.0 WORK PROCESSES

5.1 BI-MONTHLY INSPECTIONS

Every other month, access permitting, each meteorology tower site shall be inspected and the results recorded on the bi-monthly inspection form (Attachment 1). For time efficiency, site inspections should be combined, when possible, with other routine site work. The following steps should be completed:

| Step | Action |
|------|---|
| 1 | Perform a visual inspection of the instruments. With 50x binoculars identify on attachment 1 any damage or wear identified. All instruments should be visually inspected for physical damage and observed for anomalies in operation. |
| 2 | Clean the sensor surfaces of the solar radiation instruments. Clean the surfaces of solar panels. Inspect the collection funnels & buckets of the tipping bucket rain Gauges for debris and remove as necessary. |
| 3 | For the PIR solar radiation instruments change the batteries each month to maintain consistency in measurements. |
| 4 | Assess the working area around the monitoring site for small shrubs and potential tripping hazards; remove the shrubs and hazards as necessary |
| 5 | Operate, maintain, and inspect the Meteorology Tower Carriage/Hoisting Systems following LANL P101-25 and Standing Order UI-SO-012-R0. |
| 6 | Perform general site housekeeping clean-up, removing downed tree limbs & trash that has accumulated at the site. |

5.2 ANNUAL MONITORING SITE INSPECTION

On an annual basis, during the spring, each meteorology tower site shall be inspected and the results recorded on the annual inspection form (Attachment 2).

The following steps should be completed:

| Step | Action |
|------|---|
| 1 | Obstruction Monitoring- in each wind direction sectors (e.g. N, NNE, NE, etc.), measure the height of nearby obstacles (trees, shrubs, buildings, etc.) which are 5m in height or greater. The separation between the tower and the obstruction should be 10 times the obstruction height. For objects with cross-section dimension of less than 1 m (utility pole or small trees), the separation can be 5 times the height of the obstruction. If trees or shrubs do not meet these criteria make arrangements for them to be cut. |

| | |
|---|---|
| | NOTE: It may not be possible to achieve this goal in canyon locations and any deviations will be documented in the site descriptions of the Meteorology Monitoring Plan. |
| 2 | Impact Monitoring- assess locations within 30 m of surface temperature and humidity measurements for asphalt, concrete, and heat/moisture sources (EPA 1999). If these sources are identified, take action to remove these sources, or consider relocating the instruments. |
| 3 | Impact Monitoring- in each wind direction, measure the distance from the rain Gauges to nearby obstructions and the height of the obstructions. The distance to obstructions should be four times the height of the obstruction. If trees and shrubs are of greater heights, take action to cut these trees and shrubs. |
| 4 | Contact the Los Alamos County open space coordinator to request that he visit the North Community rain Gauge for inspection and cleaning. |

6.0 REFERENCES

- ANS 2010: American Nuclear Society, “Determining meteorological information at nuclear facilities,” ANS Standard ANSI/NAS-3.11-2005 (R2010), December 23, 2010
- EPA 1999: Environmental Protection Agency, “Meteorological Monitoring Guidance for Regulatory Modeling Applications,” EPA-454/R-99-005, February 2000.

7.0 DEFINITIONS

None

8.0 ATTACHMENTS

Attachment 1- Meteorology Tower Site Bi-monthly Inspection Checklist

Attachment 2- Meteorology Tower Site Annual Inspection Checklist

[Click here for “Required Read” credit.](#)

ATTACHMENT 1- METEOROLOGY TOWER SITE BI-MONTHLY INSPECTION CHECKLIST

| Site and Tasks | Date | Notes/Findings |
|---|------|------------------------------------|
| <u>TA-5, MDCN</u> INSTRUMENT & SOLAR PANEL VISUAL INSPECTIONS MONTHLY HOIST INSPECTION (FORM 1591) BATTERY & SOLAR PANEL VOLTAGE MEASUREMENTS CLEAN RADIATION INSTRUMENT DOMES & PV PANELS | | |
| <u>TA-6</u> INSTRUMENT & SOLAR PANEL VISUAL INSPECTIONS MONTHLY HOIST INSPECTION (FORM 1591) SOLAR PANEL VOLTAGE MEASUREMENTS CLEAN RADIATION INSTRUMENT DOMES & PV PANEL REPLACE PIR INSTRUMENT BATTERIES INSPECT RAIN GAUGE FOR DEBRIS INSPECT SNOW GAUGE REF. SURFACE FOR GRASS GROWTH FUEL MOISTURE MONITORING SITE INSPECTION | | |
| <u>TA-41</u> INSTRUMENT VISUAL INSPECTIONS CLEAN 8-48 RADIATION INSTRUMENT DOME MONTHLY HOIST INSPECTION (FORM 1591) | | SPRING FLOOD ACCESSIBILITY CONCERN |
| <u>TA-49</u> INSTRUMENT VISUAL INSPECTIONS CLEAN 8-48 RADIATION INSTRUMENT DOME CLEAN SOLAR PANEL MONTHLY CARRIAGE INSPECTION (FORM 1591) INSPECT RAIN GAUGE FOR DEBRIS SOLAR PANEL VOLTAGE MEASUREMENT | | SHORT LADDER REQUIRED |
| <u>TA-53</u> INSTRUMENT VISUAL INSPECTIONS CLEAN 8-48 RADIATION INSTRUMENT DOME MONTHLY CARRIAGE INSPECTION (FORM 1591) INSPECT RAIN GAUGE FOR DEBRIS | | |
| <u>TA-54</u> INSTRUMENT VISUAL INSPECTIONS CLEAN 8-48 & PIR RADIATION INSTRUMENT DOMES CHANGE BATTERIES IN PIR INSTRUMENTS MONTHLY CARRIAGE INSPECTION (FORM 1591) INSPECT RAIN GAUGE FOR DEBRIS | | |

ATTACHMENT 2- METEOROLOGY TOWER SITE ANNUAL INSPECTION CHECKLIST

| Site and Tasks | Date | Notes/Findings |
|---|------|----------------|
| <p><u>TA-5, MDCN</u> HEIGHT AND LOCATION TO NEARBY OBSTACLES FOR WIND SENSORS LOCATION OF NEARBY ASPHALT OR CONCRETE FOR TEMPERATURE AND HUMIDITY SENSORS</p> | | |
| <p><u>TA-6</u> HEIGHT AND LOCATION TO NEARBY OBSTACLES FOR WIND SENSORS LOCATION OF NEARBY ASPHALT OR CONCRETE FOR TEMPERATURE AND HUMIDITY SENSORS HEIGHT AND LOCATION TO NEARBY OBSTACLES FOR RAIN GAUGE</p> | | |
| <p><u>TA-41</u> HEIGHT AND LOCATION TO NEARBY OBSTACLES FOR WIND SENSORS LOCATION OF NEARBY ASPHALT OR CONCRETE FOR TEMPERATURE AND HUMIDITY SENSORS HEIGHT AND LOCATION TO NEARBY OBSTACLES FOR SOLAR RADIATION MONITORING SENSORS</p> | | |
| <p><u>TA-49</u> HEIGHT AND LOCATION TO NEARBY OBSTACLES FOR WIND SENSORS LOCATION OF NEARBY ASPHALT OR CONCRETE FOR TEMPERATURE AND HUMIDITY SENSORS HEIGHT AND LOCATION TO NEARBY OBSTACLES FOR RAIN GAUGE HEIGHT AND LOCATION TO NEARBY OBSTACLES FOR SOLAR RADIATION MONITORING SENSORS</p> | | |
| <p><u>TA-53</u> HEIGHT AND LOCATION TO NEARBY OBSTACLES FOR WIND SENSORS LOCATION OF NEARBY ASPHALT OR CONCRETE FOR TEMPERATURE AND HUMIDITY SENSORS HEIGHT AND LOCATION TO NEARBY OBSTACLES FOR RAIN GAUGE HEIGHT AND LOCATION TO NEARBY OBSTACLES FOR SOLAR RADIATION MONITORING SENSORS</p> | | |
| <p><u>TA-54</u> HEIGHT AND LOCATION TO NEARBY OBSTACLES FOR WIND SENSORS LOCATION OF NEARBY ASPHALT OR CONCRETE FOR TEMPERATURE AND HUMIDITY SENSORS HEIGHT AND LOCATION TO NEARBY OBSTACLES FOR RAIN GAUGE HEIGHT AND LOCATION TO NEARBY OBSTACLES FOR SOLAR RADIATION MONITORING SENSORS</p> | | |
| <p><u>NORTH COMMUNITY RAIN GAUGE</u> INSPECT RAIN GAUGE FOR DEBRIS</p> | | |