

May 27, 2011

Excess Emissions from Plant Power Outage- 05/26/11 - 11:19 AM  
 Adkins Energy LLC – Lena Illinois  
 Site No. 177802AAA; FESOP Permit No. 03060057



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On May 26, 2011 at 11:19 AM the plant lost all power due to a loss of utility power. The on-site turbine generator was online and the plant was running parallel with ComEd at the time of the outage. Due to the severity of the event on the utility side, it caused the turbine to immediately shut down as well. The loss of electrical power caused an interruption of the water flow to the fermentation scrubber. Water flow to the fermentation scrubber was restarted at 11:25 AM. The dryer and dryer RTO also lost power causing the emergency vent to open but the loss of the fan motors minimized dryer emissions. Distillation process exhausts were routed to the dryer RTO at the time of the power outage. Although the distillation control device (dryer RTO) shut down, the distillation processes also shutdown so there were no excess emissions from distillation. The water flow to the distillation scrubber was started prior to restarting the distillation process. Excess emissions from this event are summarized in Tables 1 - 4 below.

**Table 1 - Estimated Uncontrolled Dryer VOM/HAP Emissions  
 Plant Power Outage on May 26, 2011 at 11:19 AM.**

When plant power was interrupted, the dryer emergency relief vent immediately opened to atmosphere. The dryer, dryer RTO, and all dryer fans lost power and stopped operating. Due to the lack of air flow through the dryer it took an extended period of time for the outlet dryer temperature to reach 130°F - the point at which VOM and HAP emissions are negligible. Due to the lack of air flow, excess emissions would have been minimal; however, for the purpose of this emission estimate we have calculated emissions as if this was a typical dryer shutdown with continuing air flow and a typical period of 90-minutes to reach an outlet temperature of 130°F resulting in a conservative estimate of actual emissions.

26-May-11 11:19 AM Parameter	Dryer By-Pass Uncontrolled Emissions	
	(lbs)	tons
Duration	90 min	
PM/PM10	1.95	0.001
CO	16.79	0.008
VOM	42.17	0.021
Total HAPs	4.66	0.002
Acetaldehyde	3.522	0.002
Acrolein	0.020	0.000
Formaldehyde	0.526	0.000
Methanol	0.591	0.000

Uncontrolled dryer VOM emissions based on August 2004 compliance testing.

**Table 2 - Estimated Uncontrolled Distillation Scrubber VOM/HAP Emissions  
 Plant Power Outage on May 26, 2011 at 11:19 AM.**

The distillation process exhaust fan was ducted to the dryer RTO at the time of this event. When power to the dryer RTO was lost, power was also lost to the distillation process exhaust fan and other distillation processes, so there were no uncontrolled process emissions during this event. The scrubber was brought back on line with distillation process exhaust fan ducted to the scrubber. The scrubber water flow was established prior to restarting distillation process operations. Based on the above there were no excess distillation process emissions during this event.

Compound	Uncontrolled Distillation Scrubber VOM Emissions August 2003 Test (lb/hr)	Uncontrolled Distillation Scrubber VOM Emissions 0.00 Hrs	
		(lbs)	(tons)
Acetaldehyde (HAP)	4.62	0.00	0.0000
Formaldehyde (HAP)	0.00	0.00	0.0000
Acrolein (HAP)	0.00	0.00	0.0000
Methanol (HAP)	0.06	0.00	0.0000
<b>Total HAPs</b>	<b>4.68</b>	<b>0.00</b>	<b>0.0000</b>
<b>Total VOM (MSF)</b>	<b>85.33</b>	<b>0.00</b>	<b>0.0000</b>



**Table 3 - Estimated Uncontrolled Fermentation VOM/HAP Emissions  
 Plant Power Outage on May 26, 2011 at 11:19 AM.**

Water flow to the fermentation scrubber was lost at 11:19 AM and was restarted at 11:25 AM. During this time, the uncontrolled emissions from the fermentation tanks vented to the atmosphere through the scrubber by-pass stack. The estimate of uncontrolled emissions from this event is presented below.

Time 5/26/2011	Excess Emissions Duration (hrs)	Ferm. Tank #1		Ferm. Tank #2		Ferm Tank #3		Total VOM Uncontrolled (lbs)
		Tank Age (hrs)	VOM Uncontrolled (lbs)	Tank Age (hrs)	VOM Uncontrolled (lbs)	Tank Age (hrs)	VOM Uncontrolled (lbs)	
Fermentation Scrubber water supply was lost at 11:19								
05/26/11 11 - 12 AM	0.10	-	-	36.00	16.46	18.00	27.98	44.4
Fermentation Scrubber was placed back on line at approximately 11:25 AM (0.10-hr deviation)								
<b>Totals</b>	<b>0.10</b>							<b>44.44</b>

**Fermentation Process Emission Estimate**

Compound	Uncontrolled VOM Emissions by FTIR		Estimated Uncontrolled Fermentation Emissions	
	low flow Uncontrolled VOM <sup>a</sup> (lb/hr)	Percent of Total VOM by FTIR (%)	(lbs)	(tons)
	Acetaldehyde	3.0000	0.8192%	0.3641
Formaldehyde	0.3967	0.1083%	0.0481	0.0000
Acrolein	0.0000	0.0000%	0.0000	0.0000
Methanol	0.0200	0.0055%	0.0024	0.0000
<b>Total HAPs</b>	<b>3.4167</b>	<b>0.9330%</b>	<b>0.4146</b>	<b>0.0002</b>
<b>Total VOM (M25A)</b>	<b>366.20</b>		<b>44.44</b>	<b>0.0222</b>

a. Distribution of HAPs in VOM emissions based on uncontrolled emissions from August 2006 testing upstream of scrubber during low flow conditions.

**Table 4 - Estimated Total Uncontrolled VOM/HAP Emissions from Deviation Event  
 Plant Power Outage on May 26, 2011 at 11:19 AM.**

Compound	Estimated Uncontrolled VOM / HAP Emissions from Event	
	(lbs)	(tons)
Acetaldehyde (HAP)	3.89	0.0019
Formaldehyde (HAP)	0.07	0.0000
Acrolein (HAP)	0.53	0.0003
Methanol (HAP)	0.59	0.0003
<b>Total HAPs</b>	<b>5.07</b>	<b>0.0025</b>
<b>Total VOM (MSF)</b>	<b>86.62</b>	<b>0.0433</b>