ATTACHMENT 12

WASTE FEED CUTOFF SYSTEMS TESTING PROCEDURE

Attachment 12
Waste Feed Cutoff Systems Testing Procedure

The testing of the automatic waste feed cutoff system will be done on a weekly basis (once every 168 hours on waste). The test initiation will shut off waste feed (effects) as each "cause" is electronically checked.

1. The control board operator is responsible to initiate the weekly waste feed cutoff test.

   Once the test is started, a total waste feed cutoff is initiated by a simulated "cause." The "effects" of this condition will be field verified and recorded on forms. Once this occurs the control system will simulate signals internally for each of the waste feed cutoff causes and generate an alarm printout to indicate that each one operated.

2. The control system is programmed such that one coil (programming loop) will cause all the associated effects. Also, all of the associated waste feed causes will energize the one coil.

   The waste feed cutoff test is conducted in two parts. The first part consists of testing that the one coil causes all the associated "effects" which are field verified and initialed by the operator performing the verification. The second part tests that all of the associated "causes" energize the one coil. In doing this, it is inferred that any of the "causes" will cause the "effects."

3. The following cutoffs (effects) will occur:

a)	Apron Feeder	SV 1036	on/off
	Upper Flop Gate	SV 1035B	open/shut
	Lower Flop Gate	SV 1034B	open/shut
b)	Kiln Elevator Container Feed Gate	SV 1033B	open/shut
c)	Direct Burn (A-101)		
	Block Valve	SV 1170	open/closed
	Control Valve	FV 1171	open/closed
d)	Kiln Liquid Waste Feed (A-104A)		
	Block Valve	SV 1120	open/closed
	Control Valve	FV 1121	open/closed
e)	North ABC Liquid Waste Feed (A-106A)		
	Block Valve	SV 1183	open/closed

	Control Valve	FV 1184	open/closed
f)	South ABC Cylinder Waste Feed (A-106B-3)		
	Block Valve	SV 1103	open/closed
	Control Valve	SV 1104	open/closed
g)	North ABC Aqueous Waste Feed (A-105A)		
	Aqueous Block Valve	SV 1252	open/closed
	Aqueous Control Valve	FV 1253	open/closed
h)	South ABC Liquid Waste Feed (A-106B-1)		
	Block Valve	SV 1220	open/closed
	Control Valve	FV 1221	open/closed
i)	South ABC Aqueous Waste Feed (A-105B)		
	Aqueous Block Valve	SV 1262	open/closed
	Aqueous Control Valve	FV 1263	open/closed
j)	Kiln Sludge Feed (A-103)		
	Kiln Sludge Control Valve	PV 4021	open/closed
	Kiln Sludge Block Valve	SV 4022	open/closed
k)	Kiln Aqueous Waste Feed (A-102)		
	Aqueous Block Valve	SV 1150	open/closed
	Aqueous Control Valve	FV 1151	open/closed
l)	Drum Pumping Station		
	Block Valve	SV 3016	open/closed
m)	South ABC Corrosive Waste Feed (A-106B-5)		
	Block Valve	SV 3364	open/closed
	Control Valve	FV 3365	open/closed
n)	Shred Tower Feed Auger	Kom_Feeder_SP0	on/off
	Isolation Valve	XV 7108	open/closed*

*one minute delay

4. When the waste feed cutoff test is initiated, waste feed ceases. The liquid burners are put on clean fuel to maintain temperature. A field check verifies that the effect occurred. This is done by a person who will physically check that the cutoff occurred and record the results on the form at the end of this attachment.

5. Once the waste feed ceases, the following list of waste feed cutoff causes will be simulated internally in the control system. Alarms will be recorded to verify operation (signal sent, signal received). The following causes will be simulated:

TOTAL WASTE FEED CUTOFF CAUSES (1)

a) ABC low temperature, TALL-1009
< 2026°F, HRA

b) ABC high pressure, PAH-1006
≥ 0.0" H_2O, 5 sec

c) ABC low oxygen
< 3%, 2 min, AAL-1010
< 2%, 15 sec, AALL-1010

d) Spray dryer high exit temperature
> 385°F, HRA, TAH-2001R
> 520°F, TAH-2001

e) Spray dryer low exit temperature
< 350°F, 15 minutes, TAL-2001
< 250°F, TALL-2001

f) Spray dryer upper nozzle low brine pressure, PAL-2044
< 300 psi

g) Spray dryer lower nozzle low brine pressure, PAL-2045
< 300 psi

h) Baghouse low differential pressure, PDAL 2020
< 1.8" H_2O

i) Baghouse minimum compartments on-line, ZAL2020
<7 compartments

j) Baghouse high broken bag detector, AAH2020B
>50% of the instrument span

k) Saturator high exit temperature, TAHH-2082
> 225°F

l) Saturator low brine flow, FALL-2081
< 300 gpm, HRA

m) 1st stage scrubber feed low pH, AAL-2104
< 5.99, HRA

n) 1st stage scrubber low brine flow, FALL-2092
< 1907 gpm, HRA

o) 1st stage scrubber low pressure drop, PAL-2093A
< 0.5" H_2O, HRA

p) 2nd stage scrubber feed low pH, AAL-2130
< 6.25, HRA

q) 2nd stage scrubber rundown low pH, AAL-2129
< 5.8, HRA

r) 2nd stage scrubber low brine flow, FALL-2095
< 1972 gpm, HRA

s) 2nd stage scrubber low pressure drop, PAL-2093B
< 0.5" H_2O HRA

t) Activated carbon feed rate WT-2037RL
< 26.2 lb/hr, HRA

u) Stack gas high flow, FAH-2195
> 77,147 ACFM, HRA

v) Stack high CO
> 100 ppm, HRA, AHH-2199
> 500 ppm for more than 60 sec, AAH-2199

w) ABC burners BMS trip, A106AM and A106BM, both simultaneously

x) Emergency waste feed stop red button, PB-0004

y) WDPF waste feed cutoff, PB-0005

z) Loss of utility power, UA-0001

aa) ABC safety vent open, ZAO-1017

bb) Baghouse on bypass, ZAL-2021

cc) Induced draft fan off, K-201

TOTAL KILN WASTE FEED CUTOFFS CAUSES (2)

a) Kiln outlet temperature, TAL 1005
< 1824°F, HRA (two pyrometers on-line)
< 1940°F, HRA (one pyrometer on-line)

b) Low kiln rotation, SAL-1003
< 0.15 RPM

c) Kiln Burner Management System, A104M
Loss of Flame
Low Combustion Air Pressure
Low Differential Pressure (atomizing air to waste liquid or fuel) on all enabled fuels and waste liquids
Low Liquid Pressure on all enabled fuels and waste liquids
Disabling all fuels and waste liquids
Manual shutdown of BMS

KILN CONTAINERS, SOLIDS, AND SLUDGE CUTOFF CAUSES (3)

a) Kiln low secondary combustion air pressure, PAL-1018
< 2" H_2O

COMBINED BULK SOLIDS AND CONTAINERS WASTE FEED CUTOFF CAUSES (4)

a) Bulk Solids and Kiln Barrel Feed
High hourly combined container and bulk solids feed rate, WQAH-1040, >18,600 lb/hr, HRA

WASTE FEED CUTOFF TO THE AFFECTED GUN/LANCE/FEED MECHANISM CAUSES (5)

a) Kiln Blend Liquid Lance (A-104)
Kiln blend liquid low pressure switch PSL-1119A
Kiln atomizing air/waste liquid differential low pressure switch, PDSL-1124
High Kiln blend liquid flow rate, FAH-1121, >3090 lb/hr, HRA or >90 lb/min for 15 sec
Low Kiln blend liquid flow rate (turndown), <1.125 gpm for 15 sec (except during 3 minute gun startup)

b) Direct Burn Lance (A-101)
Direct burn atomizing air low pressure switch PSL-1162
High hourly direct burn feed rate, FQAH-1171, >1710 lb/hr, HRA

c) Sludge Feed (A-103)
High hourly sludge feed rate, FQAH-4042, >2170 lb/hr, HRA or >200 lb/min for 15 sec

d) North ABC Blend Liquid Lance (A-106A)
North ABC blend liquid low pressure switch PSL-1119B
North ABC atomizing air/waste liquid differential low pressure switch, PDSL-1187
Low North ABC blend liquid flow rate (turndown), <1.125 gpm for 15 sec (except during 3 minute gun startup)
High North ABC blend liquid flow rate, FAH-1184D, >90 lb/min for 15 sec

e) South ABC Blend Liquid Lance (A-106B)
South ABC blend liquid low pressure switch PSL-1196
South ABC atomizing air/waste liquid differential low pressure switch, PDSL-1224
Low South ABC blend liquid flow rate (turndown), <1.125 gpm for 15 sec (except during 3 minute gun startup)
High South ABC blend liquid/gas flow rate, FAH-1221D, >90 lb/min for 15 sec

f) South ABC Cylinder Lance (A-106B-3)
South ABC cylinder eductor nitrogen low pressure switch, PSL-1107

g) North ABC Aqueous Lance (A-105A)
North ABC aqueous low pressure switch, PSL-1165B
North ABC aqueous atomizing air low pressure switch, PSL-1256
High North ABC aqueous flow rate, FAH-1253D, >60 lb/min for 15 sec

h) South ABC Aqueous Lance (A-105B)
South ABC aqueous low pressure switch, PSL-1165C
South ABC aqueous atomizing air low pressure switch, PSL-1266
High South ABC aqueous flow rate, FAH-1263D, >60 lb/min for 15 sec

i) North ABC Burner Management System, A106AM
Loss of Flame
Low Combustion Air Pressure
Low Differential Pressure (atomizing air to waste liquid or fuel) on all enabled fuels and waste liquids
Low Liquid Pressure on all enabled fuels and waste liquids
Disabling all fuels and waste liquids

Manual shutdown of BMS

j) South ABC Burner Management System, A106BM
Loss of Flame
Low Combustion Air Pressure
Low Differential Pressure (atomizing air to waste liquid or fuel) on all enabled fuels and waste liquids
Low Liquid Pressure on all enabled fuels and waste liquids
Disabling all fuels and waste liquids
Manual shutdown of BMS

k) Kiln Aqueous Lance (A-102)
Kiln aqueous low pressure switch, PSL-1157A
Kiln aqueous atomizing air low pressure switch, PSL-1156A
High Kiln aqueous flow rate, FAH-1151, >1350 lb/hr, HRA or > 60 lb/min for 15 sec

l) South ABC Corrosive Lance (A-106B-5)
South ABC corrosive atomizing air low pressure switch, PSL-3382
Loss of both blend liquid feed to A-106B-1 and fuel oil to A-106B-2

COMBINED A-106A AND A-106B WASTE FEED CUTOFF CAUSES (6)

a) North and South ABC Blend Liquid Guns (A-106A and A-106B-1), South ABC Cylinder Feed (A-106B-3), and Corrosive Direct Burn Feed (A-106B-5) (when the waste has a heat content equal to or greater than 5000 Btu per pound)
High combined North and South ABC blend liquid/gas/corrosive direct burn (when the waste has a heat content equal to or greater than 5000 Btu per pound) flow rate, FAH-1290, >3720 lb/hr, HRA

COMBINED A-105A AND A-105B WASTE FEED CUTOFF CAUSES (7)

a) North and South ABC Aqueous Lances (A-105A and A-105B) and Corrosive Direct Burn Feed burner (A-106B-5) (when the waste being fed has a heat content less than 5000 Btu per pound)
High combined North and South ABC aqueous flow rate, and Corrosive Direct Burn flow rate (when the waste being fed has a heat content less than 5000 Btu per pound), FAH-1270, >6440 lb/hr, HRA

COMBINED SOUTH ABC BURNER (A-106B) WASTE FEED CUTOFF CAUSES (8)

a) South ABC Blend Liquid Guns (A-106B-1, A-106B-3 and A-106B-5 (when the waste being fed from the drive through corrosive direct burn system has a heat content equal to or greater than 5000 Btu per pound))
   South ABC blend liquid low pressure switch PSL-1196
   South ABC atomizing air/waste liquid differential low pressure switch, PDSL-1224
   High South ABC blend liquid/gas/corrosive direct burn (when the waste being fed from the drive through corrosive direct burn system has a heat content equal to or greater than 5000 Btu per pound) flow rate, FAH-1221D, >90 lb/min for 15 sec
b) South ABC Blend Liquid Guns (A-106B-1 and A-106B-5 (when the waste being fed from the drive through corrosive direct burn system has a heat content equal to or greater than 5000 Btu per pound))
   Low South ABC blend liquid and corrosive direct burn flow rate (turndown), <1.125 gpm for 15 sec (except during 3 minute gun startup)

COMBINED A-105B AND A-106B WASTE FEED CUTOFF CAUSES (9)

a) South ABC Aqueous Lance (A-105B) and ABC Blend Liquid Gun (A-106B-5 (when the waste being fed from the drive through corrosive direct burn system has a heat content less than 5000 Btu per pound))
   High South ABC aqueous and corrosive direct burn (when the waste being fed from the drive through corrosive direct burn system has a heat content less than 5000 Btu per pound) flow rate, FAH-1263D, >60 lb/min for 15 sec

6. The six signals (loss of flame, low combustion air pressure, low atomizing air pressure, low waste liquid pressure, disabling all fuels, and manual shutdown of the BMS) which will cause the Burner Management System on each burner to shut down, causing a waste feed cutoff, are not tested during the weekly waste feed cutoff test. These signals shall be tested periodically in the field at a frequency at least that recommended by the manufacturer. However, the minimum frequency shall be at least quarterly. Documentation of these tests shall be maintained in the facility's operating record.

7. Some causes in section 5 do not create all the effects in section 3. The list of causes with their limited effects follows.

	Cause	Effect
1)	total waste feed cutoff causes	All effects occur
2)	total kiln waste feed cutoff causes	3a, 3b, 3c, 3d, 3j, 3k, 3l, 3n

3)	kiln containers, solids, and sludge waste feed cutoff causes	3a, 3b, 3j, 3l, 3n
4)	combined bulk solids and containers waste feed cutoff causes	3a, 3b, 3n
5)	waste feed cutoff to the affected gun/lance/feed mechanism causes	Affected individual waste stream only
6)	combined A-106A, A-106B-1, A-106B-3, and A-106B-5 (when the waste being fed from the drive through corrosive direct burn system has a heat content equal to or greater than 5000 Btu per pound) waste feed cutoff causes	3e, 3f, 3h, 3m* *when the waste being fed from the drive through corrosive direct burn system has a heat content ≥5000 Btu/lb
7)	combined A-105A and A-105B and burner A-106B-5 (when the waste being fed from the drive through corrosive direct burn system has a heat content <5000 Btu/lb) waste feed cutoff causes	3g, 3i, 3m* *when the waste being fed from the drive through corrosive direct burn system has a heat content <5000 Btu/lb
8a)	combined A-106B-1, A-106B-3 and A-106B-5 (when the waste being fed from the drive through corrosive direct burn system has a heat content equal to or greater than 5000 Btu per pound) waste feed cutoff causes	3f, 3h, 3m* *when the waste being fed from the drive through corrosive direct burn system has a heat content ≥5000 Btu/lb
8b)	combined A-106B-1 and A-106B-5 (when the waste being fed from the drive through corrosive direct burn system has a heat content equal to or greater than 5000 Btu per pound) waste feed cutoff causes	3h, 3m* *when the waste being fed from the drive through corrosive direct burn system has a heat content ≥5000 Btu/lb
9)	combined A-105B and A-106B-5 (when the waste being fed from the drive through corrosive direct burn system has a heat content less than 5000 Btu per pound) waste feed cutoff causes	3i, 3m* *when the waste being fed from the drive through corrosive direct burn system has a heat content <5000 Btu/lb

8. Waste feed not operating at the time of the test will not be tested. That is, if the direct burn system is not in use, it will not be set up just for the test. Clean Harbors Aragonite will verify all valves are still shut.

EQUIPMENT	TAG#	STATUS	INITIALS
Bulk Solids:			
Apron Feeder	SV-1036		
Upper Flop Gate	SV-1035B		
Lower Flop Gate	SV-1034B		
Kiln Elevator:			
Slide Gate	SV-1033B		
Shred Tower:			
Isolation Gate	XV-7108		
Feed Auger	Kom_Feeder_SP0		
Direct Burn:			
Block Valve	SV-1170		
Control Valve	FV-1171		
Kiln Liquid Waste Feed:			
Blended Waste Block Valve	SV-1120		
Blended Waste Control Valve	FV-1121		
North ABC Liquid Waste Feed:			
Blended Waste Block Valve	SV-1183		
Blended Waste Control Valve	FV-1184		
Aqueous Block Valve	SV-1252		
Aqueous Control Valve	FV-1253		
South ABC Liquid Waste Feed:			
Blended Waste Block Valve	SV-1220		
Blended Waste Control Valve	FV-1221		
Aqueous Block Valve	SV-1262		
Aqueous Control Valve	FV-1263		
Cylinder Block Valve	SV-1103		
Cylinder Control Valve	SV-1104		
Corrosive Waste Block Valve	SV-3364		
Corrosive Waste Control Valve	FV-3365		

EQUIPMENT	TAG#	STATUS	INITIALS
Kiln Sludge Feed:			
Sludge Control Valve	PV-4021		
Sludge Block Valve	SV-4022		
Drum Pumping Station:			
Drum Pumping Station Block Valve	SV-3016		
Kiln Aqueous Feed:			
Aqueous Block Valve	SV-1150		
Aqueous Control Valve	FV-1151		