

**APPENDIX E-5**  
**Startup, Shutdown, and Malfunction Plan**

TAPI PUERTO RICO, INC.  
GUAYAMA, PUERTO RICO



**TRANE I & TRANE II HWC MACT  
START-UP, SHUT DOWN, AND  
MALFUNCTION PLAN**

**JUNE, 2006  
REVISION 3.0**

LOCATION: \_\_\_\_\_

RECORDKEEPING:           FIVE YEARS          

ADMINISTRATOR: \_\_\_\_\_

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Figure 4-1. Periods of Startup and Shutdown for the Incineration System

Figure 4-2. Decisions, Actions, and Records Associated with the Startup, Shutdown, and Malfunction Plan

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Table 3-1. Target HWC MACT Permit Operating Limits

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Table 4-1. Potential Malfunctions from TAPI's Incineration Systems That May Result in HWC MACT Exceedances

**APPENDIX**

Exhibit A1. Example Startup, Shutdown, and Malfunction Documentation Form

Exhibit A-2. Example Periodic Startup, Shutdown, and Malfunction Report Template

## **1.0 INTRODUCTION**

TAPI Puerto Rico, Inc. (TAPI) operate two Trane® Thermal liquid/gaseous waste incineration systems (Trane #1 and Trane #2) for the treatment of liquid hazardous wastes at its Guayama, Puerto Rico facility. The incineration systems are subject to the requirements of the National Emissions Standards for Hazardous Air Pollutants for Hazardous Waste Combustors, otherwise known as the Hazardous Waste Combustor MACT (HWC MACT). The HWC MACT standards are codified under 40 CFR 63 Subpart EEE.

Section 1206(c)(2) of the HWC MACT rule requires an affected facility to develop a startup, shutdown, and malfunction plan (SSMP) as specified in Section 63.6(e)(3) of the MACT General Provisions. The purpose of the SSMP is to (1) ensure the combustion unit, including emission control equipment is operated and maintained in fulfillment of TAPI's general duty to minimize emissions to the greatest extent in a manner consistent with safety and good air pollution control practices. (2) to ensure that owners and operators are prepared to correct malfunctions as soon as practicable and (3) to minimize the reporting burden associated with excess emissions. The SSMP should address startup, shutdown, and malfunction events of the incineration system that could result in a HWC MACT emission or operating limit exceedance.

To meet these SSMP objectives, this Plan includes a description of:

1. Procedures for operating and maintaining the source during periods of startup, shutdown, and malfunction
2. The corrective action program for responding to malfunctioning process, air pollution control, and related monitoring equipment used to comply with the HWC MACT standard
3. Potential causes of the identified malfunctions that may result in significant releases of hazardous air pollutants (HAPS), and actions to be taken to minimize the frequency and severity of those malfunctions

Section 1206(c)(2)(v)(A)(2) of the February 13, 2002 HWC MACT Interim Standards exempts facilities from emission standard and operating limit violations during startup, shutdown, and malfunction events, even if hazardous waste is in the combustion chamber while the violation occurs, providing the SSMP is followed and compliance with the SSMP is properly documented. The specific procedures that address startup, shutdown, and response to possible malfunctions of the incineration system, and how facility personnel must document compliance with these procedures, are described in this plan.

## 2.0 PLAN ORGANIZATION AND OBJECTIVES

This SSMP has been developed to provide guidance for operating and maintaining the incineration system during startup, shutdown, and occurrence of malfunctions in a manner that minimizes emissions to the greatest extent in a manner consistent with good air pollution control practices. Preventative measures as well as corrective measures associated with the malfunctions are also key aspects of this Plan. The SSMP is organized as follows:

- Section 3.0 provides a description of TAPI's liquids incineration system
- Section 4.0 defines startup, shutdown, and malfunctions as they apply to this Plan, and provides details for complying with the plan. Instructions for preparing new Plan procedures and revising existing procedures are also discussed.
- Section 5.0 explains the numerous decisions, actions, and records that must be addressed when a startup, shutdown, or malfunction occurs
- Section 6.0 describes and references the standard operating procedures (SOPs) to be followed during startup and shutdown of the incineration system. This section also addresses features of the incineration system intended to prevent system malfunctions, and corrective measures to be taken in the event of malfunctions. This section also references the SOP that applies during potential malfunctions.
- Section 7.0 describes the SSMP recordkeeping requirements
- Section 8.0 describes the SSMP reporting requirements.

## 3.0 PROCESS DESCRIPTION OVERVIEW

The incinerators are down-fired liquid waste incineration systems each equipped with a quench tank, high energy wet scrubber, separator (including a mist eliminator). Flue gases from both systems are vented to common wet electrostatic precipitator (WESP) and stack. Figure 3-1 provides a general process diagram of Trane #1 and Trane #2 systems. Each Trane system is designed to treat liquid low BTU aqueous wastes and high BTU organic wastes. Aqueous wastes include wastes from manufacturing processes, laboratory operations and maintenance activities that contains >50% water by weight. The organic wastes include wastes from manufacturing processes, laboratory operations and maintenance activities

that contain < 50% water by weight. Each incinerator uses kerosene as an auxiliary fuel and propane gas. Also, the propane gas is used only during the ignition only.

### **3.1 COMBUSTION SYSTEM**

Each incinerator is a Sub-X Liquid Waste Oxidizer manufactured by Trane Thermal Company. The rated thermal duty of each Trane is 11 MMBTU/hr from the combustion of wastes and auxiliary fuel. The combustion chamber is manufactured from carbon steel and is lined with 9-inch thick high duty refractory and 1.5 inches of insulating brick.

#### **3.1.1 Hazardous Waste Residence Time Determination**

The hazardous waste residence time is defined by the HWC MACT in 40 CFR 63.1201 as the "time elapsed from cutoff of the flow of hazardous waste into the combustor (including, for example, the time required for liquids to flow from the cutoff valve into the combustor) until solid, liquid, and gaseous materials from the hazardous waste (excluding residues that may adhere to the combustion chamber surfaces and excluding waste-derived recycled materials such as cement kiln dust and internally recycled metals) exit the combustion chamber." The hazardous waste residence time is a critical parameter for establishing, following automatic or manual shutoff of hazardous wastes, whether exceedances from permit limits are or could be counted as permit violations. Additional discussion of the significance of hazardous waste residence time as it applies to this SSMP is provided in Section 4 below.

The volume of the combustion zone of each incineration system is approximately 250 cubic feet. The gas minimum residence time is approximately 1.6 second at maximum throughput conditions considering a maximum air flow of 2000 scfm. For the purposes of determining whether hazardous waste has cleared the combustion chamber following cutoff of hazardous waste, the residence time will be conservatively estimated at 5 seconds. (See attached residence time calculation).

### **3.2 BURNER AND FEED SYSTEMS**

#### **3.2.1 Waste Feed Systems**

The aqueous and organic liquid wastes incinerated in Trane #1 and Trane #2 are pumped from feed tanks. All liquid waste flow rates are continuously monitored, recorded, and controlled using orifice flow meters. Waste feed is injected into the combustion chamber via two ultrasonic atomizing nozzles. The main burner is a top-mounted Trane Vortex combination burner which can fire any combination of liquid or gaseous waste or fuels. The burner is rated to deliver up to 10 MMBTU/hr. Additional heat input is provided downstream from the main burner.

### 3.2.2 Auxillary Fuel System

Kerosene and propane will be used as auxiliary fuel in the Trane incineration systems. Propane only is used during ignition and bricks curing. The fuel is stored in centrally located storage tanks and is supplied to all incinerators from a plant utility supply main and propane is stored in cylinders and is supplied by a dedicated main line. The maximum flow rate of fuel required by the incinerators is 4.79 liters/minutes.

### 3.2.3 Combustion Air Prime Mover

Each Trane incineration system is equipped with a single forced draft (FD) fan which supplies all of the air entering the incinerator. The combustion air prime movers are 100 HP, electric drive, turbo compressors. The blowers are rated at 2,199 SCFM at a pressure of 149.4 inwc.

## 3.3 AIR POLLUTION CONTROL (APC) SYSTEM

Each Trane incinerator air pollution control (APC) system includes the following equipment:

- Quench tank
- High Energy Venturi Scrubber with separator and demister

The offgas from each incinerator is treated by a common wet electrostatic precipitator (WESP) and is discharged to the atmosphere through a common stack.

### 3.3.1 Quench Tank

Flue gases from the combustion chamber are discharged downward into a Sub-X quench tank. The waster in the quench tank is maintained at approximately the midpoint of the tank by automatic controls, which use the centrifugal pump to bleed water from the venturi scrubber. The combustion gases are cooled to approximately the adiabatic saturation temperature by submerged entrance and bubbling water bubbling contained in the tank. A caustic soda solution is added to the recirculating liquid to maintain a preset pH. The dissolved solids level in the quench solution is maintained within acceptable limits by manual settings by the flow rate for a continuous bleed form the recycle line.

### 3.3.2 High Energy Venturi Scrubber

The gaseous effluent from the quench tank enters the venturi scrubber which removes the majority of the entrained particulate matter at high pressure drops and saturated adiabatic temperature. A centrifugal pump recirculates the scrubbing water from the separator to the venturi scrubber. Solution from this recycle loop is bled into the quench tank as needed. Clean water is added to the separator to make up for this loss. Flue gases from the venturi scrubber enter tangentially into the separator. A mist eliminator which consists of a 2-foot bed of 4-inch Telleretts or equivalent packing is located 12 feet from the base of the separator. A caustic soda solution is added to the recirculating liquid to maintain a preset pH. The dissolved solids level in the quench solution is maintained within acceptable limits by manual settings by the flow rate for a continuous bleed from the recycle line.

### 3.3.3 Wet Electrostatic Precipitator (WESP)

The purpose of the WESP is to remove the submicron solid particulate, liquid mist, and condensed organic matter. The WESP is configured for up flow of gas and consists of the following components: water jacketed collection tubes, ionizing electrodes, high voltage support frame, air purge and flushing systems, integral multi-channel bed pre-scrubber, transformer rectifier set and associated stainless steel high voltage bus duct, current limiting reactor and automatic voltage control (AVC) panel. The WESP is designed to operate continuously with a liquid film minimum of 25 microns thick on the surface of collecting tubes. The WESP minimum Specific Collection Area (SCA) is 200 ft<sup>2</sup>/1000 acfm. The WESP corona discharge power with ambient air load at standard conditions is 2500 Watt/1000 acfm.

## 3.4 CONTINUOUS MONITORING SYSTEM (CMS)

The Trane incineration systems are equipped with a programmable logic controller (PLC) and data acquisition system to control record and provide the process information essential for efficient operation and plant safety. This DAS records process operational information for inclusion in regulatory reports and for archival purposes. The computer system is the principal control and information center for the Trane incineration systems.

Integral to the incineration system control system and AWFCO system is a continuous monitoring system (CMS). The CMS maintains a continuous record of the incineration system's operation. The CMS includes continuous parameter monitoring systems (CPMS) such as flowmeters and thermocouples that continuously monitor process data, and continuous emission monitoring systems (CEMS) that

continuously measure CO and O<sub>2</sub> (dry) stack gas concentrations. Continuously monitored HWC MACT operating limits and emission limits are listed in Table 3-1. Key CMS instrumentation associated with these HWC MACT limits are listed in Table 3-2.

The CMS's electronic records include three types: 1) one-minute values for each continuously monitored parameter, 2) data registers for calculating and recording rolling average values for rolling average limited parameters, and 3) an alarm, shutdown and AWFCO history log 4) Exceedances and 5) CEMS Calibration. The CMS's electronic data records are periodically transferred from the CMS data storage to magnetic storage media or DVD for long term record storage required by the HWC MACT. The data are electronically retrievable for regulatory inspection for any operating period. Additionally, the CMS data management system will be used to generate compliance data for periodic regulatory reporting.

The CMS continuously calculates and records multiple, continuously monitored operating parameters. Each continuously monitored parameter is polled at least once every 10 seconds. At a minimum, every minute, the latest four 15 second readings are averaged and recorded electronically as the one-minute operating value for each continuously monitored parameter.

For continuously monitored parameters with rolling average limits, the CMS continuously calculates and records the rolling average values. The rolling average value for each rolling average limited parameter is calculated by adding the newest one-minute value to the rolling average data register, dropping the oldest one-minute value and then recalculating and recording the new rolling average using the new data set of one-minute values.

#### **3.4.1 Continuous Emissions Monitoring System (CEMS)**

The stack exhaust gases are continuously monitored for oxygen and carbon monoxide by a CO and O<sub>2</sub> Continuous Emission Monitoring Systems (CEMS). The CEMS is used to demonstrate compliance with the HWC MACT CO emission limit (dry) of 100 ppmv, corrected to 7% oxygen (dry). The CO monitor is a non-dispersive infrared (NDIR) analyzer which is capable of meeting performance requirements of 40 CFR 60, Appendix B, Specification 4B. The O<sub>2</sub> monitor is a paramagnetic analyzer that is capable of meeting the requirements of 40 CFR 60, Appendix B, Specification 4B. The CO concentration is automatically corrected to 7% O<sub>2</sub> on a dry gas basis by the DAS except when extremely high O<sub>2</sub> concentration is above 19.85 since this data will induce erroneous and exaggerated high values.

The CEMS consists of three subsystems: 1) an extractive sample conditioning system, 2) CO and O<sub>2</sub> analyzers, and 3) data acquisition system (DAS). The CO analyzer has a dual range of 0-200 ppmv and 0-3,000 ppmv. The O<sub>2</sub> analyzer has a range of 0-25% vol. The gas analyzers produce an electronic signal proportional to the analyzer range. The analyzer signals are forwarded to the DAS, which performs required calculations to convert the electronic signals into numerical values calculating the one minute average, the one hour rolling average etc. These values are forwarded to the DCS. The DAS also notified to the DCS if an AWFCO is required.

The CEMS are operated as recommended by the manufacturer. Maintenance and calibration/audits are performed on the CEMS as specified by the manufacturer and as required by performance specifications promulgated by EPA. Specific details pertaining to the CEMS operation and maintenance procedures can be found in the Continuous Monitoring System Performance Evaluation Plan which is located in the Environmental File Room and is readily available upon inspector request..

### **3.4.2 Continuous Parameter Monitoring System (CPMSs)**

Continuous parameter monitoring systems (CPMSs) consist of a combination of instruments that continuously monitor and record parameter data from the operations of the incineration systems. The CPMSs are used to show compliance with the specified HWC MACT operating limits. The instruments consist of flowmeters, pressure transducers, pH meters, level transmitters, and thermocouples that collect process information on key HWC MACT regulatory parameters. Each monitoring instrument produces an electronic signal proportional to the instrument range. The signals are outputs to the system's DCS which provides analog inputs to the DAS. The DAS conduct required data manipulations and calculations and compares the calculated value to the alarms and AWFCO preset limit.

The CPMSs are operated as specified by the manufacturers. The instruments are calibrated and preventive maintenance performed as specified by the manufacturer. Specific details pertaining to the CPMSs operation and maintenance procedures can be found in the Continuous Monitoring System Operating and Maintenance manual located in the Environmental File Room and is readily available upon inspector request.

### **3.4.3 Automatic Waste Feed Cutoff (AWFCO) System**

The function of the automatic waste feed cutoff (AWFCO) system interlocks is to prevent the feeding of hazardous waste if either Trane operating conditions are outside the regulatory limits and to prevent

unsafe operation of the systems. The continuously monitored parameters listed in Table 3-1 will be monitored by the control system to ensure the incinerators operate within their regulatory limits. When any of these HWC MACT regulatory continuously monitored parameter deviates from its established AWFCO setpoint, an electronic signal from the control system will activate the waste feed cutoff valves. A DAS send a signal to the DCS and activate an AWFCO interlock whenever a preset limit is executed and closes the waste liquid block valves in the event of an AWFCO condition. An AWFCO usually will not result in auxiliary fuel being discontinued. The pre AWFCO and AWFCO preset limits are below the MACT permit limits to avoid exceedances. Auxiliary fuel is continued to maintain minimum operating temperature until the problem causing the waste feed cutoff is resolved. If the problem is still not resolved, the system may be shut down.

The CEMS and CPMSs described in this plan and listed in Table 3-1 are integrated with the AWFCO system. The AWFCO system also incorporates safety related parameters not regulated by the HWC MACT. An AWFCO will yield closure of all hazardous wastes control and block valves. An AWFCO will occur following any of the below conditions:

- When a regulated emission setpoint is reached or exceeded
- When an operating limit setpoint below permit limit is reached or exceeded
- When a span value of any CPMS is met or exceeded
- When a CPMS or CEMS malfunctions
- When a component of the AWFCO fails.
- Loss of communication between the instrumentation, analyzer, DAS and DCS

Continuously monitored parameters that have permitted limits have two set point limits: 1) an alarm value and 2) an AWFCO value. The control system compares calculated rolling average values to the corresponding parameter trip set point. Alarm set points are above or below the respective minimum or maximum permitted limits and are established by TAPI based on operating experience. When an alarm value is reached, the control system initiates an audible alarm and a visual warning on the operator's control screen. There is no stoppage of waste feed when an alarm set point is reached. An alarm set point is intended to provide the operator with sufficient warning to acknowledge the alarm and to make operational adjustments to avoid a shutdown or an AWFCO.

Most AWFCO set points are the also set slightly above or below regulatory limits established by EPA to avoid reportable exceedances. When an AWFCO setpoint is reached, the control system initiates an

audible alarm, a visual warning on the operator's control screen and an AWFCO. Upon exceedance of the interlock set point DAS send a signal to the DCS to activate a waste shut off , command is activated to stop the hazardous waste feed. The operator must acknowledge the AWFCO and make operational adjustments to bring the monitored parameter within the shutdown set point limit before waste feed can be resumed.

#### 4.0 SSMP IMPLEMENTATION

The HWC MACT provisions place significant emphasis on operation and maintenance of MACT sources during periods of startup, shutdown, and malfunction. The presumption is that startup, shutdown, and malfunction events have a higher chance of excess emissions or operating limit exceedances compared to normal operation. Although TAPI's incineration system's sophisticated process monitoring and control system are configured to shutoff hazardous waste prior to exceeding any permit limits and upon malfunction of any instrument, the potential for emission standard (CO) or operating limit exceedances exist, even if remotely. This section defines the periods of startup, shutdown and malfunctions as it applies to the SSMP, and describes activities and responsibilities for following and documenting compliance with the SSMP procedures.

#### 4.1 APPLICABILITY

##### 4.1.1 Startup

Startup is defined under Section 63.2 of the MACT General Provisions as the setting in operation of an affected source or portion of an affected source for any purpose. For the purposes of this plan, startup will begin when a unit begins the ignition sequence for firing auxiliary fuels from a system off condition. Startup also includes the initial feeding of hazardous wastes (represented as secondary startup in Figure 4-1), since this represents periods when releases of significant HAP emissions, and possible exceedances of HWC emission standards and operating limits, could potentially occur. This includes introducing hazardous wastes following a primary start up, or reintroducing hazardous wastes following a waste cutoff, either via an AWFCO, pre-AWFCO or deliberate shutoff of hazardous waste. . The ignition sequence cannot be initiated unless the combustion chamber temperature is  $>250^{\circ}\text{C}$ . For the purposes of this Plan, startup will end 60 continuous minutes after hazardous waste feed has been initiated, which based on process experience is the time required to achieve stable conditions within the regulatory limit. After this period of time the incineration system will be considered in normal operation. If hazardous waste feed is interrupted during this 60 minutes period following hazardous waste initiation, the system will remain in start up mode unless the operator initiates a shutdown or in the event of an emergency shutdown. Periods considered start up for the incineration system are depicted in Figure 4-1.

Note that TAPI may operate only one incineration system (i.e Trane 1 or Trane 2), or may operate both units simultaneously. If starting up both units from a cold status, startup begins when the first unit initiates the auxiliary fuel ignition sequence. If one unit is operating on hazardous waste, and TAPI chooses to startup the second unit, hazardous waste feed must be discontinued to the operating unit prior to initiating the auxiliary fuel ignition sequence to the second unit. In this latter scenario (where the unit that was previously operating on hazardous waste is maintained hot with auxiliary fuel), startup begins when the second cold unit begins its auxiliary fuel ignition sequence. In this two operating unit scenario, startup ends when stable combustion conditions are achieved in both incineration units ( i.e.when both Trane units have fed hazardous waste for 60 continuous minutes). After this period of time the incineration system will be considered in normal operation. If hazardous waste feed is interrupted to either unit during their respective 60 minute period following hazardous waste initiation, the system will remain in start up mode unless the operator initiates a shutdown or in the event of an emergency shutdown. Periods considered start up for the incineration system are depicted in Figure 4-1

#### **4.1.2 Shutdown**

Shutdown is defined under Section 63.2 of the MACT General Provisions as the cessation of operation of an affected source or portion of an affected source for any purpose. For the purposes of this plan, shutdown will begin once the hazardous waste residence time (following an AWFCO, pre-AWFCO, automatic incinerator shutdown or a deliberate waste feed cutoff) has expired. Shutdown includes hot standby periods, planned total shutdown to a system cold status, and shutdown in response to an emergency. Hot standby periods are defined as periods when, following expiration of the hazardous waste residence time, the system is maintained hot (more than 250 °C) pending reintroduction of waste to the incinerator. TAPI may choose to reduce the combustion chamber temperature during this standby period as a fuel conservation measure. Planned total shutdown includes times when an auxiliary fuel feed is being ramped down to cool the unit at a controlled rate. Shutdown will end when either the system has cooled down to less than 250 °C, or, if the decision is made to resume burning hazardous waste, when hazardous waste is reintroduced to the combustion chamber. If the unit was cooling down and the auxiliary fuel had been shut off, and the decision is made to return the unit to operating status (but the combustion temperature had not yet decreased to 250 °C or below), shutdown will end and startup begin will occur upon initiation of the auxiliary fuel ignition sequence.

Similar to the startup discussion in Section 4.1.1, TAPI may operate only one incineration system (i.e Trane 1 or Trane 2), or may operate both units simultaneously. When operating both units on hazardous waste simultaneously, shutdown will begin once the hazardous waste residence time (following an AWFCO, pre-AWFCO, automatic incinerator shutdown or a deliberate waste feed cutoff) has expired in

both units. (Note that any condition that triggers an AWFCO simultaneously shuts of hazardous waste to both units.) Also, as discussed in Section 4.1.1, if one unit is operating on hazardous waste and TAPI decides to startup the other incineration unit, hazardous waste feed will be cutoff to the operating unit (initiating secondary shutdown once the hazardous waste residence time has expired) prior to beginning firing of auxiliary fuel in the unit that is being started.

Periods considered shutdown for the incineration system are depicted in Figure 4-1.

#### 4.1.3 Malfunction

Section 63.2 of the MACT General Provisions defines a malfunction as any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. The emission limitations refer to the HWC MACT CO standard and various parameter operating limits. For the purposes of this plan, failures resulting in part from inadequate maintenance or operational errors will not be considered malfunctions.

#### 4.1.4 Following the Startup, Shutdown, and Malfunction Plan

Pursuant to Section 63.6(e) of the General Provisions, an important purpose of the SSMP is to ensure that TAPI fulfills its general duty to operate and maintain the combustion unit, including emission control equipment, in a manner consistent with safety and good air pollution control practices during periods of startup and shutdown, and in responding to potential malfunctions. The instructions in this SSMP, including SOPs that are referenced in the Plan, must be followed during all startups, shutdowns, and malfunctions. Also, documentation of whether the SSMP and/or SOPs were followed during startups, shutdowns, and malfunctions must be maintained, as well as numerous specific details associated with these startup, shutdowns and malfunctions. Exceedances of the HWC MACT emission standards or operating limits during periods of startup, shutdown, or malfunctions trigger additional response actions and documentation.

For the purpose of documenting the duration of an exceedance during a startup or shutdown, or as a result of a malfunction, the exceedance will begin once a HWC MACT emission standard or operating limit is exceeded during a period when hazardous waste is in the combustion chamber. The exceedance will end once the hazardous waste has cleared the combustion chamber or once the emissions and operating parameters are reestablished within their respective permit limits, which ever occurs sooner.

Additional detailed discussions for operating the Trane incineration systems during startups and shutdowns, responding to known or potential malfunctions, and abiding by all required recordkeeping and reporting requirements, are addressed in the remainder of this SSMP.

#### 4.2 METHODOLOGY FOR IDENTIFICATION OF MALFUNCTIONS

In accordance with 40 CFR §63.2, malfunction means any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner, which causes, or has the potential to cause, the emission limitations to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.

This section discusses possible malfunctions associated with the hazardous waste Incinerators operations and possible actions to be taken to correct the malfunctions. While it is not possible to anticipate every malfunction that could occur, this section attempts to provide corrective action procedures that are to be initiated after a malfunction event.

The SSMP was developed to be both proactive and reactive to malfunctions. Malfunctions involving process equipment, instrumentation, and the process control system were included in the malfunction evaluation. A committee comprised of supervisory and management personnel from maintenance, engineering, instrumentation, and operations identified HWC MACT-related equipment and procedures. The committee identified possible malfunctions that may occur with this equipment and procedures based on a review of any historical problems experienced. In addition, safeguards to prevent excess emission events due to malfunctions associated with these items, were reviewed and others considered. A corrective response for the operator in the event the safeguards failed to minimize excess emissions was also determined.

Table 4-1 contains a list of possible malfunctions and appropriate corrective actions for the two hazardous waste Incinerators, including process and air pollution control equipment and continuous monitoring systems. This table will be revised in the future if additional information becomes available relating to types of malfunctions and associated corrective actions.

TAPI will ensure that malfunctions are corrected as soon as practicable after their occurrence in accordance with manufacturer's corrective procedures, TAPI SOPs, or other relevant and appropriate procedures based on TAPI's operating experience. Appropriate corrective action will be taken in order to

restore the hazardous waste Incinerators, air pollution control and monitoring equipment, and all ancillary equipment to normal operating conditions and minimize excess emissions.

#### 4.3 DOCUMENTATION OF COMPLIANCE WITH THE SSMP

During operational periods when the SSMP is applicable, process control operators will use the information contained in this Plan to make regulatory compliant decisions about the operation of the system, and to document what is needed to ensure compliance. The flow chart for plan implementation (Figure 4-2) is the primary tool to assist with this effort. It includes determining whether a potential malfunction event qualifies as a malfunction according to the Plan and how personnel document actions taken are consistent or not consistent with the Plan. TAPI has taken measures to train the control room operators and other key personnel on the importance of following the procedures referenced in the Plan. Pursuant to Section 63.1206(c)(2)(v)(A)(2) of the HWC MACT, exceedances of emission limits or operating parameters that occur when actions taken are consistent with the Plan are not considered violations, even if hazardous waste is present in the combustion chamber. Such incidents where the actions taken during a startup, shutdown, or malfunction event are consistent with the SSMP will be reported in the semi-annual Periodic Startup, Shutdown, and Malfunction report required under Sections 63.6(e)(3)(iii) and 63.10(d)(5)(i) of the General Provisions.

Exceedances of HWC MACT emission standards or operating parameter limits that occur during periods of startup, shutdown, or malfunction, when actions taken (including actions taken to correct a malfunction) are not consistent with the plan or not addressed in the plan, will be reported in the Immediate Startup, Shutdown, and Malfunction report as required in Section 63.10(d)(5)(ii) of the General Provisions. TAPI will use a checklist similar to the one identified in the Appendix of this plan to document compliance with the SSMP during startup, shutdown, and malfunction events. In addition, any instance where actions taken are not consistent with the SSMP, even if an exceedance of the HWC MACT emission standards or operating parameter limits did not occur, are required to be reported in the Periodic Startup, Shutdown, and Malfunction report.

Figure 4-2 provides a SSMP logic flow diagram outlining the appropriate decisions and actions, including recordkeeping and reporting activities, associated with periods of startup, shutdown, malfunction and normal operation. A detailed summary of Figure 4-2 is provided in Section 5.0 of this plan.

#### 4.4 PROCEDURE DEVELOPMENT AND MAINTENANCE

TAPI has developed Standard Operating Procedures (SOPs) that provide step-by-step instructions for startup, shutdown, and the malfunction events identified in this plan. The procedures were developed to be in compliance with the HWC MACT regulations. Anytime procedures are changed, TAPI's Management of Change procedures ensure that they are reviewed by management and supervisory staff and operators receive the appropriate training for the changes as follows:

The QA Department will have the custody of the SOP/OCM original procedures. A copy of the procedure will be located in the environmental control room for easy access of the operator. The updated procedures will contain all the changes / modifications authorized through the Management of Change Program since the last formal revision (contained in the SOP/OCM manual). These updated procedures will be used when making any subsequent changes to an already modified SOP/OCM, with the new changes indicated in highlight and strikeout text.

The SOP Manuals will be reviewed by each Area Supervisor and or his designee on a yearly basis, and any temporary SOPs will be incorporated into the SOP Manual. The Area Supervisor will stamp and sign/date any procedures which were not modified to verify that they have been reviewed and are correct. The procedures that will expire during the upcoming year will also be reissued at this time.

Pursuant to Section 63.6(e)(3)(viii) of the MACT General Provisions, TAPI will periodically revise the SSMP as necessary to address periodic changes in equipment or procedures that are currently addressed in the plan. Unless the regulatory agencies provide otherwise, such changes will not require prior approval. However each revision to the SSMP will be reported in the semiannual Periodic Startup, Shutdown, and Malfunction report required under Section 63.10(d)(5) of the MACT General Provisions.

If the SSMP fails to address or inadequately addresses an event that meets the characteristics of a malfunction, TAPI will initiate an incident investigation. Corrective actions resulting from the incident investigation will include a revision to the SSMP within 45 days after the event to include detailed procedures for operating and maintaining the incineration systems during similar malfunction events, and a program of corrective action. The corrective actions are tracked until they are closed by signature of the responsible party to ensure that they are completed.

In the event a revision to the SSMP alters the scope of activities which are deemed to be a startup, shutdown, malfunction event, or otherwise modifies the applicability of any emission limit, work practice requirement, or other requirement under the HWC MACT, the PREQB will be provided with a written notice describing the revision. The revised SSMP shall not take effect until the written notice has been provided to the Puerto Rico Environmental Quality Board.

#### 4.5 AUTOMATIC WASTE FEED CUTOFF SYSTEM REQUIREMENTS DURING MALFUNCTIONS AND STARTUPS

Consistent with the provisions in Section 63.1206(c)(2)(v) of the HWC MACT, the AWFCO requirements will continue to apply during malfunctions, and during startup periods between the time hazardous waste is introduced and stable operating conditions are achieved. If an emission limit or operation limit is exceeded during a malfunction or startup period, the automatic waste feed cutoff system must immediately cutoff hazardous waste feeds. If the malfunction itself prevents immediate and automatic cutoff of hazardous waste feed, TAPI will cease feeding hazardous wastes as quickly as possible after discovery of the malfunction. These AWFCO requirements do not apply to shutdown periods because, as defined in Section 4.1.2, shutdown commences after hazardous waste has been cut off (automatically or manually) and the hazardous waste residence time has expired.

Although AWFCO requirements continue to apply during malfunctions, an exceedance of an emission standard or operating limit is not a violation of the HWC MACT if corrective measures taken during the malfunction are consistent with procedures prescribed in the SSMP. Similarly, an exceedance of an emission standard or operating limit is not a violation of the HWC MACT during startup periods, where hazardous waste is in the combustion chamber, provided the startup is conducted consistent with the procedures prescribed in the SSMP.

#### 4.6 PROJECTED OXYGEN CORRECTION FACTOR ASSOCIATED WITH STARTUP AND SHUTDOWN

The stack gas oxygen concentration is used to calculate an oxygen correction factor, which is applied to the stack gas CO concentration to develop a CO concentration, corrected to 7% oxygen. The oxygen correction factor is determined by the following equation:

$$OCF = \left( \frac{21 - 7}{21 - O_2} \right)$$

where: OCF = oxygen correction factor

$O_2$  = stack gas oxygen concentration (vol %)

During startup or shutdown, conditions may be such that the stack gas oxygen concentration approaches 21%, resulting in an oxygen correction factor approaching infinity. To prevent this from occurring, Section 1206(c)(2)(iii) of the HWC MACT allows facilities to develop a projected oxygen correction factor based on normal operation to use during periods of startup and shutdown. TAPI will not use an oxygen

correction factor but reserves the right to readdress this issue if future operating experience dictates that it is necessary.

## 5.0 DECISIONS, ACTIONS, AND RECORDS ASSOCIATED WITH STARTUPS, SHUTDOWNS, OR MALFUNCTIONS

Figure 4-2 provides a SSMP logic flow diagram outlining the decisions and actions, including recordkeeping and reporting requirements, associated with the occurrence of startups, shutdowns, or malfunctions (known, i.e. previously defined, or potential malfunctions). This section provides an explanation of the Figure 4-2 logic flow diagram.

When a startup, shutdown or malfunction occurs, whether actions taken were consistent or not consistent with the SSMP, will be documented and reported in the Periodic Startup, Shutdown and Malfunction Report (Box A). Whether a HWC MACT emission standard or operating limit exceedance occurred while hazardous waste was in the combustion chamber during the startup, shutdown, or malfunction will be determined (Box 1). If an exceedance did occur while hazardous waste was in the combustion chamber, the occurrence and duration of the exceedance will be recorded and reported in the Summary Report and, if required, the Excess Emissions and CMS Performance Report (Box 4). The duration of the exceedance will be determined from the time the exceedance occurred until hazardous waste is no longer in the combustion chamber (i.e. the hazardous waste residence time has expired) or once the emissions and operating parameters are reestablished within their respective permit limits, whichever occurs sooner.

If an exceedance occurs when waste is no longer in the combustion chamber after an AWFCO, the cause must be investigated and appropriate corrective measures must be taken (Box 2, 5 and 6). The findings of the investigation must be recorded in the operating record (Box 11). If no exceedance occurred or the exceedance occurred when waste was no longer in the combustion chamber and was not after an AWFCO (i.e. if hazardous waste was deliberately discontinued), no further action is required (Box 3 or 10).

If an exceedance occurred when waste was in the combustion chamber, determine whether an AWFCO that should have occurred in fact did occur. If not, this indicates the AWFCO system failed and may be an indication of a malfunction (Box 7 and 8). If an AWFCO did occur, investigate the cause and take appropriate corrective measures to minimize future AWFCOs and document the findings of the investigation in the operating record (Box 9 and 12)

Steps will be taken to determine whether the exceedance was a result of a malfunction or if the exceedance occurred during startup (Box 13). Since shutdown periods begin only after the hazardous waste residence time expires, an exceedance with hazardous waste in the combustion chamber will not occur during shutdown (See Figure 4-1 and definition of shutdown in Section 4.1.2). In order to qualify as a malfunction, the event must be sudden, infrequent, and not reasonably preventable (Box 14). The investigation will determine whether poor maintenance or careless operation caused or contributed to the exceedance. Process failures that are caused in part by poor maintenance or careless operation will not be considered malfunctions and, therefore will be recorded as exceedances that are not shielded by the SSMP from permit violation (reported in the Summary Report and Excess Emissions and CMS Performance Report, if required, as noted in Box 4). An Excessive Exceedance Report will be required if 10 exceedances (that are not shielded by the SSMP) occur during a 60-day block period while hazardous waste is in the combustion chamber (Box 15).

If the exceedance occurred while hazardous waste was in the combustion chamber during startup, investigate whether the startup event was addressed in the SSMP (Box 17) and whether the SSMP was followed to respond to the event (Box 21). If the SSMP adequately addresses the startup event and the actions taken were consistent with the SSMP, document the event in the operating record and report conformance with the SSMP in the Periodic Startup, Shutdown, and Malfunction report required by 63.10(d)(5)(i) (Box 24). If the SSMP is determined to not adequately address the startup event, the SSMP will be revised after the event occurs to include detailed procedures for operating and maintaining the incineration system during a similar startup or shutdown event (Box 16). If the startup/shutdown event was addressed in the SSMP but actions taken were not consistent with the SSMP (Box 21), the occurrence will be reported to the agency within 2 working days followed by a letter within 7 working days after the end of the event (Immediate Startup, Shutdown and Malfunction report required by Section 63.10(d)(5)(ii) (Box 20). If the SSMP was deemed adequate and the actions were consistent with the SSMP, document this conformance in the Periodic Startup, Shutdown, and Malfunction Report required by Section 63.10(d)(5)(i) (Box 24). If the SSMP required revision, and/or the actions taken were not consistent with the SSMP, this must also be recorded in the Periodic Startup, Shutdown and Malfunction Report (Box 24).

If the event was caused by a malfunction, investigate whether the malfunction was adequately addressed in the SSMP (Box 18) and whether the SSMP was followed (Box 22). If the SSMP adequately addresses the malfunction and the actions taken were consistent with the SSMP, document the event in the operating record and report the event in the Periodic Startup, Shutdown, and Malfunction report required by 63.10(d)(5)(i) (Box 25). If the SSMP does not adequately address the malfunction or actions taken during the malfunction were not consistent with the SSMP, such details will be reported to the agency within 2 working days followed by a letter within 7 working days after the end of the event (Immediate

Startup, Shutdown and Malfunction report required by Section 63.10(d)(5)(ii) (Box 23). In addition, if the malfunction event was not addressed adequately in the SSMP, the SSMP will be revised within 45 days after the event occurs, and any changes will be reported in the Periodic Startup, Shutdown and Malfunction Report (Box 19 and 25).

If 10 exceedances have occurred as a result of a malfunction while hazardous waste was in the combustion chamber during the past 60-day block period, conduct an investigation pursuant to Section 63.1206(c)(2)(v)(A)(3) of the HWC MACT (a description of this investigation is provided in Sections 7.0 and 8.0) (Box 26 and 27). The investigation will be completed within 45 days of the 10<sup>th</sup> exceedance and will include the cause of each exceedance and evaluate approaches to minimize the frequency, duration, and severity of each exceedance and the SSMP will be revised as warranted by the investigation (Box 27). The results of the investigation and evaluation will be recorded in the operating record and summarized (including any changes to the SSMP) in the Excess Emissions and CMS Performance Report (if this report is required) or the Summary Report required by Section 63.10(e)(3) of the General Provisions (Box 28).

## **6.0 FACILITY PROCEDURES ADDRESSING STARTUPS, SHUTDOWNS, AND MALFUNCTIONS**

### **6.1 STARTUP AND SHUTDOWN PROCEDURES**

The procedures for operating the incineration system during startup and shutdown are delineated in detailed standard operating procedures maintained in the control room for access by personnel responsible for the operation of the incineration system. A listing of the procedures that address startup and shutdown for the incineration system are listed below:

Procedure Number	Title	Description
SOP-FU-044-00	Incinerator 1 Cold Startup Procedure	Establishes the guidelines to be followed during start-up of the incinerator, including startup from cold status and introduction of hazardous waste until stable conditions are achieved
SOP-FU-045-00	Incinerator 1 Warm Startup Procedure	
SOP-FU-046-00	Incinerator 1 Normal Operation Procedure	
SOP-FU-047-00	Incinerator 1 Shutdown Procedure	
SOP-FU-048-00	Incinerator 2 Cold Startup Procedure	
SOP-FU-049-00	Incinerator 2 Warm Startup Procedure	
SOP-FU-050-00	Incinerator 2 Normal Operation Procedure	
SOP-FU-051-00	Incinerator 2 Shutdown Procedure	

The procedures that address startup describe the pre-startup checks and walk-throughs, including checks of instrumentation, equipment, and supply lines essential for the safe and compliance operation of the incineration system. Hazardous waste cannot be introduced to the system until the system's operational process permissives are met. These procedures address startup from cold, steps for bringing on line each component of the air pollution control system, and for introducing waste liquid until reaching stable operating conditions. In addition, these procedures cover hot standby periods, planned total shutdown to a system cold status, and shutdown in response to an emergency.

## 6.2 PROCEDURES TO RESPOND TO MALFUNCTIONS

Section 4.2 described the methodology that TAPI utilized to identify possible malfunctions of the Trane incineration systems that, if they occurred, could possibly lead to an exceedance of a HWC MACT emission limit or operating parameter. The accompanying Table 4-1 provides information on the preventive measures that have and will continue to be taken to prevent the occurrence of malfunctions and/or to minimize the impact of these malfunctions on emissions of HAPs. Also provided in Table 4-1 are instructions for responding to each the identified malfunctions.

## 7.0 RECORDKEEPING REQUIREMENTS

As required by Section 63.6(e)(3) of the MACT General Provisions, TAPI will keep records for events of startup, shutdown, or corrective measures resulting from a malfunction, which document that the procedures referenced in this Plan were followed. Records will also be maintained for events that occur where the procedures were not followed, and for malfunction events that occur where no corresponding response to malfunction procedures exist in the SSMP. The occurrence and duration of all startups, shutdowns, and malfunctions must be maintained in the operating record. TAPI will document compliance with these record keeping requirements using the example form which is included in the Appendix as Exhibits A-1.

Section 8.0 summarizes reports that contain information associated with startups, shutdowns, and malfunctions and that must be submitted to the agency. In addition, in the event that 10 exceedances from malfunctions occur while hazardous waste is in the combustion chamber during a 60-day block period, TAPI will complete an investigation of the cause of each exceedance and evaluate approaches to minimize the frequency, duration, and severity of each exceedance, and revise the SSMP as warranted by the investigation. The results of the investigation and evaluation will be recorded in the operating record. A summary of the investigation and evaluation, and any changes to the SSMP, will be reported in the Excess Emissions and CMS Performance Report (if required) or the Summary Report.

TAPI will maintain the current SSMP and will make it available for inspection upon request. In addition, if the SSMP is revised, TAPI will maintain each previous version of the SSMP for a period of 5 years after the revision of the plan.

## 8.0 REPORTING REQUIREMENTS

Report requirements pertaining to the SSMP are discussed in Section 63.10(d)(5) of the MACT General Provisions. Details on the SSMP reports are provided below:

- Periodic Startup, Shutdown, and Malfunction Reports – required semi-annually and will be certified by the facility's Responsible Official, must contain the following:

-If action taken during a startup, shutdown, or malfunction event are consistent with the procedures specified in TAPI's SSMP, TAPI shall report such information in the semi-annual report.

- The identification of each instance if actions taken during a startup, shutdown, or malfunction event are not consistent with the SSMP, but no exceedance occurs (see

Immediate Startup, Shutdown and Malfunction Report below if procedures not followed and exceedance occurs)

-Number, duration and a brief description of each malfunction.

-The report shall consist of a letter containing the name, title, and signature of the responsible official certifying its accuracy.

- Summary of any changes to the SSMP during the last reporting period

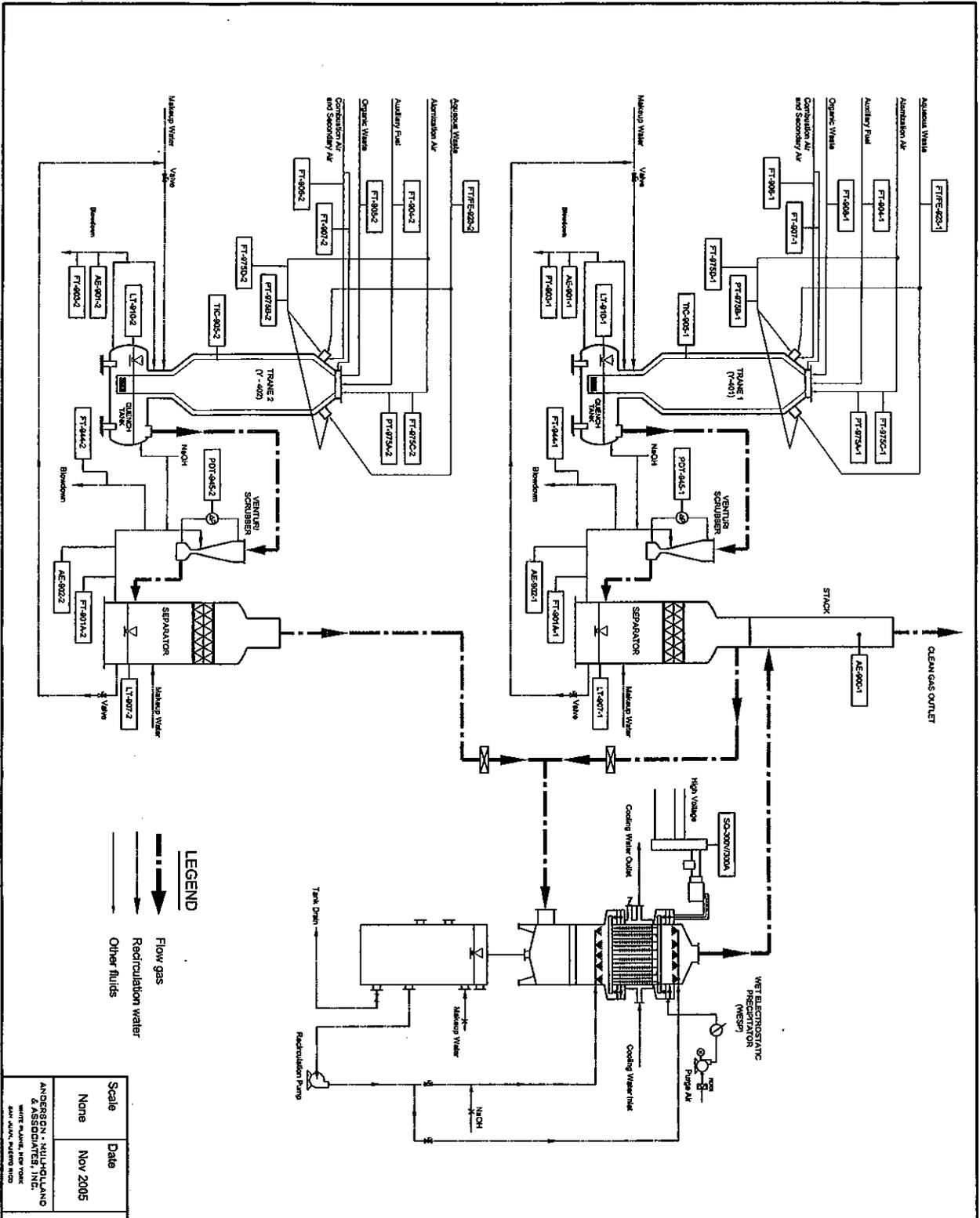
-The report shall be delivered or postmarked by the 30<sup>th</sup> day following the end of the reporting period (for semi annual reporting, the end of the reporting periods are June 30<sup>th</sup> and December 31<sup>st</sup>).

An example Semi-Annual Periodic Startup, Shutdown, and Malfunction Report Template has been provided as Exhibit A-2.

- Immediate Startup, Shutdown, and Malfunction Reports – must be certified by the Responsible Official
  - Any time an action taken during a startup, shutdown, or malfunction event is inconsistent with the procedures specified in TAPI's (including when the plan does not adequately address the event) and an exceedance of an emission standard or operating limits occurs, TAPI will notify the PREQB (i.e. vial fax or telephone call) of such actions taken within 2 working days after commencing actions inconsistent with the SSMP.
  - TAPI will follow the notification with a letter postmarked 7 working days after the end of the event, that contains the name, title, and signature of the responsible official certifying the letter's accuracy, explaining the circumstances of the event, the reasons for not following the SSMP and whether any excess emissions and/or operating parameter limits exceedances are believed to have occurred.

Section 63.1206(c)(2)(v)(A)(3)(ii) requires a summary of the investigation and evaluation of 10 excess emissions from malfunctions while hazardous waste was in the combustion chamber during a 60-day block period to be prepared, and submitted with the Excess Emissions and CMS Performance Report. Section 63.10(e) (3) of the General Provisions requires submittal of a Summary Report and, under certain conditions, an Excess Emissions and CMS Performance Report which contains various data and information associated with exceedances and CMS downtime. If the Excess Emissions and CMS Performance Report is not required to be submitted pursuant to Section 63.10(e)(3)(vii) of the General

Provisions, the investigation and evaluation required by Section 63.1206(c)(2)(v)(A)(3)(ii) will be submitted with the Summary Report.



**LEGEND**

Flow gas

Recirculation water

Other fluids

Tag	Description
FTFE-400-1	Incinerator Organic Waste Flow
FTFE-423-1	Incinerator Aquatic Waste Flow
FT-400-1	Keystone Flow
FT-407-1	Combustion Air Flow
FT-408-1	Secondary Air Flow
FT-409-1	Organic Waste Atomization Air Flow
FT-410-1	Aquatic Waste Atomization Air Flow
FT-411-1	Organic Waste Atomization Pressure
FT-412-1	Aquatic Waste Atomization Pressure
TC-400-1	Incinerator Combustion Chamber Temperature
AE-401-1	Quench Tank Blowdown PH
LI-401-1	Quench Tank Water Level
FT-403-1	Quench Tank Blowdown Flow
POT-404-1	Venturi Scrubber Pressure Drop
FT-401-1	Venturi Scrubber Recycle Water Flow
AE-402-1	Venturi Scrubber Blowdown Flow PH
FT-444-1	Venturi Scrubber Blowdown Flow Rate
LI-407-2	Separator tank water level
SO-300/200A	WESP Secondary Power Trip
AE-400-1	CO & O2 Analyzer (CEMS)

Tag	Description
FTFE-400-2	Incinerator Organic Waste Flow
FTFE-423-2	Incinerator Aquatic Waste Flow
FT-400-2	Keystone Flow
FT-407-2	Combustion Air Flow
FT-408-2	Secondary Air Flow
FT-409-2	Organic Waste Atomization Air Flow
FT-410-2	Aquatic Waste Atomization Air Flow
FT-411-2	Organic Waste Atomization Pressure
FT-412-2	Aquatic Waste Atomization Pressure
TC-400-2	Incinerator Combustion Chamber Temperature
AE-401-2	Quench Tank Blowdown PH
LI-410-2	Quench Tank Water Level
FT-403-2	Quench Tank Blowdown Flow
POT-404-2	Venturi Scrubber Pressure Drop
FT-401-2	Venturi Scrubber Recycle Water Flow
AE-402-2	Venturi Scrubber Recycle Water PH
FT-444-2	Venturi Scrubber Blowdown Flow Rate
LI-407-2	Separator tank water level
SO-300/200A	WESP Secondary Power Trip
AE-400-1	CO & O2 Analyzer (CEMS)

**Figure 1**

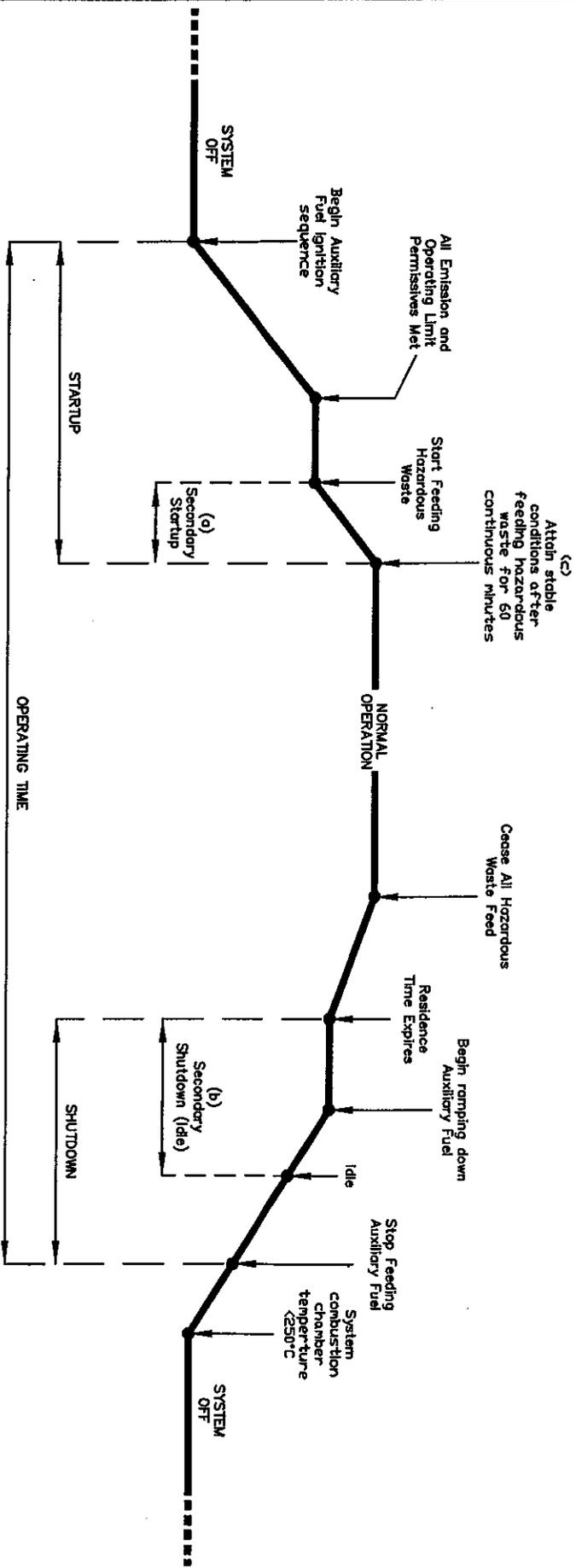
**TRANE 1 AND TRANE 2 INCINERATORS**

**PROCESS FLOW DIAGRAM**

API Industries, Inc  
 Guayama, Puerto Rico

Scale: None  
 Date: Nov 2005

ANDERSON • KILGILLIANO  
 & ASSOCIATES, INC.  
 300 WEST 42ND STREET, NEW YORK  
 NEW YORK, NY 10018



**NOTES:**

(a) Includes initiation of hazardous waste feed following a cold start, following an AWFCO, or after a hot standby period.

(b) Period when decision may be made to reintroduce hazardous waste, maintain the system in a hot standby, or shutdown to ambient temperature. If decision is to reintroduce hazardous waste, shutdown ends and startup begins when hazardous waste feed is restarted.

(c) If operating both Trane units, startup ends when both units have fed hazardous waste for 60 continuous minutes.

Figure 4-1. Startup and Shutdown Periods for API's Trane 1 & 2 Incineration Systems

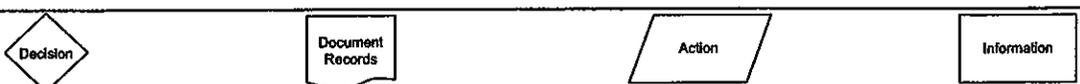
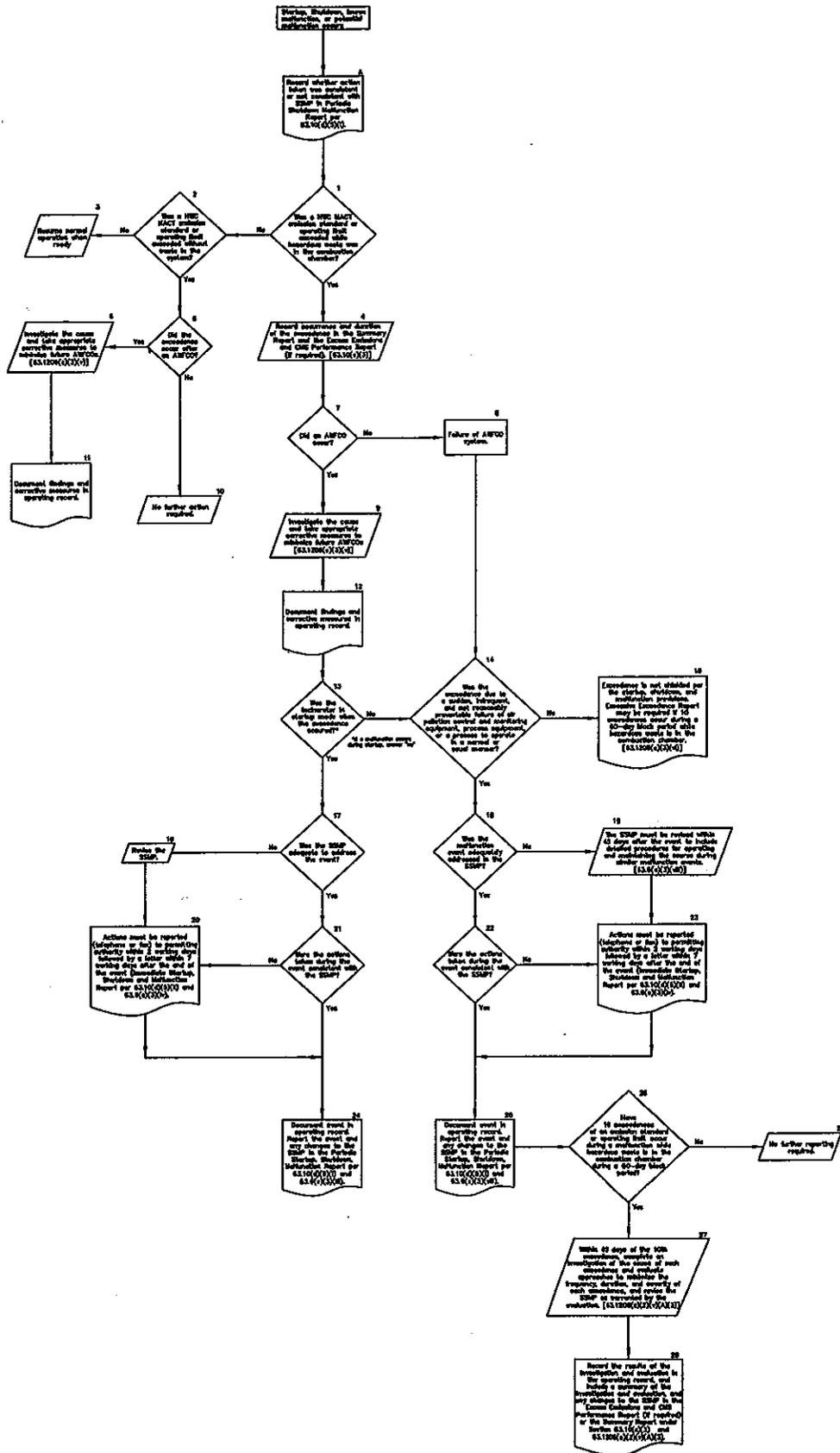


FIGURE 4-2. DECISIONS, ACTIONS AND RECORDS ASSOCIATED WITH STARTUP, SHUTDOWN, AND MALFUNCTION PLAN

**Table 3-2. API Key HWC MACT CMS Instrumentation**

Parameter	Trane 1 Instrument ID.	Trane 2 Instrument ID.	Instrument Description	Range
Maximum organic waste flow rate (a)	FT/FE-908-1	FT/FE-908-2	Organic waste flow rate	0 – 12 L/min
Maximum aqueous waste flow rate (a)	FT/FE-923-1	FT/FE-923-2	Aqueous waste flow rate	0 – 27.5 L/min
Minimum aqueous waste atomization pressure	PT-975B-1	PT-975B-2	Aqueous waste atomization pressure	0 - 75 psi
Minimum organic waste atomization pressure	PT-975A-1	PT-975A-2	Aqueous waste atomization pressure	0 - 75 psi
Kerosene flow rate (a)	FT904-1	FT904-2	Auxiliary fuel flow rate	0 – 6 L/min
Minimum combustion chamber temperature	TIC-905-1	TIC-905-2	Incinerators combustion chambers temperature	0 -1,200°C
Maximum/Minimum total combustion air flow	FT-907-1	FT-907-1	Combustion air flow rate	0 - 9.6 in H <sub>2</sub> O
	FT-906-1	FT-906-1	Secondary air flow rate	0 - 6 in H <sub>2</sub> O
	FT-975C-1	FT-975C-1	Organic waste atomization air flow rate	0 - 100 in H <sub>2</sub> O
	FT-975D-1	FT-975D-1	Aqueous waste atomization air flow rate	0 - 100 in H <sub>2</sub> O
Maximum CO in stack gas	AE-900-1	AE-900-1	CO and O <sub>2</sub> Analyzer CEMS	0 – 200 ppm 0 – 3000 ppm
Stack gas Oxygen concentration (b)	AE-900-1	AE-900-1	CO and O <sub>2</sub> Analyzer CEMS	0 – 25%
Minimum quench blowdown pH	AE-901-1	AE-901-2	Quench tank blowdown pH	0 - 14
Minimum quench tank blowdown flow rate	FT-903-1	FT-903-2	Quench tank blowdown flow rate	0 – 200 L/min
Minimum quench tank water level	LT-910-1	LT-910-2	Quench tank water level	0 – 100 in H <sub>2</sub> O
Minimum venturi scrubber pressure drop	PDT-945-1	PDT-945-2	Venturi scrubber pressure drop	0 – 100 in H <sub>2</sub> O
Minimum venturi scrubber recycle water flow	FT-901A-1	FT-901A-2	Venturi scrubber recycle water flow	0 – 492 L/min
Minimum venturi scrubber recycle water pH	AE-902-1	AE-902-2	Venturi scrubber recycle water pH	0 – 14
Minimum venturi scrubber blowdown flow rate	FT-944-1	FT-944-2	Venturi scrubber blowdown flow rate	0 – 12 gpm
Minimum separator tank water level	LT-907-1	LT-907-2	Separator tank water level	0 – 63.7 in H <sub>2</sub> O

Parameter	Trane 1 Instrument ID.	Trane 2 Instrument ID.	Instrument Description	Range
Minimum WESP secondary power input	SQ-300V/300A	SQ-300V/300A	WESP secondary power input	0 – 80 KVDC/ 0 – 2000 ma dc
Minimum total heat input	Calculated	Calculated	MMBTU/hr	NA
Maximum total Mercury feed rate	Calculated	Calculated	lb/hr	NA
Maximum total Chloride feed rate	Calculated	Calculated	lb/hr	NA
Maximum total Ash feed rate	Calculated	Calculated	lb/hr	NA
Maximum total Lead feed rate	Calculated	Calculated	lb/hr	NA
Maximum total Arsenic feed rate	Calculated	Calculated	lb/hr	NA
Maximum total Cadmium feed rate	Calculated	Calculated	lb/hr	NA
Maximum total Beryllium feed rate	Calculated	Calculated	lb/hr	NA
Maximum total Chromium feed rate	Calculated	Calculated	lb/hr	NA

- (a) The feed rates of these feedstreams are measured to calculate the chlorine, ash, mercury, LVM, and SVM feedrates.
- (b) Oxygen monitor is required to correct the CO concentration to 7% oxygen using the one minute average (OMA) O<sub>2</sub> concentration

**Table 4-1  
Hazardous Waste Incinerators  
Potential Malfunctions Corrective Actions**

API Industries, Inc.  
Guayama, Puerto Rico

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Note: For each malfunction described below, waste feed must be cut off immediately. If automatic waste feed cutoff (AWFCO) malfunctions, or if malfunctioning equipment is not equipped with AWFCO, waste feed must be cutoff manually. Corrective action must be implemented as soon as practicable. Waste may not be fed to the incinerator until the malfunction is corrected.

Nota: Por cada malfuncionamiento descrito a continuación se debe descontinuar la inyección de desperdicios inmediatamente. Si la interrupción automática del malfuncionamiento no se ejecuta, o si el equipo que tiene el malfuncionamiento no está equipado con la interrupción automática para descontinuar la inyección de desperdicios, la misma se ejecutará manualmente. La acción correctiva deberá ser implementada lo más pronto posible. No se puede inyectar desperdicios al incinerador hasta que el malfuncionamiento sea corregido.

SSV ID	Malfunction	Corrective Action
1	Loss of utilities/Pérdida de las utilidades	If the Automated preventative measures do not detect and stop waste flow, an operator will manually stop waste flow. The operator will immediately notify the waste treatment area supervisor to effect repairs to the faulty utility.    Si las medidas preventivas automáticas no se detectan y detienen el flujo de desperdicios, el operador deberá inmediatamente informar al supervisor para reparar la utilidad afectada.
2	Power failure/Falla eléctrica	Wait until power is restored and continue with normal operations. Initiate shutdown procedures if necessary.    Espere hasta que la electricidad sea restablecida y continúe con la operación normal. Comience el procedimiento de apagado si fuera necesario.
3	Malfunction of thermocouple in combustion chamber / Malfuncionamiento del medidor de temperatura en la cámara de combustión	An AWFCO will be triggered. The operator will immediately notify the waste treatment area supervisor. Determine cause and take appropriate measure to return to normal operating parameters.    Se ejecutará automáticamente la interrupción de la inyección de desperdicios al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
4	Leak in sealed system / Escape en el sello de la cámara de combustión	Determine cause and take appropriate measure to return to normal operating parameters. If preventive measures fail to manage the problem, waste feed will manually stopped by the operator upon identification of malfunction. The operator will immediately notify the waste treatment area supervisor.    Determine la causa y tome las medidas preventivas para regresar los parámetros a operación normal. Si las medidas preventivas fallan en arreglar el problema, la inyección de desperdicio al incinerador deberá ser descontinuada manualmente hasta que el operador identifique la causa del malfuncionamiento. El operador notificará inmediatamente a su supervisor.
5	High temperature in thermocouple of refractory / Alta temperatura en el refractario.	If a failure is detected, waste feed will be manually stopped by the operator upon identification of the malfunction. The operator will immediately notify the waste treatment area supervisor.    Si la falla es detectada, la inyección de desperdicios al incinerador deberá ser descontinuada manualmente hasta que el operador identifique la causa del malfuncionamiento. El operador notificará inmediatamente a su supervisor.
6	Flame outage/ Apagado de la llama en la cámara de combustión	An AWFCO will be triggered. Determine cause of the flame outage and attempt to restore flame, if possible. The operator will immediately notify the waste treatment area supervisor.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
7	Loss of atomizing air /Pérdida de aire de atomización en la cámara de combustión	An AWFCO will be executed. Determine cause and take appropriate measure to return to normal operating parameters, if possible. The operator will immediately notify the waste treatment area supervisor.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
8	Combustion air fan failure / Falla en el abanico del aire de combustión	An AWFCO will be executed. Determine cause and take appropriate measure to return to normal operating parameters, if possible. The operator will immediately notify the waste treatment area supervisor.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.

**Table 4-1  
Hazardous Waste Incinerators  
Potential Malfunctions Corrective Actions**

API Industries, Inc.  
Guayama, Puerto Rico

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Note: For each malfunction described below, waste feed must be cut off immediately. If automatic waste feed cutoff (AWFCO) malfunctions, or if malfunctioning equipment is not equipped with AWFCO, waste feed must be cutoff manually. Corrective action must be implemented as soon as practicable. Waste may not be fed to the incinerator until the malfunction is corrected.

Nota: Por cada malfuncionamiento descrito a continuación se debe discontinuar la inyección de desperdicios inmediatamente. Si la interrupción automática del malfuncionamiento no se ejecuta, o si el equipo que tiene el malfuncionamiento no está equipado con la interrupción automática para discontinuar la inyección de desperdicios, la misma se ejecutará manualmente. La acción correctiva deberá ser implementada lo más pronto posible. No se puede inyectar desperdicios al incinerador hasta que el malfuncionamiento sea corregido.

SSM ID	Malfunction	Corrective Action
9	Kerosene feed failure/ Falla en la alimentación del keroseno	An AWFCO will be executed. Determine cause and take appropriate measure to return to normal operating parameters, if possible. The operator will immediately notify the waste treatment area supervisor.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
10	Pluggage of feed gun nozzle(s)/ Ataponamiento en el orificio de alimentación del desperdicio o keroseno	If deterioration of spray patterns are suspected, waste feed will be manually stopped by the operator. The operator will immediately notify the waste treatment area supervisor.    Si se sospecha que existe un deterioro en los patrones de riego en los orificios de alimentación del desperdicio o de keroseno, el operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
11	Excessive waste feed rate/ Exceso en la razón de alimentación de flujo de desperdicio	An AWFCO will be executed. Determine cause and take appropriate measure to return to normal operating parameters, if possible. The operator will immediately notify the waste treatment area supervisor.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
12	Smoke from access doors or seals / Humo proveniente de las puertas de acceso o de los sellos	Adjust combustion air and/or verify if door or seal can be tightened to restore to normal operating parameters. If preventive measures fail to manage the problem, waste feed will be manually stopped by the operator. The operator will immediately notify the waste treatment area supervisor.    Ajuste el aire de combustión y/o verifique si la puerta o los sellos están ajustados para restablecer la operación normal de los parámetros operacionales. Si las medidas preventivas fallan en resolver el problema, el operador procederá a detener manualmente la alimentación del desperdicio. El operador notificará inmediatamente al supervisor sobre el evento.
13	Visible emissions from stack (e.g., black or gray smoke)/ Emisiones visibles en la chimenea (humo negro o gris)	Adjust combustion air and /or atomization air/stream to restore normal operating parameters. If preventive measures fail to manage the problem, waste feed will be manually stopped by the operator. The operator will immediately notify the waste treatment area supervisor.    Si las medidas preventivas fallan para manejar el problema, el operador discontinuará la inyección de desperdicios. El operador notificará inmediatamente al supervisor.
14	Low quench recycle flow water/ Bajo flujo de recirculación del "quench"	Determine cause and take appropriate measure to return to normal operating parameters. If preventive measures fail to manage the problem, waste feed will be manually stopped by the operator. The operator will immediately notify the waste treatment area supervisor.    Determine la causa y tome las medidas preventivas para regresar los parámetros a operación normal. Si las medidas preventivas fallan en arreglar el problema, la inyección de desperdicio al incinerador deberá ser discontinuada manualmente hasta que el operador identifique la causa del malfuncionamiento. El operador notificará inmediatamente a su supervisor.
15	Loss of quench recirculation pumps/ Pérdida en la bomba de recirculación del "quench"	Determine cause and take appropriate measure to restart pump or valve in backup valve and start it. If preventive measures fail to manage the problem, waste feed will be manually stopped by the operator. The operator will immediately notify the waste treatment area supervisor.    Determine la causa y tome las medidas apropiadas para encender la bomba o coloque la válvula en posición de respaldo y encienda la misma. Si las medidas preventivas fallan para manejar el problema, el operador discontinuará la inyección de desperdicios. El operador notificará inmediatamente al supervisor.

**Table 4-1  
Hazardous Waste Incinerators  
Potential Malfunctions Corrective Actions**

API Industries, Inc.  
Guayama, Puerto Rico

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Note: For each malfunction described below, waste feed must be cut off immediately. If automatic waste feed cutoff (AWFCO) malfunctions, or if malfunctioning equipment is not equipped with AWFCO, waste feed must be cutoff manually. Corrective action must be implemented as soon as practicable. Waste may not be fed to the incinerator until the malfunction is corrected.

Nota: Por cada malfuncionamiento descrito a continuación se debe descontinuar la inyección de desperdicios inmediatamente. Si la interrupción automática del malfuncionamiento no se ejecuta, o si el equipo que tiene el malfuncionamiento no está equipado con la interrupción automática para descontinuar la inyección de desperdicios, la misma se ejecutará manualmente. La acción correctiva deberá ser implementada lo más pronto posible. No se puede inyectar desperdicios al incinerador hasta que el malfuncionamiento sea corregido.

SSMP	Malfunction	Corrective Actions
16	Quench level not maintained./ Nivel del "quench" no es mantenido	An AWFCO will be executed. The operator will immediately notify the waste treatment area supervisor. Determine cause and take appropriate measure to return to normal operating parameters, if possible.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
17	Loss of quench pH control./ Descontrol en el metro de pH en el "quench"	An AWFCO will be executed. The operator will immediately notify the waste treatment area supervisor. Determine cause and take appropriate measure to return to normal operating parameters, if possible.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
18	Low Venturi recycle flow water/Baja recirculación del flujo de agua del Venturi	An AWFCO will be executed. Determine cause and take appropriate measure to return to normal operating parameters, if possible. The operator will immediately notify the waste treatment area supervisor.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
19	Loss of recirculation pumps in the Venturi/ Pérdida en la bomba de recirculado del venturi	An AWFCO will be executed. Determine cause and take appropriate measure to restart pump or valve in backup valve and start it, if possible. The operator will immediately notify the waste treatment area supervisor.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
20	Loss of pH control in the Venturi./ Descontrol en el metro de pH del Venturi	An AWFCO will be executed. The operator will immediately notify the waste treatment area supervisor. Determine cause and take appropriate measure to return to normal operating parameters, if possible.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
21	Failure to maintain pressure drop/Falla en mantener la caída en presión del venturi	An AWFCO will be executed. The operator will immediately notify the waste treatment area supervisor. Determine cause and take appropriate measure to return to normal operating parameters, if possible.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
22	CO>100 ppm WESP Safety Shutoff	An AWFCO will be executed. The operator will immediately notify the waste treatment area supervisor. Determine cause and take appropriate measure to return to normal operating parameters, if possible.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.

**Table 4-1  
Hazardous Waste Incinerators  
Potential Malfunctions Corrective Actions**

API Industries, Inc.  
Guayama, Puerto Rico

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Note: For each malfunction described below, waste feed must be cut off immediately. If automatic waste feed cutoff (AWFCO) malfunctions, or if malfunctioning equipment is not equipped with AWFCO, waste feed must be cutoff manually. Corrective action must be implemented as soon as practicable. Waste may not be fed to the incinerator until the malfunction is corrected.

Nota: Por cada malfuncionamiento descrito a continuación se debe descontinuar la inyección de desperdicios inmediatamente. Si la interrupción automática del malfuncionamiento no se ejecuta, o si el equipo que tiene el malfuncionamiento no está equipado con con la interrupción automática para descontinuar la inyección de desperdicios, la misma se ejecutará manualmente. La acción correctiva deberá ser implementada lo más pronto posible. No se puede inyectar desperdicios al incinerador hasta que el malfuncionamiento sea corregido.

SSMP ID	Malfunction	Corrective Action
23	Loss of WESP recirculation pump/Pérdida en la bomba de recirculación en el WESP	An AWFCO will be executed. The operator will immediately notify the waste treatment area supervisor. Determine cause and take appropriate measure to return to normal operating parameters, if possible.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
24	Loss of purge air blower and heater / Pérdida de la purga de aire en el secador y calentador del precipitador	An AWFCO will be executed. The operator will immediately notify the waste treatment area supervisor. Determine cause and take appropriate measure to return to normal operating parameters, if possible.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
25	Loss of cooling recirculation water	An AWFCO will be executed. The operator will immediately notify the waste treatment area supervisor. Determine cause and take appropriate measure to return to normal operating parameters, if possible.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
26	Instruments out of control/ Instrumentos fuera de control	An AWFCO will be executed. The operator will generate a work order and must contact the instrumentist. The instrumentist will inspect and complete a troubleshooting, calibrate the instrument if necessary, document the failure and the actions taken to correct the problem in exhibit A-1 of the SSMP and in the work order. Return to normal operations if possible.    Se ejecutará automáticamente la interrupción de la inyección del desperdicio al incinerador (AWFCO). El operador generará una orden de trabajo y contactará al instrumentista. El instrumentista inspeccionará y realizará pruebas de ejecución hasta encontrar la causa del malfuncionamiento, calibrará el instrumento de ser necesario. Documentará la falla y la acción correctiva en el exhibit A-1 del SSMP y en el work order. El operador tomará las medidas necesarias para regresar a condición normal los parámetros operacionales, si es posible.
27	Low or high heat input/ Nivel de calor alto o bajo en la cámara de combustión	An AWFCO will be executed. Operator will immediately notify the supervisor. Operator immediately will adjust the waste flow in order to increase or decrease the heat input value. Se ejecutará automáticamente la interrupción del desperdicio. If preventive measures fail to manage the problem, waste feed will be manually stopped by the operator. The operator will immediately notify the waste treatment area supervisor.    Se ejecutará automáticamente la interrupción del desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. El operador inmediatamente ajustará el flujo del desperdicio para disminuir el valor del calor introducido en la cámara de combustión.
28	Low quench blowdown flow / Bajo flujo del blowdown del "quench"	An AWFCO will be executed. The operator will immediately notify the waste treatment area supervisor. Determine cause and take appropriate measure to return to normal operating parameters, if possible.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.

**Table 4-1  
Hazardous Waste Incinerators  
Potential Malfunctions Corrective Actions**

API Industries, Inc.  
Guayama, Puerto Rico

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Note: For each malfunction described below, waste feed must be cut off immediately. If automatic waste feed cutoff (AWFCO) malfunctions, or if malfunctioning equipment is not equipped with AWFCO, waste feed must be cutoff manually. Corrective action must be implemented as soon as practicable. Waste may not be fed to the incinerator until the malfunction is corrected.

Nota: Por cada malfuncionamiento descrito a continuación se debe descontinuar la inyección de desperdicios inmediatamente. Si la interrupción automática del malfuncionamiento no se ejecuta, o si el equipo que tiene el malfuncionamiento no está equipado con la interrupción automática para descontinuar la inyección de desperdicios, la misma se ejecutará manualmente. La acción correctiva deberá ser implementada lo más pronto posible. No se puede inyectar desperdicios al incinerador hasta que el malfuncionamiento sea corregido.

SSMP ID	Malfunction	Corrective Action
29	Quench tank high temperature/ Temperatura alta en el Quench	An AWFCO will be executed. The operator will immediately notify the supervisor. Determine cause and take appropriate measure to return to normal operating parameters, if possible.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
30	Venturi low level	An AWFCO will be executed. Determine cause and take appropriate measure to return to normal operating parameters, if possible. The operator will immediately notify the supervisor.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
31	Venturi blowdown low flow	An AWFCO will be executed. Determine cause and take appropriate measure to return to normal operating parameters, if possible. The operator will immediately notify the waste treatment area supervisor.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
32	CEM Instrument (S700) out of range/S700 fuera de rango	An AWFCO will be executed. The operator will generate a work order and must contact the instrumentist. The instrumentist will inspect and complete a troubleshooting, calibrate the instrument if necessary, document the failure and the actions taken to correct the problem in exhibit A-1 of the SSMP and in the work order. Return to normal operations if possible.    Se ejecutará automáticamente la interrupción de la inyección del desperdicio al incinerador (AWFCO). El operador generará una orden de trabajo y contactará al instrumentista. El instrumentista inspeccionará y realizará pruebas de ejecución hasta encontrar la causa del malfuncionamiento, calibrará el instrumento de ser necesario. Documentará la falla y la acción correctiva en el exhibit A-1 del SSMP y en el work order. El operador tomará las medidas necesarias para regresar a condición normal los parámetros operacionales, si es posible.
33	S700 Bad data failure off autocalibration/Data incorrecta en el S700 falla en la autocalibración	An AWFCO will be executed. Determine cause and take appropriate measure to return to normal operating parameters, if possible. The operator will immediately notify the waste treatment area supervisor.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
34	PROVOX, OPC server CEM View server and S700 loss of communication	An AWFCO will be executed. Determine cause and take appropriate measure to return to normal operating parameters, if possible. The operator will immediately notify the waste treatment area supervisor.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.

**Table 4-1  
Hazardous Waste Incinerators  
Potential Malfunctions Corrective Actions**

API Industries, Inc.  
Guayama, Puerto Rico

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Note: For each malfunction described below, waste feed must be cut off immediately. If automatic waste feed cutoff (AWFCO) malfunctions, or if malfunctioning equipment is not equipped with AWFCO, waste feed must be cutoff manually. Corrective action must be implemented as soon as practicable. Waste may not be fed to the incinerator until the malfunction is corrected.

Nota: Por cada malfuncionamiento descrito a continuación se debe discontinuar la inyección de desperdicios inmediatamente. Si la interrupción automática del malfuncionamiento no se ejecuta, o si el equipo que tiene el malfuncionamiento no está equipado con la interrupción automática para discontinuar la inyección de desperdicios, la misma se ejecutará manualmente. La acción correctiva deberá ser implementada lo más pronto posible. No se puede inyectar desperdicios al incinerador hasta que el malfuncionamiento sea corregido.

SSM ID	Malfunction	Corrective Actions
35	Low differential pressure in the combustion chamber/ Diferencial de presión bajo en la cámara de combustión	An AWFCO will be executed. Determine cause and take appropriate measure to return to normal operating parameters, if possible. The operator will immediately notify the waste treatment area supervisor.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
36	High differential pressure in the combustion chamber/Diferencial de presión alto en la cámara de combustión	An AWFCO will be executed. Determine cause and take appropriate measure to return to normal operating parameters, if possible. The operator will immediately notify the waste treatment area supervisor.    Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
37	Loss of secondary power input/	An AWFCO will be executed. The operator will immediately notify the waste treatment area supervisor. Determine cause and take appropriate measure to return to normal operating parameters, if possible.   Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
38	Low temperature in the combustion chamber/ Baja temperatura en la cámara de combustión	An AWFCO will be executed. The operator will immediately notify the waste treatment area supervisor. Determine cause and take appropriate measure to return to normal operating parameters, if possible.   Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
39	Low atomization pressure organic and aqueous/Presión de atomización bajo para el desperdicio acuoso y/o orgánico	An AWFCO will be executed. The operator will immediately notify the waste treatment area supervisor. Determine cause and take appropriate measure to return to normal operating parameters, if possible.   Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.
40	Communication Failure/ Falla de comunicación	An AWFCO will be executed. Operator will contact the system administrator to request a verification of the server. Determine cause and take appropriate measure to return to normal operating parameters, if possible.   Se ejecutará automáticamente la interrupción de la inyección de desperdicio al incinerador (AWFCO). El operador notificará inmediatamente al supervisor. Determinará la causa y tomará las medidas apropiadas para regresar los parámetros a operación normal.



### Exhibit A-1 Startup, Shutdown, or Malfunction Documentation Form

Complete this form for every startup, shutdown, or known/potential malfunction (SSM).

#### SECTION 1

Process Unit: \_\_\_\_\_

Equipment ID: \_\_\_\_\_

Event was a:  Startup  Shutdown  Malfunction (known or potential)

Brief description of event: \_\_\_\_\_

Date/time SSM commenced: \_\_\_\_\_ Date/time SSM ended: \_\_\_\_\_

Is the SSM addressed in the SSMP/ standard operating procedure (SOP)?  Yes  No

SSMP/ SOP reference number/section

Check all that apply associated with SSM:

- 1) \_\_\_\_\_ Actions taken were consistent with SSMP/ SOP
- 2) \_\_\_\_\_ Actions taken were not consistent with SSMP/ SOP
- 3) \_\_\_\_\_ HWC MACT exceedance did not occur
- 4) \_\_\_\_\_ HWC MACT exceedance did occur.

If 1) and 4), 2) and 3) or 2) and 4) are checked, complete the applicable information requests in Section 2, sign and date below, and promptly provide completed form to the **Environmental Compliance Manager**

#### SECTION 2

Description of startup, shutdown, or malfunction: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Response/corrective action taken: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Reason(s) for not following the SSMP/SOP (complete if 2 above is checked) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Suggested measures to prevent reoccurrence of malfunction: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Suggested SSMP/ SOP revisions or improvements \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

OPERATOR

SUPERVISOR

ENVIRONMENTAL CONTACT

Print name: \_\_\_\_\_  
Signature: \_\_\_\_\_  
Date: \_\_\_\_\_

Print name: \_\_\_\_\_  
Signature: \_\_\_\_\_  
Date: \_\_\_\_\_

Print name: \_\_\_\_\_  
Signature: \_\_\_\_\_  
Date: \_\_\_\_\_



The following signature certifies accuracy of this report:

Name: \_\_\_\_\_

Print name of responsible official that  
Certify Accuracy

\_\_\_\_\_ Title

\_\_\_\_\_ Signature