Weekly Generator Run Test

This standard operating procedure has an effect on the following critical infrastructure systems:

* Emergency diesel generators
* SquareD PLC switchboard
* Building Management System
* Lockout/tagouts

# References

## Authorization

## Training/Certification

## Equipment/Information

## Policies

## Related Documents

* + Vendor Service Agreements
  + Generator Operating Manual
  + Safety Policy and Supporting Administrative Procedures
  + Critical Facility Work Rules

# Security Considerations

This document describes the procedure for data center personnel to perform the Weekly Generator Run Test. Qualified technicians perform this procedure to test the operation of the emergency generators. Engineering operations technicians, electricians, DCEO facility managers, and the Alban Cat technicians are qualified for this procedure.

# Procedure Overview

1. Notify the team.
2. Assemble the test team:
3. Do final checks before the test
4. Do the generator run test.

# Initial Actions

## Notify the team

1. Before you start the test, email the DCEO Facility Manager and the data center cluster engineering team.
2. Tell them that the generator test is about to start and that they should ignore alarms related to the generator during the test.

## Get the following team together

* Data Center Operations Technician
* Alban CAT Technician
* Electrician
* DCEO Facility Manager

## Do final checks before test

1. Verify lock out tags are properly placed and secured.
2. Verify the generator indicates a **No Load** status on the PLC Switchboard.
3. Verify the generator light indicates **Available**.
4. Verify the Building Management System (BMS) operating display matches the generator display.
5. Complete the *SOP Schedule Information* *Checklist* in this document.
6. Inventory all necessary parts and tools before you start the generator test.

**NOTE:** The Alban Cat generator technician will not do the maintenance unless all parts and tools are on site.

The Alban Cat generator technician will do the following maintenance and prestart checks on the generators--one unit at a time:

**NOTE:** The Alban technician will examine, clean, measure, and replace (as necessary) all applicable components and instrumentation for proper generator operation--as written in the generator’s operating and maintenance manual.

**Important:** Record any discrepancies or corrective actions you or other technicians make in the *Comment* section of this SOP.

## Do the Generator Run Test

**Important:** Do not perform any steps of the procedure out of sequence.

1. The Data Center Operations Technician and the Alban CAT Technician complete the following *Prestart Checklist* together.

**Important:** Record any discrepancies or corrective actions you or other technicians make in the *Comment* section at the end of this SOP.

1. The assembled team members work through and complete the test as directed in the following *Generator Test Checklist*.

**Important:** If any problem or failure occurs while doing this procedure, STOP all work and skip to the following *Backout procedure*.

1. The assembled team members work through and complete the following *Weekly Generator Run SOP Completion Sign-Off Checklist.*
2. The DCEO Facility Manager sends the completed checklists to the Area Manager.

Backout procedure

1. The Engineering Operations Technician tells the DCEO Facility Manager and the upper chain of command immediately what has happened.
2. The Engineering Operations Technician and the Alban Cat Technician safely stabilize the generator and clear all tools and personnel from the generator work area.
3. If a temporary generator is required, tell the Facility Manager, Area Manager and Regional Manager immediately.
4. Determine why the generator or component failed and return it to service as soon as possible. Corrective actions will be taken to restore the failed generator or component ASAP.
5. After all systems have recovered, the test team will make an evaluation, then restart or reschedule the generator testing.

# Checklists

This section contains the following checklists:

* SOP Schedule Information
* Prestart
* Generator Test
* Weekly Generator Run SOP Completion Sign-Off

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Generator Details Schedule Information** | | | | | |
| SOP Information: | Expected Run Dates: | SOP Work Time Frame: | **USB\_\_\_\_\_\_\_\_\_** | **MSB\_\_\_\_\_\_\_\_\_** | **Data Center \_\_\_\_\_\_\_\_\_\_** |
| ) |  |  |  |  |
| Equipment Information: | Manufacturer: | Equipment ID: | Model #: | KW : | |
|  |  |  |  | |
|  | |  |  | |

**Important: Important**: The Operations Technician performs the Prestart Checklist with the Alban CAT Technician present.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Prestart Checklist** | | | **AMZN** | **ALBN** |
| 1. Verify that the generator control switches are set to the **Auto** position. | Starting Time- 1 | Ending Time- 2 | *Initial* | *Initial* |
| 1. Verify that enclosure lights operate (if the generator lights are off it’s likely that the shore power breaker has tripped). |  |  |  |  |
| 1. Verify that the generator Annunciator Control Panel has no active alarms. | | |  |  |
| 1. Do a visual inspection of the generator and look for any obvious damage or discrepancies. | | |  |  |
| 1. Record generator engine run hours: **Hours** \_\_\_\_\_\_\_\_\_\_ | | |  |  |
| 1. Verify the generator **Output Breaker** is set to the **CLOSED** position for permanent units. | | |  |  |
| 1. Record fuel level: \_\_\_\_\_\_\_\_\_  **Note:** If fuel level is below 85%, inform the facility manager to arrange to add fuel. | | |  |  |
| 1. Verify generator oil level is between the *FULL* and *ADD* marks on the engine oil dipstick (Inform Alban Cat to add oil as necessary).  * Was oil added to the engine?  YES  NO * Record type of oil added: \_\_\_\_\_\_\_\_\_\_ Record amount of oil added: \_\_\_\_\_\_\_\_\_\_ | | |  |  |
| 1. Do a visual inspection of the generator air filters and restriction gauges look for any obvious damage or discrepancies | | |  |  |
| 1. Examine all hoses and ensure they are tight, are not brittle or weak, and have no cracks or leaks.  * Are the hoses in satisfactory condition?  YES  NO | | |  |  |
| 1. Verify all hose clamps are tight.  YES  NO  * Did any hose clamps require tightening?  YES  NO | | |  |  |
| 1. Verify fan and alternator belts have proper tension and condition.  YES  NO  * Did any belts require adjustment or replacement?  YES  NO | | |  |  |
| 1. Examine piping and verify there are no leaks.  * Is the piping in satisfactory condition?  YES  NO | | |  |  |
| 1. Examine batteries and ensure they are in satisfactory condition.  Discolored cables or lugs require cleaning and tightening.  * Is any battery discoloration present?  YES  NO * Are all battery system components in satisfactory condition?  YES  NO * Did any connections require tightening?  YES  NO | | |  |  |
| 1. Verify and record generator battery installation dates here. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | |  |  |
| 1. Verify battery charger is operating properly.  YES  NO  * Is the battery charger voltage above 24 volts?  YES  NO | | |  |  |
| 1. Record battery charger output voltage: \_\_\_\_\_\_\_\_\_\_ VDC | | |  |  |
| 1. Push the **Lamp Test** button on the generator engine control panel and verify all lights come on.  * Did all the lights come on during the lamp test?  YES  NO | | |  |  |
| 1. Examine the block heaters and make sure the heaters are working properly.  Normally, the engine block section is always warm to the touch.  * Record coolant temperature: **\_\_\_\_\_\_\_\_** * Is the block heater is operating properly; normal range is 110-140 degrees?   YES  NO | | |  |  |
| 1. Examine radiator and make sure there are no leaks or clogged fins.  * Are the radiator and fins in satisfactory condition?  YES  NO | | |  |  |
| 1. Verify coolant level is adequate for engine operation.  YES  NO  * Did the engine require coolant added?  YES  NO * Record type of coolant added: \_\_\_\_\_\_\_\_\_ Record coolant to water ratio: \_\_\_\_\_\_\_\_\_ % * Record amount of coolant added: \_\_\_\_\_\_\_\_\_\_ | | |  |  |
| 1. Verify the exhaust outlet is clear and ensure that the silencer and piping are tight and in satisfactory condition.  * Are exhaust components in satisfactory condition?  YES  NO | | |  |  |
| 1. Alban Cat Generator Technician must verify that all components have been examined, and cleaned.  YES  NO  * Is the generator ready for testing?  YES  NO | | |  |  |
| 1. Verify all tools and excess materials are removed from the generator and the enclosure.   YES  NO | | |  |  |
| 1. Send the facility manager to monitor the Building Management System  YES  NO   **Note:** The EOT must stay with Alban Cat Technician at the generator yard at all times and record generator run readings. | | | |  |
| 1. Send the electrician to the Electric Room to monitor the PLC switchboard.  YES  NO | | | |  |
| 1. The electrician must verify that the *Generator Available* light is lit while the generator is running.   YES  NO | | | |  |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Generator Test Checklist** | | | | | | | | | | | |
|  | | | | | | | | | | | ***Initial*** |
| 1. At the switchboard make sure the Generator Control Key is set to **Auto**.  YES  NO   **Tip:** Use the generator Battle Switch to run  YES  NO | | | | | | | | | Time | |  |
| 1. Verify generator starts and is running properly.  YES  NO | | | | | | | | | | |  |
| 1. Verify that all radiator fans on 3- MEG generators are on and operate.  YES  NO | | | | | | | | | | |  |
| 1. Verify that the generator Dampers are open.  YES  NO | | | | | | | | | | |  |
| 1. Confirm with the electrician at the PLC switchboard to verify that the Generator Available light is lit.  YES  NO | | | | | | | | | | |  |
| 1. After 5 minutes of operation, the EOT must record the following generator operating data under the supervision of the Alban Cat Technician. | | | | | | | | | | | |
| **Run Hours** | **Oil Pressure**  **&**  **Oil Temp** | **Coolant Temp.** | **Fuel Pressure** | **Volts** | **RPM** | **Freq.** | **Fuel Cons Rate** | **Oil Leaks present?** | | **Coolant Leaks present?** | |
|  | **---------------PS.I.** |  |  | **Phase-A-B**  **Phase-B-C**  **Phase-C-A** | Phase- |  |  |  | |  | |
| **----------------Deg** |
|  | | | | | | | | | | | ***Initial*** |
| 1. Verify the following:   The Alban Cat Technician verified that all the necessary readings have been recorded.   YES  NO  The electrician confirmed that all the necessary check points at the PLC are complete.   YES  NO  Facility Manager confirmed that BMS checks points are complete.   YES  NO  The Operations Technician sets the generator Battle Switch to the **OFF** position.   YES  NO | | | | | | | | | Time | |  |
| 1. The generator’s run time should not exceed 5 minutes.  YES  NO | | | | | | | | | | |  |
| 1. Verify that there are no active alarms on the generator panel.  YES  NO | | | | | | | | | | |  |
| 1. Verify the generator Main Output Breaker is set to the **CLOSED** position.  YES  NO | | | | | | | | |  | |  |
| 1. Verify that the generator fan breakers did not trip.  YES  NO | | | | | | | | |  | |  |
| 1. Verify that the generator Block Heater Breaker did not trip.  YES  NO | | | | | | | | |  | |  |
| 1. Verify that the enclosure door is closed.  YES  NO | | | | | | | | |  | |  |
| 1. The EOT has ensured that all required work is completed and satisfactory.   YES  NO | | | | | | | | | Time | |  |
| 1. Verify that the generator area is clean of debris and trash.   YES  NO | | | | | | | | | | |  |
| 1. The DCEO Facility Manager must ensure that all *Sign Off* sections and *yes/no* blocks are recorded properly.  YES  NO | | | | | | | | | | |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | | |
|  | | |  |
|  | |  |  |
|  | | |  |
|  | | |  |
|  | | |  |
|  | | |  |
|  | | |  |
|  | | |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Weekly Generator Run SOP Completion Sign-Off Checklist** | | | |
| *SOP Supervisor Completion:* | *Engineering Operations Technician Name:* | *Technician Signature:* | *Date:* |
|  |  |  |
|  |  |  |
| *Comments:* |  | | |
|  |  | | |
| *Alban Completion:* | *Alban Cat Technician Name:* | *Technician Signature:* | *Date:* |
|  |  |  |
|  |  |  |
| *Comments:* |  | | |
|  |  | | |
| *Power Solutions*  *Acceptance:* | *Electrician Name:* | *Electrician Signature:* | *Date:* |
|  |  |  |
|  |  |  |
| Facility Manager Acceptance: | *Facility Manager Name:* | *Facility Manager Signature:* | *Date:* |
| Area Manager  Approval | *Area Manager Name:* | *Area Manager Signature:* | *Date:* |
| *Comments:* |  | | |
|  |  | | |

# Comments

|  |
| --- |
| **Generator Issues for Follow-Up** |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |

## Document Properties

|  |  |
| --- | --- |
| **Property** | **Value** |
| Site Code | DCA |
| Filename | dca\_dceo\_sop\_weekly-generator-run-test |
| Title | Weekly Generator Run Test |
| Version number/Date version published | Draft |
| Doc Type | PM |
| Zone | Region |
| Technical Owner | swilleye@ |
| Technical Writer | beelliot@ |
| Affected Equipment | Emergency diesel generators  SquareD PLC switchboard  Building Management System |
| Sensitivity rating | Amazon Confidential |
| Origin | Commercial version |
| URL | TBD |
| Physical location | TBD |
| Audience | EOT |
| Renewal date | 1/1/15 |

## Status

|  |  |  |
| --- | --- | --- |
| **Status** | **Date mm/dd/yy** | **Approver/Reviewer Name** |
| Original filed | 1/1/14 | NA |
| Writer sent to SME for review | 1/1/14 | NA |
| SME sent to Writer | 1/1/14 | NA |
| Writer sent to SME for approval |  | NA |
| SME approved |  |  |
| Writer copy edited |  | NA |
| Site Manager approved |  |  |
| Regional Manager approved |  |  |
| Writer published |  | NA |