STARTUP / SHUTDOWN / MALFUNCTION PLAN

LEON COUNTY

SOLID WASTE MANAGEMENT FACILITY

Pursuant to state and federal regulations (CFR 40-63.6 (e) (3)) Leon County has developed a startup, shutdown, malfunction (SSM) Plan for the landfill gas flare system.

SYSTEM EQUIPMENT

The Shaw LFG Specialties, L.L.C. Candle (Utility) Flare Model CF62016 has been designed and constructed for the controlled combustion of landfill gas. During this process, the combustion temperature is controlled to ensure the efficient removal of pollutants and prevent their release in the atmosphere. The major components of the flare system are listed below.

Control Panels

The Flare is equipped with a *Main Control Panel* and a *Main Power Panel*. The main control and the main power panels are mounted together on a pedestal on one side of the flare operation skid.

- The **main control panel** houses the components that control the operation of the flare and provides the signaling capability to other areas as to the status of the flare operation.
- The **main power panel** houses the disconnect switch along with high voltage electrical connections, protection, and control devices.

Programmable Logic Controller (PLC)

The PLC monitors the parameters of the process and automatically controls the operation of the flare system. Sensors and instruments within the flare system are attached to the input modules of the PLC while the control devices and actuators are attached to the output modules of the PLC. The PLC has been programmed to safely operate the flare system based on operator selections and process input parameters as measured by the sensing instruments.

Flame Safeguard System

The Flame Safeguard System is programmed to safely operate the flare system based on process input parameters as measured by the sensing instruments. The flame safeguard system consists of the flame safeguard control in conjunction with a flame detection sensor. The flame safeguard controls the ignition system, pilot fuel solenoid valve(s), and landfill gas valve(s). The flame detection sensor detects the presence of flame and provides this signal to the flame safeguard for safe operation of the combustion process.

Alarm Enunciator

An alarm annunciator is mounted to the swing-out panel behind the glass window on the door of the main control panel. It serves to inform system operators of conditions which may lead to an automatic shutdown of the system.

Pilot Assembly

The pilot assembly provides a fuel source to ignite the burner during flare start-up. The pilot assembly consists of fuel tanks, instrumentation, spark generator, and igniter.

Landfill Gas Inlet Valve

The landfill gas inlet valve is pneumatically and electronically controlled and controls the flow of landfill gas to the burner. It operates in a fail-safe manner to close and prevent the release of landfill gas upon loss of power or other shutdown alarm conditions.

Thermocouple

A thermocouple is installed at the upper part of the stack to provide temperature-indicating signals to the temperature controller, via a temperature transmitter within the ignition enclosure mounted lower on the candle supports.

Blower

The blower provides the means to extract, under negative pressure, the LFG from the landfill. The gas compresses and is discharged into the flare to be disposed of by controlled combustion.

Knockout Pot (KO Pot)

The KO Pot provides moisture and particulate separation and collection of the incoming LFG from the field.

Flow Meter

The flow rate of the flare is monitored by an orifice plate flow meter and the data is transmitted to the chart recorder for display and data storage.

OPERATION

- The Flare system is electrically activated and automatically enters a standby mode when the main disconnect switch is turned on.
- The flare system is designed for ***manual*** or ***automatic*** start.
- Selection of manual or automatic start is made via the "TIME-OFF-AUTO" selector switch.
- The default condition for the Flare system is for ***automatic start***.

STARTUP PROCEDURE

For the purposes of this SSM Plan, a "*Startup*" will be defined *as the setting in operation of the flare system.*

The manual start-up process is initiated by momentarily pressing the "PUSH TO START" button on the main control panel. The automatic startup is initiated via an electronic start-up signal. Upon startup initiation the flare system executes the following sequences prior to switching to its normal mode of operation.

- Pilot Ignition Cycle
  - The pilot solenoid valve and the igniter are automatically and simultaneously activated in order to establish a pilot flame inside the stack.
  - There is a 10 second window in which the pilot flame has to be established by its detection by the flame detection sensor.
  - If the flame detection sensor does not detect a flame, the system enters a "Start-up Flame Failure" mode and automatically shuts down.
  - Once the "Start-up Flame Failure" mode is entered, the pilot is automatically turned off after the expiration of the programmed time period.
- Landfill Gas Inlet Valve Opening and Blower Activation
  - Once the pilot flame is established the landfill gas valve is automatically opened, and the blower motor is started.
  - The tripping of the limit switch within the pneumatic actuator is a sign of proper operating conditions.
  - The flare enters normal operating mode once the blower has started.

NORMAL OPERATION

- The flame detection sensor continuously monitors the presence of flame.
- The thermocouple monitors the flame temperature.
- The chart recorder continuously records operating parameters (temperature, flow rate, etc.).
- The flare system will continue to operate normally until abnormal conditions are encountered. Abnormal conditions include loss of flame, high or low temperature, or system component failure.
- Abnormal operating conditions will cause the system to automatically execute a shutdown procedure and will activate the alarm annunciator.

SHUTDOWN PROCEDURE

For the purposes of this SSM Plan, a "Shutdown" will be defined *as the cessation of operation of the flare system for any purpose.*

- *Manual* system shutdown can be accomplished by
  - Pushing the emergency shutdown switch.
  - Changing the position of the "Time-Off-Auto" switch to "off."
- *Automatic* system shutdown occurs when the system encounters and senses abnormal operating conditions
- During system shutdown the following actions occur
  - The gas inlet valve is closed
  - The gas pilot valve is closed
  - The alarm annunciator panel will display the reason for the shutdown.

MALFUNCTION PROCEDURES

For the purposes of this SSM Plan, a "Malfunction" will be defined *as any sudden, infrequent, and not reasonably preventable failure of the flare system. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.*

All malfunction events must be recorded (see: the SSM event form) and reporting requirements must be followed. Reporting requirements differ based on whether the actions taken to correct a malfunction were consistent or inconsistent with the SSM Plan. Reference the reporting section of the SSM Plan for these requirements.

SSM EVENT 1	
SSM Event	Power spiking of the flare electrical system.
SSM Event Description	Power supply to the flare system is interrupted due to lightening or electrical system surges that cause the flare system to sense abnormal operating conditions. This event will cause an automatic shutdown of the flare system.
Corrective Action	Once the flare system has completely executed the automatic shutdown process and system parameters (i.e., temperature) have returned to acceptable values, the flare system will enter automatic startup mode. If the automatic startup process is unable to re-initiate operation of the flare, the system will enter the "Startup Flame Failure Mode". Once the system enters this mode a manual restart of the system is required (see Startup Procedure of this SSM Plan).

SSM EVENT 2	
SSM Event	Condensate buildup in the flare system components
SSM Event Description	Condensate buildup in the flare system components or the landfill gas line leading to the flare system. Buildup of condensate in the Knockout Pot or the landfill gas line or sump leading to flare system will prevent landfill gas from reaching the flare for combustion.
Corrective Action	Initiate a shutdown of the flare system. Investigate the liquid levels via the sight-glass in the water trap and KO Pot that trap and collect condensate from the landfill gas collection system. If the liquid levels are significant, open the drain valves and allow the fluid to drain from the system components. Initiate the flare startup procedure and determine whether corrective action was successful. If flare system does not ignite, this is an indication of the condensate buildup (or other blockage) in the sump and/or the landfill gas line leading to the flare system. With the flare system shutdown, the sump pump(s) should be investigated for their operational status. Malfunctioning pumps should be replaced and the collected leachate in the sump discharged to the leachate collection system. If pumps are operating normally, the landfill gas line leading to the flare system may be blocked. The line should be cleaned to remove the obstruction and clear the line for normal landfill gas flow. The manual flare startup procedure should be initiated.

SSM EVENT 3	
SSM Event	Air compressor failure.
SSM Event Description	Air compressor malfunction leading to pneumatic failure of the gas inlet valve remaining in the open position. An automatic or manual shutdown following this failure can result in an improper flare system shutdown and cause excess emissions. This condition may also result in a "Startup Flame Failure" condition preventing automatic or manual startup of the flare system.
Corrective Action	The system should be shutdown and the air compressor motor and components evaluated for the cause of failure. Malfunctioning or failed components are to be replaced with new, operating components and compressor maintenance performed to ensure proper operation of the air compressor. Once completed, the system should be manually started and the air compressor checked for proper operation.

SSM EVENT 4	
SSM Event	Blower failure.
SSM Event Description	Blower failure will lead to a vacuum not being pulled on the system. Unless significant positive pressure exists in the landfill gas collection system or the flare combustion is able to entrain significant flow from within the system, combustion at the flare will not be supported.
Corrective Action	The system should be shutdown and the blower motor and components evaluated for the cause of failure. Malfunctioning or failed components are to be replaced with new, operating components and blower maintenance performed to ensure proper operation of the unit. Once completed, the system should be manually started and the blower checked for proper operation.

SSM EVENT 5	
SSM Event	Adverse weather conditions, specifically high wind and rain.
SSM Event Description	High wind and rain may prevent re-ignition of the flare.
Corrective Action	Appropriate modifications to the flare will be made, where possible, to prevent adverse weather from affecting operation of the flare. If flare re-ignition is still not possible, the flare will enter "Start-up Flame Failure" mode. In this case, the weather should be allowed to pass and the flare be restarted manually.

SSM EVENT 6	
SSM Event	Automatic pneumatic valve fails to close automatically when flare goes out.
SSM Event Description	Valve failure or instrumentation failure
Corrective Action	The flare should be shutdown and the valve and components evaluated for the cause of failure. Malfunctioning or failed components are to be replaced with new, operating components and maintenance performed to ensure proper operation of the valve and control system. Once completed, the system should be manually started and the automatic valve checked for proper operation

REPORTING PROCEDURES

SSM Events

For each SSM event, a SSM event form (see Appendix) must be filled out. The event form should remain "active" until the SSM event has been concluded. At conclusion of the SSM event the event form should be fully completed and filed. The event forms should be compiled on a monthly basis into an electronic spreadsheet suitable for incorporation into an official report (see below, Semi-Annual Report).

Actions taken that are inconsistent with the SSM Plan will trigger immediate reporting requirements (see below).

Semi-Annual Report

A semi-annual report must be submitted to the Administrator documenting all SSM events (whether consistent or inconsistent with the SSM Plan) over the previous 6-month period. The report is to include a list of the SSM events that occurred, the duration, and a description of each. The report will consist of a letter with name, title, and the signature of the owner or authorized operator. The semi-annual SSM report is due 30-days following the end of the calendar half-year (or other calendar reporting period, as appropriate). The report is to include the name, title, and signature of the designated responsible official. A transmittal letter accompanying the report should include a statement that, based on the information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

The semi-annual report is required *only* if an SSM event occurred during the reporting period.

Immediate Reports

Immediate reports are required for SSM events that require actions to be taken that are inconsistent with the SSM Plan. Following the taking of action inconsistent with the SSM Plan, the Administrator must be notified within two (2) working days. A letter report to the Administrator must follow this initial notification within seven (7) working days of the end of the SSM event. The letter report must contain a description of the SSM event and the surrounding circumstances, the reasons for not following the SSM Plan, and an explanation of whether any excess emission or parameter monitoring exceedences are believed to have occurred. The letter should contain the name, title, and signature of the designated responsible official. A transmittal letter accompanying the report should include a statement that, based on the information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

SSM PLAN REVISION PROCEDURES

The SSM Plan must be revised for malfunctions that are not adequately addressed in the SSM Plan.

You must modify your current SS&M Plan in the following situations:

- To reflect changes to your MACT operations or SS&M procedures since your prepared the last SS&M Plan (§63.6(e)(viii)); and
- If your current SS&M Plan:
  - Does not include instructions for a SS&M that has occurred (§63.6(e) (3) (vii) (A)).

- Does not include instructions for what you will do during a SS&M that are safe procedures and are good air pollution control practices that minimize emissions to the greatest extent (§63.6(e)(3)(vii)(B)).

- Does not include enough instructions for correcting/repairing the malfunctioning process, air pollution control, or monitoring equipment as quickly as practical (§63.6(e) (3) (vii) (C)).

- Includes instructions for anything that is not a SS&M, as defined above (§63.6(e) (3) (vii) (D)).

Note:

If the current SS&M Plan leaves out or does not include enough instructions to correctly handle any incident that occurs that can be called a malfunction, you must revise your current SS&M Plan within 45 days after the incident. You must add to the revised SS&M Plan what you will do in case this type of incident happens again (§63.6(e) (3) (viii)). Depending on what your SS&M Plan revisions are, the permitting authority and/or EPA may ask to see a copy of your revised SS&M Plan.

APPENDIX A

SSM EVENT FORM

STARTUP / SHUTDOWN / MALFUNCTION (SSM) EVENT FORM

Date:

Form Initiated:
Form Completed:

Complete this form if a startup, shutdown, or malfunction (SSM) event occurred.

FACILITY INFORMATION	
Title V Permit No.	
Name	Leon County Solid Waste management Facility
Identification No.	0730099
Address	
street address	7550 Apalachee Parkway
city	Tallahassee
state	Florida
zip	32311
Contact Person	Mr. Norm Thomas, Solid Waste Director
Contact Phone	(850) 606-1810

EVENT INFORMATION			
Date Started		Date Ended	
Time Started		Time Ended	
TYPE OF EVENT			*Check one*
1	STARTUP		
2	SHUTDOWN		
3	MALFUNCTION		
Circumstances leading to the SSM event.			

ACTION TAKEN				
Check one only				
Action **CONSISTENT** with SSM Plan		Action **INCONSISTENT** with SSM Plan		
		Reporting Requirement	*Check*	*Date*
		2-Day Notification		
		7-Day Notification		
		45-Day SSM Plan Modification		
Description of action taken.				
If SSM Plan was not followed, provide explanation here.				