

ORIGINAL



Your Touchstone Energy® Cooperative 

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MAY 06 2015

PUBLIC SERVICE  
COMMISSION

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

In the Matter of:

AN EXAMINATION OF THE APPLICATION )  
OF THE FUEL ADJUSTMENT CLAUSE )  
OF BIG RIVERS ELECTRIC CORPORATION ) Case No.  
FROM ) 2014-00230  
NOVEMBER 1, 2013 THROUGH APRIL 30, 2014 )

AN EXAMINATION OF THE APPLICATION )  
OF THE FUEL ADJUSTMENT CLAUSE )  
OF BIG RIVERS ELECTRIC CORPORATION ) Case No.  
FROM ) 2014-00455  
NOVEMBER 1, 2012 THROUGH OCTOBER 31, 2014 )

Forced Outage Reports in response to Item 3d of the  
Kentucky Industrial Utility Customers, Inc.'s  
Request for Information dated March 6, 2015  
(*Provided on electronic media filed on March 20, 2015*)

Volume 2 of 2  
(*Electronic files 41 through 87*)

FILED: May 6, 2015

ORIGINAL

# Forced Outage Report

**To:** Bob Berry

**From:** Billy Boarman

**Date:** 29-Aug-2013

**Plant:** HMP&L Station Two

**Unit:** 1

**GADS Class:** UO2

## Duration

Trip Time: 17-Aug-2013 01:56

Tie Time: 8-Aug-2013 11:39

Time Offline: 33:43

## Outage Description

HMP&L Station Two Unit 1 tripped on Saturday, 17-Aug-2013 at 01:55 on a turbine low vacuum trip due to losing the power feed to the C and D circulating water pumps.

## Root Cause

While taking H-2 offline the H-2 "A" 4160 volt main breaker did not open when transferring from auxiliary power to start up power which caused a fault in the T1 tie Transformer. When T1 tie Transformer tripped we lost all start-up power to H2 which caused C and D circulating water pumps to trip. At this time H1 was at full load and the HMP&L units have a common circulating water system. With the loss of two circulating water pumps H-1 began experiencing back pressure and vacuum problems; the operator was in the process of reducing load when the unit tripped.

## Failure History

No failures of this nature have occurred in the last three years.

## Corrective Action

A new OPL on Transferring to and from Auxiliary power was initiated. If the transfer had been performed correctly the C and D circulating water pumps would not have tripped.

# Forced Outage Report

## SOE Print Out

### STANDARD SOE REPORT

Triggered on: 17-Aug-2013 01:55:20:523

Event Time	State	Tag Name	Tag Description
17-Aug-2013 01:55:43:300	TRIP	H125DRMTP	BLR DRUM LEVEL TRIP
17-Aug-2013 01:55:39:217	HIGH	H140EXHOODTEHI	TURB EXH HOOD HIGH TEMP
17-Aug-2013 01:55:36:967	HIGH	H140THROPRESHI	TURB THROTTLE PRESS HIGH
17-Aug-2013 01:55:35:292	TRBLE	H132LOSSSAFANS	LOSS OF SEAL AIR FANS
17-Aug-2013 01:55:33:965	LOW	H125DRMLVLOW	BLR DRUM LEVEL LOW
17-Aug-2013 01:55:33:965	OK	H150FLDBKRTP	GEN H1 FIELD BKR TRIP
17-Aug-2013 01:55:33:591	CLOSED	H103CONP2BST	4160 BKR COND PUMP 2B STATUS
17-Aug-2013 01:55:30:513	OK	H141BRGOILLOTP	TURB BRG OIL PRESS LOW TRIP
17-Aug-2013 01:55:30:211	LOW	H132FLUGASLOO2	FLUE GAS LOW OXYGEN
17-Aug-2013 01:55:29:521	TRIP	H141BRGOILLOTP	TURB BRG OIL PRESS LOW TRIP
17-Aug-2013 01:55:29:445	TRBLE	H147HYDTROUBLE	HYDROGEN TROUBLE
17-Aug-2013 01:55:29:301	TRIP	H148DCEMSOPST	DC EMERG.SEAL OIL PMP STATUS
17-Aug-2013 01:55:29:115	OPEN	H140HYDOP2BST	HYD OIL PUMP 2B STATUS
17-Aug-2013 01:55:29:110	OPEN	H124AXCWP2BST	AUX CIRC WTR PMP 2B STATUS
17-Aug-2013 01:55:29:051	OPEN	H148MNSOPST	MAIN SEAL OIL PUMP STATUS
17-Aug-2013 01:55:28:978	OPEN	H141BGOPP2BST	BRG OIL PUMP 2B STATUS
17-Aug-2013 01:55:28:962	OFF	H132NOSCABRNG	NO SCNNR CLNG AIR BLWR RNG
17-Aug-2013 01:55:28:901	OK	H103AIRCMPATP	4160 BKR AIR COMP A TRIP
17-Aug-2013 01:55:28:896	OPEN	H132SAF2AST	SEAL AIR FAN 2A STATUS
17-Aug-2013 01:55:28:896	TRIP	H141BGOPP2BTP	BRG OIL PUMP 2B TRIP
17-Aug-2013 01:55:28:893	OPEN	H124AXCWP2AST	AUX CIRC WTR PMP 2A STATUS
17-Aug-2013 01:55:28:881	OPEN	H132BRCAF2ST	BNR CLG AIR FAN 2 STATUS
17-Aug-2013 01:55:28:878	OPEN	H140HYDOP2AST	HYD OIL PUMP 2A STATUS
17-Aug-2013 01:55:28:872	OPEN	H103AIRCMPAST	4160 BKR AIR COMP A STATUS
17-Aug-2013 01:55:28:858	TRIP	H140HYDOP2BTP	HYD OIL PUMP 2B TRIP
17-Aug-2013 01:55:28:854	TRIP	H148MNSOPTP	MAIN SEAL OIL PUMP TRIP
17-Aug-2013 01:55:28:838	TRIP	H103AIRCMPATP	4160 BKR AIR COMP A TRIP
17-Aug-2013 01:55:28:812	OK	H132SAF2BTP	SEAL AIR FAN 2B TRIP
17-Aug-2013 01:55:28:811	ENGD	H140TGRSTPENG	TURNING GEAR STOPPED/ENGAGED
17-Aug-2013 01:55:28:805	OK	H132SAF2ATP	SEAL AIR FAN 2A TRIP
17-Aug-2013 01:55:28:798	OPEN	H132AHDR2AST	AIR HTR DRIVE 2A STATUS
17-Aug-2013 01:55:28:796	TRIP	H124AXCWP2ATP	AUX CIRC WTR PMP 2A TRIP
17-Aug-2013 01:55:28:793	TRIP	H140HYDOP2ATP	HYD OIL PUMP 2A TRIP
17-Aug-2013 01:55:28:783	TRIP	H132AHDR2ATP	AIR HTR DRIVE 2A TRIP
17-Aug-2013 01:55:28:782	OK	H124AXCWP2ATP	AUX CIRC WTR PMP 2A TRIP
17-Aug-2013 01:55:28:778	OPEN	H103BUSAMAINST	4160 BKR BUS A MAIN STATUS
17-Aug-2013 01:55:28:776	TRIP	H141BGOPP2ATP	BRG OIL PUMP 2A TRIP
17-Aug-2013 01:55:28:770	TRIP	H124AXCWP2ATP	AUX CIRC WTR PMP 2A TRIP

## Forced Outage Report

17-Aug-2013 01:55:28:749	TRIP	H132BRCAF2TP	BNR CLG AIR FAN 2 TRIP
17-Aug-2013 01:55:28:747	OK	H141BGOPP2ATP	BRG OIL PUMP 2A TRIP
17-Aug-2013 01:55:28:725	TRIP	H141BGOPP2ATP	BRG OIL PUMP 2A TRIP
17-Aug-2013 01:55:28:584	OPEN	H150OCB166ST	OCB 0166 GEN H1 STATUS
17-Aug-2013 01:55:28:526	OPEN	H150FLDBKRST	GEN H1 FIELD BKR STATUS
17-Aug-2013 01:55:28:518	OK	H103BUSAMAINTP	4160 BKR BUS A MAIN TRIP
17-Aug-2013 01:55:28:516	OK	H103BUSBMAINTP	4160 BKR BUS B MAIN TRIP
17-Aug-2013 01:55:28:492	OPEN	H103BUSBMAINST	4160 BKR BUS B MAIN STATUS
17-Aug-2013 01:55:28:455	OK	H150OCB166GETP	OCB 0166 GEN H1 TRIP
17-Aug-2013 01:55:28:454	TRIP	H103BUSAMAINTP	4160 BKR BUS A MAIN TRIP
17-Aug-2013 01:55:28:454	OK	H150OCB162GETP	OCB 0162 GEN H1 TRIP
17-Aug-2013 01:55:28:452	TRIP	H103BUSBMAINTP	4160 BKR BUS B MAIN TRIP
17-Aug-2013 01:55:28:452	TRIP	H150FLDBKRTP	GEN H1 FIELD BKR TRIP
17-Aug-2013 01:55:28:447	OK	H150REVPWR67G2	GEN H1 REVERSE PWR (67G2)
17-Aug-2013 01:55:28:447	LKOUT	H150GENLO86G2	GEN DIFFERENTIAL LO (86G2)
17-Aug-2013 01:55:28:429	TRIP	H150OCB162GETP	OCB 0162 GEN H1 TRIP
17-Aug-2013 01:55:28:429	TRIP	H150OCB166GETP	OCB 0166 GEN H1 TRIP
17-Aug-2013 01:55:28:425	TRBLE	H150REVPWR67G2	GEN H1 REVERSE PWR (67G2)
17-Aug-2013 01:55:25:775	OK	H133LMISTP	LAST MILL IN SERVICE TRIP
17-Aug-2013 01:55:23:951	OK	H132NOSCABRNG	NO SCNNR CLNG AIR BLWR RNG
17-Aug-2013 01:55:23:710	OFF	H132NOSCABRNG	NO SCNNR CLNG AIR BLWR RNG
17-Aug-2013 01:55:22:514	OK	H140LOVACTP	TURB LOW VACUUM TRIP
17-Aug-2013 01:55:21:780	TRIP	H133LMISTP	LAST MILL IN SERVICE TRIP
17-Aug-2013 01:55:21:772	TRIP	H140STPVLVTP	TURB STOP VLV CLSD TRIP
17-Aug-2013 01:55:21:362	OK	H103M2BTRIP	4160 BKR MILL 2B TRIP
17-Aug-2013 01:55:21:351	TRIP	H103M2BTRIP	4160 BKR MILL 2B TRIP
17-Aug-2013 01:55:21:340	OPEN	H103M2AST	4160 BKR MILL 2A STATUS
17-Aug-2013 01:55:21:336	OPEN	H103PAF2AST	4160 BKR PA FAN 2A STATUS
17-Aug-2013 01:55:21:329	OPEN	H103M2BST	4160 BKR MILL 2B STATUS
17-Aug-2013 01:55:21:329	OPEN	H103PAF2BST	4160 BKR PA FAN 2B STATUS
17-Aug-2013 01:55:21:278	TRIP	H133EMERBLRTP	EMERGENCY BLR TRIP
17-Aug-2013 01:55:20:753	LOW	H143HYDOILPRLO	TURB HYD OIL PRESS LOW
17-Aug-2013 01:55:20:737	OK	H143HYDOILPRLO	TURB HYD OIL PRESS LOW
17-Aug-2013 01:55:20:523	TRIP	H140LOVACTP	TURB LOW VACUUM TRIP

# Forced Outage Report

## Operators Event Log

8/17/2013	1:00 AM	H-2 OFF TO WASH AIR HEATERS													
	5:06AM	LOST START-UP POWER TO STATION													
		N.DENTON CALLED IN SICK													
8/17/2013		FELTY, CECIL, BLAIR, EMBRY, HILLIARD												A SHIFT T. TOW	
		DUVALL S/L, BEAN S/L M JOHNSON													
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	12 HOUR	50	45								18'		
			STANDBY										26'		
		H1	OFF	165	153	0.794	10.5	0.19	74.4	85.8	65.08	200	2.7		
		H2	OFF	160	147	0.418	11.3	0.079	22.8	92.9	7.87	208	3.1		
		C.T.	0	61	61								15.5'		
		ALARMS:										GAUGE GLASSES		DRYING AGENT	
		R1											OK		
		H1	STEAM SEAL HI/LO, BURNER MANG., EH PRSS LO												
		H2	EH RES LEVEL HI												
		SOOTBLOWERS TAGGED													
		R1	1, 2, 3, 6, 7, 16, 17, 18, 19, 22L, 28, 29, 30, 31												
		H1	5, 6, 7, 8, 9, 10, 11, 20, 29, 30, 33, 39												
		H2	1, 2, 4, 5, 7, 9, 10, 11, 15, 18, 19, 20, 21, 22, 23, 24, 30, 32, 34, 39												
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH								SILO	BOOTHE SYSTEM
		LEVELS	7' 3"	11' 9"	16' 5"	8 1/4"									
	7:00am	L.BREEDEN HERE													
	730am	H2 D.C. LO PUMP RUNNING BUT FOUND PIN SHEARED													
	8:00AM	D.EDMONDS HERE													
	9:00AM	INLAND STATRING ON H2 SCRUBBERS													
	9:00AM	A.HOGAN HERE													
	NOTE	H2 D.C. LO PUMP R/T COUPLING SHEARED													
	NOTE	DIESEL GENERATOR QUIT RUNNING / B.CHEATHAM NOTIFIED 7:38AM													
	NOTE	H2 D.C. LO PUMP RUNNING BUT FOUND PIN SHEARED													
	9:37AM	CLOSED IN SCRUBBER EMERGENCY FEED 21-1 TO BACK FEED THRU H2 TO POWER UP 480V POWER ONLY TO RUN H1& H2 TURBINE OIL PUMPS													
		& T.G. - WOULD NOT CLOSE IN													
	9:44AM	H2 TURNING OIL PUMP ON													
	10:00AM	H1 480V CLOSED IN SCRUBBER EMERGENCY FEED 21-1 TO BACK FEED THRU H2 TO POWER UP 480V POWER ONLY TO RUN H1& H2 TURBINE OIL PUMP													
		& T.G. - WOULD NOT CLOSE IN													
	10:01AM	H1 AC LO PUMP ON													
	10:09AM	H1 TURBINE ON GEAR													
	10:50AM	H1 MAIN SEAL OIL PUMP ON													
	12:30PM	DIESEL GEN RUNNING AGAIN													
	12:45PM	PURGING H-2 GEN TO CO2 THAN AIR													
	2:30PM	PURGING HYDROGEN THRU H1 GENERATOR													
	5:15PM	INLAND DONE ON H2 M.E. WASH CHEVERONS MAINT WILL PULL NOZZLES & PULLING BACK PLATES													
	5:23PM	416-2 R/T FOR BREC DISPATCH													
8/17/2013	8:00PM	DENTON, ONAN, REYNOLDS, BAKER, GATTON, TATE, EDWARDS												D SHIFT PAYNE	
		MORRIS-S/L, DENCIL HERE													
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	12 HOUR	50	45										
			STANDBY												
		H1		165	153		OFF								
		H2		160	147		OUTAGE								
		C.T.	0	58	58										
		ALARMS:										GAUGE GLASSES		DRYING AGENT	
		R1											OK		
		H1	STEAM SEAL HI/LO, BURNER MANG., EH PRSS LO, FEEDWATER PRESSURE LO												
		H2	EH RES LEVEL HI												
		SOOTBLOWERS TAGGED												SILO	BOOTHE SYSTEM
		R1	1, 2, 3, 6, 7, 16, 17, 18, 19, 22L, 28, 29, 30, 31												
		H1	5, 6, 7, 8, 9, 10, 11, 20, 29, 30, 33, 39												
		H2	1, 2, 4, 5, 7, 9, 10, 11, 15, 18, 19, 20, 21, 22, 23, 24, 30, 32, 34, 39												
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH									
		LEVELS	7' 3"	11' 9"	16' 5"	8 1/4"									

# Forced Outage Report

8/17/2013	8:00PM	SAFETY BRIEFING												
	11:00PM	H1 BOILER SET TO FIRE												
8/18/2013	1:06AM	H1 POWER RESTORED												
	1:27AM	R1 #3 CIRCULATOR ON, R1 1&2 CONDENSER VAC PUMPS ON												
	1:52AM	H1 B CONDENSATE PUMP ON												
	1:57AM	R1 A AUX CIRC WATER PUMP ON												
	1:59AM	R1 A BEARING WATER COOLING WATER PUMP ON												
	2:00AM	H1 B CONDENSATE PUMP OFF												
	2:34AM	H1 B CIRC WATER PUMP ON												
	2:51AM	H1 A CIRC WATER PUMP ON												
	2:54AM	H1 A MAKE UP PUMP ON												
	3:01AM	H1 B AUX WATER PUMP ON												
	3:07AM	H1 B BEARING WATER PUMP ON												
	3:14AM	H1 A AIR COMPRESSOR AUX COOLING WATER PUMP ON												
	3:26AM	H2 B CENTAC COOLING WATER PUMP ON												
	3:37AM	H1 B CONDENSATE PUMP ON												
	3:40AM	TRYING TO START ELLIOT AIR COMPRESSORS. NO SEAL AIR. INVESTIGATING												
	4:04AM	BOTH ELLIOT AIR COMPRESSORS ON												
	4:51AM	H1 SCR DAMPERS CLOSED												
	4:54AM	H1 B BFP ON PUMPING UP H1 BOILER												
	4:57AM	H2 FD FANS ON FOR COOLING H2 BOILER, H2 B FD FAN SHUT OFF DAMPER DID NOT COME OPEN. INST WORKING ON SAME												
	5:42AM	H1 A AND B AIR HEATER DRIVES ON												
	5:42AM	H1 A SEAL AIR FAN ON												
	5:43AM	H1 BURNER COOLING AIR FAN												
	5:47AM	H1 A AND B FD FANS ON												
	5:53AM	H1 B SCREW FEEDER ON												
	6:02AM	START H1 PURGE												
	6:20AM	FIRES ESTABLISHED IN H1 BOILER												
	7:00AM	H-2 C MCC RACKING IN VENT FAN BKR TRIPPED OUT MCC												
	7:25AM	H2-B BFP ON												
8/18/2013	8:00AM	FELTY, CECIL, BLAIR, EMBRY, HILLYARD												
		DUVALL S/L, BEAN S/L M JOHNSON												
		A SHIFT T. TOW												
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
		R1	12 HOUR	50	45								18'	
			STANDBY										26'	
		H1	OFF	165	153	0.794	10.5	0.19	74.4	85.8	65.08	200	2.7	
		H2	OFF	160	147	0.418	11.3	0.079	22.8	92.9	7.87	208	3.1	
		C.T.	0	61	61								15.5'	
		ALARMS:												
		R1												
		H1	STEAM SEAL HI/LO, BURNER MANG., EH PRSS LO											
		H2	EH RES LEVEL HI											
		SOOTBLOWERS TAGGED												
		R1	1,2,3,6,7,16,17,18,19,22L,28,29,30,31											
		H1	5,6,7,8,9,10,11,20,29,30,33,39											
		H2	1,2,4,5,7,9,10,11,15,18,19,20,21,22,23,24,30,32,34,39											
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH								
		LEVELS	6' 10"	8' 1/2"	16'9 1/2"	8 1/4"								
	8:00AM	SAFETY BRIEFING												
	8:00AM	H-1 START UP H-2 PIT STOP												
	NOTE	H-1 START UP ON START UP LOG												
	8:30am	INLAND HERE / STARTING ON M.E. WASH & R.P. HEADERS												
	NOTE	COMPUTER NEW-OLD ROOM AC NOT WORKING B.EDWARDS NOTIFIED												
	9:00AM	PURGING H2 GENERATOR FROM CO2 - AIR												
	10:01AM	SEALING H1 TURBINE												
	10:03AM	H1 TURBINE PULLING VACUM												
	10:05AM	H2-C MCC MAIN BKR R/T FOR ELEC DEPT												
	10:08AM	H2-B BFP ON												
	10:09am	H2-B BFP OFF 1440 DRUM PSI												
	10:51AM	H2 HYDRO GOOD & VACUM CHECK/BLOWING PSI OFF & DRAINING BOILER												
	10:53AM	ROLLING H1 TURBINE												
	10:55AM	CALLED EXPRO (MIKE) H2 HYDRO GOOD NOT NEEDED												
	11:35AM	INLAND STARTING ON H-2 ECONS												
	11:39AM	H1 TIED ON LINE												
	11:40AM	H2 GENERATOR AIR TEST STARTED												

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# Forced Outage Report

## Estimated Outage Cost

- N/A

# Forced Outage Report

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>HMP'L 1 - H1-13-10</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	8/17/13 1:56			<b>MW</b>
<b>Date &amp; Time On Line</b>	8/18/13 11:39			<b>\$/MW</b>
<b>Outage Duration</b>	33 hr. 43 min.			100
<b>Outage Code</b>	UO2			133
<b>Outage Reason</b>	Unit tripped on low vacuum due to loss of circulating water pump when start up power was lost.			155
				\$ 29.50
				\$ 28.31
				\$ 28.16
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
8/17/13 (HE 2-24)	\$ 31.96	\$ 29.16	\$ (5,833)	\$ -
8/18/13 (HE 1-18)	\$ 24.58	\$ 23.05	\$ 4,023	\$ -
<b>Total</b>			<b>\$ (1,810)</b>	<b>\$ -</b>
<b>Start Up Fuel Cost</b>			<b>Total Forced Outage Cost</b>	
S/U Fuel Consumed	9,947		DART P&L	\$ (1,810)
S/U Fuel Price	\$ 3.13		Lost Opportunity	\$ -
S/U Fuel Cost	\$ (31,130)		S/U Fuel Cost	\$ (31,130)
			<b>Total</b>	<b>\$ (32,940)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Unforced Outage Report

**To:** Bob Berry

**From:** Billy Boarman

**Date:** 30-Aug-2013

**Plant:** HMP&L Station Two

**Unit:** 2

**GADS Class:** MO/UO1

## Duration

Trip Time: 17-Aug-2013 01:00      Converted To Forced Outage: 18-Aug-2013 13:00

Start of Forced Outage: 18-Aug-2013 13:00

Tie Time: 20-Aug-13 22:38

Time Offline: 93:38

MO Hours: 36:00

UO1 Hours: 57:38

## Outage Description

HMP&L Station Two Unit 2 was removed from service on Thursday, 17-Aug-2013 at 01:00 for a maintenance outage to wash air heaters. At 13:00 on Sunday, 18-Aug-2013 it was switched to a forced outage due to the loss of startup power at the Reid/HMP&L Station.

## Root Cause

The differential across the air heaters was caused by an accumulation of ammonia bisulfate deposits.

The continuation into the forced outage was caused by the T1 tie transformer tripping which resulted in the loss of start-up power to Reid and Station Two, as well as possible issues with the generator and with the turbine bearings.

## Failure History

No failures of this type have been reported in the last three years.

# Unforced Outage Report

## Corrective Actions

- Washed the Air Heaters
- Midwest Switchgear inspected H-2 4160 "A" main breaker. They found the trip coil burned up. They replaced the trip coil and gave ok for the breaker to be returned to service
- The DC Turbine Lube Oil Pump coupling was replaced; the pump was run and it tested well.
- After consultation with Siemens and their review of the record of events, the bearing temperatures and the coast down speed it was advised that we check the lube oil strainer for indications of Babbitt and to complete a borescope inspection on the #1 turbine bearing. No Babbitt was found in the strainer and the bearing revealed no issues.
- After consultation with Siemens concerning the generator motoring; Siemens concluded that this event appears to be a low risk to continued operation of the unit.
- Both the Reid electricians and the ET&S crews began looking for a short causing a 20,000 amp arc.
- The electricians systematically meggered each section of bus back to the Start-up transformer. All megger readings were good. All bus was visually inspected from the outside for obvious damage. No damage was found. Random panels were removed to visually inspect the bus internally. No broken insulators or misaligned bus was found. Cable bus on Reid 1 was meggered at the switchgear and from the removed links on the outside of the plant wall. Both readings were identical.
- ET&S Doble tested the Start-up transformer with normal results.
- ET&S visually inspected the cables running into the plant and found indications of the arc, but no damage that required repairs.
- ET&S opened and inspected the Ground Neutral transformer and found no indication of damage.
- Oil samples were taken on the Start-up transformer, the Ground Neutral transformer and the Start-up transformer Load Tap Changer.
- The switch 416-2 was visually inspected and found to have damage on the B phase connection. The A and C phases showed some signs of overheating, but B phase was the worse. ET&S opted not to clean or repair this switch at this time.
- After all testing was completed it was decided to begin putting the system back together in pieces to verify that the fault was cleared.
  - First the 416-2 switch was opened, the links were removed to R1, and the Start-up transformer was energized. This worked as designed.
  - Switch 416-2 was closed and with the H1 and H2 main and tie breakers open, and the Start-up was energized. This worked as designed.

## Unforced Outage Report

- The links were reinstalled on Reid 1, Switch 416-2 was opened, and the Start-up was again energized. This worked as designed.
- Finally, Switch 416-2 was closed and the Start-up transformer was energized. With this configuration we verified that the second fault had cleared.
- All bus into the plant was energized and ready to begin switch over operations.
- The diesel generator was disconnected and the scrubber feed was opened.
- At 01:10 H1 station power returned to normal
- At 01:16 H2 station power returned to normal
- At 01:20 R1 station power returned to normal
- ET&S Doble tested the H-2 Auxiliary transformer
- BREC electrician's meggered the bus between the Auxiliary transformer and the 4160V main.

### SOE Print Out

#### STANDARD SOE REPORT

Triggered on: 17-Aug-2013 01:00:27:573

Event Time	State	Tag Name	Tag Description
17-Aug-2013 01:00:39:652	RUNING	H241DCEMOPSTS	DC EMERG.OIL PMP STATUS
17-Aug-2013 01:00:38:549	TRIP	H224AXCWP3ATRP	AUX CIRC WATER PMP H2A TRIP
17-Aug-2013 01:00:38:420	CLOSED	H232SAF3BSTS	SEAL AIR FAN H2B STATUS
17-Aug-2013 01:00:38:346	OPEN	H232BRCAF3STS	BRNR COOLING AIR FAN 2 STATUS
17-Aug-2013 01:00:38:229	CLOSED	H248DCEMSOPSTS	DC EMERG.SEAL OIL PMP STATUS
17-Aug-2013 01:00:38:127		H241DCEMOPTRP	DC EMERG OIL PMP AUTOSTR
17-Aug-2013 01:00:37:939	OPEN	H240HYDOP3ASTS	TURB HYD FLUID PMP H2A STATUS
17-Aug-2013 01:00:37:857	OPEN	H232SAF3ASTS	SEAL AIR FAN H2A STATUS
17-Aug-2013 01:00:37:847	TRIP	H232AHDR3ATRP	AH DRIVE H2A DRIVE TRIP
17-Aug-2013 01:00:37:845	OPEN	H248MNSOPSTS	MAIN SEAL OIL PMP H2 STATUS
17-Aug-2013 01:00:37:838	TRIP	H241BGOPP3ATRP	TG OIL PMP H2A TRIP
17-Aug-2013 01:00:37:826	OK	H241BGOPP3ATRP	TG OIL PMP H2A TRIP
17-Aug-2013 01:00:37:815	TRIP	H241BGOPP3ATRP	TG OIL PMP H2A TRIP
17-Aug-2013 01:00:37:813	TRIP	H240HYDOP3ATRP	TURB HYD FLUID PMP H2A TRIP
17-Aug-2013 01:00:37:799	TRIP	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:37:785	OK	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:37:778	TRIP	H248MNSOPTRP	MAIN SEAL OIL PMP H2 TRIP
17-Aug-2013 01:00:37:774	TRIP	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:37:764	TRIP	H232BRCAF3TRP	BRNR COOLING AIR FAN 2 TRIP
17-Aug-2013 01:00:37:763	TRIP	H242TGRMTRTRP	TG DRIVE MTR TRIP
17-Aug-2013 01:00:37:760	OK	H232SAF3ATRP	SEAL AIR FAN H2A TRIP

# Unforced Outage Report

17-Aug-2013 01:00:37:748	TRIP	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:37:744	OK	H203BUSATIETRP	4160 BKR BUS A TIE TRIP
17-Aug-2013 01:00:37:734	OPEN	H203BUSATIESTS	4160 BKR BUS A TIE STATUS
17-Aug-2013 01:00:37:727	OK	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:37:716	TRIP	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:37:688	TRIP	H203BUSATIETRP	4160 BKR BUS A TIE TRIP
17-Aug-2013 01:00:36:894	OK	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:36:883	TRIP	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:36:611	OK	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:36:600	TRIP	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:36:419	OK	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:36:408	TRIP	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:36:177	OK	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:36:166	TRIP	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:35:835	OK	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:35:824	TRIP	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:35:060	OK	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:35:049	TRIP	H232SAF3ATRP	SEAL AIR FAN H2A TRIP
17-Aug-2013 01:00:33:038	OK	H233LMISTRP	LAST MILL IN SERVICE TRIP
17-Aug-2013 01:00:32:341	TRBLE	H247HYDTROUBLE	GEN H2 HYDROGEN TROUBLE
17-Aug-2013 01:00:29:041	TRIP	H233LMISTRP	LAST MILL IN SERVICE TRIP
17-Aug-2013 01:00:28:293	TRIP	H233EMERBLRTRP	EMERGENCY BLR TRIP
17-Aug-2013 01:00:28:044	TRIP	H240STPVLVTRP	TURB STOP VLV CLSD TRIP
17-Aug-2013 01:00:27:793	TRBLE	H246XFERTOMAN	VOLTAGE REG TROUBLE
17-Aug-2013 01:00:27:709	OPEN	H250FLDBKRSTS	GEN H2 FIELD BKR STATUS
17-Aug-2013 01:00:27:700	OPEN	H250OCB186STS	OCB 0186 GEN H2 STATUS
17-Aug-2013 01:00:27:690	OPEN	H250OCB182STS	OCB 0182 GEN H2 STATUS
17-Aug-2013 01:00:27:598	OK	H250OCB182GETR	OCB 0182 GEN H2 TRIP
17-Aug-2013 01:00:27:596	OK	H250OCB186GETR	OCB 0186 GEN H2 TRIP
<b>17-Aug-2013 01:00:27:573</b>	<b>TRIP</b>	<b>H203BUSAMAINTR</b>	<b>4160 BKR BUS A MAIN TRIP</b>
17-Aug-2013 01:00:27:572	LKOUT	H240STPVLO86TV	TURB STOP VLV LOCKOUT (86TV3)
17-Aug-2013 01:00:27:566	TRIP	H250OCB182GETR	OCB 0182 GEN H2 TRIP
17-Aug-2013 01:00:27:566	TRIP	H250OCB186GETR	OCB 0186 GEN H2 TRIP

# Unforced Outage Report

## Other Work Completed While Unit Was Offline

- Boiler Hydro and Reheat Vacuum Check, no issues
- Repaired gas leaks on the Economizer Dead Air Space, Economizer Duct work and the Air Heaters
- Air heater wash
- Inspected "A" and "B" SCR Damper vertical jamb seals
- Calibrated all coal feeders
- Inspected precipitators
- Replaced three steam coils
- Replaced east drum gauge glass bottom water isolation valve
- Repaired gas leaks
- ET&S Doble tested the Start-up transformer with normal results
- 4160 A main breaker trip coil was replaced
- Performed Borescope inspection on the front standard of the turbine. Inspection displayed no flaws in the bearing

## Operators Event Log

6


## 7

[illegible]

Your Touchstone Energy® Cooperative 

CTV 1

# Unforced Outage Report

Your Touchstone Energy® Cooperative 

	H1	165	165	153	0.407	10.3	0.07	30.7	92.5	19.05	255/c
	H2	OUTAGE									
	C.T.	ON STANDBY		58							
	ALARMS:										
	R1										
	H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/H1 COOLING TOWER HI / LOW									
	H2	EH RES LEVEL HI									
	SOOTBLOWERS TAGGED										
	R1	1, 2, 3, 6, 7, 16, 17, 18, 19, 22L, 28, 29, 30, 31									
	H1	20 / 5, 6, 7, 8, 9, 10, 11, 32, 39-									
	H2	1, 2, 4, 5, 7, 9, 10, 11, 15, 16, 18, 19, 20, 21, 22, 23, 24, 30, 32, 34, 39									
	FUEL OIL TANKS										
	LEVELS	C.H.	HMPL	NORTH	SOUTH	SILO LVL 15'		BOOTHE SYSTEM			
		6' 6 1/2"	13' 4"	16' 6 1/2"	8 1/4"						
	7:40pm	H2 OFF GEAR									
	7:43PM	H2 D.C. OIL PUMP ON 38.5 WITH A.C. RUNNING									
	7:45PM	H2 TURNING GEAR OIL PUMMP OFF									
	7:51PM	H2 TURBINE BACK ON GEAR									
	NOTE	SAFETY BRIEFING & CLEANING H2 BTG SWITCH GEAR BOARD									
	8:45PM	H2 DC OIL PUMP OFF									
	8:55PM	H2 DOING AC-DC OIL PUMP TEST									
	9:12PM	H2 OIL PUMP TEST COMPLETE									
	9:14PM	H2 SEALING TURBINE & PULLING VACUM									
	9:40pm	ROLLING H2 TURBINE									
	10:21PM	H2 TURBINE TV-GV TRANSFER									
	10:22PM	H2 TURBINE 3600 & FRONT STANDARD TEST									
	10:27PM	H2 GENERATOR FIELD ON									
	10:32PM	H2-B MILL ON									
	10:38PM	H2 TIED ON LINE									

GAUGE GLASS!  
OK

PWTL / 26.2'

CTL / 15.0'

DRYING AGENT

R1-0%

H1-0%

H2- 0%

# Unforced Outage Report

## Air Preheater wash estimated outage cost

- Vacuuming Economizer Hoppers, Wash seal trough, ME panels and Air Heaters
- Total           \$13,636
- Misc. Work – Titan
- Labor           \$21,840
- Grand Total   \$35,476

## “A” 4160 Main Breaker Trip estimated outage cost

- PPSI – Inspect #1 Turbine Bearing  
Labor           \$8,540
- Misc. work – Titan  
Labor           \$40,560  
Material        \$2,426  
Grand Total   \$51,526

# Unforced Outage Report

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>HMP'L 2 - H2-13-07</b>		<b>Production Cost</b>	
<b>Date &amp; Time Off Line</b>	8/17/13 1:00 & 8/18/13 13:00		<b>MW</b>	<b>\$/MW</b>
<b>Date &amp; Time On Line</b>	8/18/13 13:00 & 8/20/13 22:38		94	\$ 29.73
<b>Outage Duration</b>	36 hr. 0 min. & 57 hr. 38 min.		127	\$ 28.45
<b>Outage Code</b>	MO & UO1		149	\$ 28.13
<b>Outage Reason</b>	MO - Wash air heaters & UO1 - Inspect #1 turbine bearing			
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
8/17/13 (HE 1-24)	\$ 31.56	\$ 28.84	\$ (630)	\$ (13,484)
8/18/13 (HE 1-24)	\$ 25.45	\$ 23.45	\$ -	\$ -
8/19/13 (HE 1-24)	\$ 29.02	\$ 44.78	\$ -	\$ (4,291)
8/20/13 (HE 1-24)	\$ 31.97	\$ 40.36	\$ (616)	\$ (14,658)
8/21/13 (HE 1-12)	\$ 26.80	\$ 27.55	\$ (6,589)	\$ -
<b>Total</b>			\$ (7,835)	\$ (32,433)
<b>Start Up Fuel Cost</b>			<b>Total Forced Outage Cost</b>	
S/U Fuel Consumed	8,428		DART P&L	\$ (7,835)
S/U Fuel Price	\$ 3.13		Lost Opportunity	\$ (32,433)
<b>S/U Fuel Cost</b>	<b>\$ (26,376)</b>		S/U Fuel Cost	\$ (26,376)
			<b>Total</b>	<b>\$ (66,644)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Bob Berry

**From:** Billy Boarman

**Date:** 26-Sep-2013

**Plant:** HMP&L Station Two

**Unit:** 1

**GADS Class:** UO2

## Duration

Trip Time: 19-Sep-2013 10:19

Tie Time: 24-Sep-13 02:19

Time Offline: 112:00

## Outage Description

HMP&L Station Two Unit 1 was removed from service on Thursday, 19-Sep-2013 at 10:19 due to a suspected tube leak in the Radiant Superheat Area of the boiler.

## Root Cause

Tube leak on the Radiant SH Outlet, 6<sup>th</sup> element from the east wall, outer loop, at elevation 537' – 5" was caused by external corrosion.



# Forced Outage Report

## Failure History

16-Mar-2012	31:31	Tube leak in the radiant superheat outlet section, 3 <sup>rd</sup> element from the west wall, inner loop
3-Aug-2012	91:48	Tube leak in the radiant superheat outlet section, 2 <sup>nd</sup> element from the west wall, inner loop caused by soot blower erosion
24-Feb-2013	68:22	Tube leak on the Radiant SH Outlet 3 <sup>rd</sup> element from the west wall, on the outer loop at elevation 537' – 5" was caused by external corrosion
23-Mar-2013	70:02	Tube leak on the Radiant SH Outlet 4 <sup>th</sup> element from the east wall inner (hairpin) loop, at elevation 542' was caused by external corrosion
2-June-2013	70:00	Tube leak on the Radiant SH Outlet 5th element from the west wall outer loop, at elevation 537' – 5" was caused by external corrosion.
21-July-2013	75:39	Tube leak on the Radiant SH Outlet 5th element from the east wall outer loop, at elevation 537' – 5" was caused by external corrosion.
8-Aug-2013	84:04	Tube leak on the Radiant SH Outlet, 5 <sup>th</sup> element from the east wall, inner loop, at elevation 542' was caused by external corrosion.

# Forced Outage Report

## Corrective Action

The outer loop on the 6<sup>th</sup> element from the east wall at elevation 537'-5" was replaced along with next inner loop which was washed from the leak on the outer loop. Based on past Radiant Superheat outlet section failures it was determined that all leaks had been either in the inner loops (E1) or outer loops (E10). Additional UT readings indicated that the next to outer loops (E9) were thin and subject to failure also. At this time it was decided that to increase unit reliability 39 additional loops (11 inner loops, 13 outer loops, and 15 next to outer loops) would need to be replaced. During the replacement of these loops which have four foot tangent legs on them an additional 17 dutchmen were installed due to thin tubes.

## SOE Print Out

Triggered on: 21-Jul-2013 10:19:31:580

Event Time	State	Tag Name	Tag Description
19-Sep-2013 10:19:38:756	OK	H150OCB166CSTP	OCB 0166 GEN H1 CS TRIP
19-Sep-2013 10:19:38:049	TRIP	H150OCB166CSTP	OCB 0166 GEN H1 CS TRIP
19-Sep-2013 10:19:36:576	OK	H133LMISTP	LAST MILL IN SERVICE TRIP
19-Sep-2013 10:19:32:581	TRIP	H133LMISTP	LAST MILL IN SERVICE TRIP
<b>19-Sep-2013 10:19:31:580</b>	<b>TRIP</b>	<b>H133EMERBLRTP</b>	<b>EMERGENCY BLR TRIP</b>
19-Sep-2013 10:19:30:910	OPEN	H150OCB166ST	OCB 0166 GEN H1 STATUS

# Forced Outage Report

## Other Work Completed While Unit Was Offline

- Replaced South West water wall automatic drain valve
- Repaired gas leaks in the boiler penthouse and economizer dead air space
- Repaired gas leaks on the SCR Diverter Damper Duct
- Inspected the SCR diverter damper seal area
- Inspect/Clean H-1 Station Battery Charger
- Cleaned Wetbottom Seal Trough
- Cleaned Scrubber Mist Eliminator panels and nozzles
- Replaced bottom ash hopper west side equalizing valve gasket
- Repaired gas leaks SCR sonic horns
- Precipitator inspection
- Back-pass inspection
- Calibrated all coal feeders.
- Changed oil in all FD Fan, PA Fan, and Mill motors
- Repaired coal leaks on "A" Mill
- Repaired coal leaks on "B" Mill
- Cleaned seal air fan filters
- Replaced #5 feed water heater inlet equalizing valve
- Replaced #7, #24 and #31 boiler ports
- Replaced east side wet bottom grinder motor and gear box, also repaired mounting plate
- Repaired gas leak on the #9 precipitator hopper
- Replaced the soot blower safety
- From the initial boiler hydro a weeper leak was discovered on the upper south water wall header tubes, 2<sup>nd</sup> tube from the east, this leak is located at the weld where it meets the south upper water wall header at elevation 579'-4". Repaired via Base Metal Repair

# Forced Outage Report


## Operators Event Log

9/19/2013	8:00AM	MORRIS, DENTON, REYNOLDS, BAKER, GATTON, EDWARDS, TATE										D SHIFT ASKINS			
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1		50		12 HOUR STANDBY									
		H1	143	160	153	0.32	10.1	0.09	19	94	19.05	200	2.8		
		H2	141	160	152	0.311	10.5	0.07	15	94	7.59	230	3.2		
		C.T.	STANDBY	60											
		ALARMS:									GAUGE GLASSES			DRYING AGENT	
		R1									OK			H-1 0%	
		H1	STEAM SEAL HI/LO	BURNER MANGT.	EH PRESSURE LO/PUMP START REQ									H-2 0%	
		H2	EH RES LEVEL HI											R-1 0%	
		SOOTBLOWERS TAGGED							FUEL OIL LEVELS	C.H.	HMPL	NORTH	SOUTH		
		R1	1,2,3,6,7,16,17,18,19,22L,28,29,30,31							10' 3 1/4"	9' 3 7/8"	15' 10 1/8"	8 1/4"		
		H1	20,32,43												
		H2	1,2,4,5,7,9,10,11,15,18,19,20,21,22,23,24												
	8:00AM	SAFETY BRIEFING													
	9:05AM	H-1 RUNNING HOT WELL CHECK - MAKEUP 35% OPEN - LOUD AROUND S.H. AREA EAST SIDE													
	9:15AM	H-1 LOST 5" IN 10 MINUTES - SETTING UP TO TAKE H-1 OFF.													
	10:05AM	H-1 SCR'S OUT OF SERVICE													
	10:15AM	H-1 PRECIPS OUT													
	10:19AM	H-1 OFF LINE													
	11:06AM	H-1 DRAINING BOILER													
		NOTE TRANSFERRED FUEL OIL TO HMP'L TANK													
	1:40PM	H-1 SCRUBBERS TAGGED AND DOORS ARE OPEN													
	3:15PM	INLAND HERE TO SET UP TO CLEAN M.E. TRAYS AND VACUUM PENTHOUSE H-1.													
	3:30PM	DANNY EDMONDS ON SICK LEAVE FRIDAY													
	4:00PM	BRENT DUVALL WILL BE OFF 4 MORE WEEKS GOES BACK TO DOCTOR OCT 24TH.													
	5:25PM	TAGGED H-1 0169 DISCONNECT FOR DISPATCH.													
		NOTE ASKED INLAND NOT TO LOCK OUT HENDERSON ELEVATOR.													
	6:05PM	EXPRO IS AT THE PLANT													
	7:10PM	WALKING DOWN ALL TAGGS WITH EXPRO													
	7:35PM	PULLED INLAND OUT OF SCRUBBERS FOR MAINT TO PULL M.E. NOZZLES AND HEADER CAPS													
9/19/2013	8:00PM	FELTY, CECIL, BLAIR, EMBRY, HILLIARD										A SHIFT T. TOW			
		DUVALL S/L, BEAN P.D. T. YOUNG HERE													
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	12 HOUR STANDBY	50	45									18'	
		H1		165	153									26'	
		OFF TUBE LEAK													
		H2	142	165	152	0.257	10.9	0.075	14.2	95.3	7.99	197	3.1	15.5'	
		C.T.	OFF	60	60										
			STANDBY												
		ALARMS:									GAUGE GLASSES			DRYING AGENT	
		R1									OK			HMPL 0%	
		H1	STEAM SEAL HI/LO	BURNER MANGT.	EH PRSS LO									REID 0%	
		H2	EH RES LEVEL HI	GEN H2, CT											
		SOOTBLOWERS TAGGED													
		R1	1,2,3,6,7,16,17,18,19,22L,28,29,30,31												
		H1	20,32,43												
		H2	1,2,4,5,7,9,10,11,15,18,19,20,21,22,23,24												
		FUEL OIL LEVELS	C.H.	HMPL	NORTH	SOUTH					SILO 18.7'			BOOTHE SYSTEM IN	
			10' 2 1/2"	12' 4 3/4"	15' 3 1/2"	8 1/4"									

# Forced Outage Report

	8:00PM	SAFETY BRIEFING											
	8:15PM	INLAND BACK WORKING IN SCRUBBERS											
	8:15PM	INLAND OUT OF PENTHOUSE FOR EXPRO TO START BLASTING											
	8:15PM	EXPRO START BLASTING											
	9:15PM	H-1 FLYASH PULLED DOWN TAKING BACK PLATES OFF OPENING DOORS											
	9:55PM	INLAND GOING BACK IN TO VAC ON PENTHOUSE H-1 EXPRO DOWN TO 4TH FLOOR											
	10:10PM	EXPRO DONE BLASTING USING SHOTGUN FOR REST											
	10:42PM	CALLED TO INSPECT BOILER AFTER DESLAG INSPECTING SAME WITH TITAN AND EXPRO											
	11:36PM	HAD TO DO A LITTLE MORE SHOTING IN SUPERHEATS AND FROM WET BOTTOM DOORS DESLAG COMPLETE											
		PULLING WET BOTTOM DOWN FOR CLEAN AND TAG											
	11:45PM	CALLED OUT TO INSPECT ME,S NEEDED A LITTLE MORE WASHING ON TRAYS											
	11:50PM	D. EDMONDS CALLED WILL BE OFF SAT AND SUN DAY SHIFT SCHEDULED D FELTY SAT E. CECIL SUN											
9/20/2013	12:30AM	EXPRO GOING HOME											
	12:30AM	INLAND DONE AT ME,S THAT CREW GOING HOME DON'T HAVE ANOTHER VAC TRUCK TRING TO GET ONE											
		FOR IN THE AM AND ANOTHER CREW FOR ECONS											
	12:30AM	H-1 WET BOTTOM PULLED AND TAGGED											
	1:30AM	H-1 PA FAN AND SEAL AIR FAN MOTORS COVERED											
	3:45AM	CALLED UP TO INSPECT PENTHOUSE STILL NEED SOME WORK ON WEST SIDE											
	5:00AM	H-1 PENTHOUSE DONE LEAVING VAC HOSE UP THERE INCASE NEEDED SOMEMORE INLAND MOVING TO ECONS											
9/20/2013	7:00AM	INLAND STARTING ON H1 ECONS											
	8:00AM	MORRIS,JACKSON, HOGAN,TATE, ALEXANDER, WADLINGTON											
		C SHIFT - PAYNE											
		EDMONDS-S/L, JOHNSON-VAC											
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE
		R1		50		12 HOUR STANDBY							
		H1		165	153			TUBE LEAK					R-1 CTL PWTL
		H2	165	165	152	0.28	11	0.079	19	94.6	6.68	258	3.3
													HMPL
		C.T.	STANDBY	61									
		ALARMS:										GAUGE GLASSES	
		R1										OK	DRYING AGENT
		H1	STEAM SEAL HI/LO	BURNER MANGT.	EH PRESSURE LO/PUMP START REQ								H-1 0%
		H2	EH RES LEVEL HI										H-2 0%
													R-1 0%
		SOOTBLOWERS TAGGED											
		R1								SILO			BOOTHE SYSTEM
		H1	20,32,43							17FT			EAST SIDE ONLY
		H2	1,2,4,5,7,9,10,11,15,18,19,20,21,22,23,24										
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH							
		LEVELS	10' 1 1/8"	12' 4 3/4"	15' 3 1/2"	8 1/4"							
9/20/2013	8:00AM	SAFETY BRIEFING											
	9:30AM	DONE WITH FLUSHING ME WASH HEADERS. NOTIFY B.CHEATHAM											
	NOTE:	INLAND VACUUMING ECONS AND PENTHOUSE											
	10:30AM	INST. STROKING H1 TURBINE VALVES											
	11:30AM	DRAINING H1 FEEDWATER LINE BETWEEN FW REG AND #5 HEATER FOR B.CHEATHAM											
	1:45PM	EXHAUST HOOD SPRAYS TAGGED FOR INST.											
	2:05PM	H1 SET UP FOR VAC CHECK. NOTIFY B.CHEATHAM											
	3:30PM	INST DONE STROKING H1 TURBINE VALVES											
	3:44PM	LOST AMMONIA ON H2 DUE TO LOW INJECTION TEMP											
	3:47PM	H2 AMMONIA BACK IN SERVICE											
	7:25PM	PUT H-1 'B' F.D. FAN ON - TOOK 'A' OFF											
	NOTE:	DRAINED & CLEANED H-1 E.H. SYSTEM											
9/20/2013	8:00PM	CONN, CLARK, BREEDEN, HIGGINS, CUTSHAW, BLANKS, YOUNG											
		B SHIFT - D. PENDLEY											
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE
		R1		50		12 HOUR STANDBY							
		H1		160	153	UNIT OFF							R-1 CTL PWTL
		H2	143	160	152	0.249	10.6	0.062	14.3	95.1	8.21	205	
													HMPL
		C.T.	STANDBY	61									
		ALARMS:										GAUGE GLASSES	
		R1										OK	DRYING AGENT
		H1	STEAM SEAL HI/LO	BURNER MANGT.	EH PRESSURE LO/PUMP START REQ								H-1 0%
		H2	EH RES LEVEL HI										H-2 15%
													R-1 0%
		SOOTBLOWERS TAGGED											
		R1								SILO			BOOTHE SYSTEM
		H1	20,43							16'			IN
		H2	1,2,4,5,7,9,10,11,15,18,19,20,21,22,23,24										
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH							
		LEVELS	10' 1 1/8"	12' 4 3/4"	15' 3 1/2"	8 1/4"							

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## Forced Outage Report

9/21/2013	8:00PM	CONN, CLARK, BREEDEN, HIGGINS, CUTSHAW, BLANKS, YOUNG										B SHIFT - D. PENDLEY			
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1		50		12 HOUR STANDBY								R-1 CTL	PWTL
		H1		160	153	UNIT OFF									
		H2	141	160	152	0.23	11	0.06	11.9	95.4	6.79	192	2.9	HMPL	
		C.T.	STANDBY	61											
		ALARMS:									GAUGE GLASSES			DRYING AGENT	
		R1									OK			H-1 0%	
		H1	STEAM SEAL HI/LO	BURNER MANGT.	EH PRESSURE LO/PUMP START REQ									H-2 15%	
		H2	EH RES LEVEL HI											R-1 0%	
		SOOTBLOWERS TAGGED													
		R1								SILO				BOOTHE SYSTEM	
		H1	20,43							13'				IN	
		H2	1,2,4,5,7,9,10,11,15,18,19,20,21,22,23,24												
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH									
		LEVELS	9' 10 1/2"	12' 4 3/4"	15' 3 1/2"	8 1/4"									
9/21/2013	8:00PM	SAFETY BRIEFING													
	NOTE	CLEANING ASH OUT OF H-1 SONIC HORN OPENINGS													
	11:00PM	T. GRAY, T. BROWN & B. WILLETT LEAVING													
9/22/2013		H-1 SONIC HORN OPENINGS CLEAN													
	2:00AM	H-2 TURBINE VALVE TEST - OK													
	5:00AM	TAGGED OUT #1 CIRCULATOR AT INTAKE													
9/22/2013	8:00AM	CECIL, JACKSON, HOGAN, TATE, ALEXANDER, WADLINGTON										C SHIFT - PAYNE			
		EDMONDS-S/L, JOHNSON-VAC													
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1		50		12 HOUR STANDBY								R-1 CTL	PWTL
		H1		165	153	TUBE LEAK									
		H2	142	155	142	0.268	10.9	0.064	15	94.6	5.51	191	2.8	HMPL	
		C.T.	STANDBY	61											
		ALARMS:									GAUGE GLASSES			DRYING AGENT	
		R1									OK			H-1 0%	
		H1	STEAM SEAL HI/LO	BURNER MANGT.	EH PRESSURE LO/PUMP START REQ									H-2 10%	
		H2	EH RES LEVEL HI											R-1 0%	
		SOOTBLOWERS TAGGED													
		R1								SILO				BOOTHE SYSTEM	
		H1	20,32,43							11FT				IN	
		H2	43												
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH									
		LEVELS	9' 8"	12' 4 1/2"	15' 3 1/2"	8 1/4"									
9/22/2013	8:00AM	SAFETY BRIEFING													
	NOTE:	10% DRYING AGENT													
	8:15AM	STROKING H1 DIVERTER DAMPERS. OK													
	8:50AM	H1 FD FAN OFF PER B.CHEATHAM													
	10:30AM	INST CHECKING FD FAN THERMOCOUPLES ON AIR IN TEMP, ALL CHECK OK													
	11:00AM	CAN NOT SHUT H2 B MASS FLOW OFF. NOTIFY D.JAGGERS													
	1:00PM	H2 B MASS FLOW WORKING													
	1:30PM	INST REPLACED PART ON H1 BYPASS DAMPER. INST DID NOT WANT TO STROKE BYPASS DAMPER													
	2:00PM	H2 LUBE OIL STRAINER CLEAN AND PLACED IN TRASH BAG													
	2:30PM	J.GLASCO HERE													
	2:45PM	BOOTH SYSTEM OUT. 6FT													
	3:00PM	INST/ELEC DEPT LEAVING													
	5:30PM	H2 IS GOOD FOR FULL LOAD (10% DRYING AGENT) NOTIFY ACES AND DISTRIBUTION LIST													
	6:50PM	CALLED MURPHY ELEVATOR. HMPL NOT WORKING													

# Forced Outage Report

9/22/2013	8:00PM	CONN, CLARK, BREEDEN, HIGGINS, CUTSHAW, BLANKS, YOUNG										B SHIFT - D. PENDLEY		
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
		R1		50		12 HOUR STANDBY								R-1 CTL
		H1		160	153	UNIT OFF								PWTL
		H2	141	160	152	0.234	10.8	0.057	10.6	95.3	7.24	196	2.85	HMPL
		C.T.	STANDBY	62										
		ALARMS:										GAUGE GLASSES		DRYING AGENT
		R1												H-1 0%
		H1	STEAM SEAL HI/LO	BURNER MANGT.	EH PRESSURE LO/PUMP START REQ									H-2 10%
		H2	EH RES LEVEL HI											R-1 0%
		SOOTBLOWERS TAGGED												
		R1												
		H1	20,43											
		H2	1,2,4,5,7,9,10,11,15,18,19,20,21,22,23,24											
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH								
		LEVELS	9' 8"	12' 4 1/2"	15' 3 1/2"	8 1/4"								
9/22/2013	8:00PM	SAFETY BRIEFING												
	NOTE	DOING FIREWATER INSPECTION CHECKS												
	10:15PM	MURPHY ELEVATOR LEAVING												
	11:00PM	J. GLASSCO LEAVING												
9/23/2013		CLEANING H-1 EQUIPMENT												
	2:00AM	HELD WEEKLY SAFETY MEETING												
	3:30AM	SETTING H-1 BOILER FOR HYDRO												
	4:30AM	TOOK DRYING AGENT OFF COAL												
	5:30AM	TAGGED OUT BOOTHE SYSTEM - TO REPAIR LEAKING GATE												
	NOTE	H-1 BOILER SET FOR HYDRO												
	7:45AM	ISSUED C/W H-1 TURBINE MANIFOILD AREA												
9/23/2013	8:00AM	FELTY, CECIL, BLAIR, EMBRY, HILLIARD										A SHIFT T. TOW		
		DUVALL S/L, BEAN												
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
		R1	12 HOUR	50	45									17"
			STANDBY											27"
		H1		165	153									
		OFF TUBE LEAK												
		H2	160	165	152	0.256	10.9	0.062	25.7	94.6	5.04	207	3.1	15.5'
		C.T.	OFF	61	61									
			STANDBY											
		ALARMS:										GAUGE GLASSES		DRYING AGENT
		R1												HMPL 0%
		H1	STEAM SEAL HI/LO	BURNER MANG.	EH PRSS LO									REID 0%
		H2	EH RES LEVEL HI, GEN H2											
		SOOTBLOWERS TAGGED												
		R1	1,2,3,6,7,16,17,18,19,22L,28,29,30,31											
		H1	20,32											
		H2	1,2,4,5,7,9,10,11,15,18,19,20,21,22,23,24,43											
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH								
		LEVELS	9' 5 1/4"	12' 4 1/8"	15' 3"	8 1/4"								
	8:00AM	SAFETY BRIEFING												
	9:00AM	HYDRO H-1 BOILER												
	10:25AM	HAVE A WEEPER IN PENTHOUSE H-1												
	10:30AM	H-1 OCB 0162 CLOSED LIGHT NOT WORKING BULB OK CALLED DISPATCH TO OPEN BKR , BKR WILL NOT OPEN CHECK LOCAL/REMOTE SWITCH IT IS IN REMOTE DISPATCH CHECKING INTO												
	10:40AM	DRAINING H-1 BOILER DOWN PAST LEAK												
	1:35PM	H-1 B BFP ON FOR HYDRO												
	1:58PM	H-1 DRY BOILER DRAINING TO FIRING LEVEL SETTING TO FIRE												
	2:35PM	TOOK HEAD COUNT CLOSING BOILER												
	3:00PM	THOMPSON GOING HOME FOR TODAY												
	NOTE	BOOTHE SYSTEM STILL LEAKING												
	3:25PM	PURGING BOOTHE SYSTEM OUT AND SHUTTING DOWN												
	3:50PM	H-1 BOILER SET TO FIRE												
	4:00PM	TAGS BEING RELEASED ON H-1 BOILER EQUIPMENT MAINT CLOSING DOORS												
	4:07PM	GOT SWITCHING ORDERS FROM DISPATCH, AFTER OCB'S WERE OPENED, PULLED LOCK CONTROL SWITCH ON EACH OCB. WHEN 166 CONTROL SWITCH WAS PULL LOCK EAST INDICATION LIGHT ON 169 DISCONNECT BOTH LIGHTS LIT AFTER CLOSING IN 169 DISCONNECT CALLED DISPATCH HIS INDICATION SHOWS DISCONNECT STILL OPEN ELECT CHECKING OUR END												
		CHECKED EAST GRINDER ON H-1 WET BOTTOM DID RUN CORRECT DIRECTION												
	5:21PM	REOPENED AND CLOSED 0169 DISCONNECT THIS TIME GOT A CLOSED LIGHT ON 0169 DISCONNECT PER DISPATCH												
	5:47PM	GOT OK TO START H-1 FD FANS 5:51 FD FANS ON												
	6:15PM	SHUT DOWN H-1 FD FANS ONE PORT LEAKING REPAIRING SAME												
	6:26PM	H-1 C DIVERter DAMPER FAN ON AND OK												
	7:10PM	CALLED MURPHY ELEVAYOR - HENDERSON ELEVATOR												
	7:20PM	H-1 BOILER RELEASED												
	7:37PM	H-1 FIRE IN H-1 BOILER - only one oil gun in - instrument dept. helping												

# Forced Outage Report

9/23/2013	8:00PM	MORRIS, DENTON, REYNOLDS, BAKER, GATTON, EDWARDS, TATE										D SHIFT ASKINS			
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSUF		
		R1		50		12 HOUR STANDBY									
		H1	START UP												
		H2	141	160	152	0.35	10.5	0.07	10	93	6.8	210	2.8		
		C.T.	STANDBY 60												
		ALARMS:										GAUGE GLASSES			
		R1											OK		
		H1	STEAM SEAL HI/LO BURNER MANGT. EH PRESSURE LO/PUMP START REQ												
		H2	EH RES LEVEL HI												
		SOOTBLOWERS TAGGED													
		R1	1,2,3,6,7,16,17,18,19,22L,28,29,30,31										SILO		
		H1	20,32,43										9'		
		H2	1,2,4,5,7,9,10,11,15,18,19,20,21,22,23,24												
		8:00PM	SAFETY BRIEFING												
		8:04PM	H-1 A-3 AND A-4 OIL GUNS IN WORKING ON A-1 AND A-2												
		8:10PM	H-1 A-2 - A-3 - AND A-4 OIL GUNS IN. SEE START UP LOG												
9/24/2013		WEEKLY SAFETY MEETING													
	2:19AM	H-1 TIED ON													
	2:32AM	H-1 PRECIPS INSERVICE													
	3:35AM	H-1 SCRUBBER IN SERVICE													

# Forced Outage Report

## Boiler Tube Leak Record

Plant: HMP&L Station Two

Unit: 1

### Type of Leak:

Pin Hole ✓ (terminal tube) Thick Lip Failure \_\_\_\_\_ Thin Lip Failure ✓ (6<sup>th</sup> SH outlet element from the east) \_\_\_\_\_

Tube Wall Thinning \_\_\_\_\_

Orientation of Rupture: Longitudinal ✓ Circumferential \_\_\_\_\_

### Probable Cause:

Stress \_\_\_\_\_ Overheat \_\_\_\_\_ Erosion \_\_\_\_\_ Internal Corrosion \_\_\_\_\_

External Corrosion ✓ Weld Failure \_\_\_\_\_ (Shop \_\_\_\_\_ Field \_\_\_\_\_)

Internal Obstruction to Flow \_\_\_\_\_ Soot blower Erosion \_\_\_\_\_

Other \_\_\_\_\_

### Type of Repair:

Dutchman ✓ Pad Weld ✓ Plug Tube \_\_\_\_\_ Short Circuit \_\_\_\_\_ Other \_\_\_\_\_

### Description of Repair:

The outer loop on the 6<sup>th</sup> element from the east wall at elevation 537'-5" was replaced along with next inner loop which was washed from the leak on the outer loop. Based on past Radiant Superheat outlet section failures it was determined that all leaks had been either in the inner loops (E1) or outer loops (E10). Additional UT readings indicated that the next to outer loops (E9) were thin and subject to failure also. At this time it was decided that to increase unit reliability 39 additional loops (11 inner loops, 13 outer loops, and 15 next to outer loops) would need to be replaced. From the initial boiler hydro a weeper leak was discovered on the upper south water wall header tubes, 2<sup>nd</sup> tube from the east, this leak is located at the weld where it meets the south upper water wall header at elevation 579'-4". Repaired via a BMR

# Forced Outage Report

## Exact Location of Leaks:

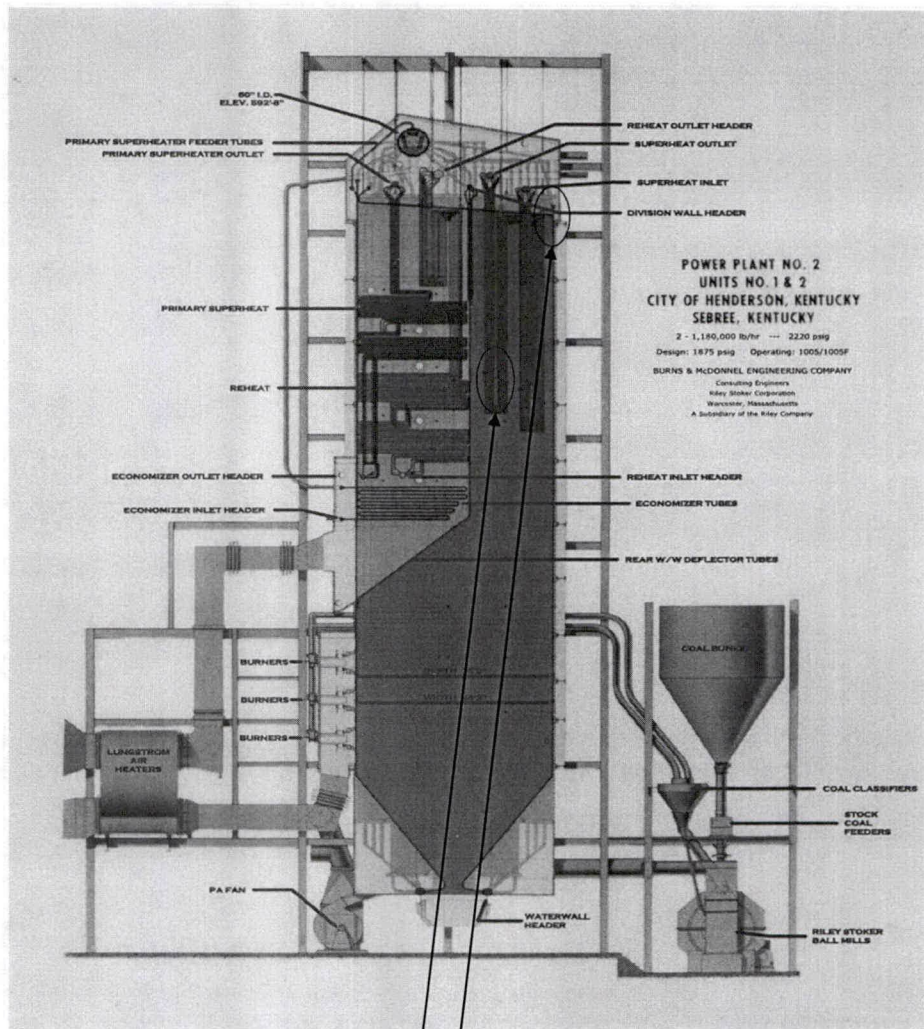
HMPL STATION UNIT 1

2013

(42) TUBES INVOLVED

Date and Time Unit Off 1020 9-19-13

Date and Time Unit On Stand-by 0219 9-24-13



The outer loop on the 6<sup>th</sup> element from the east wall at elevation 537'-5" was replaced along with next inner loop which was washed from the leak on the outer loop. Based on past Radiant Superheat outlet section failures it was determined that all leaks had been either in the inner loops (E1) or outer loops (E10). Additional UT readings indicated that the next to outer loops (E9) were thin and subject to failure also. At this time it was decided that to increase unit reliability 39 additional loops (11 inner loops, 13 outer loops, and 15 next to outer loops) would need to be replaced. From the initial boiler hydro a weeper leak was discovered on the upper south water wall header tubes, 2<sup>nd</sup> tube from the east, this leak is located at the weld where it meets the south upper water wall header at elevation 579'-4". Repaired via a BMR

# Forced Outage Report

## Estimated Outage Cost

- Vacuuming Economizer Hoppers, Economizer Dead Air Space, and Boiler Penthouse, Wash seal trough, ME panels

Total           \$12,154.50

- Titan – tube leak and SH outlet tube repairs

Labor           \$129,582

Material       \$1,305.26

Total           \$130,887.26

- Titan – Misc. repairs (Gas leaks, coal leaks)

Labor           \$18,732

Total           \$18,732

Grand Total       \$161,773.76

# Forced Outage Report

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>HMP'L 1 - H1-13-11</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	9/19/13 10:19			<b>MW</b>
<b>Date &amp; Time On Line</b>	9/24/13 2:19			<b>\$/MW</b>
<b>Outage Duration</b>	112 hr. 0 min.			78
<b>Outage Code</b>	UO2			133
<b>Outage Reason</b>	Repair superheater tube leak			155
				\$ 31.34
				\$ 28.67
				\$ 28.52
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
9/19/13 (HE 11-24)	\$ 34.53	\$ 30.01	\$ (3,443)	\$ -
9/20/13 (HE 1-24)	\$ 27.90	\$ 29.75	\$ -	\$ -
9/21/13 (HE 1-24)	\$ 25.05	\$ 29.35	\$ -	\$ -
9/22/13 (HE 1-24)	\$ 23.13	\$ 26.06	\$ -	\$ -
9/23/13 (HE 1-24)	\$ 28.44	\$ 28.68	\$ 448	\$ (768)
9/24/13 (HE 1-10)	\$ 23.25	\$ 22.74	\$ (1,041)	\$ -
<b>Total</b>			\$ (4,036)	\$ (768)
<b>Start Up Fuel Cost</b>		<b>Total Forced Outage Cost</b>		
S/U Fuel Consumed	6,293	DART P&L	\$ (4,036)	
S/U Fuel Price	\$ 3.13	Lost Opportunity	\$ (768)	
<b>S/U Fuel Cost</b>	<b>\$ (19,685)</b>	S/U Fuel Cost	\$ (19,685)	
		<b>Total</b>	<b>\$ (24,489)</b>	
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Bob Berry

**From:** Billy Boarman

**Date:** 25-Sep-2013

**Plant:** HMP&L Station Two

**Unit:** 1

**GADS Class:** UO2

## Duration

Trip Time: 24-Sep-2013 22:53

Tie Time: 25-Sep-13 04:55

Time Offline: 06:02

## Outage Description

HMP&L Station Two Unit 1 was tripped on Tuesday, 24-Aug-2013 at 22:53 via the emergency boiler trip due to a hydraulic fluid leak on the right side intercept valve.

## Root Cause

An O-ring on the main turbine right side intercept valve oil supply tubing failed.

## Failure History

No failures of this nature have been reported in the last three years.

## Corrective Action

Replaced the failed Viton O-ring with a new Viton O-ring and pressure tested the system.

# Forced Outage Report

## SOE Print Out

### STANDARD SOE REPORT

Triggered on: 24-Sep-2013 22:53:05:465

Event Time	State	Tag Name	Tag Description
24-Sep-2013 22:53:11:732	LKOUT	H140SPVLO86TV2	TURB STOP VLV LOCKOUT (86TV2)
24-Sep-2013 22:53:11:727	TRIP	H150OCB166GETP	OCB 0166 GEN H1 TRIP
24-Sep-2013 22:53:11:726	TRIP	H150OCB162GETP	OCB 0162 GEN H1 TRIP
24-Sep-2013 22:53:10:462	OK	H133LMISTP	LAST MILL IN SERVICE TRIP
24-Sep-2013 22:53:07:187	TRIP	H140STPVLVTP	TURB STOP VLV CLSD TRIP
24-Sep-2013 22:53:06:467	TRIP	H133LMISTP	LAST MILL IN SERVICE TRIP
24-Sep-2013 22:53:06:189	LOW	H143HYDOILPRLO	TURB HYD OIL PRESS LOW
24-Sep-2013 22:53:06:148	OK	H143HYDOILPRLO	TURB HYD OIL PRESS LOW
24-Sep-2013 22:53:05:526	OPEN	H103M2AST	4160 BKR MILL 2A STATUS
24-Sep-2013 22:53:05:522	OPEN	H103PAF2AST	4160 BKR PA FAN 2A STATUS
<b>24-Sep-2013 22:53:05:465</b>	<b>TRIP</b>	<b>H133EMERBLRTP</b>	<b>EMERGENCY BLR TRIP</b>
24-Sep-2013 22:53:05:215	TRIP	H125DRMTP	BLR DRUM LEVEL TRIP
24-Sep-2013 22:53:00:330	LOW	H122HOTWELLLO	COND HOTWELL LEVEL LOW

# Forced Outage Report

## Operators Event Log

9/24/2013	8:00PM	MORRIS, DENTON, REYNOLDS, BAKER, GATTON, EDWARDS, TATE										D SHIFT ASKINS		
		UNIT R1	LOAD 12 HOUR STANDBY	UNIT CAP 50	NET CAP. 45	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSUF	
		H1	160	146	153	0.43	10.3	0.07	23	92	19.48	240	3.3	
		H2	148	165	152	0.37	10.1	0.05	12	94	7.59	250	3.4	
		C.T.	ON	61	61									
			STANDBY											
		ALARMS:										GAUGE GLASSES		
		R1										OK		
		H1	STEAM SEAL HI/LO, BURNER MANG., EH PRSS LO, BFP OIL PUMP											
		H2	EH RES LEVEL HI, GEN H2											
		SOOTBLOWERS TAGGED												
		R1	1, 2, 3, 6, 7, 16, 17, 18, 19, 22L, 28, 29, 30, 31											
		H1	20, 32											
		H2	1, 2, 4, 5, 7, 9, 10, 11, 15, 18, 19, 20, 21, 22, 23, 24, 43											
											SILO			
											13'			
	8:00PM	SAFETY BRIEFING												
	9:55PM	H-1 RIGHT INTERCEPT VALVE, EH LEAK ON LINE FITTING TO SERVO - GOING TO TAKE UNIT OFF TO REPAIR												
	10:48PM	H-1 SCR OUT OF SERVICE												
	10:53PM	H-1 OFF LINE												
	11:00PM	H-1 E.H. PUMPS TAGGED												
	11:35PM	H-1 E.H. PUMPS ON TO CHECK FOR LEAKS												
9/25/2013	12:05AM	H-1 FIRE IN H-1 BOILER												
	12:29AM	H-1 PULLING VACUUM												
	12:48AM	H-1 ROLLING TURBINE												
	1:23AM	H-1 TURBINE AT 3600RPM CLOSED IN FIELD BKR VOLTAGE RAISED TO ABOUT 7 VOLTS AND TURBINE TRIPPED - TRIP SHOWS EHC - THE E.H. PRESSURE SHOWING 3400 LBS AND A PUMP AMP'S 34.7 - TRIPPED A EH PUMP AND SYSTEM PRESSURE DROPPED TO 1677												
	2:10AM	J. ARNOLD AT PLANT												
	NOTE	TAGGED H-1 E.H. PUMPS FOR MAINT TO CHANGE OUT A PUMP												
	4:55AM	H-1 TIED ON												
	4:59AM	H-1 PRECIPS IN SERVICE												
	6:05AM	H-1 SCRUBBER IN SERVICE												
	6:15AM	H-1 WARMING SER'S												

# Forced Outage Report

## Estimated Outage Cost

None

# Forced Outage Report

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>HMP'L 1 - H1-13-12</b>		<b>Production Cost</b>	
<b>Date &amp; Time Off Line</b>	9/24/13 22:53		<b>MW</b>	<b>\$/MW</b>
<b>Date &amp; Time On Line</b>	9/25/13 4:55		67	\$ 32.28
<b>Outage Duration</b>	6 hr. 2 min.		133	\$ 28.67
<b>Outage Code</b>	UO2		155	\$ 28.52
<b>Outage Reason</b>	Repair EHC leak on right intercept valve			
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
9/24/13 (HE 23-24)	\$ 23.11	\$ 21.49	\$ 974	\$ -
9/25/13 (HE 1-12)	\$ 25.38	\$ 31.94	\$ 694	\$ -
<b>Total</b>			<b>\$ 1,668</b>	<b>\$ -</b>
<b>Start Up Fuel Cost</b>		<b>Total Forced Outage Cost</b>		
S/U Fuel Consumed	3,486	DART P&L	\$	<b>1,668</b>
S/U Fuel Price	\$ 3.13	Lost Opportunity	\$	-
S/U Fuel Cost	\$ (10,905)	S/U Fuel Cost	\$	<b>(10,905)</b>
		<b>Total</b>	\$	<b>(9,236)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Bob Berry

**From:** Tracy Cole

**Date:** 19-Nov-2013

**Plant:** Wilson

**Unit:** 1

**GADS Class:** UO1

## Duration

Trip Time: 02-Sep-2013 15:52

Tie Time: 02-Sep-2013 22:40

Total Time Offline: 6:48

## Outage Description

Wilson Station tripped offline on Monday, 02-Sep-2013 at 15:52 due to an apparent lightning strike in near proximity to the plant.

## Root Cause

It was reported by personnel onsite that a loud clap of thunder was heard just prior to or as the unit tripped. When attempting to reset the turbine, it was discovered that a fuse had blown in the turbine control system that supplied power to detect the turbine being reset. The same fuse supplies power to determine if the generator breaker is closed. The following protective relay action occurred: 1) GENERATOR OVERCURRENT LOW FREQUENCY BACK UP RELAY 50 BU G-1 and 2) GENERATOR REVERSE POWER 32G-1. Although the protective relays tripped, it is logical to assume from the data that the loss of the Generator Breaker Closed signal resulted in the turbine trip. Review of the electrical wiring diagrams calls for voltage suppression on the breaker signal from the switchyard; inspection of the points called out on the drawings revealed no voltage suppression.

## Failure History

This is not the first time the fuse in the turbine control system has blown as a result of a nearby lightning strike.

## Corrective Action

The recommendation is to install voltage suppression on the "breaker closed" signal from the switchyard. Also recommend adding logic to determine that the fuse in the turbine control system is intact.

# Forced Outage Report

## SOE Print Out

N/A

## Other Work Completed While Unit Was Offline

None

## Operators Event Log

9/2/2013	8:30am	Had 2 large condenser tube leaks, plugged 6 tubes and pulling boards and closing doors
	11:20am	Maintenance finished closing doors
		Pulling tags and filling condenser
	12:40pm	#3 Circulating water pump on
	12:45pm	Released unit for 417 net
	1:30pm	#4 Mill in service
		Backflushed booster pump
	3:52pm	Unit tripped
	7:52PM	Fire in boiler
	10:33PM	Precips in service
	10:40PM	Unit tied on

## Estimated Outage Cost

Insignificant

# Forced Outage Report

## Lost Sales Opportunity Report

FORCED OUTAGE COST ANALYSIS				
MISO DART Revenue and LOST OPPORTUNITY				
Unit	Wilson - W1-13-05		Production Cost	
Date & Time Off Line	9/2/13 15:52		MW	\$/MW
Date & Time On Line	9/2/13 22:40		300	\$ 23.83
Outage Duration	6 hr. 48 min.		340	\$ 23.39
Outage Code	UO1		420	\$ 22.86
Outage Reason	Unit tripped due to lightning strike			
Date	DA LMP Average	RT LMP Average	DART P&L	Lost Opportunity
9/2/13 (HE 16-24)	\$ 27.65	\$ 27.45	\$ (7,758)	\$ -
9/3/13 (HE 1-7)	\$ 20.55	\$ 19.75	\$ (133)	\$ -
Total			\$ (7,891)	\$ -
Start Up Fuel Cost			Total Forced Outage Cost	
S/U Fuel Consumed	21,180		DART P&L	\$ (7,891)
S/U Fuel Price	\$ 3.13		Lost Opportunity	\$ -
S/U Fuel Cost	\$ (66,236)		S/U Fuel Cost	\$ (66,236)
			Total	\$ (74,127)
NOTES:				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Bob Berry

**From:** Billy Boarman

**Date:** 9-Sep-2013

**Plant:** HMP&L Station Two

**Unit:** 2

**GADS Class:** UO2

## Duration

Trip Time: 5-Sep-2013 19:46

Tie Time: 6-Sep-13 18:33

Time Offline: 22:47

## Outage Description

HMP&L Station Two Unit 2 was removed from service on Thursday, 5-Sep-2013 at 19:46 due to the loss of rotation on "B" Air Heater.

## Root Cause

The "B" Air Heater Gear Box locked up not allowing the "B" Air Heater to rotate.

## Failure History

N/A

## Corrective Action

The gear box, air motor and the electric motor on "B" Air Heater were replaced. Inspected both "A" and "B" Air Heaters internally specifically "B" while operating on the air drive to make sure there were no obstructions that would cause the gear box failure. Ran both "A" and "B" Air Heaters for confirmation, then released.

# Forced Outage Report

## SOE Print Out

### STANDARD SOE REPORT

Triggered on: 5-Sep-2013 19:46:37:010

5-Sep-2013 19:47:32:474	CLOSED	H241BGOPP3ASTS	TG OIL PMP H2A STATUS
5-Sep-2013 19:47:23:307	LOW	H222HTR2LVLLO	LP HEATER 2-3 LEVEL LOW
5-Sep-2013 19:47:15:405	OK	H222HTR2LVLHI	LP HEATER 2-3 LEVEL HIGH
5-Sep-2013 19:47:00:495	HIGH	H222HTR2LVLHI	LP HEATER 2-3 LEVEL HIGH
5-Sep-2013 19:46:55:970	OK	H222HTR2LVLLO	LP HEATER 2-3 LEVEL LOW
5-Sep-2013 19:46:52:515	OK	H240STPVLVTRP	TURB STOP VLV CLSD TRIP
5-Sep-2013 19:46:50:480	OK	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
5-Sep-2013 19:46:50:187	TRIP	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
5-Sep-2013 19:46:49:531	OK	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
5-Sep-2013 19:46:49:460	TRIP	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
5-Sep-2013 19:46:49:370	OK	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
5-Sep-2013 19:46:49:296	TRIP	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
5-Sep-2013 19:46:41:754	OK	H233LMISTRP	LAST MILL IN SERVICE TRIP
5-Sep-2013 19:46:41:384	TRBLE	H246XFERTOMAN	VOLTAGE REG TROUBLE
5-Sep-2013 19:46:41:296	OPEN	H250FLDBKRSTS	GEN H2 FIELD BKR STATUS
5-Sep-2013 19:46:41:287	OPEN	H250OCB186STS	OCB 0186 GEN H2 STATUS
5-Sep-2013 19:46:41:270	OPEN	H250OCB182STS	OCB 0182 GEN H2 STATUS
5-Sep-2013 19:46:41:186	OK	H250OCB182GETR	OCB 0182 GEN H2 TRIP
5-Sep-2013 19:46:41:186	OK	H250OCB186GETR	OCB 0186 GEN H2 TRIP
5-Sep-2013 19:46:41:159	LKOUT	H240STPVLO86TV	TURB STOP VLV LOCKOUT (86TV3)
5-Sep-2013 19:46:41:154	TRIP	H250OCB186GETR	OCB 0186 GEN H2 TRIP
5-Sep-2013 19:46:41:153	TRIP	H250OCB182GETR	OCB 0182 GEN H2 TRIP
5-Sep-2013 19:46:39:023	LOW	H222HTR2LVLLO	LP HEATER 2-3 LEVEL LOW
5-Sep-2013 19:46:37:759	TRIP	H233LMISTRP	LAST MILL IN SERVICE TRIP
5-Sep-2013 19:46:37:507	TRIP	H240STPVLVTRP	TURB STOP VLV CLSD TRIP
<b>5-Sep-2013 19:46:37:010</b>	<b>TRIP</b>	<b>H233EMERBLRTRP</b>	<b>EMERGENCY BLR TRIP</b>
5-Sep-2013 19:46:36:758	TRIP	H225DRMTRP	BOILER DRUM LEVEL TRIP

### Other Work Completed While Unit Was Offline

- Performed hydrostatic test on the boiler along with a reheater vacuum check and nothing was detected.
- Verified Boiler Air Temperatures
- Replaced solenoids, pilot valves, and flow adjusters on the scrubber bypass damper

# Forced Outage Report

## Operators Event Log

9/5/2013	8:00AM	SAFETY BRIEFING												
	8:00AM	H-2 A MILL OFF B AIR HEATER REPAIR												
	8:00AM	H-2 SCR OUT LO TEMP												
	9:30AM	H-2 B AIR HEATER BACK ON												
	9:30AM	OIL IN H-2 BOILER PUTTING A MILL ON												
	9:40AM	H-2 A MILL ON												
	10:16AM	OIL OUT OF H-2 BOILER												
	10:17AM	FLOWING AMM ON H-2												
	10:40AM	H-2 IN ADS												
	NOTE	H-1 A AIR HTR HOT SOOTBLOWER BACK IN AND BLEW OK												
	NOTE	H-1 27,30,31 AND 45 SOOTBLOWERS BACK IN												
	4:00PM	H-2 STEAM COILS BACK IN												
	4:45PM	VALVED OUT NW #1 STEAM COIL ON H-2 CHECKING FOR LEAK												
	5:00PM	TAGGED NW #2 STEAM COIL H-2 INTERNAL LEAK												
	5:00PM	H-1 STEAM COILS BACK IN												
	6:05PM	VALVED IN NW #3 STEAM COIL TO SEE IF IT IS LEAKING INTERNAL												
	6:25PM	H-2 B AIR HEATER GEAR BOX BROKE - AIR HEATER IS NOT TURNING												
	NOTE	H-2 52-321 MAIN BREAKER WOULD NOT OPEN FROM CONTROL ROOM - HAD TO BE TRIPPED AT THE BREAKER												
	7:13PM	H-2 SCR'S OUT												
	7:40PM	SCRUBBERS OUT- HAD LONG DELAY BEFORE BYPASS DAMPER OPENED												
	7:46PM	H-2 UNTIED												
	7:48PM	H-2 PRECIPS OUT												
9/5/2013	8:00PM	MORRIS, DENTON-VAC, REYNOLDS,BAKER,GATTON, EDWARDS, TATE										D SHIFT ASKINS		
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSUR	
		R1		50		12 HOUR STANDBY								
		H1	165	165	153	0.47	10.1	0.07	27	90	15.47	250	3	
		H2	OUTAGE											
		C.T.	STANDBY	59										
		ALARMS:												
		R1												
		H1	STEAM SEAL HI/LO,BURNER MANG., EH PRSS LO,											
		H2	EH RES LEVEL HI ,GEN H2											
		SOOTBLOWERS TAGGED												
		R1	1,2,3,6,7,16,17,18,19,28,29,30,31											
		H1	20,40,43,											
		H2	1,2,4,5,7,9,10,11,15,18,19,20,21,22,23,24,41											
	8:00PM	SAFETY BRIEFING												
	8:00PM	TIM WEST AT PLANT												
9/6/2013	NOTE	H-2 BOILER IS SET FOR HYDRO AND VACUUM CHECK												
	7:38AM	H-2 F.D. FANS ON												

# Forced Outage Report

9/6/2013	8:00AM	CONN, CLARK, BREEDEN, HIGGINS, BLANKS, YOUNG, BLANKS										B SHIFT - D. PENDLEY/CPAYN			
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSUF		
		R1		50		12 HOUR STANDBY									
		H1	143	160	153	0.378	10.5	0.072	16.3	91.8	11.07	205	2.65		
		H2		160	152		OUTAGE								
		C.T.	STANDBY	59											
		ALARMS:										GAUGE GLASSES			
		R1									OK				
		H1	STEAM SEAL HI/LO BURNER MANGT. EH PRESSURE LO/PUMP START REQ												
		H2	EH RES LEVEL HI												
		SOOTBLOWERS TAGGED													
		R1								SILO		BOOTHE SYSTE			
		H1	20,28,33,40,43,48												
		H2	1,4,5,7,9,10,11,15,18,19,20,21,22,23,24,43												
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH									
		LEVELS	7' 9"	12' 2 1/4"	15' 11"	8 1/4"									
9/6/2013	8:00AM	SAFETY BREIFING													
	8:25AM	H-2 F.D. FANS OFF													
	8:26AM	H-2 BFP ON - FILLING BOILER													
	8:18AM	CALLED D. FELTY L/M, E. CECIL L/M, J. HILLYARD L/M, M. EMBRY L/M, B. BLAIR L/M, R. BEAN L/M, M. JOHNSON													
	8:30AM	J. HILLYARD RETURNED CALL - WILL BE IN AT 1:00PM													
	8:44AM	M. EMBRY RETURNED CALL - POSITION FILLED													
	9:27AM	H-2 BFP OFF - 1440 LBS													
	9:37AM	H-2 HYRO GOOD - DRAINING BOILER TO FIRING LEVEL & SETTING TO FIRE													
	9:55AM	VAC CHECK GOOD. VAC PUMPS OFF													
	11:50AM	MAINT RELEASED H-2 'B' A.H.													
	12:00PM	D. FELTY RETURNED CALL - JUST GOT BACK FROM HOSPITAL - CAN'T COME IN													
	12:53PM	FIRE IN H-2 BOILER													
	1:05PM	R. BEAN RETURNED CALL - IN CROSSVILLE, TN - CAN'T COME IN													
	NOTE	HAVING TROUBLE WITH H-2 A1 & B3 OIL GUNS - INSTRUMENT DEPT ASSISTING													
	1:23PM	R-1 'A' AUXILIARY CIRC WATER PUMP TRIPPED - ALSO BREAKER TRIPPED - ISSUED W/O & NOTIFIED T. TAYLOR													
	2:00PM	A1, A2, A3 OIL IN, 37% AIR FLOW, 421 TEMP, 324 SAT TEMP, 75LBS, VENTS CLOSED													
	3:00PM	A1,A2,A3,B1,B3 OIL IN, 34% AIR FLOW, 379TEMP, 349 SAT TEMP, 115LBS,													
	4:00PM	A1,A2,A3,A4,B1,B2 OIL GUNS IN, 34% FAN, 529TEMP, 497SATURATION, 650LBS PRESSURE, 30 SUPERHEAT													
	4:30PM	99DEGREES SUPERHEAT. SEALING AND PULLING VAC ON TURBINE													
	4:55PM	ROLLING H-2 TURBINE													
	5:20PM	AT TRANSFER SPEED - WAITING ON SATURATION TEMP													
	5:55PM	TRANSFERRED VALVES													
	NOTE	CLOSED IN FIELD - VOLTAGE WENT TO 16.7 & STOPPED - CALLED T. TAYLOR - GOT J. ARNOLD & T. WEST INVOLVED - THEY CALLED B													
		HAD TO MANUALLY RAISE VOLTAGE TO 18.0 THEN GO TO TEST THEN TO AUTO.													
	6:33PM	H-2 GENERATOR TIED ONLINE - PRECIPS IN SERVICE													
	7:14PM	CLOSING IN H2 52-301 & 52-321 FOR EXERCISING WORKED GOOD & SPARE BREAKER FOR T.TAYLOR													
	7:21PM	H2 MAINS 52-301 & 52-321 CLOSED & TIE BKR open defeat switches in NORMAL													
9/6/2013	8:00PM	EDMONDS,JACKSON , GRIFFIN, HOGAN, BOWLEY,ALEXANDER,WADLINGTON										C SHIFT CARTER			
		ONAN	VAC												
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSUF		
		R1		50	45										
			12 HR STANDBY / GENERATOR PURGED TO CO2												
		H1	147	165	153	0.383	10.2	0.039	17.4	92.1	18.07	250/A	3.1		
		H2	131	118	152	1.183	10.2	0.356	12.5	77.3	8.6		3.3		
				1500 DRUM											
		C.T.	ON STANDBY	59											
		ALARMS:													
		R1										GAUGE GLASSI			
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/H1 COOLING TOWER HI / LOW												
		H2	HYDROGEN SYSTEMEH RES LEVEL HI												
												OK			

# Forced Outage Report

## Estimated Outage Cost

- OPEN/CLOSE BOILER DOORS, BOILER HYDRO, REHEAT VACUUM CHECK, BOILER AIR TEST – Titan

Labor	\$2,100
Material	\$ 0
Total	\$2,100

# Forced Outage Report

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>HMP'L 2 - H2-13-08</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	9/5/13 19:46			<b>MW</b>
<b>Date &amp; Time On Line</b>	9/6/13 18:33			<b>\$/MW</b>
<b>Outage Duration</b>	22 hr. 47 min.			72
<b>Outage Code</b>	UO2			127
<b>Outage Reason</b>	Replace B air heater gear box			149
				\$ 31.54
				\$ 28.83
				\$ 28.50
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
9/5/13 (HE 19-24)	\$ 28.60	\$ 27.33	\$ 1,124	\$ -
9/6/13 (HE 1-24)	\$ 28.47	\$ 30.71	\$ (11,864)	\$ -
9/7/13 (HE 1-2)	\$ 21.79	\$ 19.13	\$ (190)	\$ -
<b>Total</b>			\$ (10,929)	\$ -
<b>Start Up Fuel Cost</b>		<b>Total Forced Outage Cost</b>		
S/U Fuel Consumed	7,580	DART P&L	\$ (10,929)	
S/U Fuel Price	\$ 3.13	Lost Opportunity	\$ -	
S/U Fuel Cost	\$ (23,711)	S/U Fuel Cost	\$ (23,711)	
		<b>Total</b>	\$ (34,640)	
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Bob Berry

**From:** Chuck Tucker

**Date:** 15-Oct-2013

**Plant:** Green

**Unit:** 1

**GADS Class:** UO2

## Duration

Trip Time: 4-Oct-2013 05:04

Tie Time: 4-Oct-2013 12:52

Time Offline: 07:48

## Outage Description

Green Unit 1 was removed from service on Friday, 4-Oct-2013 at 05:04 due to power feed problems related to a 480 volt transfer switch failure at Precipitator 1B. The electrically operated transfer switch gearing broke which prevented an automatic swap to the emergency source coming from Precipitator 1A.

Fires were established in the boiler on Friday, 4-Oct-2013 at 10:35.

The unit was tied online on Friday, 4-Oct-2013 at 12:52.

## Root Cause

The failed automatic transfer switch gearing was found broken apart which prevented a transfer to the emergency source power from Precipitator 1A. The broken operator was removed by plant electricians and is presently in a manual-only mode until a replacement is located or repairs can be made. The transfer switch is the original design and installation. See attached pictures.

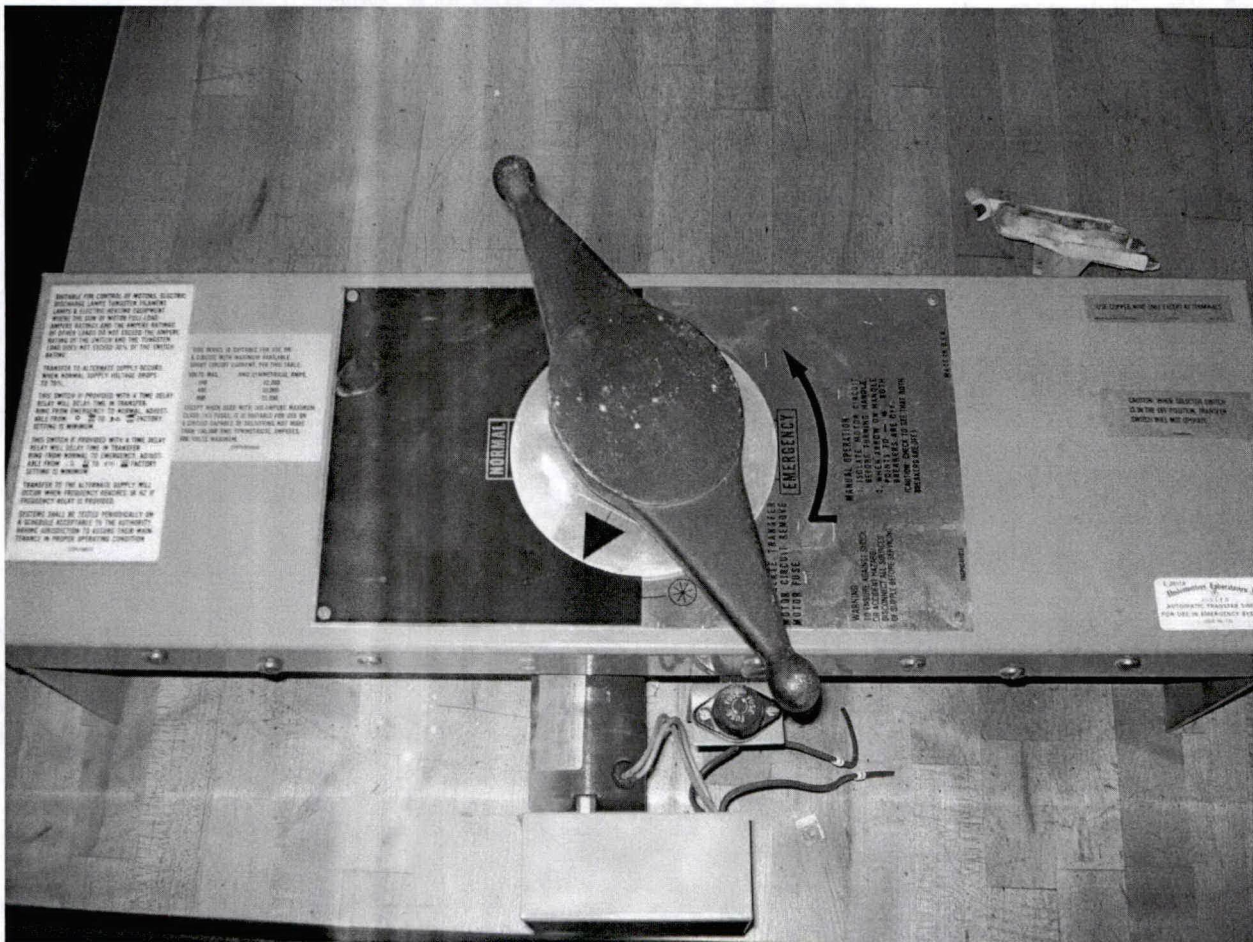
# Forced Outage Report

## Failure History

There are no recorded precipitator transfer switch failures in the period from 2007 to present for Green Station.

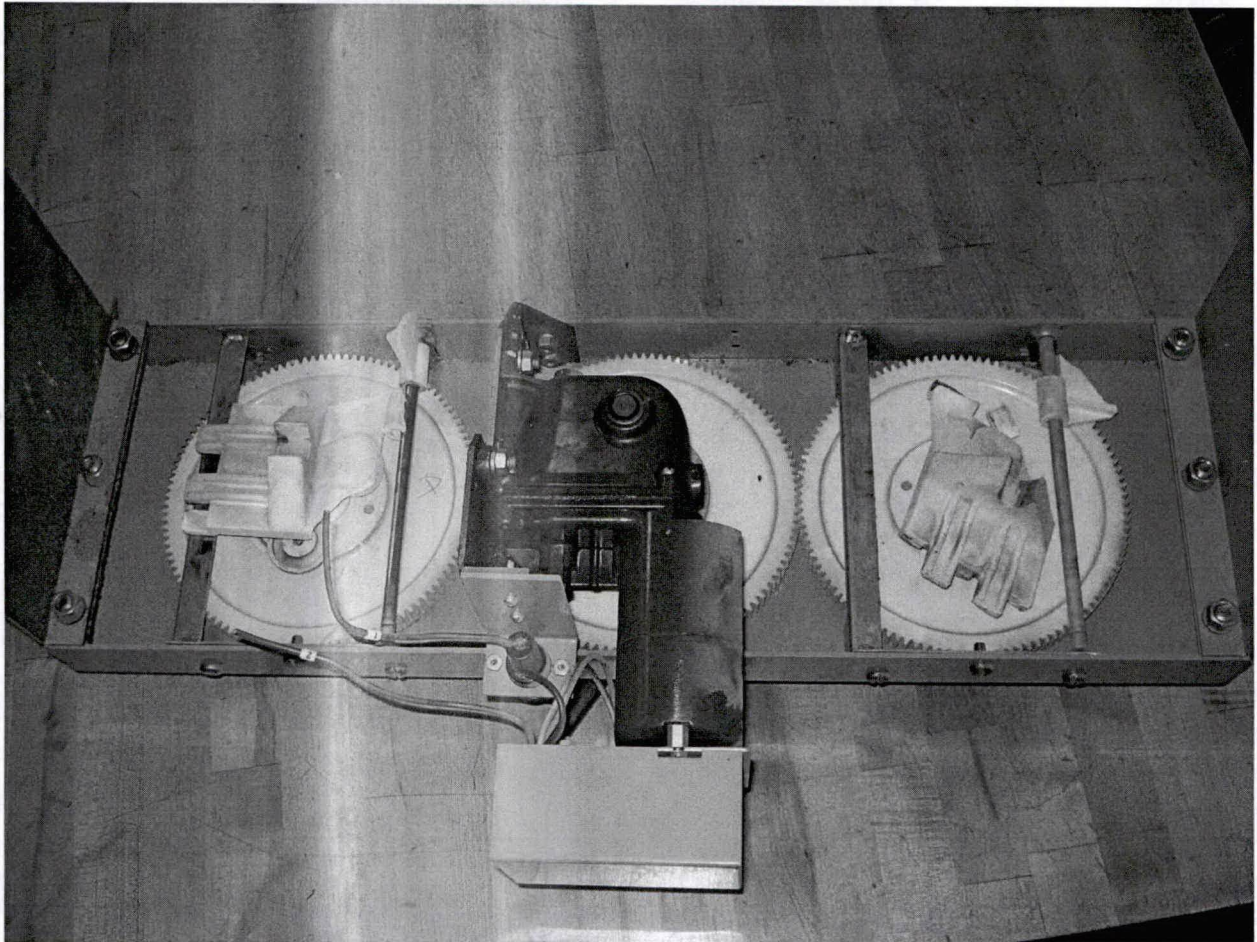
## Corrective Action

A temporary switching procedure has been developed for manual-only operation of the Precipitator '1B' Transfer Switch until repairs are made.



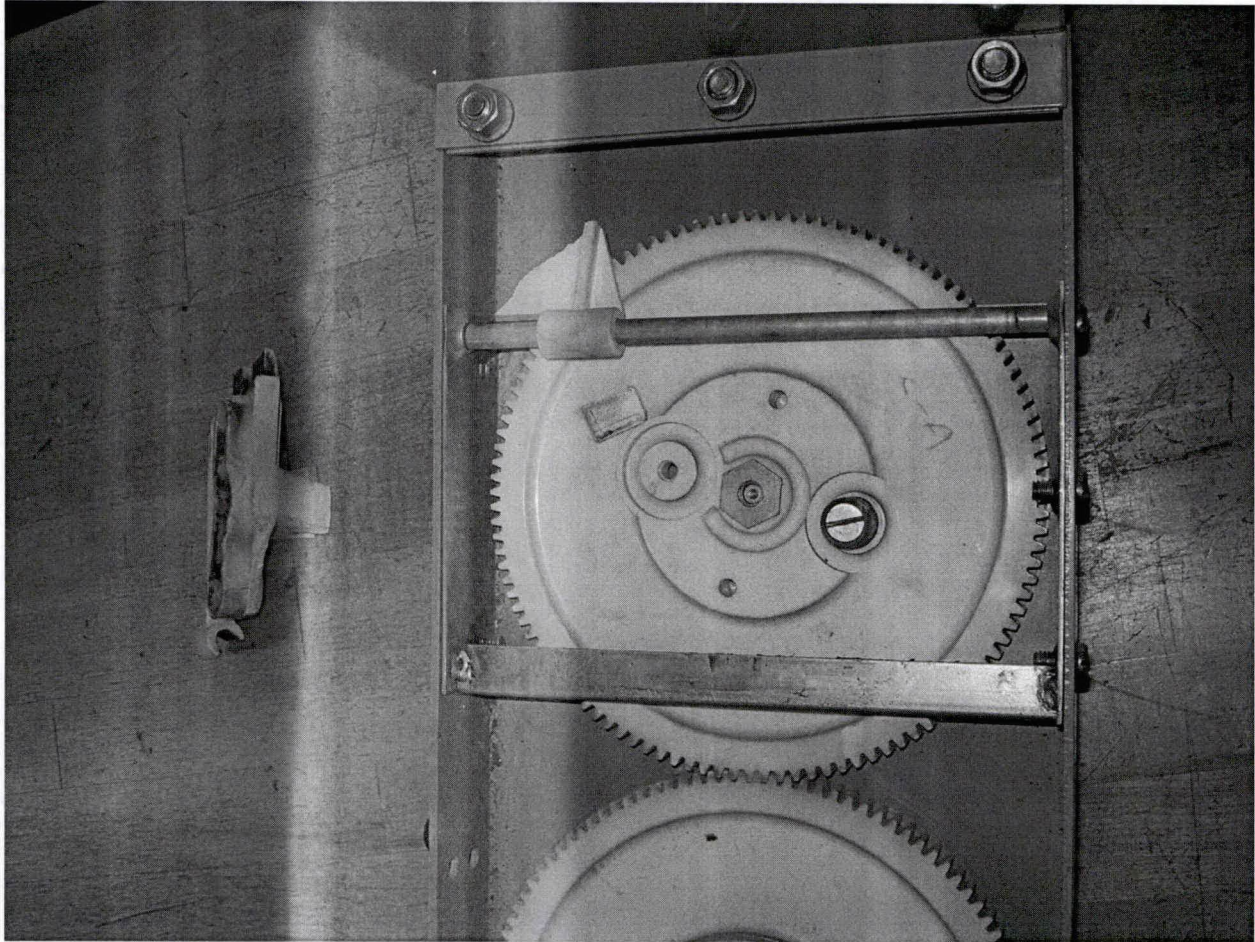
**Precipitator '1B' Transfer Switch (front view) - Operator shown removed from panel**

## Forced Outage Report



**Precipitator '1B' Transfer Switch (rear view) - Operator shown removed from panel**

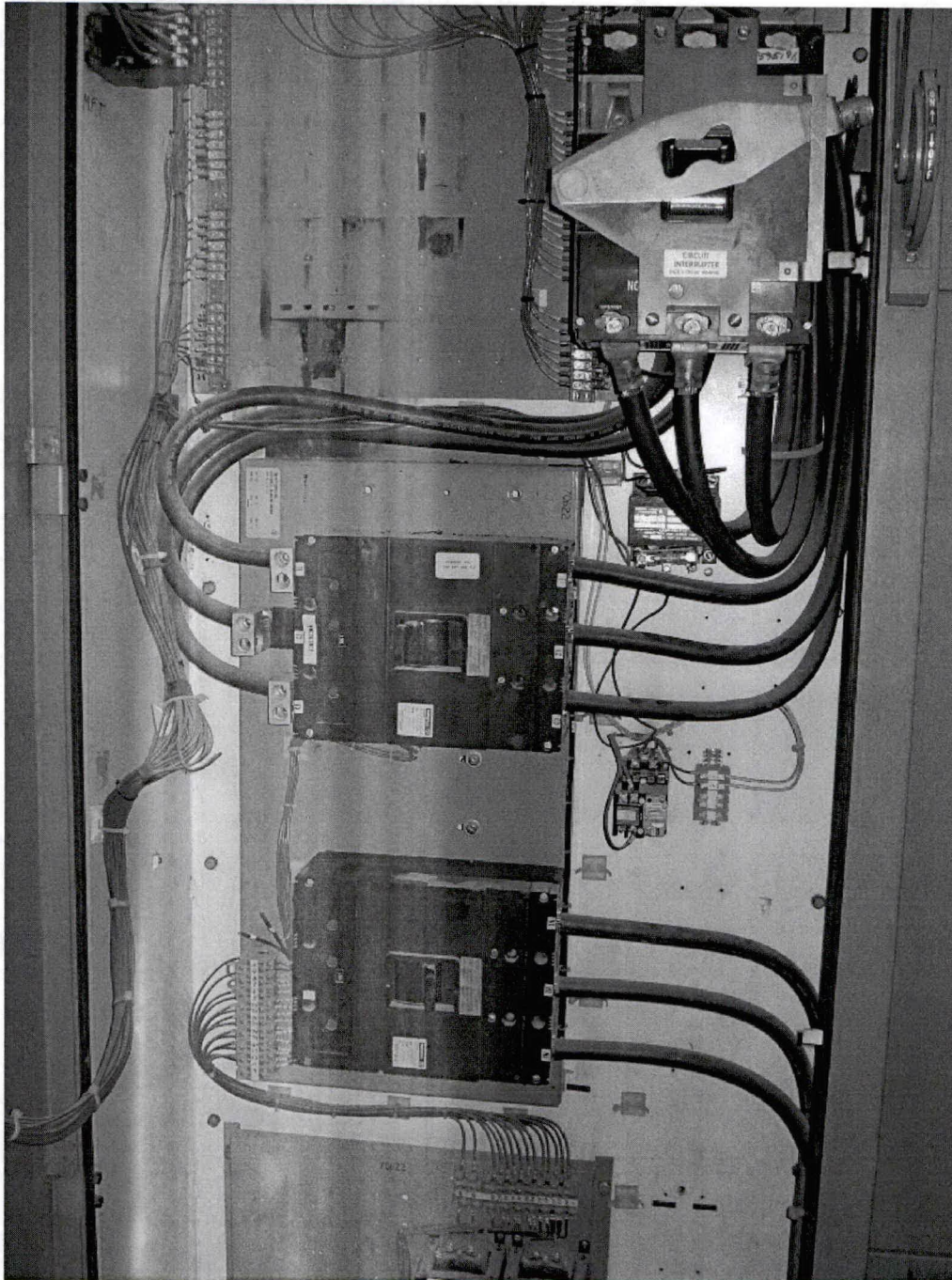
## Forced Outage Report



**Precipitator '1B' Transfer Switch (rear view)**

**Close up view shows broken racking gear follower assembly**

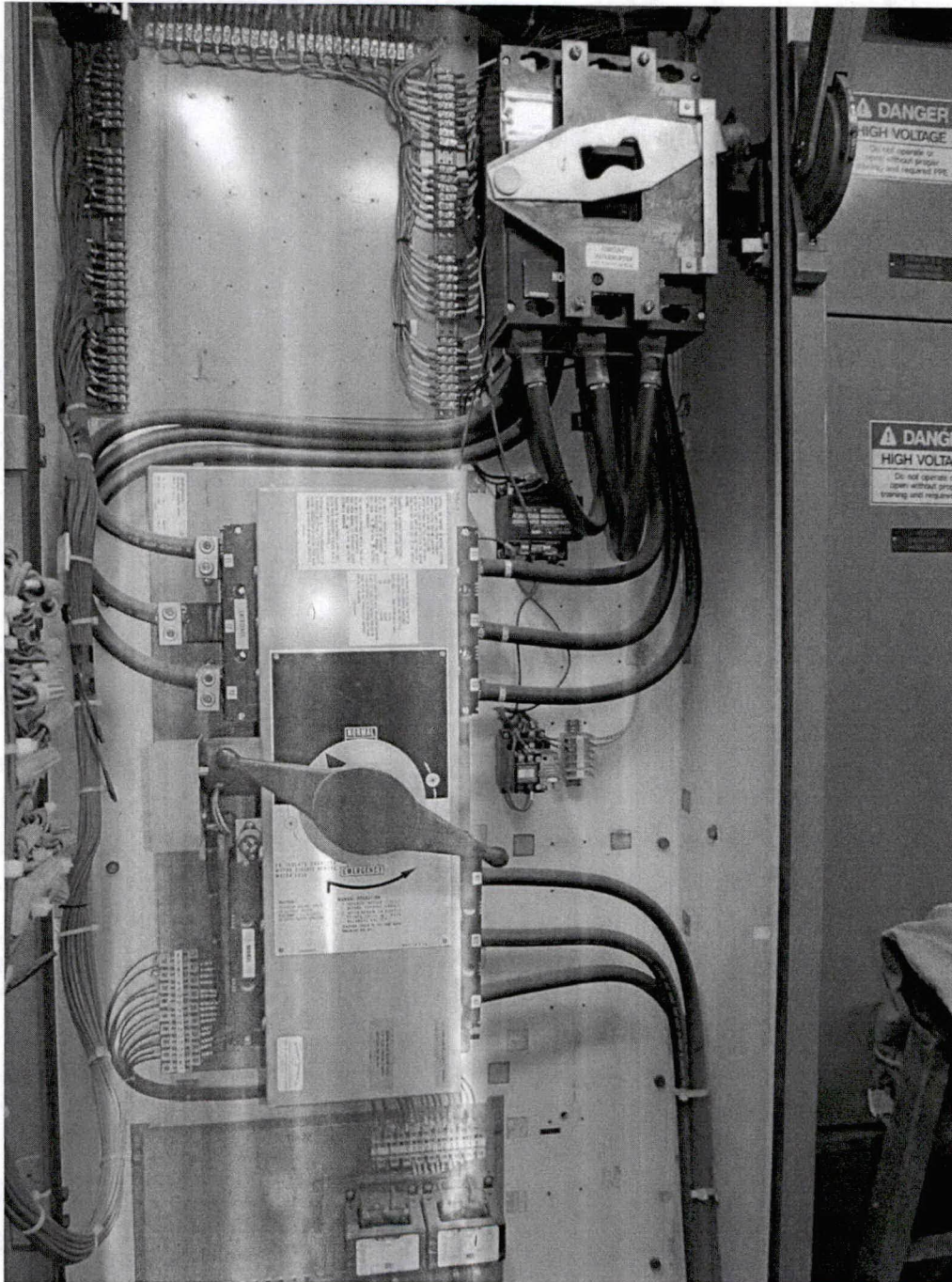
## Forced Outage Report



**Precipitator '1B' Transfer Switch Panel**

**View showing operator removed**

## Forced Outage Report



**Precipitator '1A' Transfer Switch Panel**

**View showing operator in place**

**(Typical for '1B' – shown for reference only)**

# Forced Outage Report

## SOE Print Out

N/A

## Other Work Completed While Unit Was Offline

None

# Forced Outage Report

## Operators Event Log



### LOG BOOK

DATE 10-4-13

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
12 <sup>00</sup>	
G-1	LOAD 247 Cap 250 3 mills C=5/13 SOL .36 Nox .20 opacity 10.1% ADS IN 4 Precips out
G-2	LOAD 241 Cap 242 3 mills D=5/13 SOL .23 Nox .21 opacity 7.1% ADS IN 2 Precips out
	SLAKER G-1 4 on 21.5 22 #2 G-2 4 on 19.6 20.1 #3 Prep 3 on 76.4% #4
	TU IN A CONV B+C drums #2 Flyash 30 TPH #2 smoot 36% 23' Tanks #1 silo 40' @ E 1.5 W 1.0 #2 silo 52' @ E 1.0 W @
12 <sup>16</sup>	ALL precips tripped - Lights went out - (G-1) Aux reset A+B incoming breakers - when "B" side racked back in Lights and A/E came back on A side precips went back in service - cannot get "B" side to go back in service

TIME LINE ON BACK

G1 - Precips tripped @ 0016, dropped OPER Load @ 0047, 0235, 0321, 0357  
Unit off line @ 0504, Fire in @ 1035, Unit tied online @ 1252  
248 good for fuel load @ 1044

G2 - 242

2ND	
3RD	W/12A-8A
SIGNED	

F155.12  
R 1/83

# Forced Outage Report



## LOG BOOK

DATE 10-4-13

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
12 <sup>13</sup>	Task ADS OUT AND dropped to 3 mill min.
1 <sup>20</sup>	J. Shelton on sight
2 <sup>01</sup>	G-1 ASMC precip. Tripped - Reset OK
	UNDERFLOW Run
	1A 14 HR 30min 2A 8 HR 30min
	1B 15 HR 30min 2B 11 HR 30min
	ILL Run 18 HR 30 min
	1A 40+ (72) OT-6'10" 2A 35.2 (79) OT-6'10"
	1B 31.9 (187) OT-6'5" 2B 28.7 (242) OT-6'7"
2 <sup>35</sup>	G-1 Dropping load to 100 NET
2 <sup>53</sup>	G-1 A mill OFF
3 <sup>24</sup>	ADS back in
3 <sup>29</sup>	ADS OUT ↓ to 80 NET
3 <sup>52</sup>	Dropped to 1 mill operation

OPER	SUP'R
1ST	
2ND	
3RD	<u>W/12A-8A</u>
SIGNED	

F155.12  
R 1/93



DATE 10-4-13

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

OPER	SUP'R	
1ST		
2ND		
3RD		<i>W 12A-8A</i>
SIGNED		

10

# Forced Outage Report



## LOG BOOK

DATE 10/4/13

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
7 <sup>00</sup>	Smith, Farley, Lawrence, White, Hays, Heaver, Parker, Hurst, Hayes, Travis, Temple, Shelton, Tapp, Strickland
51	Down for precip trouble
52	Cap 242 load 242 SEA 140 NOE 212 opAL 10.1
shakers	51 0 24/26 52 2 24/24 P 0 87%
thickness	1A — 0 6" 2A 0 6" 1B 5 6" 2B 5 6"
IV	In service, A side, B+C drums, #2-16T Tanks — 24' ± 2-362
5.10's	#1-45' E-1.5 W-1.0 #2-38' E-1.0 W-.5 S-0 6-0 S-0 6-0
12 <sup>52</sup>	G-1 Tied on-line
4 <sup>44</sup>	G-1 Released for full pressure on full load
note	Hotline Notified.

OPER	SUP'R
1ST	Erin Smith
2ND	
3RD	
SIGNED	

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 10/4/13

☐ REID  
☐ GREEN  
☐ COLEMAN  
☐ WILSON

☒ SHIFT SUPERVISOR  
☐ CONTROL OPERATOR  
☐ AUXILIARY OPERATOR  
☐ UTILITY OPERATOR  
☐

☐ SCRUBBER SHIFT SUPERVISOR  
☐ SCRUBBER OPERATOR  
☐ SCRUBBER AUXILIARY OPERATOR  
☐ SOLID WASTE OPERATOR  
☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
6 <sup>00</sup>	G-1 Air scrubbing safety is bad - want to replace it w/ a new one
8 <sup>00</sup>	C Shift here & B Shift leaving
	Underflow 1A) 40+ 0 6'10" 2A) off 0 6'10" 1B) 34 8 6'8" 2B) 28.6 10 6'4"
8 <sup>30</sup>	Called A-1 Septic for Guard Shack toilet pluggers
8 <sup>34</sup>	A-1 Septic called Back will be here tomorrow.
9 <sup>23</sup>	Raising G-1 PH to 6.8 SO <sup>2</sup> High
	Flyash Silo Levels #1) 40' #2) 45'
	Flyash Silo Readings
	Silo 1 2
	Silo 0 0
	Safety 0 0
	Refractor East 1.5 1.5
	Refractor West 1.5 1.5
Note	Released G-2 C Bailer feed Pump Lube oil Pump - North side of bailer feed Pump Next to oil Pump leaking getting maintenance to tighten up.

OPER	SUP'R
1ST	<i>[Signature]</i>
2ND	
3RD	<i>[Signature]</i>
SIGNED	

F155.12  
R 1/93

# Forced Outage Report

## Estimated Outage Costs

Labor	\$1,016
Material	\$ 14
Total	\$1,030

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>Green 1 - G1-13-07</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	10/4/13 5:04			<b>MW</b>
<b>Date &amp; Time On Line</b>	10/4/13 12:52			<b>\$/MW</b>
<b>Outage Duration</b>	7 hr. 48 min.			109
<b>Outage Code</b>	U02			163
<b>Outage Reason</b>	Removed from service due to opacity (precipitator) problems			235
				\$ 27.13
				\$ 25.07
				\$ 24.14
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
10/4/13 (HE 3-18)	\$ 33.69	\$ 33.29	\$ (27,397)	\$ -
<b>Total</b>			\$ (27,397)	\$ -
<b>Start Up Fuel Cost</b>			<b>Total Forced Outage Cost</b>	
S/U Fuel Consumed	13,349		DART P&L	\$ (27,397)
S/U Fuel Price	\$ 3.12		Lost Opportunity	\$ -
<b>S/U Fuel Cost</b>	<b>\$ (41,714)</b>		S/U Fuel Cost	\$ (41,714)
			<b>Total</b>	<b>\$ (69,111)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Bob Berry

**From:** Billy Boarman

**Date:** 9-Oct-2013

**Plant:** HMP&L Station Two

**Unit:** 2

**GADS Class:** UO1

## Duration

Trip Time: 5-Oct-2013 05:46

Tie Time: 7-Oct-2013 01:09

Time Offline: 43:23

## Outage Description

HMP&L Station Two Unit 2 was removed from service on Saturday, 5-Oct-2013 at 05:46 due to failure of the turbine emergency backup DC lube oil pump motor. While the Auxiliary Operator was completing the weekly oil pump test he noticed the DC Lube Oil Pump motor was smoking. Then the pump started turning slowly and fire flashed out of motor. The Auxiliary called the Control Room Operator to shut off the DC Lube Oil Pump.

## Root Cause

The upper bearing lock washer tang was broken off and this allowed the bearing lock nut to loosen. The pump impeller and shaft had slipped to the bottom and were rubbing the suction bell.

## Failure History

No failures of this nature have been reported in the last three years.

## Corrective Action

After removing the motor the pump was inspected and found to be locked up. The upper bearing cap was removed and discovered the upper bearing lock washer tang was broken off. This allowed the lock nut to unscrew and the pump impeller and shaft slipped to the bottom of the suction bell. A new shaft lock washer and lock nut were installed and the pump turned free at this time. The motor was sent to Mohler for testing and repair. After the motor was repaired it was reinstalled and the pump was test run for 5 hours. The pump was approved to be returned to service.

# Forced Outage Report

## SOE Print Out

### STANDARD SOE REPORT

Triggered on: 5-Oct-2013 05:46:23:058

5-Oct-2013 05:46:30:635	LOW	H222HTR3LVLLO	LP HEATER 3-3 LEVEL LOW
5-Oct-2013 05:46:30:618	OK	H222HTR2LVLHI	LP HEATER 2-3 LEVEL HIGH
5-Oct-2013 05:46:30:596	OK	H222HTR3LVLLO	LP HEATER 3-3 LEVEL LOW
5-Oct-2013 05:46:30:403	LOW	H222HTR3LVLLO	LP HEATER 3-3 LEVEL LOW
5-Oct-2013 05:46:29:805	OK	H225DRMTRP	BOILER DRUM LEVEL TRIP
5-Oct-2013 05:46:28:881	OK	H222HTR3LVLHI	LP HEATER 3-3 LEVEL HIGH
5-Oct-2013 05:46:28:053	OK	H233LMISTRP	LAST MILL IN SERVICE TRIP
5-Oct-2013 05:46:27:659	TRBLE	H246XFERTOMAN	VOLTAGE REG TROUBLE
5-Oct-2013 05:46:27:531	OPEN	H250FLDBKRSTS	GEN H2 FIELD BKR STATUS
5-Oct-2013 05:46:27:524	OPEN	H250OCB186STS	OCB 0186 GEN H2 STATUS
5-Oct-2013 05:46:27:511	OPEN	H250OCB182STS	OCB 0182 GEN H2 STATUS
5-Oct-2013 05:46:27:421	OK	H250OCB182GETR	OCB 0182 GEN H2 TRIP
5-Oct-2013 05:46:27:421	OK	H250OCB186GETR	OCB 0186 GEN H2 TRIP
5-Oct-2013 05:46:27:394	LKOUT	H240STPVL086TV	TURB STOP VLV LOCKOUT (86TV3)
5-Oct-2013 05:46:27:390	TRIP	H250OCB182GETR	OCB 0182 GEN H2 TRIP
5-Oct-2013 05:46:27:390	TRIP	H250OCB186GETR	OCB 0186 GEN H2 TRIP
5-Oct-2013 05:46:24:058	TRIP	H233LMISTRP	LAST MILL IN SERVICE TRIP
5-Oct-2013 05:46:23:559	TRIP	H240STPVLVTRP	TURB STOP VLV CLSD TRIP
5-Oct-2013 05:46:23:058	TRIP	H233EMERBLRTRP	EMERGENCY BLR TRIP
5-Oct-2013 05:46:22:806	TRIP	H225DRMTRP	BOILER DRUM LEVEL TRIP

## Other Work Completed While Unit Was Offline

- Boiler hydrostatic test and reheat vacuum checks, no issues
- Repaired coal leaks on mills
- Calibrated all coal feeders

# Forced Outage Report

## Operators Event Log

10/5/2013

12:50AM AUX DOING H2 OIL PUMP TEST NOTICED H2 DC LUBE OIL PUMP SMOKING WHILE CHECKING PSI 37PSI THEN STARTED TURNING SLOW FIRE FLASHED OUT OF MOT  
HAD C.R. OPERATOR SHUT OFF. DID NOT SEE OR SMELL ANYTHING AT BREAKER  
12:58AM R. PARKER NOTIFIED ABOUT H2 DC LUBE OIL PUMP.  
1:00AM RUNNING ELEC LIST NO ANSWER  
1:08AM NOTIFIED B. CHEATHAM  
2:49AM B. CHEATHAM CALLED SAID D. JAGGERS COMING IN  
3:51am H2 OUT OF ADS  
4:05AM H2 TRANS AUXILIARIES A SIDE 52-321 CLOSED IN/ B SIDE 52-321 MAIN WOULD NOT OPEN UP TRIED 2X TIMES AFTER TIE WAS CLOSED  
NOTE STARTED BLOWING B MILL OUT TAKING ALL B SIDE 4160V EQUIP  
4:17AM H2 FUEL OIL IN BOILER  
4:33AM GIVE H2 SCR STOP SIGNAL AMMONIA OUT  
4:44AM H2-B MILL & B PA FAN OFF, C ASP, B CONDENSATE PUMP, D C.T.CWP, B BFP  
5:10AM MANUALLY TRIPPED H2-B MAIN 52-321 THEN CLOSED 52-324 TIE  
5:46 AM H2 OFF LINE  
5:48AM H2 PRECIPS OUT & SH&RH SPRAYS  
6:25am H2 TURBINE BRAKING VAC  
6:40AM H2 TURBINE ON GEAR

10/5/2013

8:00AM CLARK, BREEDEN, HIGGINS, CUTSHAW, BLANKS, YOUNG  
CONN VAC - ONAN HERE  
UNIT LOAD UNIT CAP NET CAP. SO2 CO2 NOX OPACITY REMOVAL DUST AMM. FLOW BACK PRESSURE  
R1 50 12 HOUR STANDBY  
H1 165 165 153 0.544 10.3 0.076 27.2 90.1 25.03 238 3.9  
H2 0 165 OUTAGE  
C.T. STANDBY 58  
ALARMS:  
R1 STEAM SEAL HI/LO BURNER MANGT. EH PRESSURE LO/PUMP START REQ  
H2 EH RES LEVEL HI  
SOOTBLOWERS TAGGED  
R1 SILO  
H1 20 19  
H2 1,2,4,6,7,9,10,11,15,18,19,20,21,22,23,24,43  
FUEL OIL C.H. HMPL NORTH SOUTH  
LEVELS 12' 6 1/2" 12' 3" 12' 8 3/4" 8 1/4"

10/5/2013

8:00AM SAFETY BRIEFING  
8:05AM CALLED EXPRO - ANSWERING SERVICE SAID THEY WERE CLOSED FOR THE WEEKEND - COULD NOT GET ANYBODY IN  
8:06AM I CALLED JACK HULETT CELL PHONE - EXPRO - LEFT MESSAGE FOR HIM TO CALL ME  
8:10AM CALLED JASON - EXPRO-HE WILL CALL ME BACK  
NOTE FANS AT PENTHOUSE - GETTING AIR MOVERS & HOSES FOR L.P. TURBINE  
NOTE TAGGED OUT H-2 FUEL OIL, AMMONIA & ACCUTEMP  
8:15AM JASON - EXPRO - CALLED BACK - SAID HE COULDN'T GET A CREW HERE TIL 6AM SUNDAY MORNING - NOTIFIED J. FRANCIS  
9:30AM H-2 BOILER SET FOR HYDRO & VACUUM  
9:45AM H-2 TURBINE L.P. DOORS OFF & AIR MOVERS IN PLACE  
10:20AM CALLED JASON - EXPRO- TOLD HIM THEY WERE NOT NEEDED  
NOTE TAGGED OUT H-2 PRECIPS  
NOTE TAGGED OUT H-2 COAL FEEDERS FOR CALIBRATION  
12:00PM PUTTING 10% DRYING AGENT ON COAL  
12:25PM H-2 'B' BFP ON FOR HYDRO  
1:25PM H-2 'B' BFP OFF - VENTS CLOSED - F.D. FANS OFF - MAINT OPENING BOILER DOORS  
1:30PM ELECT. UNLOCKED PRECIP HOPPER DOORS  
1:42PM H-2 'B' BFP ON TO PRESSURE BOILER  
1:49PM H-2 'B' BFP OFF - H-2 'A' & 'B' CONDENSER VACUUM PUMPS ON FOR VACUUM CHECK  
1:55PM CALLED SOLO - INLAND- LEFT MESSAGE FOR A.H. WASH & VACUUM ECONOMIZERS  
2:30PM H-2 SET UP FOR A.H. WASH  
2:45PM H-2 HYDRO & REHEAT CHECK OK - DRAINING BOILER TO FIRING LEVEL  
3:00PM CALLED INLAND - THEIR DISPATCHER IS TRYING TO GET IN TOUCH WITH A CREW  
3:07PM INLAND RETURNED CALL - WILL BE HERE AS SOON AS POSSIBLE  
4:00PM H-2 PRECIP DOORS CLOSED  
NOTE H-2 BOILER SET TO FIRE 4:50PM  
4:50PM CALLED R. DENTON - L/M ON HOME PHONE - CELL PHONE NOT ACCEPTING CALLS  
4:50PM CALLED E. CECIL - L/M  
4:52PM CALLED D. FELTY - L/M  
4:54PM CALLED J. REYNOLDS - L/M  
5:01PM CALLED J. GATTON - L/M  
5:02PM CALLED J. BAKER - L/M  
5:05PM CALLED M. EMBRY - NOT ACCEPTING CALLS  
5:05PM CALLED B. BLAIR - WILL COME IN IF NOONE ELSE CALLS BACK  
5:07PM CALLED J. HILLYARD - L/M  
5:48PM BUMPED H-2 D.C. LUBE OIL PUMP FOR ROTATION  
6:45PM H-2 TURBINE OFF TURNING GEAR  
6:48PM H-2 LUBE OIL PRESSURE WITH A.C. PUMP ON - 33 LOCAL 21 CONTROL ROOM  
6:48PM H-2 D.C. LUBE OIL PUMP ON LOCAL PRESSURE 39.5 22 IN CONTROL ROOM  
6:52PM H-2 TURBINE BACK ON TURNING GEAR



# Forced Outage Report

10/6/2013	8:00PM	EDMONDS,JACKSON ,JOHNSON , HOGAN, ,ALEXANDER,WADLINGTON										C SHIFT CARTER		
		S/L		EDWARDS										
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
		R1		50	45									
			12 HR STANDBY / GENERATOR PURGED TO CO2											
		H1	150	165	138	0.388	9.8	0.084	22.1	90.2	15.16	181/C	2.4	
					WET FUEL									
		H2		165	137				3550 RPM-945 PSI					
					WET FUEL									
		C.T.	ON STANDBY		64									
		ALARMS:												
		R1												
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/H1 COOLING TOWER HI / LOW										GAUGE GLASS!	
		H2	EH RES LEVEL HI										OK	
		SOOTBLOWERS TAGGED												
		R1	1,2,3,6,7,16,17,18,19,22L,28,29,30,31											
		H1	20											
		H2	1,2,4,5,7,9,10,11,15,18,19,20,21,22,23,24,32,34,39											
		FUEL OIL TANKS												
		LEVELS	C.H.	HMPL	NORTH	SOUTH			SILO LVL 16'		BOOTHE SYSTEM		IN	
			12' 6 1/2"	12' 3"	12' 8 3/4"	8 1/4"								
		NOTE	H2 DC LUBE OIL PUMP R/T											
	8:00PM	SAFETY BRIEFING												
	8:05PM	TRIPPED H2 TURBINE UNTIL REPAIRS ARE MADE ON DC LUBE OIL PUMP												
	8:35PM	CALLED E.CECIL L/M,D.FELTY L/M,B.BLAIR COMING IN												
	8:43pm	BREAKING VACUUM / TAKING SEALS OFF												
	9:07PM	H2 TURBINE ON GEAR												
	9:40PM	B.BLAIR HERE												
	9:45PM	J.HIGGINS GOING HOME												
	9:50PM	J.ARNOLD HERE												
	10:45PM	H2 DC LUBE OIL PUMP ON 40PSI-LOCAL / 23 C.R.												
	NOTE	H2 DC LUBE OIL PUMP ON 40PSI-LOCAL / 22 C.R. WITH AC LO PUMP OFF TURBINE OFF GEAR												
	10:56 PM	H2 TURBINE ON GEAR AC LO PUMP ON / DC LO PUMP IN AUTO												
	11:00PM	H2 SEALING TURBINE & PULLING VACUUM												
	NOTE	H2 TURBINE WILL NOT RESET NO AUTO STOP PSI HP SEAL BACK-UP LOST PSI VENT OFF												
	11:30PM	H2 DC LO PUMP OFF MAINT CHECKING COUPLING												
	11:57PM	H2 ROLLING TURBINE												
	NOTE	HAVING LOT OF TROUBLE WITH COAL SYSTEM HAD COAL SPILL AT CRUSHER HOUSE												
10/7/2013														
	12:52AM	H2 TV-GV TRANSFER												
	1:00AM	PUTTING FIELD ON H2 GEN												
	1:03AM	H2-B MILL ON												
	1:09AM	H2 TIED ON LINE												
	1:11AM	H2 PRECIPS IN												
	2:04AM	H2-A MILL ON												
	NOTE	WENT TO TRANSFER H2 AUXILIARIES B INCOMING -GEN VOLTS ONLY SHOWED 32 VOLTS WHEN SYNC SCOPE WAS TURNED ON/ ELECTRICIAN INVESTIGATING												
		GEN P.T.s DOOR WAS NOT LATCHED COMPLETELY RELATCHED												
	2:35AM	H2 SCR START SIGNAL												
	2:35AM	H2 SCR START SIGNAL												
	3:00AM	S.HALLMAN GOING HOME/R.BIESWINGER HERE												
	3:14AM	H2 SCRUBBERS IN SERVICE												
	3:17AM	GEN P.T.s DOOR WAS NOT LATCHED COMPLETELY RELATCHED												
	3:24AM	H2 AUXILIARIES TRANFERED												
	3:51AM	H2 FUEL OIL OUT OF BOILER												
	5:20am	PUTTING 20% DRYING AGENT												
	6:57AM	H-2 FLOWING AMMONIA												

## Estimated Outage Cost

- Open/close boiler doors, Boiler Hydro – Titan

Labor	\$3,150
Material	\$ 0
Total	\$3,150

# Forced Outage Report

## Lost Sales Opportunity Report

### FORCED OUTAGE COST ANALYSIS

#### MISO DART Revenue and LOST OPPORTUNITY

Unit	HMP'L 2 - H2-13-07	Production Cost	
Date & Time Off Line	8/17/13 1:00 & 8/18/13 13:00	MW	\$/MW
Date & Time On Line	8/18/13 13:00 & 8/20/13 22:38	94	\$ 29.73
Outage Duration	36 hr. 0 min. & 57 hr. 38 min.	127	\$ 28.45
Outage Code	MO & UO1	149	\$ 28.13
Outage Reason	MO - Wash air heaters & UO1 - Inspect #1 turbine bearing		

Date	DA LMP Average	RT LMP Average	DART P&L	Lost Opportunity
8/17/13 (HE 1-24)	\$ 31.56	\$ 28.84	\$ (630)	\$ (13,484)
8/18/13 (HE 1-24)	\$ 25.45	\$ 23.45	\$ -	\$ -
8/19/13 (HE 1-24)	\$ 29.02	\$ 44.78	\$ -	\$ (4,291)
8/20/13 (HE 1-24)	\$ 31.97	\$ 40.36	\$ (616)	\$ (14,658)
8/21/13 (HE 1-12)	\$ 26.80	\$ 27.55	\$ (6,589)	\$ -
<b>Total</b>			\$ (7,835)	\$ (32,433)

Start Up Fuel Cost		Total Forced Outage Cost	
S/U Fuel Consumed	8,428	DART P&L	\$ (7,835)
S/U Fuel Price	\$ 3.13	Lost Opportunity	\$ (32,433)
<b>S/U Fuel Cost</b>	<b>\$ (26,376)</b>	S/U Fuel Cost	\$ (26,376)
		<b>Total</b>	<b>\$ (66,644)</b>

#### NOTES:

All negative values are money out of pocket.

DART Revenue is calculated from differences between the DA award and RT events

Lost Opportunity is the lost margins if the unit had stayed running

# Forced Outage Report

**To:** Bob Berry

**From:** Bart Boles

**Date:** 4-Nov-2013

**Plant:** Wilson

**Unit:** 1

**GADS Class:** UO3

## Duration

Trip Time: 18-Oct-2013 20:40

Tie Time: 20-Oct-2013 11:02

Total Time Offline: 38:22

## Outage Description

Wilson Station was removed from service on Saturday, October 18, 2013 at 20:40 due to a tube leak on the east water wall of the furnace on the 8<sup>th</sup> floor at Elevation 499'-0". Titan Contracting replaced a section of water wall tube that was approximately 4' long. This was the 10<sup>th</sup> tube on the north side of IR-32 wall blower. The tube being replaced was 3" O.D. x 0.368" MW, SA-210-C rifled tube material. Additional work completed during this outage is listed in the sections below.

## Root Cause

It appears that the east water wall tube failed as a result of weld overlay that was applied to a tube that was too thin, thus causing a section of the tube to blowout. The failure was approximately 18 inches in length, and covered a 180 degree section of tube (as indicated in the photographs). There have been numerous tube leaks in this area over the past few years. There was supposed to be a 6' x 20' water wall panel installed in the tube leak area during the spring 2012 outage and again in the fall 2013 outage (that were both cancelled), to reduce the risk of this happening again.

## Failure History

The last water wall tube leak in the furnace was on May 18, 2013 on the east water wall on the 8<sup>th</sup> floor at Elevation 500". This leak was three feet north of the IR-32 wall blower between elevations 500'- 507". The May 18<sup>th</sup> tube leak on the east water wall was due to weld overlay that was applied to a tube that was too thin, thus causing a pinhole in the tube.

# Forced Outage Report

## Corrective Action

The recommendation is to install six (6) new water wall panels during the spring 2014 Wilson Station Outage. The tube leak location will be included in the water wall sections being replaced.

## Other Work Completed While Unit Was Offline

### ELECTRICAL

- Completed cooling tower PLC project
- Installed inverter at cooling tower
- Performed work on lab sample chiller

### INSTRUMENTATION

- Short Outage – No major work completed

### MECHANICAL

- Checked for leaks on the condenser baffles
- Performed work on rubber boot on #1 ID fan beek drive
- Stroked and checked for movement on #1 ID fan inlet damper
- Repaired steam coil piping leaks
- Repaired leak on #1 PA fan inspection door
- Repaired leaks in FGD duct drains
- Reinstalled the drag chain sprocket
- Installed and removed ammonia spool pieces
- Replaced drum glass steam isolation valve on West Side of Drum
- Repaired economizer recirc. Gearbox
- Repaired #9 conveyor backstop

# Forced Outage Report

## Operators Event Log

/18/2013 12:00AM  
5:00AM Unit Status Update  
5:00AM S03 in service 6.0/5.4  
7:00am Todd in, Mattingly out  
Current-446 Gross MW 417 Net MW Cap @ 8:00am  
SCR in, SO3 in, 1,2,3,4 modules, CSI 14, Ball mill- #1-47 amps  
1,2,3,4 Mills Boiler O2-2.9% Windbox- 2.53 Total Coal-362 Total Air-96.27% Control Air Dwpt- -7.4  
So2 Removal- 92.0 Nox-.060 Opacity- 2.0%, Ammonia tank levels- 64/28 S02 inlets-5.0/5.1 CO 27/20  
H2 Pressure- 59 H2 Purity- 98% Gen. Gas Density- 42% INWC Fan Diff.- 75 Seal Oil Diff.- 15 LBS H2 Dew F  
Back Press.- 2.64/3.64 Stator Gas Temp. diff.- 6.56 Gen. Voltage- 24.00 Gen. Megavars- 123 Ambient Temp  
McIntyre, J. Stewart, S. Roby, Hall, Drake, Barrett in  
8:00am Safety Briefing  
8:30am Boiler Walkdown  
Tube leak on 8th floor SE side  
9:50am Started Hotwell Check  
10:30am Communication Meeting  
10:50am Lost 2.5 in hotwell check  
A oxidation tank is empty  
Daily Vehicle Checklist  
Daily Ash & Sludge Handling Checks  
Smoke Run  
12:30pm Fly Ash Samples  
1:00pm Disaster Alarm Test  
Cleaned Flyash Pad  
Cleaned Air handler room  
Added 6 barrels balls to #1 Ballmill  
8:00 PM Peercy in / Todd out  
McCarty, Roby day shift, Wilson, Worley, McElwain, Piper, in  
W Eaves out  
Hotwell Check  
Checksheet - Combustion Log  
8:40 PM Unit Off Line  
9:12 PM Turbine on Gear  
9:30 PM Ran call-out list for Ops  
/19/2013 11:00 PM Ran call-out list for Ops  
12:00 AM  
5:16 AM Generator Hold #616  
6:00 AM ID & FD Fans R/T  
7:00am Todd in/Peercy out  
SCR spool pieces out  
Cancelled SBS & hydrated lime trucks for Monday  
Drag Chain off top sprockets. WO# 6111676 Notified Baker. Drag Chain RT  
WO# 6111677 CT bypass vlv would not operate. Notified Crume  
RT bottom ash for surge tank cleaning  
Boiler Set to Hydro

## Forced Outage Report

/20/2013

Outer loop back in service  
8:00 PM Peercy in / Todd out  
McCarty, Roby day shift, Wilson, Worley, McElwain, Piper, Caldwell, in  
7:37 PM Ran Call-Out List for Lab / got E Ball will be in at 11:00 PM  
9:00 PM C Poore in  
12:00 AM  
4:00 AM B Tichenor in  
4:09 AM Fire in Boiler / Notified H/L  
7:00am Todd in/Peercy out  
8:00am McIntyre, J. Stewart, Hall, S. Roby, Drake, Barrett in  
Safety briefing  
8:00am PA fans on  
8:25am Sealing turbine  
9:17am Rolling turbine  
BFPT overspeed test  
10:45am Transferring valves  
10:54am #2 mill on, precips in service. Notified HL  
11:02am Unit tied online. Notified HL

# Forced Outage Report

## Boiler Tube Leak Record

### WATERWALL TUBE

Plant: Wilson

Unit: 1

#### Type of Leak: (Check One)

Pin Hole \_\_\_\_\_ Thick Lip Failure \_\_\_\_\_ Thin Lip Failure \_\_\_\_\_

Tube Wall Thinning X Other: It appears that the tube leak occurred as a result of thinning, then blew a section of tube out.

#### Orientation of Rupture: (Check One)

Longitudinal X Circumferential \_\_\_\_\_

#### Probable Cause: (Check One)

Stress \_\_\_\_\_ Overheat \_\_\_\_\_ Erosion \_\_\_\_\_ Internal Corrosion \_\_\_\_\_

External Corrosion \_\_\_\_\_ Weld Failure \_\_\_\_\_ (Shop \_\_\_\_\_ Field \_\_\_\_\_)

Internal Obstruction to Flow \_\_\_\_\_

Other: Tube was too thin when it had weld overlay applied to it.

#### Type of Repair: (Check One)

Dutchman: X Length of Dutchman: 4' Pad Weld: No

Plug Tube \_\_\_\_\_ Short Circuit \_\_\_\_\_ Other: \_\_\_\_\_

# Forced Outage Report

## Description of Repair:

Tube Size OD: 3" Wall Thickness: 0.368" M.W.

Tube Material: SA-210C, Rifled

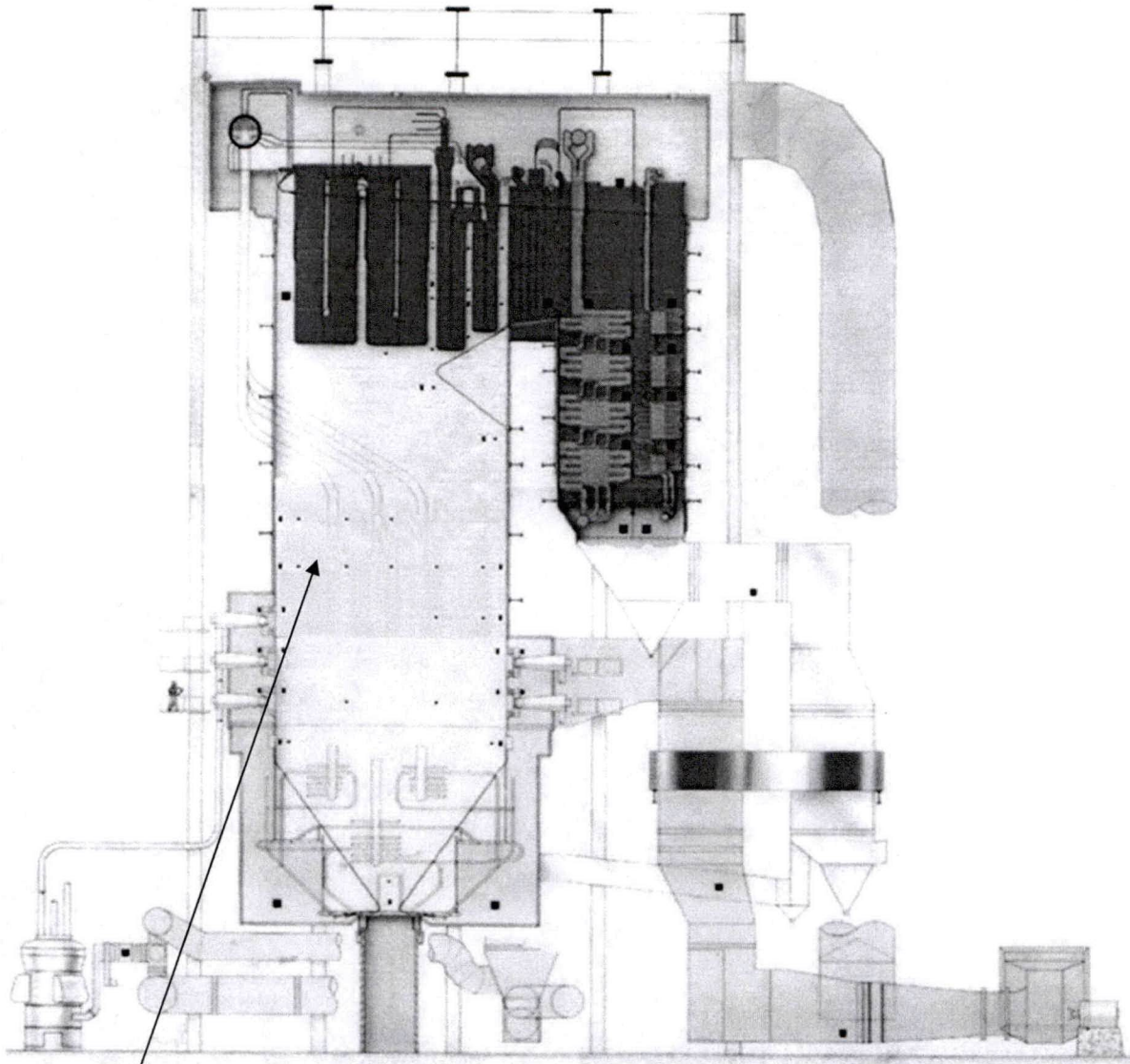
Welding Rod Used 7018

Welded By: Daniel Burden, Jared Burden: Titan Contracting

## Exact Location of Leak: Be Specific

East waterwall, 8<sup>th</sup> floor, 10<sup>th</sup> tube on the north side of IR—32 wallblower, Elevation 499'-0". This leak was within 2 feet of the May 18, 2013 tube leak at a slightly different elevation (Approximately 1-2 feet lower).

# Forced Outage Report



**FOSTER WHEELER STEAM GENERATOR**  
FOR  
**BIG RIVERS ELECTRIC CORPORATION**  
D.B. WILSON STATION—UNITS 1 & 2  
Centertown, Kentucky

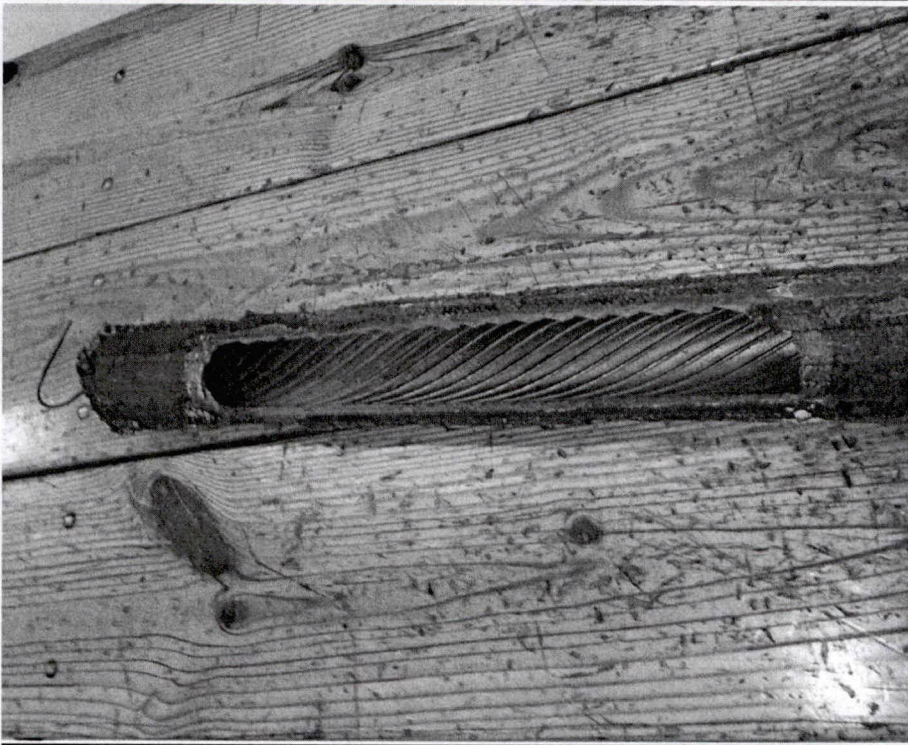
Burns and Roe—Engineers

Capacity: 3,484,000 lb/hr      Design Pressure: 2950-690 psig  
OPERATING CONDITIONS  
Superheater Outlet Pressure: 2620 psig      Temperature: 1005/1005F  
REHEAT UNIT

**Tube Leak Here** – East Wall (Near Side) 10<sup>th</sup> tube north of IR-32 wall blower,

# Forced Outage Report

## Photos



# Forced Outage Report

## Estimated Outage Cost

### TOTAL OUTAGE COST

The total outage cost including labor, materials and rental is **\$23,193.12**

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>Wilson - W1-13-06</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	10/18/13 20:40			<b>MW</b>
<b>Date &amp; Time On Line</b>	10/20/13 11:02			<b>\$/MW</b>
<b>Outage Duration</b>	38 hr. 22 min.			280
<b>Outage Code</b>	UO3			340
<b>Outage Reason</b>	Unit removed from service to repair tube leak			420
				\$ 24.05
				\$ 23.35
				\$ 22.82
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
10/18/13 (HE 21-24)	\$ 27.24	\$ 35.36	\$ (8,179)	\$ -
10/19/13 (HE 1-24)	\$ 28.85	\$ 34.42	\$ (116,080)	\$ -
10/20/13 (HE 1-24)	\$ 27.27	\$ 27.29	\$ (8,240)	\$ (19,848)
<b>Total</b>			\$ (132,500)	\$ (19,848)
<b>Start Up Fuel Cost</b>		<b>Total Forced Outage Cost</b>		
S/U Fuel Consumed	46,596	DART P&L	\$	(132,500)
S/U Fuel Price	\$ 3.13	Lost Opportunity	\$	(19,848)
<b>S/U Fuel Cost</b>	<b>\$ (145,720)</b>	S/U Fuel Cost	\$	(145,720)
		<b>Total</b>	\$	<b>(298,067)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Bob Berry

**From:** Perry Bowley

**Date:** 17-Dec-2013

**Plant:** Green

**Unit:** 1

**GADS Class:** UO3

## Duration

Trip Time: 26-Nov-2013 23:55

Tie Time: 27-Nov-2013 21:08

Time Offline: 21:13

## Outage Description

Green Unit 1 was removed from service on Tuesday, 26-Nov-2013 at 23:55 due to an economizer inlet isolation valve packing leak. While the unit was down, a tube leak was plugged in Feed Water Heater #5.

Fires were established in the boiler on Wednesday, 27-Nov-2013 at 17:30.

The unit was tied online on Wednesday, 27-Nov-2013 at 21:08.

## Root Cause

The Economizer inlet isolation valve leak was due to worn out packing related to age and use.

## Failure History

There are no failures of this nature recorded for Green Unit 1 in the last three years.

# Forced Outage Report

## Corrective Action

Economizer inlet isolation valve was repacked.  
Feed Water Heater #5 tube leak was located and plugged.

## SOE Print Out

N/A

## Other Work Completed While Unit Was Offline

None



# Forced Outage Report



## LOG BOOK

DATE 11/27/13

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> REID             | <input checked="" type="checkbox"/> SHIFT SUPERVISOR | <input type="checkbox"/> SCRUBBER SHIFT SUPERVISOR   |
| <input checked="" type="checkbox"/> GREEN | <input type="checkbox"/> CONTROL OPERATOR            | <input type="checkbox"/> SCRUBBER OPERATOR           |
| <input type="checkbox"/> COLEMAN          | <input type="checkbox"/> AUXILIARY OPERATOR          | <input type="checkbox"/> SCRUBBER AUXILIARY OPERATOR |
| <input type="checkbox"/> WILSON           | <input type="checkbox"/> UTILITY OPERATOR            | <input type="checkbox"/> SOLID WASTE OPERATOR        |
|   | <input type="checkbox"/> _____                       | <input type="checkbox"/> SCRUBBER UTILITY OPERATOR   |

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
12 <sup>00</sup>	
61	off line
62	Cap 232 100% 232 502 224 202 256 924 9.0
slakers	61 3 23/23 62 2 23/24 P 2 79%
Thickers	1A - 0 6 <sup>10</sup> 2A 37.6 0 6 <sup>11</sup> B 0.0 4 <sup>10</sup> 1B OFF 2 7 2B OFF 0 6 <sup>10</sup> F 7.5
IV	In Service, B side, B-C Drums, #1-14 T 19' #1-36%
12 <sup>06</sup>	Found G1 Field Breakers still closed - Had to trip G Breaker
12 <sup>30</sup>	G2 slakers at of service due to broken LSC
2 <sup>00</sup>	Hotline called
2 <sup>00</sup>	Buler drum Floated 12 - Draining now and BFP R/T

Repairs completed on economizer inlet valve packing

G1 from 1730, fuel valve 2108 present 2357

	SUP'R
1ST	<i>[Signature]</i>
2ND	
3RD	

G2 - max load 732 dated 10/24 AM plugging / Surfactant pressure

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 11-27-13

- ☐ REID  
☒ GREEN  
☐ COLEMAN  
☐ WILSON

- ☒ SHIFT SUPERVISOR  
☐ CONTROL OPERATOR  
☐ AUXILIARY OPERATOR  
☐ UTILITY OPERATOR  
☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR  
☐ SCRUBBER OPERATOR  
☐ SCRUBBER AUXILIARY OPERATOR  
☐ SOLID WASTE OPERATOR  
☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
8 A	Hust, Hayes, Northington, Butler, J Barron, Turner, Collins, Cook, Combs, R. Parker, T Parker.
G1	off -
G2	Load 230 A, B&C Mills precip 300 SO <sub>2</sub> .27 Nov. 24 opacity 9.5
IV	B conveyor B&C Drums #1 s. 10 20' #1 smoot 36" s. 10s 25-0 33-0 E 4.5 E 0 W 4.0 W. 5
Slakers	G1 3 on 22.5 & 22.5 #1 s. 10 G2 out 21 & 22.5 prep 2 on 78"
	1A 60 0' 6' 9" 2A 37.5 0' 6' 9" 1B - 2' 6' 11" 2B 32.3 2' 6' 8"
2:42	Boiler Feedpump on filling Boiler To Fire
4:57	Duro called in sick - ST app reporting in
5:30	Fires Established in G1 for start up
5:PM	IV out of service 10 min Tank

OPER	SUP'R
1ST	B200
2ND	
3RD	
SIGNED	

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 11-27-13

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> REID             | <input type="checkbox"/> SHIFT SUPERVISOR   | <input type="checkbox"/> SCRUBBER SHIFT SUPERVISOR   |
| <input checked="" type="checkbox"/> GREEN | <input type="checkbox"/> CONTROL OPERATOR   | <input type="checkbox"/> SCRUBBER OPERATOR           |
| <input type="checkbox"/> COLEMAN          | <input type="checkbox"/> AUXILIARY OPERATOR | <input type="checkbox"/> SCRUBBER AUXILIARY OPERATOR |
| <input type="checkbox"/> WILSON           | <input type="checkbox"/> UTILITY OPERATOR   | <input type="checkbox"/> SOLID WASTE OPERATOR        |
|   | <input type="checkbox"/> _____              | <input type="checkbox"/> SCRUBBER UTILITY OPERATOR   |

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
6:50	Sealed Turbine and pulling Vacuum
Note	C Front Toucher will not Move
8 <sup>PM</sup>	Polles, Reed (Ho), Rittmeyer, Bachman, Hopkins, Berry, Hoover, Kuhna (SL), Bell, Rigdon, Gerrell, Duvall (SL), Tapp
8 <sup>14</sup>	closed in 100-9 disconnect Tried to put Voltage on - HAD Temp Alarm Hi, 2 FIRING ALARMS, ALL PTS BAD, VHL Electrician disconnect WIRE - Notified M. Maloney
8 <sup>46</sup>	Voltage on Gen.
9 <sup>08</sup>	Tied on Line - B mill on - Trouble with coal
9 <sup>16</sup>	Precips in
10 <sup>22</sup>	D mill on
	1A 40+ (39) OT-6'10" 2A 39.1 (77) OT-6'9"
	1B 40+ (172) 2T-7' 2B 35 (202) 15T-6'8"

OPER	SUP'R
1ST	<i>BS 272</i>
2ND	<i>W 8P-12A</i>
3RD	
SIGNED	

F155.12  
R 1/93

# Forced Outage Report



LOG BOOK

DATE 11-27-13

- ☐ REID  
☒ GREEN  
☐ COLEMAN  
☐ WILSON

- ☒ SHIFT SUPERVISOR  
☐ CONTROL OPERATOR  
☐ AUXILIARY OPERATOR  
☐ UTILITY OPERATOR  
☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

[illegible]

OPER		SUP'R
1ST		
2ND		<i>W/ 8P-12A</i>
3RD		
SIGNED		

F155.12  
R 1/93

# Forced Outage Report

## Estimated Outage Costs

Work Order#	Work Order Description	Project	Estimated Labor Cost	Actual Labor Cost
6115038	G-1 USO General Outage work	G1USO	1,235.85	1,251.29
6115060	G-1 Start up Nov 27 2013	G1USO	2,471.70	602.49

Total Actual Cost

\$ 1,853.78

## Lost Sales Opportunity Report

FORCED OUTAGE COST ANALYSIS				
MISO DART Revenue and LOST OPPORTUNITY				
Unit	Green 1 - G1-13-09		Production Cost	
Date & Time Off Line	11/26/13 23:55		MW	\$/MW
Date & Time On Line	11/27/13 21:08		163	\$ 24.83
Outage Duration	21 hr. 13 min.		199	\$ 24.12
Outage Code	U03		235	\$ 23.92
Outage Reason	Repair leak on the economizer inlet valve			
Date	DA LMP Average	RT LMP Average	DART P&L	Lost Opportunity
11/27/13 (HE 1-24)	\$ 41.47	\$ 27.23	\$ 278	\$ (97,311)
11/28/13 (HE 1-8)	\$ 25.85	\$ 28.64	\$ 3,646	\$ (1,681)
Total			\$ 3,924	\$ (98,992)
Start Up Fuel Cost		Total Forced Outage Cost		
S/U Fuel Consumed	13,531		DART P&L	\$ 3,924
S/U Fuel Price	\$ 3.13		Lost Opportunity	\$ (98,992)
S/U Fuel Cost	\$ (42,415)		S/U Fuel Cost	\$ (42,415)
			Total	\$ (137,482)
NOTES:				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Bob Berry

**From:** Bart Boles

**Date:** 5-Dec-2013

**Plant:** Wilson

**Unit:** 1

**GADS Class:** UO3

## Duration

Trip Time: 1-Nov-2013 02:10

Tie Time: 2-Nov-2013 10:28

Total Time Offline: 32:18

## Outage Description

Wilson Station was removed from service on Friday, November 1, 2013 at 02:10 to repair a leak in the superheat spray line. While the unit was offline the boiler was hydrostatically tested and a tube leak was discovered in the east water wall of the furnace on the 8<sup>th</sup> floor at Elevation 500'-0". Titan Contracting replaced a section of water wall tube that was approximately 54" long. This was the 13<sup>th</sup> tube on the north side of IR-32 wall blower. The tube being replaced was 3" O.D. x 0.368" MW, SA-210-C rifled tube material. Additional work completed during this outage is listed in the sections below.

## Root Cause

It appears that the east water wall tube failed as a result of weld overlay that was applied to a tube that was too thin, thus causing a section of the tube to blowout. The failure was approximately 8 inches in length, and covered a 180 degree section of tube. There have been numerous tube leaks in this area over the past few years. There was supposed to be a 6' x 20' water wall panel installed in the tube leak area during the spring 2012 outage and again in the fall 2013 outage (that were both cancelled), to reduce the risk of this happening again.

# Forced Outage Report

## Failure History

The last water wall tube leak in the furnace was on October 18, 2013 on the east water wall of the 8<sup>th</sup> floor at Elevation 499". This leak was the 10<sup>th</sup> tube north of the IR-32 wall blower at elevation 499". The October 18<sup>th</sup> tube leak on the east water wall was due to weld overlay that was applied to a tube that was too thin, thus causing a 18" rupture in the tube.

## Corrective Action

The recommendation is to install six (6) new water wall panels during the spring 2014 Wilson Station Outage. The tube leak location will be included in the water wall sections being replaced.

## Other Work Completed While Unit Was Offline

### ELECTRICAL

- Short Outage – No Major work completed

### INSTRUMENTATION

- Short Outage – No major work completed

### MECHANICAL

- Repaired Condenser Baffles
- Installed Boot on #1 ID Fan Beck Drive
- Stroked ID Fan Inlet Dampers
- Repaired Steam Coil Piping Leaks
- Repaired Leak on Burner Scrolls
- Repaired Leak on #1 PA Fan Inspection Door
- Repaired Precipitator Door Leaks
- Reinstalled Drag Chain back on the Sprocket
- Replaced #1 ID Fan Lube Pump Valve
- Replaced Drum Gauge Glass Steam Isolation Valve
- Repaired #9 Conveyor Backstop.

# Forced Outage Report

## Operators Event Log

11/1/2013	12:00AM	
	1:00AM	Taking unit down for leak on superheat spray line
	2:10AM	Unit Off Line
	7:00 AM	Peercy in / Cooper out
		McCarty, Roby, Wilson, Worley, McElwain, Piper, in
	7:12 AM	D Stovall called back / coming in
	7:00pm	Todd, Cooper in/ Peercy, Crowe, Owens out
	7:42pm	Aux BFP on for hydro
	8:00pm	H. Roby, McIntyre, J. Stewart, Baker, Hall, Poore, Drake, Barrett in
		Safety Briefing
		Boiler and Turbine set to fire
		Inspected inner loop and put back in service. Found 1 leak
		Opened BFP knocker valves
		Put BA system back in service
		Debusk deslagging superheats
		Plant Headcount
11/2/2013	12:00am	WO# 6112827 #1 SAH air drive will not run
	3:00am	ID/FD fans on. Purging boiler
	3:58am	Oil fires established. Notified HL
	7:00 AM	Peercy, Crowe in / Todd, Cooper out
		McCarty, Roby, Wilson, Worley, McElwain, Piper, Stovall, in / Baker, Roby, Hall staying over
	8:00 AM	
		Ran Call-Out List for M/M / got no one
		Ran Call-Out List for Lab / got J Burnett for 2:30 pm
	8:36am	Rolling turbine
	10:12am	W. Eaves called back , coming in at 2:00pm
	10:15am	Precips in service H/L notified
	10:16am	#2 Mill in service
	10:28am	Unit tied online. Notified HL

# Forced Outage Report

## Boiler Tube Leak Record

### WATERWALL TUBE

Plant: Wilson

Unit: 1

#### Type of Leak: (Check One)

Pin Hole \_\_\_\_\_ Thick Lip Failure \_\_\_\_\_ Thin Lip Failure \_\_\_\_\_

Tube Wall Thinning X Other: It appears that the tube leak occurred as a result of thinning, then blew a section of tube out.

#### Orientation of Rupture: (Check One)

Longitudinal X Circumferential \_\_\_\_\_

#### Probable Cause: (Check One)

Stress \_\_\_\_\_ Overheat \_\_\_\_\_ Erosion \_\_\_\_\_ Internal Corrosion \_\_\_\_\_

External Corrosion \_\_\_\_\_ Weld Failure \_\_\_\_\_ (Shop \_\_\_\_\_ Field \_\_\_\_\_)

Internal Obstruction to Flow \_\_\_\_\_

Other: Tube was too thin when it had weld overlay applied to it.

#### Type of Repair: (Check One)

Dutchman: X Length of Dutchman: 54" Pad Weld: No

Plug Tube \_\_\_\_\_ Short Circuit \_\_\_\_\_ Other: \_\_\_\_\_

# Forced Outage Report

## Description of Repair:

Tube Size OD: 3.00" Wall Thickness: 0.368" M.W.

Tube Material: SA-210C, Rifled

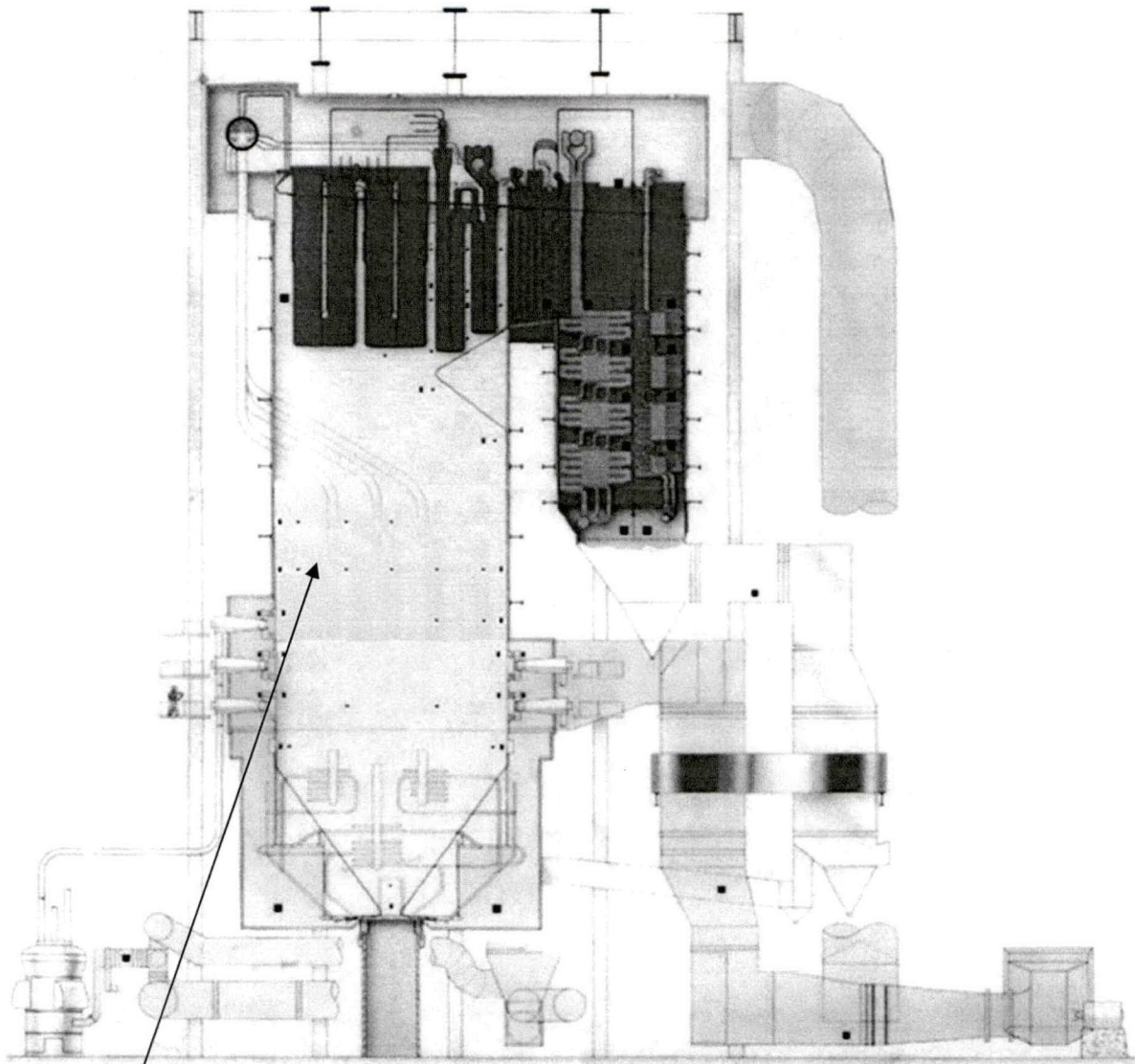
Welding Rod Used 7018

Welded By: Daniel Burden, Jared Burden: Titan Contracting

## Exact Location of Leak: Be Specific

Water wall, 8<sup>th</sup> floor east wall, 13<sup>th</sup> tube on the north side of IR—32 wall blower, Elevation 500'-0". This leak was the next tube over from the October 18, 2013 tube leak at a slightly different elevation (Approximately 1-2 feet higher).

# Forced Outage Report



**FOSTER WHEELER STEAM GENERATOR**  
FOR  
**BIG RIVERS ELECTRIC CORPORATION**  
D.B. WILSON STATION—UNITS 1 & 2  
Centertown, Kentucky

**Burns and Roe—Engineers**

Capacity: 3,484,000 lb/hr Design Pressure: 2950 psig

OPERATING CONDITIONS

Superheater Outlet Pressure: 2620 psig Temperature: 1005/1005F  
REHEAT UNIT

Tube Leak Here – East Wall (Near Side) 13<sup>th</sup> tube north of IR-32 wall blower

# Forced Outage Report

## ESTIMATED OUTAGE COST

**TOTAL OUTAGE COST = \$14,677.40**

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>Wilson - W1-13-07</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	11/1/13 2:10			<b>MW</b>
<b>Date &amp; Time On Line</b>	11/2/13 10:28			<b>\$/MW</b>
<b>Outage Duration</b>	32 hr. 18 min.			300
<b>Outage Code</b>	U02			340
<b>Outage Reason</b>	Repair leak in superheater spray line			420
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
11/1/13 (HE 1-24)	\$ 29.46	\$ 24.46	\$ (17,494)	\$ -
11/2/13 (HE 1-22)	\$ 29.52	\$ 38.61	\$ (94,878)	\$ (9,642)
<b>Total</b>			\$ (112,372)	\$ (9,642)
<b>Start Up Fuel Cost</b>				<b>Total Forced Outage Cost</b>
S/U Fuel Consumed	31,533			DART P&L
S/U Fuel Price	\$ 3.13			Lost Opportunity
<b>S/U Fuel Cost</b>	<b>\$ (98,613)</b>			S/U Fuel Cost
				<b>Total</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Bob Berry

**From:** Perry Bowley

**Date:** 28-Jan-2014

**Plant:** Green

**Unit:** 1

**GADS Class:** UO1

## Duration

Trip Time: 2-Dec-2013 07:26

Tie Time: 3-Dec-2013 06:57

Time Offline: 23:31

## Outage Description

Green Unit 1 tripped from service on Monday, 2-Dec-2013 at 07:26 due to a tube leak on the south east burner wall. "C" Mill, south east burner, center tube at the bottom of the burner, after bend tube straightens out below burner at an original construction field weld.

Fires were established in the boiler on Tuesday, 3-Dec-2013 at 04:45.

The unit was tied online on Tuesday, 3-Dec-2013 at 06:57.

## Root Cause

Leak was in an original construction weld line.

## Failure History

There is no water wall tube failures of this type recorded in the period from 2007 to present for Green Unit 1.

# Forced Outage Report

## Green Boiler Tube Leak Record

Unit Green Unit 1

Date and Time Unit Off 2-Dec-2013 07:26

Date and Time Unit On 3-Dec-2013 06:57

### Type of Leak: (Check One)

Pin Hole ☐ Thick Lip Failure ☐ Crack ☐ Thin Lip Failure ☐

Tube Wall Thinning ☐ Other ☐

### Orientation of Rupture: (Check One)

Longitudinal ☐ Circumferential ☒

### Probable Cause: (Check One)

Stress ☐ Overheat ☐ Erosion ☐ Internal Corrosion ☐

External Corrosion ☐ Weld Failure ☒ (Shop ☐ Field ☒)

Internal Obstruction to Flow ☐ Sootblower Erosion ☐

Other ☐

### Type of Repair: (Check One)

Dutchman ☒ (Length of Dutchman 8") Pad Weld ☐

Plug Tube ☐ Short Circuit ☐ Other ☐

# Forced Outage Report

## Description of Repair:

Tube Size OD 2 1/2" Wall Thickness .203 Tube Material SA210A1

Welding procedure GS-P1-1L

Welded By: Titan

## Exact Location of Leak: Be Specific

C Mill South East Burner Center tube bottom of burner, after bend tube straightens out below burner

# Forced Outage Report

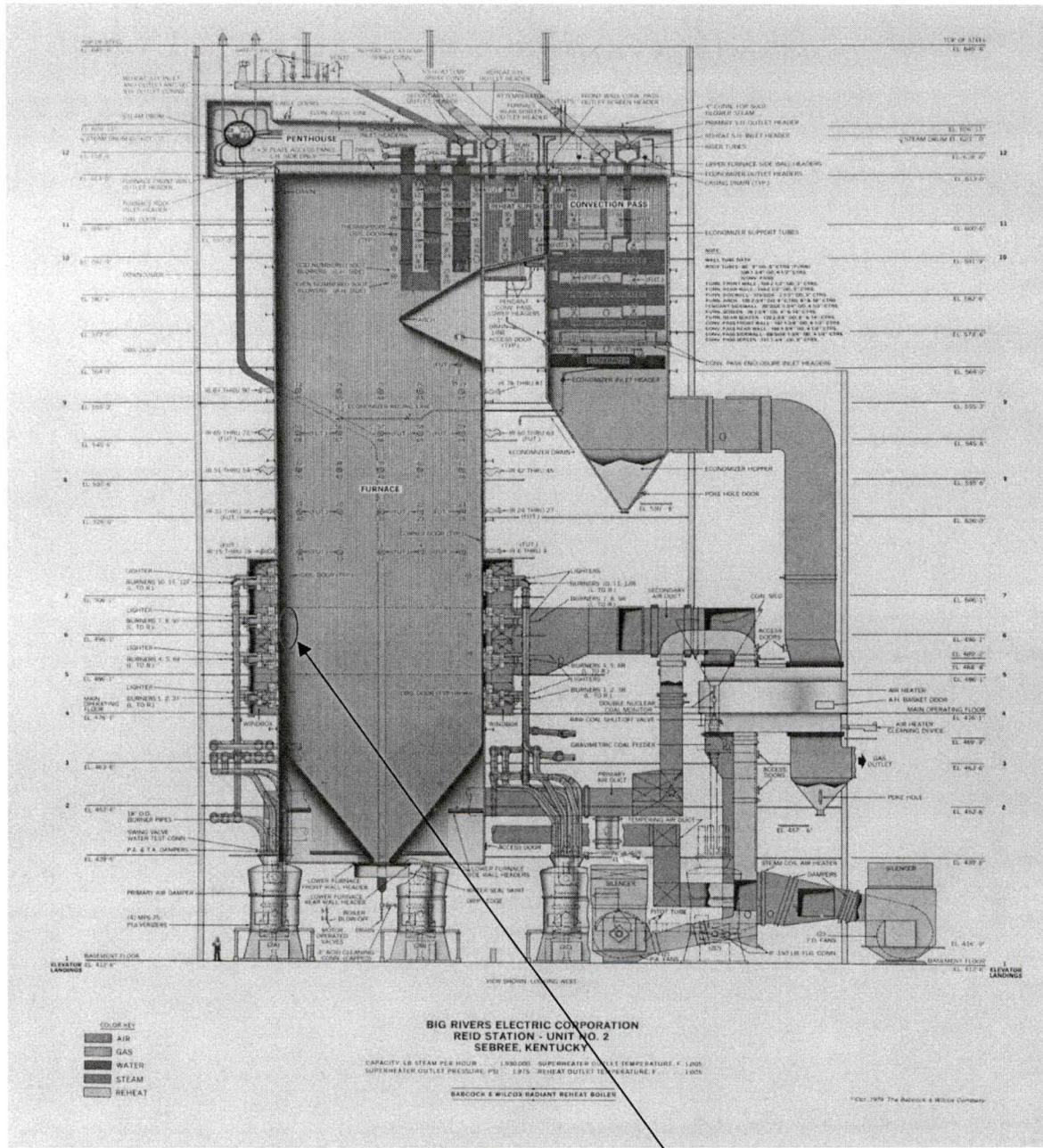
## GREEN STATION UNIT 1

2013

### (1) TUBES INVOLVED

Date and Time Unit Off 12-2-2013, 7:26AM

Date and Time Unit On 12-3-2013, 6:57am



**G1 C Mill South East burner center tube below burner 8" dutchman installed**

# Forced Outage Report

SOE Print Out

Not Available

Other Work Completed While Unit Was Offline

None

# Forced Outage Report

## Operators Event Log



### LOG BOOK

DATE 12-2-13

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
12 MN - 8A	
12 <sup>00</sup> PM	Barron - Beer (Voc) - Hayes - Turner - Denton - Butler - Strickland - Mahan - Thomas (Voc) - Townsend - Loran - Holgood - R. Parker
	G-1 Load 247 Cap 250 3 Mills on Coff
	Nor. 157 S <sup>2</sup> 313 Opacity 7.30
	ADS Control in Service 2 people out of Service
	G-2 Startup
	T4 in Service - B Conveyor - A+B Drums - #1 Flyash Sis e. 22 tons of Ash per hour - #1 Smoot System e. 36% lime rate - in Sludge tanks
	Slakers - #1 Building in Service 4 on 24.5/23.8 #1 Silo #2 Building out of Service 22.7/22.7 Prep Building in Service 2 on 79.6% #4 Silo
	Underflows 1A) 40+ 0 6'9" 2A) off 0 6'10" 1B) off 2 7' 2B) off 0 6'10" Bed 0.00 Thick 7.5 Stock Drains OK
12 <sup>40</sup>	Putting Condensate System in Service & I.D. Fans & F.D. Fans in Service

G1 tripped @ 0726 T furnace passed tube leak WW SE side around  
SH-7.43 Burner  
WOI-15.57

OPER	SUP'R
1ST	Green 12MN-8A
2ND	
3RD	
SIGNED	

G2 fired in @ 0215, tied on line @ 0702 problems with FO regulator  
1052 PW reg. repaired, 1235 All at fire out of back  
CA-1 CS-1 WOB-7.03 SH-16.97 NO DEWTE

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 12-2-13

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
	<i>FU run time 14 hours</i>
	<i>Underflow Pumps run time 1A) 20 hours + 30 Minutes</i>
	<i>1B) 5 hours + 30 Minutes</i>
	<i>2A) 3 hours + 30 Minutes</i>
	<i>2B) 4 hours</i>
<i>Note</i>	<i>Cannot get Purge on G-2 Boiler - C Mill east near Secondary air running to high to get Purge. Getting Inst. department to assist</i>
<i>1<sup>46</sup></i>	<i>Purge started on G-2</i>
<i>2<sup>15</sup></i>	<i>Fires established in G-2 Boiler - Notified H/L</i>
<i>3<sup>45</sup></i>	<i>TU Down 6' in Sludge tanks</i>
<i>4<sup>00</sup></i>	<i>Underflow 1A) 40+ 0 6'9" 2A) off 0 6'10"</i>
	<i>1B) off 2 7' 2B) off 0 6'10"</i>
	<i>Bed 0.00 Block 7.5</i>
<i>4<sup>46</sup></i>	<i>Released Hold #755 - Closed in 110-9 Generator disconnect - Operator closed in field breaker &amp; started putting Voltage on Generator &amp; 110-9 tripped open</i>

OPER	SUP'R
1ST	<i>DeVine 12th St</i>
2ND	
3RD	
SIGNED	

F155.12  
R 1/93



DATE 12-2-13

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
Note	Setting electrical Department & Electrical engineer to check
703	Tied G-2 Generator - Put "B" mill on
726	G-1 Tripped - Tube Leak approx. between 9 <sup>th</sup> & 10 <sup>th</sup> Floor
	G-2 Trouble with F.W. Reg - INST. changing out Positioner

OPER	SUP'R
1ST	HUBBARD 12AM-8A
2ND	
3RD	
SIGNED	

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 12-2-13

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
8 <sup>AM</sup>	Polles, Reed (vac), Rittmeyer, Bachman, Hopkins, Berry, Kuhwa (S/C), Bell, Rigdon, Grexell, Duvall, Donathan, Farley
G-1	7 <sup>26</sup> Tube leak
G-2	START-UP Load 40 B mill on SO2 .03 NOx .25 opacthc 6.4 ADS out 4 Precip out
	G-2 F.W. Reg. INST. changing out Positioner
	IU out 13' Tanks
	#1 silo 34' silo + SAFETY 5 E1.5 W1.0
	#2 silo 28' silo + SAFETY 1 E1.5 W1.0
8 <sup>04</sup>	G-1 Turbine ON gear
10 <sup>52</sup>	G-2 F.W. Regulator Repaired
11 <sup>12</sup>	G-2 "D" mill ON
12 <sup>35</sup>	G-2 OIL FIRED OUT OF boiler - START-UP complete
12 <sup>03</sup>	A mill on

OPER		SUP'R	
1ST		W 8A-SP	
2ND			
3RD			
SIGNED			

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 12-2-13

- ☐ REID
- ☐ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
	1A N/A (51) OT-6'9" 2A OFF OT-6'10"
	1B OFF ST-6'11" 2B OFF OT-6'8"
	Floc 7.5 Bed .00
	STACK DRAINS OK
	SLAKERS G-1 ON 25 25
	G-2 1 ON 25 25 #3
	Prep 2 ON 83% #4
4:00	Lime silo's
	11/2 5/2 9/3 23/14 Dig. 17'6"
	Added Fuel oil D.T. 14'7 3/8"
5:28	Called M. Turner - called back will be in @ 8 AM
	1A N/A (74) OT-6'8" 2A 31.7 (89) OT-6'10"
	1B N/A (169) ST-6'11" 2B 33.6 (248) OT-6'8"
	Floc 7.5 Bed .00
9:30	1A off OT 6'8" 2A 34.5 OT 6'10"
	1B 146 10' 6'11" 2B 33.8 OT 6'8" Bed 0 Floc 7.5

OPER	SUP'R
1ST	
2ND	
3RD	
SIGNED <u>JSZ</u>	

F155.12  
R 1/93



DATE 12-2-13

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

[illegible]

OPER		SUP'R
1ST		
2ND		
3RD		<i>73202</i>
SIGNED		

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 12-3-13

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
12:17	Hus T, Hayer, D. Barron, Northington, Butler, J Barron, Denton, Haner, Cook, Combs, Collins, R. Parker.
G1	Filling Boiler for Hydro
G2	Load 242 A, D & D Mills precip 4 out SO <sub>2</sub> .19 Nov. 20 capacity 5.8
Slaker	G1 out 23.8 + 23.8 G2 3 on 23.8 + 23 #3 c.i.o. prep 2 on 80.9"
IV	Conveyors A & B Drums #1 s.i.o. 19" #1 smooth 36" 12.5 in Tanks silos 32.0 30 IV 11 hrs 45 min 1A 21 Lvs 2A 5.5 Lvs E 2.0 E 2.0 1B 5.5 Lvs 2B 4.5 Lvs W 1.5 W 1.0
1:00	1A - 0" 6'9" 2A 30.8 0" 6'10" 1B 162° 4" 6'8" 2B 32.8 0" 6'8"
1:30	Hydro complete setting Boiler To Fire
4:00	IV Down 8' in Tanks

G1 hydro good @ 0130, fuel  
fuel on line @ 0657, good for  
1101-6.95 SH-17.05 SA-1 SS-1  
G1 max load 249 mws  
G2 max load - 242 mws

OPER	SUP'R
1ST full pressure at 1320 NO OPERATE	
2ND	
3RD	
SIGNED	

F155.12  
R 1/93



# Forced Outage Report

## Estimated Outage Costs

Outside Contractor \$31,094

Material \$46.00

Labor \$2,842

Total Actual Cost \$33,982

# Forced Outage Report

## Lost Sales Opportunity Report

FORCED OUTAGE COST ANALYSIS					
MISO DART Revenue and LOST OPPORTUNITY					
Unit		Green 1 - G1-13-10		Production Cost	
Date & Time Off Line		12/2/13 7:26		MW	\$/MW
Date & Time On Line		12/3/13 6:57		91	\$ 27.72
Outage Duration		23 hr. 31 min.		181	\$ 24.33
Outage Code		UO1		235	\$ 23.84
Outage Reason		Repair waterwall tube leak			
Date	DA LMP Average	RT LMP Average	DART P&L	Lost Opportunity	
12/2/13 (HE 8-24)	\$ 35.17	\$ 37.05	\$ (51,395)	\$ -	
12/3/13 (HE 1-24)	\$ 34.12	\$ 33.34	\$ 32,387	\$ (56,974)	
Total			\$ (19,008)	\$ (56,974)	
Start Up Fuel Cost			Total Forced Outage Cost		
S/U Fuel Consumed	17,171		DART P&L	\$ (19,008)	
S/U Fuel Price	\$ 3.14		Lost Opportunity	\$ (56,974)	
S/U Fuel Cost	\$ (53,915)		S/U Fuel Cost	\$ (53,915)	
			Total	\$ (129,897)	
NOTES:					
All negative values are money out of pocket.					
DART Revenue is calculated from differences between the DA award and RT events					
Lost Opportunity is the lost margins if the unit had stayed running					

# Unforced Outage Report

**To:** Bob Berry

**From:** Perry Bowley

**Date:** 19-Jan-2014

**Plant:** Green

**Unit:** 2

## Outage Type

☐ Planned    ☒ MOH    ☐ Delayed    ☐ Extended    ☐ Other    GADS Class: MO

## Duration

Trip Time: 30-Nov-2013 00:02

Tie Time: 2-Dec-2013 07:02

Total Time Offline: 55:00

MO Hours 48:00

UO3 Hours 07:00

## Outage Description

Green Unit 2 was removed from service on Saturday, 30-Nov-2013 at 00:02 for air heater washing and to repair a reheater tube leak. While the unit was offline, a boiler hydro was performed and a weeper tube leak was located and repaired in the west furnace wall area. Other work items were addressed as listed below.

Fires established in boiler on 2-Dec-2013 at 02:15

The unit was tied online 2-Dec-2013 at 07:02

## Root Cause

1<sup>st</sup> Boiler tube leak was caused by a cracked intermediate reheater tube attributed to external corrosion. The intermediate reheater tube leak impinged on an adjacent tube in the reheater outlet section causing another tube leak.

2<sup>nd</sup> Boiler waterwall tube leak was

See tube leak report and location map below.

# Unforced Outage Report

## Failure History

This is the first Reheater outlet bank tube leak since the replacement of the Reheater Outlet tube bundle in 2009. Intermediate tube bank was not replaced.

There has been one outage attributed a water wall tube leak since 2007.

## SOE Print Out

N/A

## Other Work Completed While Unit Was Offline

### **Mechanical**

Replaced MOV 1444 that was leaking through  
Repacked several Valves on boiler that were leaking  
Industrial Valve Inc. reseated 3 of the 4 drum safeties that were leaking through  
Air Heater Wash Completed  
Inspected boiler tube shielding  
Inspected and cleaned scrubber nozzles and chevron panels

### **Instrument**

Blow back furnace pressure and air heater differential taps  
Cleaned scanners / igniter packages  
Stroked ID & PA Fan dampers

### **Electrical**

Southern Environmental repaired precipitators as required.

# Unforced Outage Report

## Operators Event Log

N/A

# Unforced Outage Report

## Green Boiler Tube Leak Record

Unit Green Unit 2

Date and Time Unit Off November 30, 2013 12:02 A.M

Date and Time Unit On December 2, 2013 07:02 AM

### Type of Leak: (Check One)

Pin Hole \_\_\_\_\_ Thick Lip Failure \_\_\_\_\_ Crack X Thin Lip Failure \_\_\_\_\_

Tube Wall Thinning \_\_\_\_\_ Other \_\_\_\_\_

### Orientation of Rupture: (Check One)

Longitudinal X Circumferential \_\_\_\_\_

### Probable Cause: (Check One)

Stress \_\_\_\_\_ Overheat \_\_\_\_\_ Erosion \_\_\_\_\_ Internal Corrosion \_\_\_\_\_

External Corrosion X Weld Failure \_\_\_\_\_ (Shop \_\_\_\_\_ Field \_\_\_\_\_)

Internal Obstruction to Flow \_\_\_\_\_ Sootblower Erosion \_\_\_\_\_

Other \_\_\_\_\_

### Type of Repair: (Check One)

Dutchman X (Length of Dutchman 3 FT) Pad Weld \_\_\_\_\_

Plug Tube \_\_\_\_\_ Short Circuit \_\_\_\_\_ Other \_\_\_\_\_

# Unforced Outage Report

**Description of Repair:** Tube Size OD 2.5" Wall Thickness .148

Tube Material SA213-T11

Welding procedure GS-P5-P5-NSR

Welded By: Titan

## **Exact Location of Leak: Be Specific**

Reheat Intermediate Bank 30th element from the east. Lead tube.

Reheat Outlet Bank 30th element from the east, last tube in the bundle. Both located in IK 34 and IK 35 Sootblower lane at approximate elevation 606'. Titan installed a 3 ft. dutchman. The Reheat Intermediate tube was an original tube that failed and washed the Reheat Outlet Bank tube that was installed in 2008.

# Unforced Outage Report

## Green Boiler Tube Leak Record

Unit Green Unit 2

Date and Time Unit Off November 30, 2013 12:02 A.M

Date and Time Unit On December 2, 2013 07:02 AM

### Type of Leak: (Check One)

Pin Hole \_\_\_\_\_ Thick Lip Failure \_\_\_\_\_ Crack X Thin Lip Failure \_\_\_\_\_

Tube Wall Thinning \_\_\_\_\_ Other \_\_\_\_\_

### Orientation of Rupture: (Check One)

Longitudinal X Circumferential \_\_\_\_\_

### Probable Cause: (Check One)

Stress \_\_\_\_\_ Overheat \_\_\_\_\_ Erosion \_\_\_\_\_ Internal Corrosion \_\_\_\_\_

External Corrosion \_\_\_\_\_ Weld Failure \_\_\_\_\_ (Shop \_\_\_\_\_ Field \_\_\_\_\_)

Internal Obstruction to Flow \_\_\_\_\_ Sootblower Erosion X

Other \_\_\_\_\_

### Type of Repair: (Check One)

Dutchman \_\_\_\_\_ (Length of Dutchman \_\_\_\_\_) Pad Weld X

Plug Tube \_\_\_\_\_ Short Circuit \_\_\_\_\_ Other \_\_\_\_\_

# Unforced Outage Report

**Description of Repair:** Tube Size OD 2.5" Wall Thickness .203"

Tube Material: SA210-A1

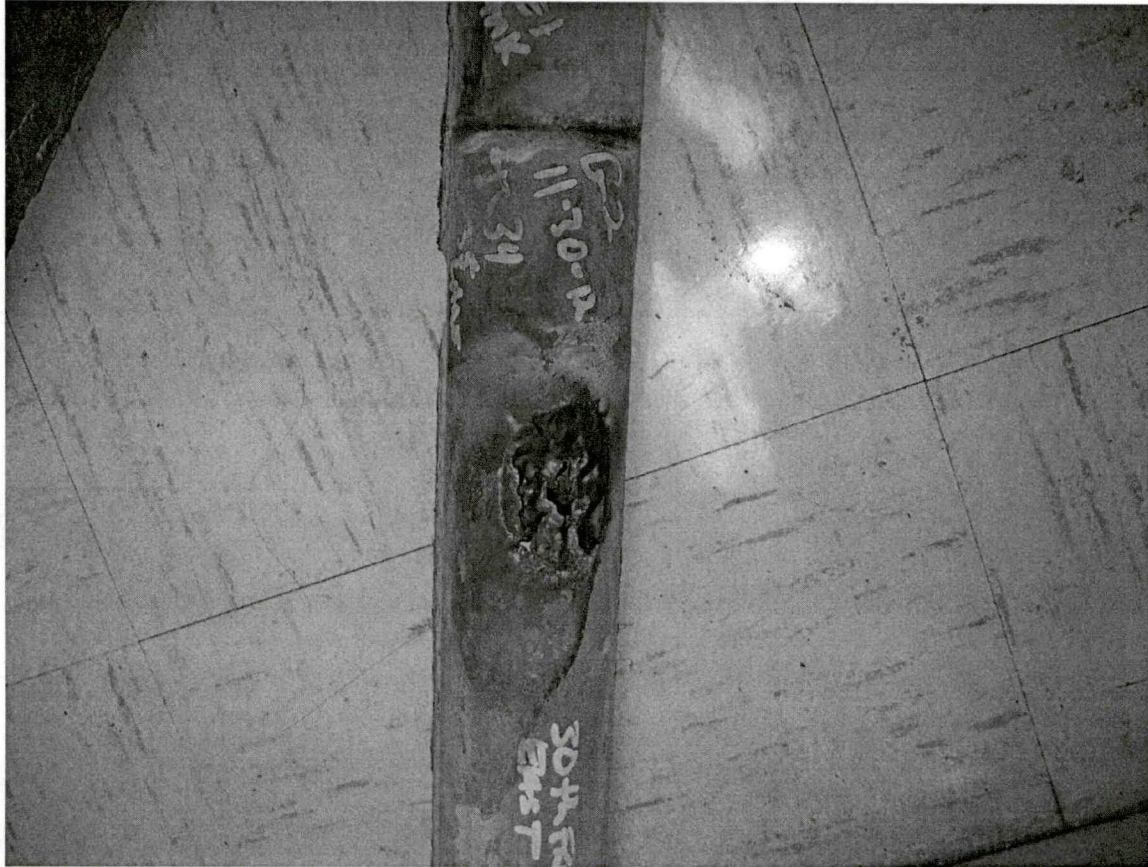
Welding procedure GS-P5-P5-NSR

Welded By: Titan

Exact Location of Leak: Be Specific: West Wall at IR 39

# Unforced Outage Report

## Pictures



New 2008 Reheat Outlet Bank tube, 30th bundle from East, lead tube at IK 34-35 Sootblowing Lane. Tube was shielded. Leak from Intermediate bank washed through the shield into tube.

## Unforced Outage Report



Original installed Reheat Intermediate tube, 30 from East. 1st tube in bundle.

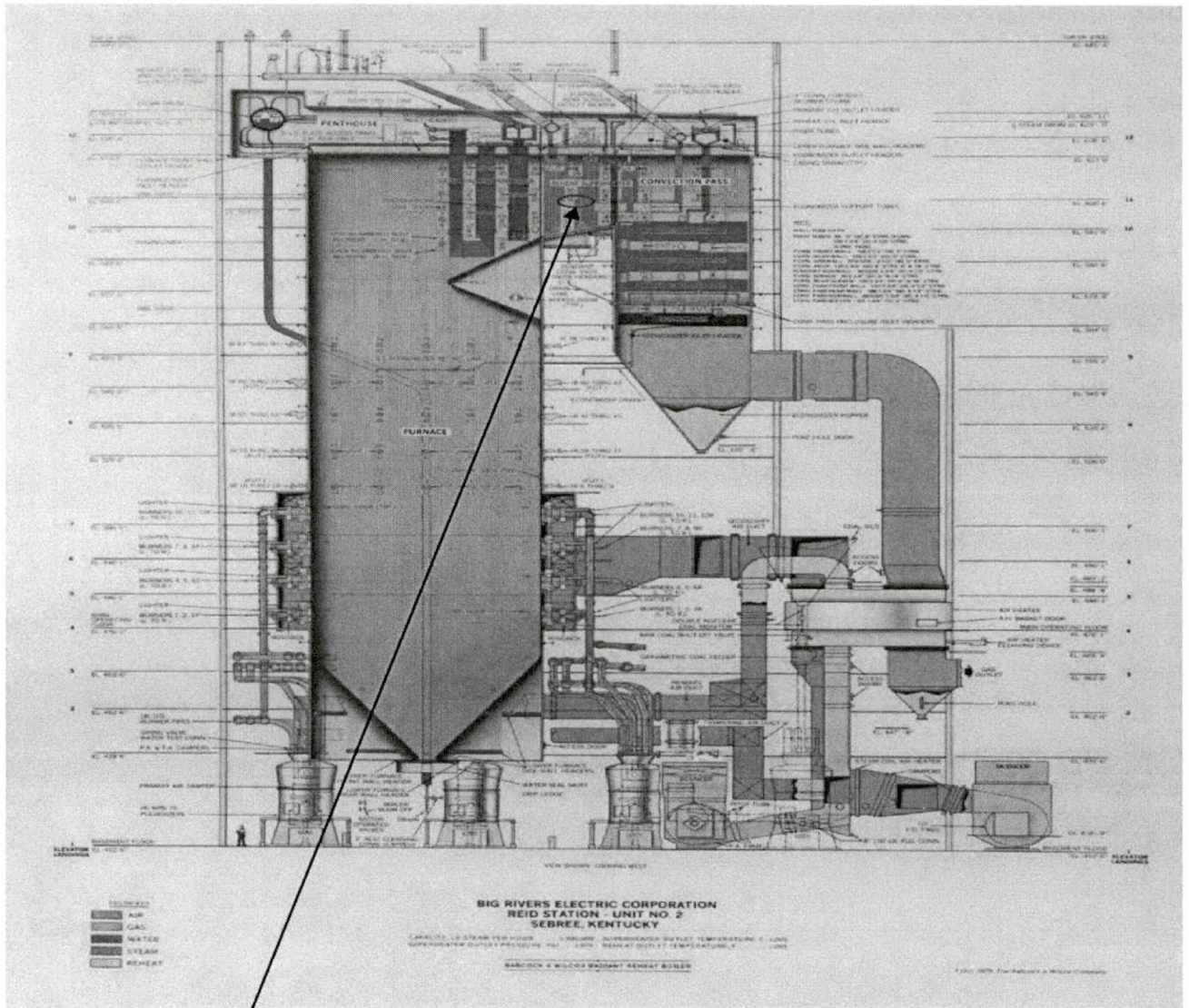
IK 34-35 Sootblowing lane.

# Unforced Outage Report

GREEN STATION UNIT 2

2013

(2) TUBES INVOLVED



Reheat Intermediate Bank Lead 30<sup>st</sup> bundle from east (near) side at elevation 606'.

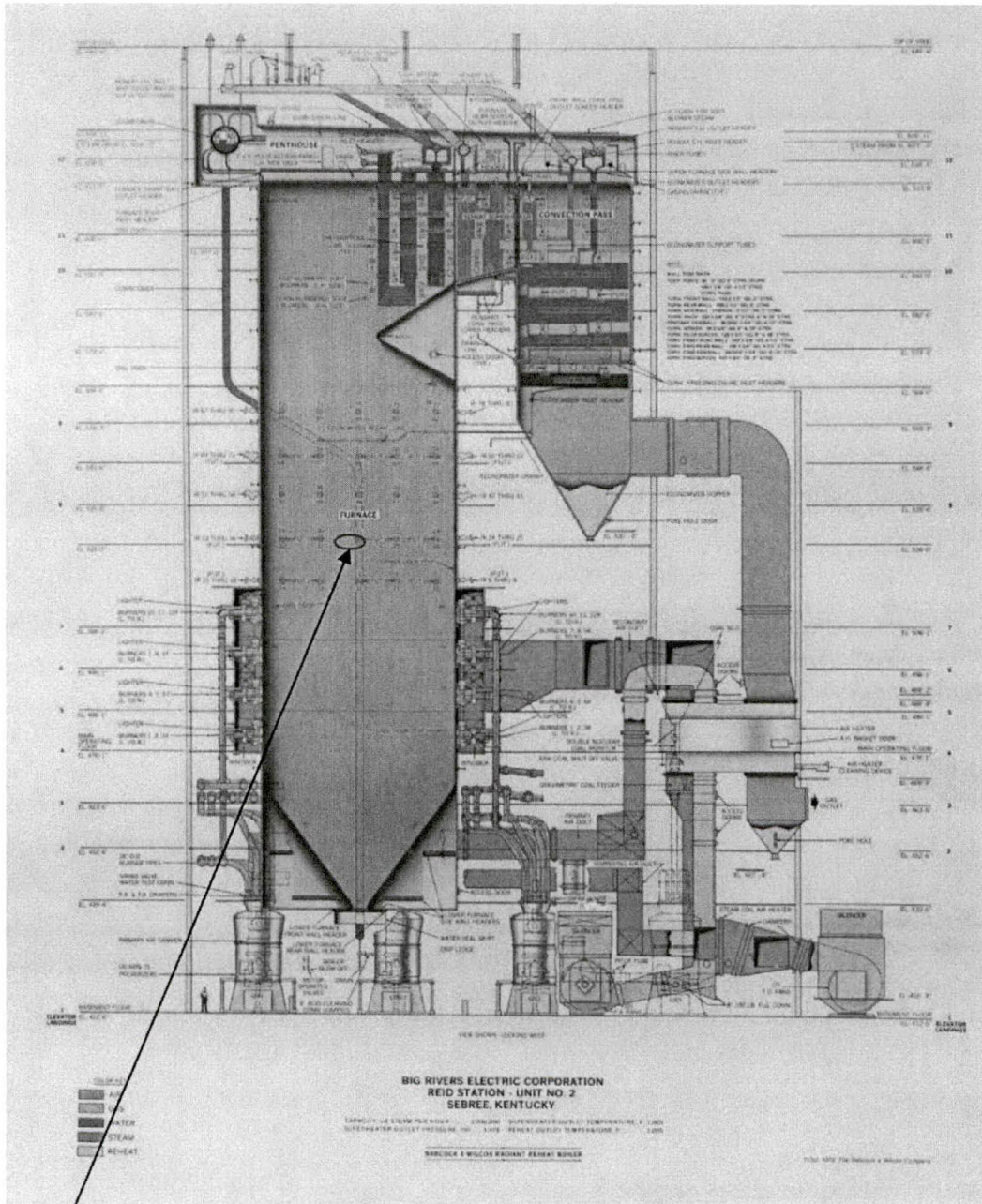
Reheat Outlet Bank 30<sup>th</sup> Bundle from east in IK 34-35 Sootblower lane at elevation 606'.

# Unforced Outage Report

GREEN STATION UNIT 2

2013

(1)TUBE INVOLVED



West (far side) water wall at IR 39 at elevation 537'.

# Unforced Outage Report

## Estimated Outage Costs

Labor & Materials    \$212,784

## Lost Sales Opportunity Report

MAINT. & FORCED OUTAGE COST ANALYSIS					
MISO DART Revenue and LOST OPPORTUNITY					
Unit	Green 2 - G2-13-03		Production Cost		
Date & Time Off Line	11/30/13 0:02 & 12/1/13 0:02		MW	\$/MW	
Date & Time On Line	12/1/13 0:02 & 12/2/13 7:02		89	\$ 28.68	
Outage Duration	48 hr. 0 min. & 7 hr. 0 min.		174	\$ 24.90	
Outage Code	MO & UO3		225	\$ 24.42	
Outage Reason	Removed from service to wash air heaters (MO). While off, a leak was discovered and repaired on circulating water header at SW corner of condenser.				
Date	DA LMP Average	RT LMP Average	DART P&L	Lost Opportunity	
11/30/13 (HE 1-24)	\$ 29.20	\$ 34.06	\$ 690	\$ (25,596)	
12/1/13 (HE 1-24)	\$ 33.13	\$ 26.06	\$ -	\$ (46,634)	
12/2/13 (HE 1-24)	\$ 32.69	\$ 37.70	\$ (44,049)	\$ (2,002)	
Total			\$ (43,359)	\$ (74,232)	
Start Up Fuel Cost			Total Forced Outage Cost		
S/U Fuel Consumed	20,018		DART P&L	\$ (43,359)	
S/U Fuel Price	\$ 3.14		Lost Opportunity	\$ (74,232)	
S/U Fuel Cost	\$ (62,855)		S/U Fuel Cost	\$ (62,855)	
			Total	\$ (180,446)	
NOTES:					
All negative values are money out of pocket.					
DART Revenue is calculated from differences between the DA award and RT events					
Lost Opportunity is the lost margins if the unit had stayed running					

# Forced Outage Report

**To:** Bob Berry

**From:** Perry Bowley

**Date:** 10-Jan-2014

**Plant:** Green

**Unit:** 2

**GADS Class:** UO1

## Duration

Trip Time 7-Dec-2013 01:48

Tie Time: 7-Dec-2013 19:12

Time Offline: 17:24

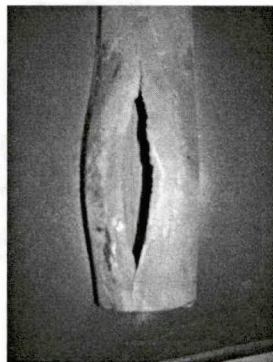
Fire were established on 7-Dec-2013 at 15:00.

## Outage Description

Green Unit 2 was removed from service on Saturday, 7-Dec-2013 at 01:48 due to failure of the steam seal header supply line between the main steam line and the steam seal supply isolation valve.

## Root Cause

The Main Steam Supply Header to the Steam Seal Root Valve was found to be the incorrect material. The piping material that failed was A106 XXS and should have been SA335-P22 XXS.



# Forced Outage Report

## Failure History

There have been no similar failures documented for Green Unit 2 in the last three years.

## Corrective Action

Titan Contracting replaced the section of pipe with the correct material. Removed remaining insulation and inspected complete steam seal line to the steam seal regulator header. Titan Quality Control technicians used a portable metallurgy instrument to verify the piping materials. All other piping sections were found to be correct material.

## Other Work Completed While Unit Was Offline

Removed insulation and inspected the high temperature turbine drain lines for proper material while the unit was off line. Titan's Quality Control technicians used a portable metallurgy instrument to verify the piping materials. All piping was found to be correct material.

## SOE Print Out

Not Available

## Forced Outage Report

### Operators Event Log

Big Rivers  
ELECTRIC CORPORATION

#### LOG BOOK

DATE 12-7-13

☐ REID  
☒ GREEN  
☐ COLEMAN  
☐ WILSON

☒ SHIFT SUPERVISOR  
☐ CONTROL OPERATOR  
☐ AUXILIARY OPERATOR  
☐ UTILITY OPERATOR

☐ SCRUBBER SHIFT SUPERVISOR  
☐ SCRUBBER OPERATOR  
☐ SCRUBBER AUXILIARY OPERATOR  
☐ SOLID WASTE OPERATOR  
☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

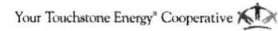
TIME	REMARKS
12 <sup>mn</sup>	
G-1	LOAD 250 Cap 250 4 mills SO <sub>2</sub> .31 NOx .40 opacity 8.7% ADS IN 2 Precip OUT
G-2	LOAD 242 Cap 242 4 mills SO <sub>2</sub> .14 NOx .32 opacity 9.8% ADS IN 1 Precip OUT
	SLAKERS G-1 3 ON 24 24 #1 G-2 3 ON 22 22 #3 Prep 2 ON 87% #4
	IN IN B CONU A+B drums #1 Flyash 21 TPH #2 Smoot 36% 29' Tanks #1 silo 49' FRC E 1.5 W 1.0 #2 silo 31' FRC E & W 1.5
106	Aux. Reported LEAK on STEAM SEAL LINE
130	STEAM Line seem to be a little worse called in. malarkey - starting to drop Pres on boiler -

G1 max load - 251

OPER	SUP'R
1ST	Time line →
2ND	
3RD	W/ 12A-8A

G2 - Aux reported leak on turbine steam seal line  
@ 0106, line blew apart @ 0140 trapping Boiler feed  
water valve released boiler @ 1347, line established @ 1500,  
unit tied online @ 1912, G2 tripped @ 2023 due to Air compressor  
problems. fires in @ 2142

F155.12  
R 1/93



**Big Rivers**  
ELECTRIC CORPORATION

DATE 12-7-17

- THIS FORM TO BE COMPLETED IN INK

OPER		SUP'R
1ST		
2ND		
3RD		
SIGNED		

Your Touchstone Energy® Cooperative 

# Forced Outage Report



## LOG BOOK

DATE 12-7-13

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
8 A	Hurt, Hager, Northington, Butler, J. Barron, Turner, Haner, Combs, Cook, R. Parker, Collins
G1	Load 249 A, B, C & D Mills SO <sub>2</sub> .70 NOx .79 opacity 7.7
G2	off - leak in steam seal Header
Slaker	G1 3 on 25.2 + 24.4 #1 silo G2 1 on 25.7 + 25.6 #3 prop out 85.7
IV	Conveyors A+B Drums #1 silo 25' 25" out 36" 28.6 + 29.5 in Tanks
2:00	Fly Ash 33-0 36.0 E 5.5 E 5.5 W 5.0 W 5.0
1:47	Maint Released Boiler + Turbine.
3:00	Fire established in G2 Boiler

OPER	SUP'R
1ST	<i>BZM</i>
2ND	
3RD	
SIGNED	

F155.12  
R 1/93

## Forced Outage Report



### LOG BOOK

DATE 12-7-13

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
2:00	1A 68 <sup>60'</sup> 3" 6'7" 2A 33.3 0" 6'9"
	1B 210 5" 6'10" 2B 32.8 9" 6'8"
	Red 0 FL 7.5
Line	30 - 4 - 35 - 40
7:12	G-2 Tied on Line
	Precips Put IN SERVICE
8:00	Pailes, Reed, Rittmeyer, Bachman, Hopkins, Berry, Lubna (SL)
	Bell, Rigdon, Gorrell, Duvall
8:23	G-2 Tripped Air Comp Trouble, G-2 Tripped Hot Temp. - G-1 - Tripped Elliott
9:19	G-2 ON TURNING GEAR
NOTE:	4160 V Bus 2SUA Tie Breaker slow in TRANSFERRING Load of A equipment
9:15	"A" Circ. back on

OPER	SUP'R
1ST	BZM
2ND	
3RD	
SIGNED	

F155.12  
R 1/93

# Forced Outage Report

## Estimated Outage Cost

Work Order	<b>6115827</b>
Total Material Cost(USD)	<b>4,310.44</b>
Total Labor Cost(USD)	<b>4,943.69</b>
Total Actual Hours	<b>82.00</b>
Total Equipment Cost(USD)	<b>0.00</b>
Total Asset Maintenance Cost(USD)	<b>9,254.13</b>

# Forced Outage Report

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>Green 2 - G2-13-04</b>		<b>Production Cost</b>	
<b>Date &amp; Time Off Line</b>	12/7/13 1:48		<b>MW</b>	<b>\$/MW</b>
<b>Date &amp; Time On Line</b>	12/7/13 19:12		72	\$ 30.12
<b>Outage Duration</b>	17 hr. 24 min.		174	\$ 25.12
<b>Outage Code</b>	UO1		225	\$ 24.64
<b>Outage Reason</b>	Repair leak on steam seal header			
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
12/7/13 (HE 3-21)	\$ 36.24	\$ 36.55	\$ (47,901)	\$ -
<b>Total</b>			\$ (47,901)	\$ -
<b>Start Up Fuel Cost</b>		<b>Total Forced Outage Cost</b>		
S/U Fuel Consumed	15,000	DART P&L	\$ (47,901)	
S/U Fuel Price	\$ 3.14	Lost Opportunity	\$ -	
S/U Fuel Cost	\$ (47,099)	S/U Fuel Cost	\$ (47,099)	
		<b>Total</b>	\$ (95,000)	
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Bob Berry

**From:** Perry Bowley

**Date:** 10 Jan-2014

**Plant:** Green

**Unit:** 2

**GADS Class:** UO1

## Duration

Trip Time 7-Dec-2013 20:23

Tie Time: 8-Dec-2013 03:50

Time Offline: 07:27

Fire were established on 8-Dec-2013 at 21:42

## Outage Description

Green Unit 2 tripped from service on Saturday, 7-Dec-2013 at 20:23 due to high cooling water temperature to the plant air compressors.

## Root Cause

The unit had just returned to service from a steam seal header repair. The circulating water system was set up to bypass the cooling tower due to cold ambient temperature. The operators were in the process of restoring the circulating water system to normal operation when the high temperature of the closed cooling water system resulted in high oil temperature tripping the air compressors.

## Failure History

There have been no similar failures documented for Green Unit 2 in the last three years.

## Corrective Action

Returned all systems to normal operation

# Forced Outage Report

## SOE Print Out

Not Available

## Other Work Completed While Unit Was Offline

G2 Air Heater Sootblowing header line started leaking at the flange of the safety valve. Weld repair was completed.

# Forced Outage Report

## Operators Event Log



### LOG BOOK

DATE 12-7-13

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

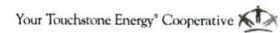
- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
8 A	Hurt, Hayes, Northington, Butler, J. Barron, Turner, Haner, Combs, Cook, R. Parker, Collins
G1	Load 249 A, D, C & D Mills SO <sub>2</sub> 70 Max 79 opacity 7.3
G2	off - leak in steam seal Header
Slaker	G1 3 on 25.2 + 24.4 #1 silo G2 1 on 25.3 + 25.6 #3 prop out 85.3
IV	Boiler operators A+B Drum #1 silo 25' 2 sheet 36" 28.6 + 29.5 in Tanks
2:00	Fly Ash 33-0 36-0 E 5.5 E 5.5 W 5.0 W 5.0
1:47	Maint Released Boiler + Turbine.
3:00	Fire established in G2 Boiler

OPER	SUP'R
1ST	BZON
2ND	
3RD	
SIGNED	

F155.12  
R 1/93



**Big Rivers**  
ELECTRIC CORPORATION

DATE 12-7-13

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

TIME	REMARKS
.	1A OFF OT-6'8" 2A OFF OT-6'9"
	1B OFF 3T-6'11" 2B OFF 14T-6'8"
	STACK draw OK G-1 Floc 7.5 Bed.00
9 <sup>42</sup>	Fires in G-2 boiler
10 <sup>55</sup>	SEAL Turbine
11 <sup>30</sup>	SEALS OFF DUE to DIFF. EXPANSION .344
11 <sup>55</sup>	SEAL Turbine

OPER		SUP'R
1ST		
2ND		<i>W 8A-12mm</i>
3RD		
SIGNED		

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 12-8-13

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
12 <sup>00</sup>	
G-1	Load 249 Cap 250 4 mills
	SO2 .26 Max .38 capacity 9.5%
	ADS IN 2 Precip out
G-2	START-UP
	R/T 2 A mill 40 Pump - oil LEAK
12 <sup>20</sup>	Tripped G-2 Turbine - DIFF expansion
12 <sup>30</sup>	ON GEAR
12 <sup>37</sup>	SEALS OFF
	SLACKERS G-1 3 ON 23.6 23.9 #1
	G-2 1 ON 23.3 22.5 #3
	Prep 1 ON 75.7% #4
	TH IN B CONT A+B drums #2 Flyash 18TPH
	#2 smoot 36% 23' TANKS
	#1 silo 40' @ E 1.5 W 1.5
	#2 silo 21' @ E @ W 1.5

G1 max load - 253

G2 tied online @ 0350, had trouble with mills/coal flow  
oil line out @ 0946, good oil full pressure W/2A-PA  
load @ 1454, 2200 pound leak on AN seal on header  
2304 starting down with unit on 2325, A mill off 2328  
B mill off 2359

# Forced Outage Report



## LOG BOOK

DATE 12-8-13

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
	Add Fuel oil to Day Tank 14' 7 1/4"
	UNDERFLOW RUN
	1A 22 HRS 2A 5 HRS 30 min
	1B 7 HRS 2B 8 HRS 30 min
	IN RUN 24 HRS
130	1A N/A (66) OT-6'8" 2A OFF OT-6'9"
	1B OFF IT-6'11" 2B OFF IST-6'8"
	FLOC 7.5 Bed. 00
246	G-2 A Vacuum Pump on + put seals on
305	Reset TURBINE & Rolling
336	switd YARD close in 110-9 disconnected
350	Tied on line - B mill on
	Put precip on
447	D mill on - NO COAL
510	C mill on - NO COAL

OPER	SUP'R
1ST	
2ND	
3RD	TW 12A-8A
SIGNED	

F155.12  
R 1/93

# Forced Outage Report

## Estimated Outage Cost

Work Order 6115841

Total Material Cost(USD) **9,980.99**

Total Labor Cost(USD) **2,081.10**

Total Actual Hours **33.00**

Total Equipment Cost(USD) **0.00**

Total Asset Maintenance Cost(USD) **12,062.09**

# Forced Outage Report

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>Green 2 - G2-13-05</b>		<b>Production Cost</b>	
<b>Date &amp; Time Off Line</b>	12/7/13 20:23		<b>MW</b>	<b>\$/MW</b>
<b>Date &amp; Time On Line</b>	12/8/13 3:50		72	\$ 30.12
<b>Outage Duration</b>	7 hr. 27 min.		174	\$ 25.12
<b>Outage Code</b>	UO1		225	\$ 24.64
<b>Outage Reason</b>	Issues with plant air compressors			
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
12/7/13 (HE 22-24)	\$ 37.96	\$ 41.64	\$ (10,874)	\$ -
12/8/13 (HE 1-16)	\$ 36.06	\$ 37.73	\$ (11,890)	\$ (8,435)
<b>Total</b>			<b>\$ (22,764)</b>	<b>\$ (8,435)</b>
<b>Start Up Fuel Cost</b>		<b>Total Forced Outage Cost</b>		
S/U Fuel Consumed	21,155	DART P&L	\$	(22,764)
S/U Fuel Price	\$ 3.14	Lost Opportunity	\$	(8,435)
<b>S/U Fuel Cost</b>	<b>\$ (66,425)</b>	S/U Fuel Cost	\$	(66,425)
		<b>Total</b>	<b>\$</b>	<b>(97,624)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Bob Berry

**From:** Perry Bowley

**Date:** 19-Dec-2013

**Plant:** Green

**Unit:** 2

**GADS Class:** UO2

## Duration

Trip Time: 9-Dec-2013 00:24

Tie Time: 10-Dec-2013 06:54

Time Offline: 30:30

## Outage Description

Green Unit 2 was removed from service under a controlled shutdown on Monday, 9-Dec-2013 at 00:24 to repair an air heater soot blowing header steam leak. Operators established fires in the boiler following a good hydro-test on Tuesday, 10-Dec-2013 at 00:03. The unit was tied online on Tuesday, 10-Dec-2013 at 06:54.

## Root Cause

The G-2 Air Heater Soot blowing supply header failure was due to fatigue of the piping at the main steam header. The pressure regulator sensing line broke and caused excessive lifting of the safety valve.

## Failure History

There have been no similar failures documented for Green Unit 2 in the last three years.

## Corrective Action

Maintenance replaced the air heater soot blowing header piping from the main steam header connection to the first 90° elbow with SA335, F22 schedule XXS material from inventory. Maintenance also rebuilt the pressure-reducing valve with spare parts from inventory, and replaced the air heater soot blowing supply isolation root valve.

# Forced Outage Report

## SOE Print Out

N/A

## Other Work Completed While Unit Was Offline

None

# Forced Outage Report

## Operators Event Log

**Big Rivers**  
ELECTRIC CORPORATION

### LOG BOOK

DATE 12-9-13

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> REID             | <input checked="" type="checkbox"/> SHIFT SUPERVISOR | <input type="checkbox"/> SCRUBBER SHIFT SUPERVISOR   |
| <input checked="" type="checkbox"/> GREEN | <input type="checkbox"/> CONTROL OPERATOR            | <input type="checkbox"/> SCRUBBER OPERATOR           |
| <input type="checkbox"/> COLEMAN          | <input type="checkbox"/> AUXILIARY OPERATOR          | <input type="checkbox"/> SCRUBBER AUXILIARY OPERATOR |
| <input type="checkbox"/> WILSON           | <input type="checkbox"/> UTILITY OPERATOR            | <input type="checkbox"/> SOLID WASTE OPERATOR        |
|   | <input type="checkbox"/> _____                       | <input type="checkbox"/> SCRUBBER UTILITY OPERATOR   |

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
12 <sup>00</sup>	
G-1	LOAD 249 CAP 250 4 mills
	SO2 .25 NOX .33 opacity 11%
	ADS IN 2 Precips
G-2	TAKING UNIT OFF
12 <sup>11</sup>	G-2 D mill OFF
12 <sup>24</sup>	G-2 OFF LINE
	SLAKER G-1 4 on 24' 24' #1
	G-2 3 on 23' 24' #3
	Prep 2 on 60% #4
	FU IN B CONV A+C drums #1 Flyash 18TPH
	#2 smoot 36% 22' Tanks
	1A N/A (68) OT-6'6" 2A 33.5 (84) OT-6'10"
	1B OFF 4T-6'10" 2B OFF OT-6'7"
	Floc 7.5 Bcd .00
	UNDERFLOW
	1A 17 HR 30 min 2A 8 HR
	1B 10 HR 30 min 2B 12 HR 30 min

G1 - 250 max

G2 off line @ 0024 for AH sealhead repair  
2220 hydro seal/bale dry

SH-0.4 UO2-23.6

OPER	SUP'R
1ST	
2ND	
SIGNED	JW/1A-8A

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 12-9-13

- ☐ REID                      ☒ SHIFT SUPERVISOR                      ☐ SCRUBBER SHIFT SUPERVISOR  
☒ GREEN                      ☐ CONTROL OPERATOR                      ☐ SCRUBBER OPERATOR  
☐ COLEMAN                      ☐ AUXILIARY OPERATOR                      ☐ SCRUBBER AUXILIARY OPERATOR  
☐ WILSON                      ☐ UTILITY OPERATOR                      ☐ SOLID WASTE OPERATOR  
    ☐ \_\_\_\_\_                      ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

[illegible]

OPER	SUP'R	
1ST		
2ND		
3RD		
SIGNED		

F155.12  
R 1/93

# Forced Outage Report



LOG BOOK

DATE 12-9-13

- ☐ REID  
☒ GREEN  
☐ COLEMAN  
☐ WILSON

- ☒ SHIFT SUPERVISOR  
☐ CONTROL OPERATOR  
☐ AUXILIARY OPERATOR  
☐ UTILITY OPERATOR  
☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

[illegible]

OPER	SUP'R	
1ST		
2ND		
3RD		<i>W 12A-8A</i>
SIGNED		

F155.12  
R 1/93

# Forced Outage Report

**Big Rivers**  
ELECTRIC CORPORATION

## LOG BOOK

DATE 12-9-13

- ☐ REID  
☒ GREEN  
☐ COLEMAN  
☐ WILSON

- ☒ SHIFT SUPERVISOR  
☐ CONTROL OPERATOR  
☐ AUXILIARY OPERATOR  
☐ UTILITY OPERATOR  
☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR  
☐ SCRUBBER OPERATOR  
☐ SCRUBBER AUXILIARY OPERATOR  
☐ SOLID WASTE OPERATOR  
☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
Note	Filling G-2 Boiler for Hydro
8 <sup>00</sup>	C Shift here + B Shift leaving
	Underflows 1A) off 0 6'9" 2A) off 0 6'10"
	1B) off 2 6'10" 2B) 32.5 0 6'9"
	Bed 0.00 Flick 7.5
9 <sup>59</sup>	1600 lbs on G-2 Boiler -
10 <sup>20</sup>	G-2 Has Dry Boiler - Draining Pressure off Boiler + Setting Boiler to fire
Note	Valved out G-2 D.A Regulator for Maintenance to replace regulator
11 <sup>13</sup>	Putting on ID + FD Fans + Purging Boiler

OPER	SUP'R
1ST	
2ND	
3RD	<i>Given 8p-12m</i>
SIGNED	

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 12-10-13

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

12MN-8AM

TIME	REMARKS
12 <sup>00</sup>	Barron - Greer - Poole - Turner - Denton - Rittmeier - Strickland - Mahan - Thomas - Townsend - Loran - Holgood
	G-1 load 238 Cap 250 Mills on Max 356 So. 436 Opacity 13.30 APS Control in Service 2 preps out of Service
	G-2 Startup
	TU in Service - B Conveyor - A+C Drums + #1 Flycatcher Silo @ 9 tons of ash per hour - #2 Smart System @ 36% lime rate - 10' in Sludge Tanks
	Underflows 1A) off 0 6' 9" 2A) off 0 6' 10" 1B) off 2 6' 10" 2B) off 0 6' 9" Bed 0.00 Flock 7.5
	Slakers #1 Building in Service 3 on 25.2/24.8 #1 Silo #2 Building out of Service 1 on 24.3/24.1 #3 Silo Reg Building in Service 2 on 22% #4 Silo
12 <sup>03</sup>	Fire established in G-2 Boiler - Notified H/H Air Heaters
12 <sup>00</sup>	Cross firm <del>Steam</del> <del>Truck</del> from G-1 - Auxiliary found line busted below safety on G-2

G1 - max load 251

G2 Tune line on back



OPER	SUP'R
1ST	Greene 12MN-8A
2ND	
3RD	
SIGNED	

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 12-10-13

- ☐ REID  
☒ GREEN  
☐ COLEMAN  
☐ WILSON

- ☒ SHIFT SUPERVISOR  
☐ CONTROL OPERATOR  
☐ AUXILIARY OPERATOR  
☐ UTILITY OPERATOR  
☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR  
☐ SCRUBBER OPERATOR  
☐ SCRUBBER AUXILIARY OPERATOR  
☐ SOLID WASTE OPERATOR  
☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
Note	Valved out Cross tie on air heater + Maintenance, checking to see if they have parts to repair leak
4:20	Maintenance released @ Air Heater sootblowers - Blowed OK
	Full run time 21 hours
	Underflow Pump run times 1A) 15 hours + 30 Minutes 1B) 8 hours + 30 Minutes 2A) 7 hours 2B) 13 hours
4:00	Underflow 1A) off @ 6'9" 2A) up @ 6'10" 1B) off @ 2'6" 2B) off @ 6'9" Bed 0.00 Flock 1.5
5:00	Sealing Turbine + Pulling Turbine
5:24	Rolling turbine
6:54	Tied G-2 on Line + Put Precip. in service - Notified H&S Also 2B Mill on. Raising load
7:35	2D Mill on

OPER	SUP'R
1ST	Swain DAN-PA
2ND	
3RD	
SIGNED	

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 12/10/13

- ☐ REID  
☒ GREEN  
☐ COLEMAN  
☐ WILSON

- ☒ SHIFT SUPERVISOR  
☐ CONTROL OPERATOR  
☐ AUXILIARY OPERATOR  
☐ UTILITY OPERATOR  
☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR  
☐ SCRUBBER OPERATOR  
☐ SCRUBBER AUXILIARY OPERATOR  
☐ SOLID WASTE OPERATOR  
☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

8A-8P

Tuesday

TIME	REMARKS
8AM	Donithan, Beaven, Farley, Lawrence, Whittedge, Hoover, T. Parker Travis, Temple, Shelton, Tapp
8-1	Load - 250 Cap - 250 4 Mill Operation SO <sub>2</sub> - .29 NOx - .27 Opacity - 8% A.D.S. in service Precipitator - 2
8-2	Unit start up in progress. Load - 95 2B + 2D Mills on SO <sub>2</sub> - .23 NOx - .24 Opacity - 9%
Slabers	Green 1 - 3 25/24 Green 2 - 3 25/24 Prep Bldg. - 1 80.7 %
I.U.	Remains in service w/ B Conveyors, C Drum, ash from #1 silo @ 10 tph, #2 smoot system @ 18%, 16' in sludge tanks.
Silos	#1 - 47' E-2 W-1.5 #2 - 25' E-1.5 W-1.5 S-2 G-2 S-10 G-0

OPER	SUP'R
1ST	
2ND	
3RD	
SIGNED	

F155.12  
R 1/93

# Forced Outage Report

## Estimated Outage Costs

Materials	\$ 3,934
Labor	\$1,551
Contractor Labor	\$ 17,310
<b>Total Cost</b>	<b>\$ 22,795</b>

## Lost Sales Opportunity Report

FORCED OUTAGE COST ANALYSIS					
MISO DART Revenue and LOST OPPORTUNITY					
Unit		Green 2 - G2-13-06		Production Cost	
Date & Time Off Line		12/9/13 0:24		MW	\$/MW
Date & Time On Line		12/10/13 6:54		72	\$ 30.12
Outage Duration		30 hr. 30 min.		157	\$ 25.58
Outage Code		UO2		225	\$ 24.64
Outage Reason		Repair leak on air heater sootblowing steam header			
Date	DA LMP Average	RT LMP Average	DART P&L	Lost Opportunity	
12/9/13 (HE 1-24)	\$ 33.56	\$ 52.40	\$ (142,668)	\$ -	
12/10/13 (HE 1-11)	\$ 48.02	\$ 42.73	\$ 8,339	\$ (56,064)	
Total			\$ (134,329)	\$ (56,064)	
Start Up Fuel Cost			Total Forced Outage Cost		
S/U Fuel Consumed	14,000		DART P&L	\$	(134,329)
S/U Fuel Price	\$ 3.14		Lost Opportunity	\$	(56,064)
S/U Fuel Cost	\$ (43,959)		S/U Fuel Cost	\$	(43,959)
			Total	\$	(234,351)
NOTES:					
All negative values are money out of pocket.					
DART Revenue is calculated from differences between the DA award and RT events					
Lost Opportunity is the lost margins if the unit had stayed running					

# Forced Outage Report

**To:** Bob Berry

**From:** Bart Boles

**Date:** 14-Jan-2014

**Plant:** Wilson

**Unit:** 1

**GADS Class:** UO3

## Duration

Trip Time: 4-Dec-2013 22:58

Tie Time: 8-Dec-2013 11:42

Total Time Offline: 84:44

## Outage Description

Wilson Station was removed from service on Wednesday 4-Dec-2013 at 22:58 due to a tube leak in the "B" Platen Superheat Section of the boiler. The leak was on the 4<sup>th</sup> element from the east wall, and was the 2<sup>nd</sup> tube in from the outside of the bundle. This was on the 13<sup>th</sup> floor at elevation 562'-0". Titan Contracting replaced a section of superheat tube that was 48" long, and also performed six pad welds. The Dutchman was 1.75" x 0.300" M.W. and was SA-213-T22 material. Three of the pad welds were SA-213-T22, while the other three pad welds were SA-213-T91. Additional work completed during this outage is listed in the sections below.

## Root Cause

It appears that the "B" Platen Superheat tube failed as a result of erosion from a soot blower over a period of time. The failure was approximately 24-30 inches in length, and covered a 180 degree section of tube.

## Failure History

There have been no tube leaks in the "B" Platen Superheat Section since the new elements were installed in 2009.

## Corrective Action

The recommendation is to perform an inspection of the "B" Platen Superheat elements during the next major unit outage and add shields as necessary to prevent soot blower erosion.

# Forced Outage Report

## Other Work Completed While Unit Was Offline

### ELECTRICAL

- No Major work completed

### INSTRUMENTATION

- No major work completed

### MECHANICAL

- Repaired hole in pipe at cooling tower
- Made repairs to the #1 scrubber module top hats
- Replaced #1 module dilution water valve
- Removed and reinstalled ammonia spools
- Replaced 1-1 ME wash valve
- Replaced 2-4 ME wash valve
- Replaced #1 secondary air heater air drive
- Replaced 2<sup>nd</sup> stage west superheat spray packing
- Replaced the gland steam exhaust valve
- Repaired circulating water inlet sample port
- Repaired penthouse ventilation piping
- Replaced #1 ID fan fluid drive oil seal
- Repaired AL1-West top gate seat
- Replaced drag chain submerged idler shields
- Removed scrubber duct drains and reinstalled
- Repaired vacuum pump cooler head

# Forced Outage Report

## Operators Event Log

12/4/2013	12:00mn	
	9:27am	Started Hotwell check
	10:27am	Lost 2.25 inches local
	10:30am	Communication Meeting
		Weekly drag chain check
	12:00am	Caldwell out
		Ball mill Fineness
		Monthly Qual
	4:50pm	Barry Bowman taking vacation tomorrow. AT submitted
	8:00pm	Owens, Mattingly in Todd out
		McElwain, Tichenor, S.Roby, Daugherty, Wilson, Worley in, Piper on S/L
		Safety briefing
		Working on taking unit off for a tube leak
	10:58pm	Unit off line due to a tube leak. H/L notified
12/5/2013	12:00am	
	7:00am	Crowe, Todd in
		J. Stewart, Caldwell, Hall, Stovall, Drake, Barrett in
	8:00am	Job Briefing
		Start Deslag
		Fire impairment on FPV-139 for #1 conveyor
	8:00pm	Owens, Cooper in Todd out
		McElwain, Poore, S.Roby, B.Jones, Worley in. Piper on S/L Wilson on P/D
		Safety briefing
		Outage
12/6/2013	12:00am	
	7:00PM	Cooper Owens, in Mattingly Todd out
		Roby, Stewart S/L, Baker, Poore, Jones, Calhoun, S Roby, McElwain
	8:42PM	Filling Hotwell
	10:18PM	#1 condensate pump on
	11:52PM	Filling Cooling Tower
12/7/2013	12:00AM	
	12:59AM	Filling DA
	6:15AM	Cir water system in
	6:30AM	#4 circ water booster pump on
		Working on weekly and monthly test
	6:40AM	Bottom ash system in
	7:00PM	Cooper Owens, in Mattingly Todd out
	8:00PM	Roby, Stewart S/L, Baker, Poore, Jones, Calhoun. S Roby, McElwain
	7:22PM	Hydro boiler found leak on nose
12/8/2013	12:00AM	
	1:03AM	Hydro boiler no leaks
	2:12AM	Head Count
	2:34AM	Putting fans on
	4:01AM	Fire in boiler
	7:00am	Mattingly, Todd in Cooper, Owens out

## Forced Outage Report

8:19am	PA fans on
8:30am	Sealed turbine
9:28am	Rolled turbine
11:15am	Transferred valves
11:35am	Put #4 on
11:42am	Unit tied on line

# Forced Outage Report

## Boiler Tube Leak Record

### "B" Platen Superheat Tube

Plant: Wilson

Unit: 1

#### Type of Leak: (Check One)

Pin Hole \_\_\_\_\_ Thick Lip Failure \_\_\_\_\_ Thin Lip Failure \_\_\_\_\_

Tube Wall Thinning X Other: It appears that the tube leak occurred as a result of thinning, and then blew a section of tube out.

#### Orientation of Rupture: (Check One)

Longitudinal X Circumferential \_\_\_\_\_

#### Probable Cause: (Check One)

Stress \_\_\_\_\_ Overheat \_\_\_\_\_ Erosion X Internal Corrosion \_\_\_\_\_

External Corrosion \_\_\_\_\_ Weld Failure \_\_\_\_\_ (Shop \_\_\_\_\_ Field \_\_\_\_\_)

Internal Obstruction to Flow \_\_\_\_\_

Other: \_\_\_\_\_

#### Type of Repair: (Check One)

Dutchman: X Length of Dutchman: 48" Pad Weld: Yes (6 Pad Welds on adjacent tubes)

Plug Tube \_\_\_\_\_ Short Circuit \_\_\_\_\_ Other: \_\_\_\_\_

# Forced Outage Report

## Description of Repair:

Tube Size OD: 1.75" Wall Thickness: 0.300" M.W. x 0.238 M.W.

Tube Material: SA-213-T22, & SA-213-T91

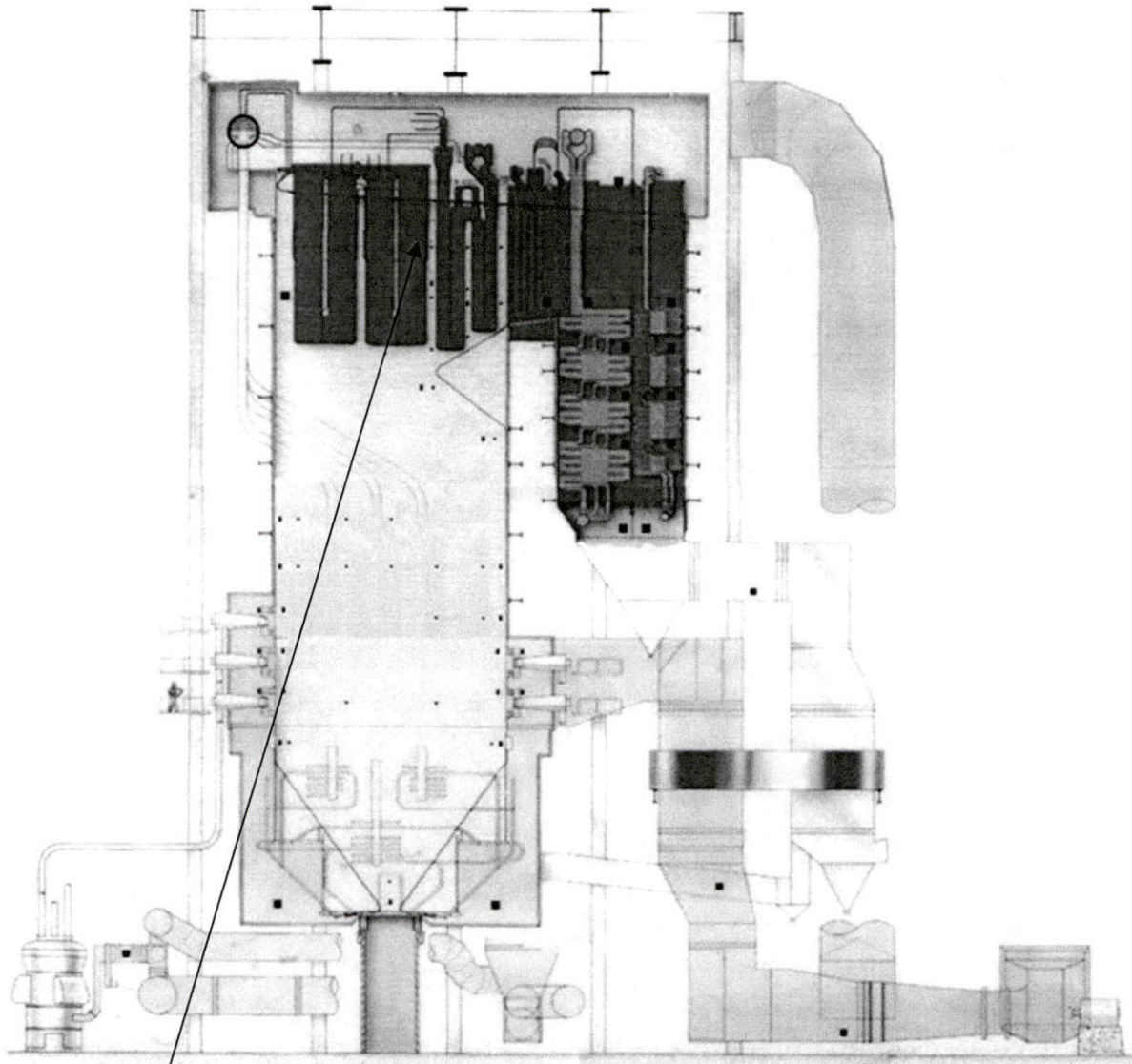
Welding Rod Used 90-SB3, 9018-CM

Welded By: Daniel Burden, Jared Burden: Titan Contracting

## Exact Location of Leak: Be Specific

"B" Platen Superheat Section, 4<sup>th</sup> element from east wall, 2<sup>nd</sup> tube in from the outside of the bundle. In the 13<sup>th</sup> floor area, elevation 562'-0"

# Forced Outage Report



**FOSTER WHEELER STEAM GENERATOR**  
FOR  
**BIG RIVERS ELECTRIC CORPORATION**  
D.B. WILSON STATION—UNITS 1 & 2  
Centertown, Kentucky

Burns and Roe—Engineers

Capacity: 3,484,000 lb/hr Design Pressure: 2950-690 psig

OPERATING CONDITIONS

Superheater Outlet Pressure: 2620 psig Temperature: 1005/1005F

REHEAT UNIT

**Tube Leak Here** – “B” Platen Superheat Section, 4<sup>th</sup> element from east wall, 2<sup>nd</sup> tube in from the outside of the bundle. 13<sup>th</sup> floor area elevation 562'-0”

# Forced Outage Report

## TOTAL OUTAGE COST

**TOTAL OUTAGE COST = \$146,325.98**

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>Wilson - W1-13-08</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	12/4/13 22:58			<b>MW</b>
<b>Date &amp; Time On Line</b>	12/8/13 11:42			<b>\$/MW</b>
<b>Outage Duration</b>	84 hr. 44 min.			240
<b>Outage Code</b>	UO3			380
<b>Outage Reason</b>	Repair superheater tube leak			420
				\$ 24.40
				\$ 22.78
				\$ 22.58
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
12/4/13 (HE 23-24)	\$ 23.32	\$ 22.12	\$ (297)	\$ -
12/5/13 (HE 1-24)	\$ 29.40	\$ 27.46	\$ (48,893)	\$ -
12/6/13 (HE 1-24)	\$ 41.61	\$ 36.51	\$ -	\$ (190,437)
12/7/13 (HE 1-24)	\$ 34.99	\$ 36.74	\$ -	\$ (124,148)
12/8/13 (HE 1-24)	\$ 36.00	\$ 38.33	\$ 68,077	\$ (134,246)
<b>Total</b>			<b>\$ 18,887</b>	<b>\$ (448,831)</b>
<b>Start Up Fuel Cost</b>		<b>Total Forced Outage Cost</b>		
S/U Fuel Consumed	31,770	DART P&L	\$	18,887
S/U Fuel Price	\$ 3.13	Lost Opportunity	\$	(448,831)
<b>S/U Fuel Cost</b>	<b>\$ (99,354)</b>	S/U Fuel Cost	\$	(99,354)
		<b>Total</b>	<b>\$</b>	<b>(529,299)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Bob Berry

**From:** Perry Bowley

**Date:** 29-Jan-2014

**Plant:** Green

**Unit:** 1

**GADS Class:** UO2

## Duration

Trip Time: 6-Jan-2014 09:18

Tie Time: 6-Jan-2014 16:33

Time Offline: 7:15

## Outage Description

Green Unit 1 was removed from service under a controlled shutdown on Monday, 6-Jan-2014 at 09:18 due to a generator voltage problem. Upon investigation it was discovered the center (B) phase of generator disconnect 100-9 did not fully engage into the 'jaw' of the switch when it was closed earlier in the day.

The boiler was bottled and maintained in a pressurized state until unit was ready to return to service.

The unit was tied online on Monday, 6-Jan-2014 at 16:33.

## Root Cause

The center (B) phase of generator disconnect 100-9 did not fully engage into the 'jaw' of the switch. The switch was covered with ice from the HMPL Cooling Tower plume.

## Failure History

Green 2 experienced a hot spot on 110-9 Generator disconnect 21-Jul-2012. Time Offline: 06:59.

## Corrective Action

ET&S was dispatched; the buildup of ice was removed. The switch was repaired and returned to service.

# Forced Outage Report

## SOE Print Out

Not Available

## Other Work Completed While Unit Was Offline

None

## Forced Outage Report

### Operators Event Log



#### LOG BOOK

DATE 1-6-14

- ☐ BEID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
12 <sup>mn</sup>	
G-1	LOAD 248 Cap 250 4 mills SOL .17 NOX .25 opacity 10.3% ADS IN 2 Precips out
G-2	LOAD 240 Cap 242 4 mills SOL .14 NOX .26 opacity 7.9% ADS IN 2 Precips out
	Slakers G-1 4 ON 24.5 24.1 #2 G-2 4 ON 24 20.3 #3 Prep 2 ON 53.2% #4
	ILL IN A CONV A+B drums #1 Flyash 17TPH #2 smoot 36% 25'+26' TANKS #1 silo 53' silo & SAFETY N/A E1.5 W1.0 #2 silo 49' silo & SAFETY N/A E1.0 W1.0
156	G-1 Tripped OFF Line - Drum Transmitter (LEFT) WENT BAD
245	ON GEAR
416	OIL Torches in Boiler Time line →

G-1 tripped @ 0156 on own level fuel oil in 0412, tied on line @ 0649, unit removed @ 0918 to repair disconnect in scrubber, 1610 disconnect repaired, unit tied on line @ 1633  
Coal flow up in bunkers!!

G-2 - 241

1ST	2ND	3RD
		12A-PA
SIGNED		

X for fuel oil

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 1-6-14

- ☐ REID  
☒ GREEN  
☐ COLEMAN  
☐ WILSON

- ☒ SHIFT SUPERVISOR  
☐ CONTROL OPERATOR  
☐ AUXILIARY OPERATOR  
☐ UTILITY OPERATOR  
☐

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
	Underflow Run
	1A 12 HR                      2A 11 HR
	1B 13 HR 30 min      2B 12 HR 30 min
	ILU Run 21 HR 30 min
3 <sup>00</sup>	J. Dow, than here
NOTE:	Drum Trips Disabled on both units Per M. Malow -
6 <sup>03</sup>	Reset TURBINE
6 <sup>21</sup>	@ 3600 RPM
6 <sup>40</sup>	Closed in Gen Disc. 109
6 <sup>49</sup>	Tied on Line

OPER		SUP'R
1ST		
2ND		
3RD		
SIGNED		

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 1/6/14

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> REID             | <input checked="" type="checkbox"/> SHIFT SUPERVISOR | <input type="checkbox"/> SCRUBBER SHIFT SUPERVISOR   |
| <input checked="" type="checkbox"/> GREEN | <input type="checkbox"/> CONTROL OPERATOR            | <input type="checkbox"/> SCRUBBER OPERATOR           |
| <input type="checkbox"/> COLEMAN          | <input type="checkbox"/> AUXILIARY OPERATOR          | <input type="checkbox"/> SCRUBBER AUXILIARY OPERATOR |
| <input type="checkbox"/> WILSON           | <input type="checkbox"/> UTILITY OPERATOR            | <input type="checkbox"/> SOLID WASTE OPERATOR        |
|   | <input type="checkbox"/> _____                       | <input type="checkbox"/> SCRUBBER UTILITY OPERATOR   |

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
8 <sup>00</sup>	Dunkham, Farley, Lawrence, White, Hodge, Harver, Parker, Travis, Loran, Sheltens, Tapp
61	start up
62	Cap 242      Used 241 552 .135      WORK .272 opac 9.1
Shakers	51 2    23/23    52 4    24/23 P 2    80%
Thickness	18A      52A 1B      2B
5:05	#1-50 E-3 U-2      #2-48' E-1.5 W-1.5 5-0 6-0      5-0 5-0
11:55	Called Hotline for unit status
9V	In service, A side, A+B Drums, #2-26T Tanks 25'      #2-36%
9 <sup>00</sup>	61 ghd line to repair Disconnect.

OPER	SUP'R
1ST	<i>E. H. H.</i>
2ND	
3RD	
SIGNED	

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 1/4/14

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> REID             | <input checked="" type="checkbox"/> SHIFT SUPERVISOR | <input type="checkbox"/> SCRUBBER SHIFT SUPERVISOR   |
| <input checked="" type="checkbox"/> GREEN | <input checked="" type="checkbox"/> CONTROL OPERATOR | <input type="checkbox"/> SCRUBBER OPERATOR           |
| <input type="checkbox"/> COLEMAN          | <input type="checkbox"/> AUXILIARY OPERATOR          | <input type="checkbox"/> SCRUBBER AUXILIARY OPERATOR |
| <input type="checkbox"/> WILSON           | <input type="checkbox"/> UTILITY OPERATOR            | <input type="checkbox"/> SOLID WASTE OPERATOR        |
|   | <input type="checkbox"/>                             | <input type="checkbox"/> SCRUBBER UTILITY OPERATOR   |

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
4 <sup>15</sup>	G-1 Gen Disc Repair and Release
4 <sup>42</sup>	1A on 0 6 <sup>8</sup> 2A on 38.4 0 6 <sup>10</sup> 1D on 5 6 <sup>9</sup> 2B on 37.6 4B 6 <sup>8</sup>
4 <sup>32</sup>	G-2 Drum Trips back in service.
4 <sup>33</sup>	G-1 Tied out. Notified H/H
—	Transferred fuel oil from Reid to Green. Our day tank before 9'7". After 14'3 1/2". This is after we received delivery of kerosene that went directly in our day tank. Notified Reid R/L of numbers.
8 <sup>00</sup>	C Shift here B Shift leaving
	Underflow 1A 40+ 0+ 6'10" 2A) 37.1 0+ 6'9" 1B) 40+ 4+ 6'10" 2B) 34.9 50+ 6'8" Bed 0.12 Flack 7.5
8 <sup>38</sup>	G-1 D Mill on 9" G-1 D Mill off
9 <sup>13</sup>	G-1 C Mill on
10 <sup>48</sup>	G-1 C Mill on

OPER	SUP'R
1ST	
2ND	
3RD	
SIGNED <u>Guero Sp-12m</u>	

F155.12  
R 1/93

# Forced Outage Report

## Estimated Outage Costs

Material and Labor \$0

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>Green 1 - G1-14-01 &amp; G1-14-02</b>		<b>Production Cost</b>	
<b>Date &amp; Time Off Line</b>	1/6/14 1:56 & 1/6/14 9:18		<b>MW</b>	<b>\$/MW</b>
<b>Date &amp; Time On Line</b>	1/6/14 6:49 & 1/6/14 16:33		91	\$ 27.34
<b>Outage Duration</b>	4 hr. 53 min. & 7 hr. 15 min.		163	\$ 24.37
<b>Outage Code</b>	U01 & U02		235	\$ 23.46
<b>Outage Reason</b>	Unit tripped off due to high drum level (frozen level transmitter). After start up, generator voltage issues discovered that B phase of disconnect did not fully close due to ice. Unit was removed from service and disconnect switch was repaired.			
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
1/6/14 (HE 3-24)	\$ 58.38	\$ 213.39	\$ (843,933)	\$ -
1/7/14 (HE 1-6)	\$ 80.53	\$ 404.28	\$ (119,037)	\$ -
<b>Total</b>			\$ (962,970)	\$ -
<b>Start Up Fuel Cost</b>			<b>Total Forced Outage Cost</b>	
S/U Fuel Consumed	48,914		DART P&L	\$ (962,970)
S/U Fuel Price	\$ 3.11		Lost Opportunity	\$ -
<b>S/U Fuel Cost</b>	<b>\$ (152,015)</b>		S/U Fuel Cost	\$ (152,015)
			<b>Total</b>	<b>\$ (1,114,985)</b>

# Forced Outage Report

**To:** Bob Berry

**From:** Billy Boarman

**Date:** 7-Feb-2014

**Plant:** HMP&L Station Two

**Unit:** 2

**GADS Class:** UO2

## Duration

Trip Time: 31-Jan-2014 19:14

Tie Time: 3-Feb-14 06:03

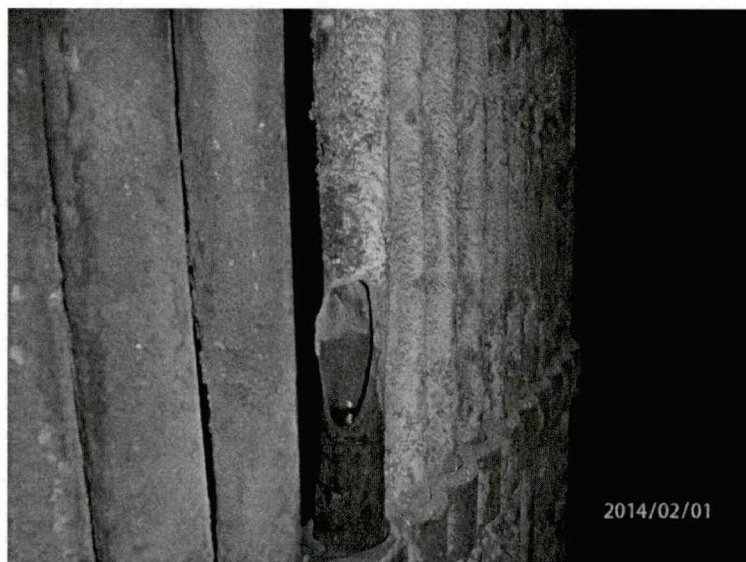
Time Offline: 58:49

## Outage Description

HMP&L Station Two Unit 2 was removed from service on Friday, 31-Jan-2014 at 19:14 due to a suspected tube leak in the Radiant Superheat Area of the boiler.

## Root Cause

Tube leak on the Radiant SH Outlet, 4<sup>th</sup> element from the west wall, North side of inner (hair pin) loop above the handcuff, at elevation 542' was caused by external corrosion.



# Forced Outage Report

## Failure History

5-Sep-2011	59:12	Tube leak in the high temperature superheater section caused by soot blower erosion.
23-May-2012	56:38	Tube leak in the radiant superheat section caused by soot blower erosion.
7-Sept-2012	42:7	Tube leak in the radiant superheat section caused by soot blower erosion.
5-Oct-2012	53:24	Tube leak in the radiant superheat section caused by soot blower erosion.
26-Jan-2013	33:37	Tube leak on the Radiant SH Outlet 3 <sup>rd</sup> element from the east wall, on the outer loop at elevation 537' – 5" caused by external corrosion

## Corrective Action

Installed a 22" Dutchman at the leak location (north tube) and also a 22" Dutchman on the tube in front of the leak (south tube) of the hair pin at elevation 542'

# Forced Outage Report

## SOE Print Out

Triggered on: 31-Jan-2014 19:13:51:453

31-Jan-2014 19:14:06:718	TRIP	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
31-Jan-2014 19:14:06:457	OK	H240STPVLVTRP	TURB STOP VLV CLSD TRIP
31-Jan-2014 19:14:05:775	TRIP	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
31-Jan-2014 19:14:02:748	OK	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
31-Jan-2014 19:14:02:585	TRIP	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
31-Jan-2014 19:14:02:097	OK	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
31-Jan-2014 19:14:01:875	TRIP	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
31-Jan-2014 19:13:56:447	OK	H233LMISTRP	LAST MILL IN SERVICE TRIP
31-Jan-2014 19:13:56:316	LOW	H222HTR2LVLL0	LP HEATER 2-3 LEVEL LOW
31-Jan-2014 19:13:56:248	OK	H222HTR2LVLL0	LP HEATER 2-3 LEVEL LOW
31-Jan-2014 19:13:55:624	OPEN	H250FLDBKRSTS	GEN H2 FIELD BKR STATUS
31-Jan-2014 19:13:55:619	OPEN	H250OCB186STS	OCB 0186 GEN H2 STATUS
31-Jan-2014 19:13:55:609	OPEN	H250OCB182STS	OCB 0182 GEN H2 STATUS
31-Jan-2014 19:13:55:516	OK	H250OCB186GETR	OCB 0186 GEN H2 TRIP
31-Jan-2014 19:13:55:510	OK	H250OCB182GETR	OCB 0182 GEN H2 TRIP
31-Jan-2014 19:13:55:483	TRIP	H250OCB186GETR	OCB 0186 GEN H2 TRIP
31-Jan-2014 19:13:55:482	TRIP	H250OCB182GETR	OCB 0182 GEN H2 TRIP
31-Jan-2014 19:13:55:482	LKOUT	H240STPVLO86TV	TURB STOP VLV LOCKOUT (86TV3)
31-Jan-2014 19:13:52:865	LOW	H222HTR2LVLL0	LP HEATER 2-3 LEVEL LOW
31-Jan-2014 19:13:52:451	TRIP	H233LMISTRP	LAST MILL IN SERVICE TRIP
31-Jan-2014 19:13:52:022	OK	H222HTR2LVLHI	LP HEATER 2-3 LEVEL HIGH
31-Jan-2014 19:13:51:759	HIGH	H222HTR2LVLHI	LP HEATER 2-3 LEVEL HIGH
31-Jan-2014 19:13:51:703	TRIP	H233EMERBLRTRP	EMERGENCY BLR TRIP
31-Jan-2014 19:13:51:653	OK	H222HTR2LVLHI	LP HEATER 2-3 LEVEL HIGH
<b>31-Jan-2014 19:13:51:453</b>	<b>TRIP</b>	<b>H240STPVLVTRP</b>	<b>TURB STOP VLV CLSD TRIP</b>
31-Jan-2014 19:13:51:307	HIGH	H222HTR2LVLHI	LP HEATER 2-3 LEVEL HIGH

# Forced Outage Report

## Other Work Completed While Unit Was Offline

- Repaired gas leaks on the bottom ash hopper and the 'B' air heater inlet expansion joint
- Repaired air leak on the 'A' PA fan duct
- Clean 480V transformer
- Repaired packing leak on #5 high pressure heater extraction valve
- Cleaned furnace and PA Fan taps
- Cleaned Wet bottom Seal Trough
- Cleaned Scrubber Mist Eliminator panels and nozzles
- Precipitator inspection
- Back-pass inspection
- Calibrated all coal feeders.
- Changed oil in all FD Fan, PA Fan, and Mill motors
- Repaired coal leaks on "A" Mill
- Repaired coal leaks on "B" Mill
- Replaced damaged section of B4 coal pipe on 5<sup>th</sup> floor
- Replaced boiler manifold header
- Cleaned seal air fan filters
- Replaced A1 burner shroud
- Repaired coal leak on A1 burner
- Replaced 'B' seal air fan motor
- Replaced left hand governor valve cylinder
- Replaced #20 and #23 observation ports
- Replaced EH unit filters
- AH wash, 9 hr. pass
- Installed a new gate on A2 bunker gate
- BMR repairs to 4 Reheat tubes in the #36 soot blower path that were found during the back pass inspection at elevation 545' - 2"

# Forced Outage Report

## Operators Event Log

1/31/2014	8:00AM	SAFETY BRIEFING												
	NOTE:	H2 DERATED 5 MW'S DUE TO PLUGGAGE OF AIR HEATERS												
	NOTE:	POTABLE WATER LEAK AT COOLING TOWERS. LINE APPEARS TO GO TO ELECTRICAL SHOP. TRYING TO GET IT ISOLATED												
	NOTE:	TAGGING OUT STEAM TO GAS TURBINE TRAP AT WARMING STATION												
	NOTE:	MAINT SETTING PRESSURES ON H2 AIR HEATER STEAM CLEANERS												
	8:45AM	TAGGED OUT R1 CENTAC AIR COMPRESSOR TO CHANGE FILTERS												
	NOTE:	ISSUED WO ON LEAK ON BLEED DISCHARGE LINE BEHIND BUILDING LEAKING. LOTS OF ICE												
	10:00AM	NEW TRAP AND STRAINER INSTALLED ON GAS TURBINE WARMING STATION												
	10:30AM	7A CONVEYOR RELEASED AND IN SERVICE												
	10:35AM	22R SOOTBLOWER ON R1 WONT BLOW. ELECTRICIANS WORKING ON SAME												
	NOTE:	27L SOOTBLOWER ON R1 BLOWING MORE STEAM OUT THAN IN AND VIBRATING BADLY. SPOKE WITH J.WEST. PARTS ON ORDER												
	1:00PM	INLAND ON SITE TO SHOOT THE DRAIN BY THE R1 STACK												
	2:00PM	H2 B RECYCLE PUMP ON , A RECYCLE PUMP OFF FOR ELECTRICIANS TO SET SUCTION VALVE LIMITS												
	2:10PM	22R SOOTBLOWER ON R1 WORKING AGAIN												
	2:30PM	R1 CENTAC BACK IN SERVICE. AIR SYSTEM SET UP NORMAL												
	2:40PM	R1 #25L HITTING SOMETHING AND BACKING OUT. NOTIFY MAINT												
	2:45PM	H2 A RECYCLE PUMP ON, B OFF. B SUCTION VALVE <u>NOT</u> COMPLETED												
	2:55PM	R1 #22R CHAIN BROKEN. MAINT WORKING ON SAME												
	3:00PM	MAINT GOT POTABLE WATER LINE ISOLATED AT COOLING TOWERS. A1 SEPTIC WILL BE HERE MONDAY TO REPAIR LINE												
	3:25PM	R1 25L AND 22R NOT WORKING. MAINT GONE. NOTIFY J.WEST.												
	3:35PM	T.GREY, AND J.JACKSON ARE COMING BACK IN												
	4:30PM	H2 FURNACE PRESSURE JUMPED UP TO 20.1, AH DIFF 8.8, 9.8, BACKING LOAD DOWN TO 155MW'S												
	5:45PM	RUNNING HOTWELL CHECK ON H2. LOST 5" IN TEN MINUTES. SPOKE WITH J.FRANCIS. TAKING UNIT OFF												
	6:00PM	AMMONIA TRIPPED OFF H2, TAKING UNIT OFF												
	6:11PM	CALLED EXPRO. WILL HAVE DE SLAG CREW HERE BY 3:30 - 4:00AM												
	NOTE:	H-2 A-2 BUNKER GATE WILL NOT CLOSE - W.O. ISSUED												
	7:14PM	H-2 UNTIED												
	7:14PM	H-2 SCRUBBERS OUT OF SERVICE												
	7:15PM	H-2 PRECIPS OUT OF SERVICE												
1/31/2014	8:00PM	MORRIS, DENTON, REYNOLDS, BAKER, TATE, GATTON, EDWARDS												
		D SHIFT - ASKINS												
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
		R1	48	50	45	0.45	10.9	0.41	11					
		H1	165	165	153	0.27	10.5	0.07	22	93	10.99	257	3.5	
		H2	OUTAGE											
		CT..	OFF STANDBY		65									
		ALARMS:												
		R1												
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT											
		H2	EH RES LEVEL HI											
		SOOT BLOWERS TAGGED												
		R1	22R,25L										GAUGE GLASSES	
		H1	20,26,29,30										OK	DRYING AGENT
		H2	35		SILO LVL		BOOTHE SYSTEM					R1-0%		
					14FT		IN					H1-0%		
												H2-0%		
	8:00PM	SAFETY BRIEFING												
	NOTE	COULD ONLY FIND ONE FAN FOR THE PENTHOUSE ON H-2												
	8:30PM	R-1 SOOT BLOWING SYSTEM RELEASED - 25L WILL NOT BLOW - BRINGING IN LOW PRESSURE ALARM - POSSIBLE END OF LANCE IS OFF.												
	10:30PM	R-1 GRINDER LOCKED UP - OPENED DOOR - FOUND SOOTBLOWING TIP (#25L)?												
	11:50PM	H-2 F.D. FANS OFF FOR MAINTENANCE TO OPEN BOILER DOOR												
	NOTE	CHECKED H-2 AIR HTR AIR DRIVES - RAN OK.												
2/1/2014	NOTE	INLAND HERE TO VACCUM PENTHOUSE												
	12:39AM	H-2 BOILER FEED PUMP ON - CAN NOT LOCATE THE TUBE LEAK												
	1:40AM	EXPRO AT GUARD SHACK - TWO NEED AMMONIA TRAINING.												
	2:01AM	H-2 BOILER FEED PUMP OFF, 1440 HYDRO - MAINT. FOUND LEAK, DRAINING BOILER												
	2:30AM	TITAN OPENING SCRUBBER DOORS AND REMOVING M.E. NOZZLES												
	4:30AM	EXPRO STARTED H-2 DE SLAG												
	5:20AM	TITAN HAS H-2 M.E. NOZZLES OUT												
	7:30AM	CHECKING TAGS WITH INLAND TO GET STARTED ON ME WASH												

# Forced Outage Report

2/1/2014	8:00AM	CECIL, FELTY, EMBRY, HILLYARD, BLAIR, JAMES, DUVALL										A SHIFT PAYNE		
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
		R1	48	50	45	4.6	10.8	0.44	9.5					
		H1	165	165	153	0.298	10.7	0.079	24.6	94.7	9.7	237	3.6	
		H2		165	OFF FOR TUBE LEAK								CTL / 15.1'	
		CT..	OFF STANDBY		65									
		ALARMS:												
		R1												
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT											
		H2	EH RES LEVEL HI											
		SOOT BLOWERS TAGGED						GAUGE GLASSES		PWTL / 27		DRYING AGENT		
		R1							OK				R1-0%	
		H1	20,26,29,30										H1-0%	
		H2	35										H2-0%	
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH								
		LEVELS	8' 4"	9' 5 1/2"	14' 9 1/2"	8 5/8"	SILO LVL		BOOTHE SYSTEM					
									8FT		OUT			
2/1/2014	8:00AM	SAFETY BRIEFING												
		NOTE: BOILER DESLAG ONGOING												
	8:15AM	STARTED ME WASH AT SCRUBBERS (INLAND)												
	11:01AM	ISSUE HOLD ON #0189 DISCONNECT												
	11:30AM	BOILER DESLAG COMPLETE. PULLING DOWN WETBOTTOM AND TAGGING FOR ENTRY												
	11:50AM	EXPRO OFF TAGS AND LEAVING												
	12:30PM	H2 WETBOTTOM TAGGED. NOTIFY B.CHEATHAM												
	1:00PM	INLAND WORKING ON H2 ECONOMIZERS												
		NOTE: COVERING FANS AROUND H2 WETBOTTOM												
	2:00PM	NOTIFY MAINT THEY CAN TAKE CORNER PLATES OFF OF WET BOTTOM												
	2:10PM	WORKING ON GETTING PRECIP DOOR OPEN AND CLEANED OUT												
		NOTE: H2 ELECTROMATIC FOR H2 REPAIRED												
	2:35PM	H2 BOILER PORT AIR TAGGED OUT												
	3:00PM	H1 # 26 SOOTBLOWER BACK IN SERVICE												
	4:40PM	R1 GRINDER LOCKED UP. ELEC CHECKED MOTOR. OK USING FLUSHING JETS TO SEAL OFF GATE SO WE CAN CHECK INSIDE												
	5:00PM	H2 PRECIP HOPPERS CLEAN												
		NOTE: H2 VOLTAGE REGULATOR FIXED												
2/1/2014	8:00PM	MORRIS, DENTON, REYNOLDS, BAKER, TATE, GATTON, EDWARDS										D SHIFT - ASKINS		
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
		R1	48	50	45	0.45	10.6	0.38	10.6					
		H1	165	165	153	0.37	10.5	0.06	22	93	8.71	260	3.8	
		H2	OUTAGE											
		CT..	OFF STANDBY		65									
		ALARMS:												
		R1												
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT											
		H2	EH RES LEVEL HI											
		SOOT BLOWERS TAGGED						GAUGE GLASSES						
		R1	22R						OK		DRYING AGENT			
		H1	20,29,30								R1-0%			
		H2	35						SILO LVL		H1-0%			
						2' BELOW 1				H2-0%				
		BOOTHE SYSTEM IN												
	8:00PM	SAFETY BRIEFING												
	8:09PM	H-2 VACCUM PUMPS ON FOR HYDRO												
	8:45PM	H-2 VACCUM CHECK IS GOOD ON H-2												
	11:40PM	H-2 M.E. PANELS ARE FINISHED - NOTIFIED J. WEST.												

# Forced Outage Report

2/2/2014	2:20AM	H-2 B BFP ON FOR HYDRO											
	3:25AM	H-2 HYDRO 1440 lbs											
	3:55AM	H-2 DRY BOILER											
	4:15AM	H-2 AIR HTR WASH STARTED											
	NOTE	WORKING ON SETTING H-2 BOILER TO FIRE											
	NOTE	REMOVED 32 BARRELS OF AIR HTR BASKET MATERIAL H-2											
2/1/2014	8:00AM	CECIL, FELTY, EMBRY, HILLYARD, BLAIR, JAMES, DUVAL										A SHIFT PAYNE	
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE
		R1	48	50	45	4.34	10.9	0.392	10.3				CTL 18.0'
		H1	165	165	153	0.396	10.5	0.081	19.7	92.6	8.97	256	PWTL / 27.2'
		H2		165	OFF FOR TUBE LEAK								CTL / 15.1'
		CT..	OFF STANDBY		65								
		ALARMS:											
		R1											
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT										
		H2	EH RES LEVEL HI										
	SOOT BLOWERS TAGGED						GAUGE GLASSES		PWTL / 27		DRYING AGENT		
	R1							OK				R1-0%	
	H1	20,26,29,30										H1-0%	
	H2	35										H2-0%	
	FUEL OIL		C.H.	HMPL	NORTH	SOUTH			SILO LVL	BOOTHE SYSTEM			
	LEVELS		8' 2 3/8"	9' 5 1/2"	14' 9 1/2"	8 5/8"			6.5FT	OUT			
2/2/2014	8:00AM	SAFETY BRIEFING											
	NOTE:	INLAND WORKING IN H2 ECONS AND AIR HEATER WASH											
	10:00AM	FLUSHING ME WASH HEADERS H2											
	10:30AM	ELECTRCIANS WORKING ON CLEANING 480V LOAD CENTERS											
	11:30AM	ME WASH HEADERS FLUSED. NOTIFY B.CHEATHAM											
	11:45AM	PULLING VAC ON H2 FOR MAINT											
	11:50AM	INLAND WORKING ON H2 WET SEAL. MAINT WORKING ON H2 SEAL AIR FAN. THERE WORK IS POSTPONING WET SEAL JOB											
	12:15PM	TRANSFERRED FUEL OIL TO HMPL TANK FOR START UP											
	1:15PM	H2 VAC PUMPS OFF											
	2:00PM	H2 480V LOAD CENTERS BACK IN											
	CALLING IN HELP FOR TONIGHT, JW WADLINGTON-LM, T.ALEXANDER-LM, A.HOGAN-LM, J.BOWLEY-LM, C.GRIFFIN-LM, D.EDMONDS-LM, T.JACKSON-LM												
	D.ONAN-CANT COME IN, AT HOSPITAL WITH FATHER IN LAW GETTING READY TO PASS												
	2:30PM	INLAND DONE PULLING HEADS OUT OF AIR HEATER. NOTIFY MAINT											
	NOTE:	WORKING WITH MAINT TRYING TO GET AIR DRIVES TO WORK FOR THEM TO WORK ON AIR HEATER BASKET											
	2:45PM	WASHING H2 STEAM COILS AND FD FANS											
	3:30PM	H2 WET SEAL COMPLETED. NOTIFY MAINT											
	3:40PM	D.EDMONDS CALLED. WILL BE IN TONIGHT AT 8PM											
	3:45PM	R1 24L SOOTBLOWER KEEPS BRINGING IN LOW PRESSURE ALARM LIKE THERE IS A HOLE IN LANCE OR END IS GONE. NOTIFY MAINT. THEY WILL GET TO IT WHEN THEY CAN											
	4:00PM	WORKING WITH INSTRUMENTATION STROKING H2 TURBINE VALVES											
	4:05PM	H2 ECONS COMPLETED											
	4:10PM	MOVING INLAND BACK INTO AIR HEATERS TO VACUUM OUT AREAS IN FRONT OF AIR HEATERS											
	4:40PM	STEAM COILS AND FD FANS CLEAN ON H2. NOTIFY MAINT											
	5:06PM	R. DENTON CALLED IN FOR PERSONAL DAY. OK											
	5:27PM	T.JACKSON CALLED BACK. WILL BE IN AT 8PM											
	5:30PM	INLAND HAVING TROUBLE WITH AIR HEATER CLEANUP. LINE KEEPS PLUGGING UP WITH METAL AND IS FREEZING UP											
	5:35PM	STROKING H2 B MILL BYPASS DAMPERS WITH INSTRUMENTATION											
	NOTE:	R. JENKINS ON VACATION MONDAY.											
2/2/2014	8:00PM	MORRIS, DENTON-P.D., REYNOLDS, BAKER, TATE, GATTON, EDWARDS										D SHIFT - ASKINS	
		JACKSON, EDMONDS											
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE
		R1	45	50	45	4.4	10.6	0.45	10.6				
		H1	165	165	153	0.41	10.4	0.06	33	93	10.31	236	3.8
		H2	OUTAGE										
		CT..	OFF STANDBY		65								
		ALARMS:											
		R1											
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT										
	H2	EH RES LEVEL HI											
	SOOT BLOWERS TAGGED						GAUGE GLASSES						
	R1	24L, 25L						OK		DRYING AGENT			
	H1	20,29,30								R1-0%			
	H2	35								H1-10%			
						SILO LVL	BOOTHE SYSTEM						
						9'	OUT						

# Forced Outage Report

	8:00PM	SAFETY BRIEFING																	
	9:31PM	H-2 F.D. FANS ON FOR DOOR CHECKS																	
	9:53PM	H-2 DOORS CHECKS ARE GOOD - OK TO FIRE THE BOILER																	
	10:04PM	H-2 - FIRE IN BOILER																	
	10:40PM	RUNNING 10% DRYING AGENT TO HMPL																	
	11:42PM	CLOSED IN H-2 GEN DISCONNECT 0189																	
2/3/2014	12:20AM	CLOSED H-2 DRUM VENTS																	
	1:07AM	CLOSED H-2 PRI - SEC SUPER HEAT DRAINS.																	
	NOTE	H-2 TOOK #6 HEATER OUT OF SERVICE, POSSIBLE LEAK.																	
	3:25AM	H-2 PULLING VACUUM																	
	3:49AM	H-2 ROLLING TURBINE																	
	3:55AM	H-2 HOLDING AT 1000 RPM FOR LUBE OIL TEMPTURE																	
	6:03AM	H-2 TIED ON LINE																	
	6:04AM	H-2 PRECIPS INSERVICE																	
	7:42AM	H-2 'A' MILL ON																	
2/3/2014	8:00AM	CONN. CLARK, BREEDEN, HIGGINS, CUTSHAW, BLANKS & YOUNG										B SHIFT - PENDLEY							
		JOHNSON HERE																	
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE						
		R1	43	50	44	4.5	10.5	0.487	7.9					CTL	18'				
														PWTL	27'				
		H1	165	165	153	0.371	10.8	0.076	31.1	92.9	10.11	215	3.9						
		H2	135	165		0.245	9.9	0.494	9.2	95.1	5.22		3.3						
		C.T. OFF STANDBY																	
		ALARMS:										GAUGE GLASSES							
		R1											OK						
		H1	STEAM SEAL HI/LO BURNER MANGT. EH PRESSURE LO/PUMP START REQ, DRUM MAINT																
		H2	EH RES LEVEL HI																
		SOOTBLOWERS TAGGED														DRYING AGENT			
		R1											H-1 10%						
		H1	20,26,29,30										H-2 10%						
		H2	32,35,37																
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH						SILO	BOOTHE SYSTEM						
		LEVELS	7' 10 1/4"	9' 9 1/2"	14' 1/2"	8 5/8"						14'	OUT						
	2/3/2014	8:00AM	SAFETY BRIEFING																
8:15AM		TRIED TO PUT H-2 SCRUBBER IN SERVICE - BOOSTER FAN TRIPPED 3 TIMES - FOUND OUT THAT 'A' BOOSTER FAN PRESSURE TRANSMITTER WAS BAD																	
9:40AM		H-2 SCRUBBER IN SERVICE - ADDITIVE FEED ISOLATION VALVE WILL NOT OPEN - INST CHECKING																	
9:50AM		H-2 SILICA .509 - GOOD FOR 1600# DRUM																	
10:15AM		H-2 ADDITIVE FEED IN SERVICE																	
10:08AM		FUEL OIL OUT OF H-2 BOILER - NOTIFIED H/L																	
10:12AM		TRANSFERRED H-2 AUXILIARIES																	
11:16AM		H-2 SILICA .435 - GOOD FOR 1800 DRUM - RAISING SAME																	
11:25AM		MAINT RELEASED 7A CONVEYOR																	
12:32PM		GIVE H-2 SCR START SIGNAL																	
12:53PM		H-2 SILICA .391 - GOOD FOR FULL PRESSURE - RAISING SAME																	
1:10PM		H-2 IN ADS																	
1:42PM		H-2 'B' RECYCLE PUMP ON - 'A' OFF FOR ELECT TO SET LIMITS ON 'A' SUCTION VALVE																	
1:50PM		H-2 #4 ECONOMIZER DUST VALVE REPAIRED																	
2:59PM		H-2 SCR IN SERVICE - FLOWING AMMONIA - NOTIFIED H/L																	
2:45PM	VERIFIED TUBE LEAK IN H-2 #6 HEATER																		

# Forced Outage Report

## Boiler Tube Leak Record

Plant: HMP&L Station Two

Unit: 2

### Type of Leak:

Pin Hole ☐ Thick Lip Failure ☐ Thin Lip Failure ☒

Tube Wall Thinning ☒ ( 4 RH tubes)

Orientation of Rupture: Longitudinal ☒ Circumferential ☐

### Probable Cause:

Stress ☐ Overheat ☐ Erosion ☐ Internal Corrosion ☐

External Corrosion ☒ Weld Failure ☐ (Shop ☐ Field ☐

Internal Obstruction to Flow ☐ Soot blower Erosion ☒ (4 RH tubes)

Other ☐

### Type of Repair:

Dutchman ☒ Pad Weld ☒ (4 RH tubes) Plug Tube ☐ Short

Circuit ☐ Other ☐

### Description of Repair:

Installed a 22" Dutchman above the handcuff and hair pin at the leak location (north tube) and also a 22" Dutchman on the tube in front of the leak (south tube) due to steam cutting from the leak at elevation 542'. Also performed BMR's to 4 Reheat tubes in the #36 soot blower path that were found during the back pass inspection at elevation 545' - 2"

# Forced Outage Report

## Exact Location of Leaks:

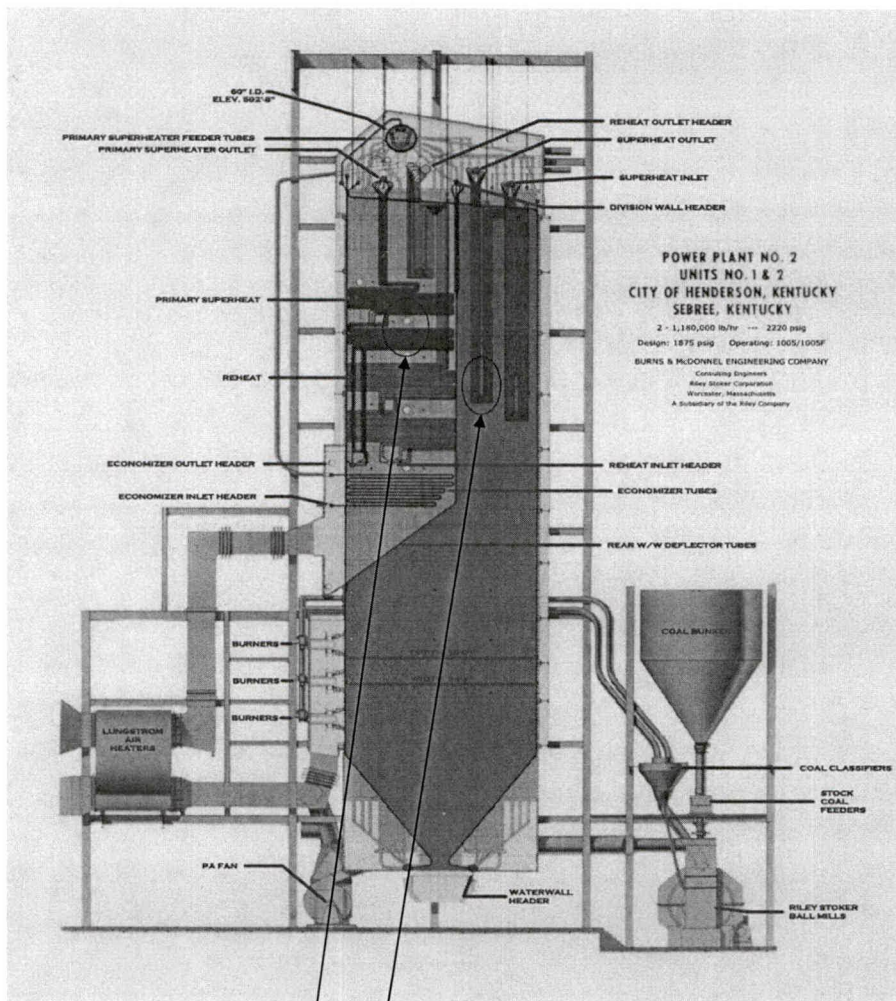
HMPL STATION UNIT 2

2014

(6) TUBES INVOLVED

Date and Time Unit Off 19:14 1-31-14

Date and Time Unit On 06:03 2-3-14



Installed a 22" Dutchman above the handcuff and hair pin at the leak location (north tube) and also a 22" Dutchman on the tube in front of the leak (south tube) due to steam cutting from the leak at elevation 542'. Also performed BMR's to 4 Reheat tubes in the #36 soot blower path that were found during the back pass inspection at elevation 545' - 2"

# Forced Outage Report

## Estimated Outage Cost

- Boiler De-Slag

**Total            \$9,246.63**

- Vacuuming Economizer Hoppers, Wash seal trough, ME panels and the AH's

**Total            \$23,041.52**

- Titan – SH tube leak repair

Labor            \$16,740

Material        \$800

**Total            \$17,540**

- Titan – Misc. repairs (Gas leaks, coal leaks, AH Repairs)

Labor            \$45,240

Material        \$5,353.53

**Total            \$50,593.53**

**Grand Total        \$100,421.68**

# Forced Outage Report

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>HMP'L 2 - H2-14-01</b>		<b>Production Cost</b>	
<b>Date &amp; Time Off Line</b>	1/31/14 19:14		<b>MW</b>	<b>\$/MW</b>
<b>Date &amp; Time On Line</b>	2/3/14 6:03		72	\$ 32.59
<b>Outage Duration</b>	58 hr. 49 min.		127	\$ 29.86
<b>Outage Code</b>	UO2		149	\$ 29.54
<b>Outage Reason</b>	Repair superheater tube leak.			
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
1/31/14 (HE 20-24)	\$ 56.01	\$ 36.74	\$ (3,948)	\$ -
2/1/14 (HE 1-24)	\$ 35.28	\$ 32.10	\$ (9,039)	\$ (689)
2/2/14 (HE 1-24)	\$ 33.27	\$ 40.19	\$ -	\$ (13,589)
2/3/14 (HE 1-15)	\$ 48.87	\$ 41.22	\$ (1,431)	\$ (17,233)
<b>Total</b>			<b>\$ (14,419)</b>	<b>\$ (31,511)</b>
<b>Start Up Fuel Cost</b>			<b>Total Forced Outage Cost</b>	
S/U Fuel Consumed	14,102		DART P&L	\$ (14,419)
S/U Fuel Price	\$ 3.11		Lost Opportunity	\$ (31,511)
<b>S/U Fuel Cost</b>	<b>\$ (43,911)</b>		S/U Fuel Cost	\$ (43,911)
			<b>Total</b>	<b>\$ (89,841)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Bob Berry

**From:** Eric Anderson

**Date:** 30-Apr-2014

**Plant:** Wilson

**Unit:** 1

**GADS Class:** UO2

## Duration

Trip Time: 1-Jan-2014 09:43

Tie Time: 6-Jan-2014 03:41

Total Time Offline: 113:58

## Outage Description

Wilson Station was removed from service on Wednesday, 1-Jan-2014 at 09:43 following an explosion of combustible vapor inside the front standard of the main turbine and subsequent fire on the insulating blankets of the HP/IP Turbine. The outage time was extensive due to the need to remove the front standard cover and inspect the main oil pump and extension shaft. The initial explosion blew the inspection cover off the front standard and allowed turbine oil to get onto the insulation blankets.

## Root Cause

The grounding brushes that normally collect the static electricity from the rotor shaft were not sufficiently discharging the rotor because they were dirty. Combustible oil mist vapor inside the front standard of the turbine was ignited by static electrical arcing between the rotor shaft and the oil seals on #1 turbine bearing.

## Failure History

There has never been a failure of this nature reported on this unit.

## Corrective Action

The turbine rotor shaft was cleaned in the grounding area and the grounding brushes were replaced. The generator loop seal vapor extractor and the turbine lube oil vapor extractor pressure were reduced to minus three inches (-3" H<sub>2</sub>O) vacuum to improve vapor removal from the lube oil system. Going forward the grounding brushes will be inspected and cleaned each time the unit is removed from service. The main oil pump and extension shaft will be refurbished during the 2014 spring outage.

# Forced Outage Report

## SOE Print Out

N/A

## Other Work Completed While Unit Was Offline

### ELECTRICAL

- Unit freeze protection
- Rotor grounding brush repairs

### INSTRUMENTATION

- Unit freeze protection

### MECHANICAL

- Inspected turbine front standard
- Unit freeze protection

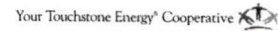
# Forced Outage Report

## Operators Event Log

1/1/2014	12:00mn	HAPPY NEW YEAR
	1:00am	1st day of month misc checks
		WO# 6117952 #1 Bottom ash Recirc pump is making a lot of noise and vibrating
	2:40am	Changed out lube oil strainer and cleaned dirty one.
	5:00am	SO3 system in service
		Unit Status Update
	7:00am	Todd in, Mattingly out
		Current-448 Gross MW 417 Net MW Cap @ 8:00am
		SCR in, SO3 in, 1,2,3,4 modules, CSI 12', Ball mill- #2-49 amps
		1,2,4,5 Mills Boiler O2-3.1% Windbox- 2.72 Total Coal-367 Total Air- 93.65% Control Air Dwpt- -71.9
		So2 Removal- 2.0 Nox-.064 Opacity- 5.2%, Ammonia tank levels- 47/46 SO2 inlets- 5.2/5.0 CO 162/227
		H2 Pressure- 57 H2 Purity- 98% Gen. Gas Density- 39% INWC Fan Diff.- 72 Seal Oil Diff.- 14 LBS H2 Dew Point out- -112
		Back Press.- 2.92 avg. Stator Gas Temp. diff.- 7.54 Gen. Voltage- 24.04 Gen. Megavars- 107 Ambient Temp 27
		McIntyre, J. Stewart, Hall, Drake, Barrett in
	8:00am	Safety Briefing
		Swift to water plant
	8:15am	Scott to water plant
	8:30am	Boiler Walkdown
	9:00am	Flushed Wet Seal
		Oil leak on front standard
	9:43am	MFT
		WO# 6117963 West reheat inlet drain knocker vlv will not open all the way
		WO# 6117962 Both finshing outlet drains on 2nd fl leaking below iso vlv
		WO# 6117961 Exciter door seal falling off
	8:00pm	Owens in Todd out
		McCarty, Mcelwain, S.Roby, Wilson, Worley in. Piper on S/L
		Safety Briefing
		Working on blowing out steam coils
		Working on draining the waterwalls
1/2/2014	12:00am	Daily report
		Purged generator with CO2
		Working on main bowser filters
	7:00am	Todd in Owens out
	8:00am	McIntyre, J. Stewart, Hall, Drake, Barrett, Caldwell, in
		Safety Briefing
	8:00pm	Owens in Todd out
		McCarty, Mcelwain, S.Roby, Wilson, Worley in. Piper on S/L
		Safety briefing
1/3/2014	12:00am	Daily report
	4:45am	V.Norris taking his P/D today. A&T filled out
		Changed filter 2 times on B lift pump
	7:00PM	Cooper, in Mattingly out
		MW KPPH SO2 NOX OPAC REMOV CO2 4 MILLS 4 MODULES 15 CIRC PUMPS
		MVARS SLURRY FEED TANKS CO Sludge tanks VOLTAGE BED LEVEL 96"
	8:00PM	Roby, Stewart S/L, Baker, Poore, Jones, Calhoun P/D Hall
		Safety briefing
		Unit off line
	7:00PM	Cooper, in Mattingly out
		MW KPPH SO2 NOX OPAC REMOV CO2 4 MILLS 4 MODULES 15 CIRC PUMPS
		MVARS SLURRY FEED TANKS CO Sludge tanks VOLTAGE BED LEVEL 96"
	8:00PM	Roby, Stewart S/L, Baker, Poore, Jones, Calhoun Hall
		Safety briefing
		Unit off line
		Cleaning Main lube oil tank
		Filling Lube oil tank
		Filling hotwell up to tube

# Forced Outage Report

1/5/2014	12:00mn	
	7:00am	Mattingly in Cooper out
	8:00am	Tichenor, Daugherty, Caldwell, Render Blandford on vac, A/T submitted, Stovall sick A/T submitted
		Safety Briefing
		Setting boiler to fire
		Set turbine bldg to fire
	6:00pm	Oil fire in boiler. Notified HL
	7:00pm	Cooper/Todd in, Mattingly/Owens out
		H. Roby, Baker, J. Stewart, Hall, B. Jones, Calhoun in
	8:00pm	Safety Briefing
1/6/2014	12:00am	
	3:05am	#1 mill on, precipis in service
	3:41am	Unit tied online
	3:49am	Steve Waltrip taking personal day. AT submitted
	5:00am	Unit Status Update
		WO# 6118374 WWP32 seal water switch froze and busted
		WO# 6118375 #1 FD fan discharge damper solenoid will not work
	8:00am	Owens, Mattingly in Todd, Cooper out
		Tichenor, McCarty, McElwain, S. Roby, Daugherty, Caldwell, Piper, Wilson, Render, Worley in
		Safety briefing
		Working on going to 5 mills
	4:45pm	SCR system in service. Notified H/L
	7:00pm	Todd/Cooper in, Owens/Mattingly out
		Current-448 Gross MW 417 Net MW Cap @ 8:00pm
		SCR in, SO3 in, 1,2,3,4 modules, CSI 4', Ball mill- #2-50 amps
		1,2,3,4,5 Mills Boiler O2-3.3% Windbox- 2.25 Total Coal-369 Total Air- 90.38% Control Air Dwpt- 9.7
		So2 Removal- 89.3 Nox-.094 Opacity- 6.8%, Ammonia tank levels- 45/64 SO2 inlets- 4.7/4.8 CO 23/98
		H2 Pressure- 59 H2 Purity- 98% Gen. Gas Density- 44% INWC Fan Diff.- 79 Seal Oil Diff.- 14 LBS H2 Dew Point out- -128
		Back Press.- 3.30 avg. Stator Gas Temp. diff.- 6.36 Gen. Voltage- 24.03 Gen. Megavars- 174 Ambient Temp -1
		McIntyre, H. Roby, Baker, J. Stewart, Hall, Drake, B. Jones, Barrett in
	8:00pm	Safety Briefing
		Freeze protection
	9:30pm	Boiler Walkdown
		Checked all boiler valving
	10:00pm	CSI in service



# Forced Outage Report

**To:** Bob Berry

**From:** Bart Boles

**Date:** 28-Jan-2014

**Plant:** Wilson

**Unit:** 1

**GADS Class:** UO2

## Duration

Trip Time: 7-Jan-2014 23:16

Tie Time: 12-Jan-2014 12:47

Total Time Offline: 109:31

The unit tripped on low load one minute after it tied on.

## Duration

Trip Time: 12-Jan-2014 12:48

Tie Time: 12-Jan-2014 13:53

Total Time Offline: 1:05

## Outage Description

Wilson Station was removed from service on Wednesday 7-Jan-2014 at 23:16 due to a tube leak in the Finishing Superheat Section of the boiler. The leak was on the 12<sup>th</sup> element from the west wall, and was the 1<sup>st</sup> tube in from the outside of the bundle. This was on the 13<sup>th</sup> floor at elevation 562'-0". An additional leak was found on the crossover loop between the inlet and outlet bundles of the same finishing superheat section. On the first leak, Titan Contracting replaced a complete loop (35 feet) of the finishing superheat section starting on the outside (primary side) of the loop and going 6 foot up the inside of the loop. The loop section was 2" x 0.293 M.W. and was SA-213-T91. On the second leak, Titan Contracting installed a 24" Dutchman. The Dutchman was 2.25" x 0.300 M.W. and was SA-213-T91. Titan also pad welded six tubes adjacent to the loop tube that was replaced. The pad welds were all SA-213-T91 material.

After performing a hydro test on the boiler, an additional leak was found in the B-Platen superheat section of the boiler. This leak was on the 4<sup>th</sup> B-Platen superheat element and was the first tube on the outside of the bundle. Titan contracting installed an 18" Dutchman in this area. The tube material was 1.75" x .300 M.W. and was SA-213-T91. Additional work completed during this outage is listed in the sections below.

# Forced Outage Report

## Root Cause

It appears that the Finishing Superheat tube failed as a result of thinning caused by erosion from a soot blower over a period of time. The failure was approximately 18 inches in length.

## Failure History

The last tube leak in the boiler was in the "B" Platen Superheat Section and was on December 4, 2013. The last tube leak in the Finishing Superheat Section was on September 13, 2011.

## Corrective Action

The recommendation is to replace all 32 Finishing Superheat Elements during the next major unit outage. The new elements are on site and are located in the laydown area.

## Other Work Completed While Unit Was Offline

### ELECTRICAL

- No Major work completed

### INSTRUMENTATION

- No major work completed

### MECHANICAL

- Removed and reinstalled ammonia spools
- Repaired steam coils
- Repaired #6 alternate drain
- Repaired penthouse ventilation piping
- Repaired circulating water inlet sample port
- Performed back pass inspection and replaced shielding
- Installed handcuffs on superheat elements
- Repaired #2 ID fan inlet dampers that were locked up
- Repaired water wall tube membrane on 7<sup>th</sup>/8<sup>th</sup> floor north wall
- Repaired #2 condensate drain tank
- Repaired #6 economizer hopper

# Forced Outage Report

## Operators Event Log

1/7/2014	12:00am	Updated red tag file Trash FREEZE PROTECTION WO# 6118474 Water Treatment Plant fire alarm will not clear WO# 6118477 #2 BA recirc pump solenoid busted WO# 6118468 T353 1A drn clr level lo alarming constant WO# 6118476 AL3W bottom gate solenoid bad WO# 6118485 Both centac LO cooler TCVs leaking thru WO# 6118480 Diesel generator rm fire panel will not reset WO# 6118483 Control Air tank outlet filter needs to be changed
	5:00am	Unit Status Update
	8:00am	Owens, Mattingly in Todd, Cooper out Tichenor, McCarty, Mcelwain, S. Roby, Daugherty, Caldwell, Piper, Wilson, Render, Worley in Safety Briefing Drag chain came off. M/M working on Fire tank is empty. Put 2nd pump on at water plant Freeze protection Working on ice at cooling tower The SCR soot blowing line is frozen from the boiler bldg. to the control valves WR#6118537 on A side SCR line needs to be insulated from the reg to the handrail
	2:11pm	Set hydrogen at 60 psi and valved out the scavenger for test Drag chain back in service Poore called back and will be here tomorrow night at 8:00pm Smoke run
	3:30pm	Put drum gauge glass in
	7:00pm	Todd/Cooper in, Owens/Mattingly out Current-444 Gross MW 417 Net MW Cap @ 8:00pm SCR in, SO3 in, 1,2,3,4 modules, CSI 8', Ball mill- #2-50 amps 1,2,3,4,5 Mills Boiler O2-3.4% Windbox- 2.80 Total Coal-392 Total Air- 95.40% Control Air Dv So2 Removal- 90.9 Nox-.081 Opacity- 8.3%, Ammonia tank levels- 39/64 S02 inlets- 5.2/4.8 C H2 Pressure- 60 H2 Purity- 98% Gen. Gas Density- 44% INWC Fan Diff.- 79 Seal Oil Diff.- 14 Back Press.- 3.47 avg. Stator Gas Temp. diff.- 6.90 Gen. Voltage- 24.05 Gen. Megavars- 161 McIntyre, H. Roby, Baker, J. Stewart, Hall, Drake, B. Jones, Barrett in
	8:00pm	Safety Briefing Freeze protection
	8:45pm	Boiler Walkdown
	9:32pm	Hotwell check started
	11:16pm	Unit trip
1/8/2014	12:00am	tube leak repair preparation
	5:00am	Unit Status Update
	7:00am	Owens, Mattingly in Todd, Cooper out Tichenor, McCarty, Mcelwain, S. Roby, Daugherty, Caldwell, Piper, Wilson, Render, Worley in Safety Briefing
	8:00am	checked coal feeder chutes to be clean Checked air heater hoppers, all are clean

# Forced Outage Report

		<p>Pulled down flyash hoppers          Cleaned out bottom ash chute          Cleaned mixer at CSI          Working on wkly and monthly testing          Checking and cleaning Main lube oil strainer every 4 hrs. if needed</p>
	5:00pm	cleaning boswer
	7:00pm	<p>Todd/Cooper in, Owens/Mattingly out          McIntyre, H. Roby, Baker, J. Stewart, Hall, Drake, B. Jones, Blandford, Poore in          Cleaning main bowser          Cleaning #4 module          Cleaning FD fan suction screen</p>
1/9/2014	12:00am	<p>Flushing slop drain 2 and 4 bearing could not get anything out of them          Daily report</p>
	7:00am	<p>Owens, Mattingly in Todd, Cooper out          Tichenor, McCarty, Mcelwain, S. Roby, Daugherty, Caldwell, Piper, Wilson, Render, Worley in          Safety Briefing</p>
	8:15am	Filling hotwell up to tube
	7:00pm	<p>Todd/Cooper in, Owens/Mattingly out          McIntyre, H. Roby, Baker, J. Stewart, Hall, Drake, B. Jones, Blandford, Poore in          Cleaning 2 and 5 deck oil guns          Setting turbine building up for fire          Working on slop drains</p>
1/10/2014	12:00AM	<p>Setting all steam coil to normal</p>
	4:00AM	Herman Roby out 4hrs vac a&t submitted
	5:00AM	Daily report
	8:00am	<p>Owens, Mattingly in Todd, Cooper out          Tichenor, McCarty, Mcelwain, S. Roby, Daugherty, Caldwell, Piper, Wilson, Render, Barrett in          Safety Briefing          Both east and west lime day tanks at CSI are empty .Started new pile          Safety meeting with A and B shift          Flyash silo 40'</p>
	1:00pm	<p>Weekly Disaster Alarm          Service water outage to repair leak on waste water sump pumps</p>
	4:00pm	Caldwell, Tichenor, Daugherty, Render out
	4:40pm	Service water system back in service
	8:00pm	<p>Todd/Cooper in, Owens/Mattingly out          McIntyre, H. Roby, J. Stewart, Baker, Hall, Poore, Drake, B. Jones, Worley in          Safety briefing          Monthly Fire Protection</p>
1/11/2014	12:00am	
	2:26am	Release to Hydro
	3:16am	At 1800# drum
	3:48am	Wet boiler
	8:00am	Owens in Todd, Cooper out

# Forced Outage Report

S.Roby, McCarty, Piper, Wilson, Barrett in. McElwain on vacation. A&T filled out  
Safety Briefing  
WR#6118889 on #1 fire hydrant is leaking underground  
Need to leave the outside air dryer valved out until M/M installs new valves on Monday. Hollar  
Crain removed the bad solenoid on the drag chain water spray. Will have to valve in spray now  
solenoid

8:00pm Todd in, Owens out  
McIntyre, H. Roby, J. Stewart, Hall, Baker, Poore, Drake, B. Jones, Worley in  
Safety Briefing  
Centac/control air problems

1/12/2014 12:00am WO# 6118927 #1 centac lube oil filters need to be changed  
2:50am Release to Hydro  
3:40am At 1800# drum  
3:50am Dry Boiler  
5:55am Release to fire  
Plant Headcount  
6:18am ID and FD fans on  
7:24am Fire in boiler.H/L notified  
8:00am Owens, Mattingly in Todd out  
Tichenor,McCarty,Mcelwain,Daugherty,S.Roby,Caldwell,Piper,Wilson,Render,Barrett in  
Safety Briefing  
12:43pm Precips in service.H.L notified  
12:47pm Unit tied online.H/L notified

# Forced Outage Report

## Boiler Tube Leak Record

### Finishing Superheat Tube

Plant: Wilson

Unit: 1

#### Type of Leak: (Check One)

Pin Hole \_\_\_\_\_ Thick Lip Failure \_\_\_\_\_ Thin Lip Failure \_\_\_\_\_

Tube Wall Thinning X Other: It appears that the tube leak occurred as a result of thinning, and then blew a section of tube out.

#### Orientation of Rupture: (Check One)

Longitudinal X Circumferential \_\_\_\_\_

#### Probable Cause: (Check One)

Stress \_\_\_\_\_ Overheat \_\_\_\_\_ Erosion X Internal Corrosion \_\_\_\_\_

External Corrosion \_\_\_\_\_ Weld Failure \_\_\_\_\_ (Shop \_\_\_\_\_ Field \_\_\_\_\_)

Internal Obstruction to Flow \_\_\_\_\_

Other: \_\_\_\_\_

#### Type of Repair: (Check One)

Dutchman: X Length of Dutchman: Entire Loop – Approximately 35' & and a 24" Dutchman.

Pad Weld: Yes (6 Pad Welds on adjacent tubes)

Plug Tube \_\_\_\_\_ Short Circuit \_\_\_\_\_ Other: \_\_\_\_\_

# Forced Outage Report

## Description of Repair:

Tube Size OD: 2" & 2.25" Wall Thickness: 0.293" M.W. & 0.300" M.W.

Tube Material: SA-213-T91

Welding Rod Used 90-SB3

Welded By: Daniel Burden, Jared Burden: Titan Contracting

## Exact Location of Leak: Be Specific

Finishing Superheat Section, 12<sup>th</sup> element from west wall, 1st tube in from the outside of the bundle. In the 13<sup>th</sup> floor area, elevation 562'-0". The other finishing superheat leak was in the same element in the crossover section.

# Forced Outage Report

## Boiler Tube Leak Record

### B-Platen Superheat Tube

Plant: Wilson

Unit: 1

#### Type of Leak: (Check One)

Pin Hole \_\_\_\_\_ Thick Lip Failure \_\_\_\_\_ Thin Lip Failure \_\_\_\_\_

Tube Wall Thinning \_\_\_\_\_ Other: X

#### Orientation of Rupture: (Check One)

Longitudinal X Circumferential \_\_\_\_\_

#### Probable Cause: (Check One)

Stress \_\_\_\_\_ Overheat \_\_\_\_\_ Erosion \_\_\_\_\_ Internal Corrosion \_\_\_\_\_

External Corrosion \_\_\_\_\_ Weld Failure \_\_\_\_\_ (Shop \_\_\_\_\_ Field \_\_\_\_\_)

Internal Obstruction to Flow \_\_\_\_\_

Other: Considering that was a very large bulge in the tube, it appears that the tube may have had water in it, froze, and busted. This is just a theory.

#### Type of Repair: (Check One)

Dutchman: X Length of Dutchman: 18" Pad Weld: No

Plug Tube \_\_\_\_\_ Short Circuit \_\_\_\_\_ Other: \_\_\_\_\_

# Forced Outage Report

## Description of Repair:

Tube Size OD: 1.75" Wall Thickness: 0.300" M.W.

Tube Material: SA-213-T91

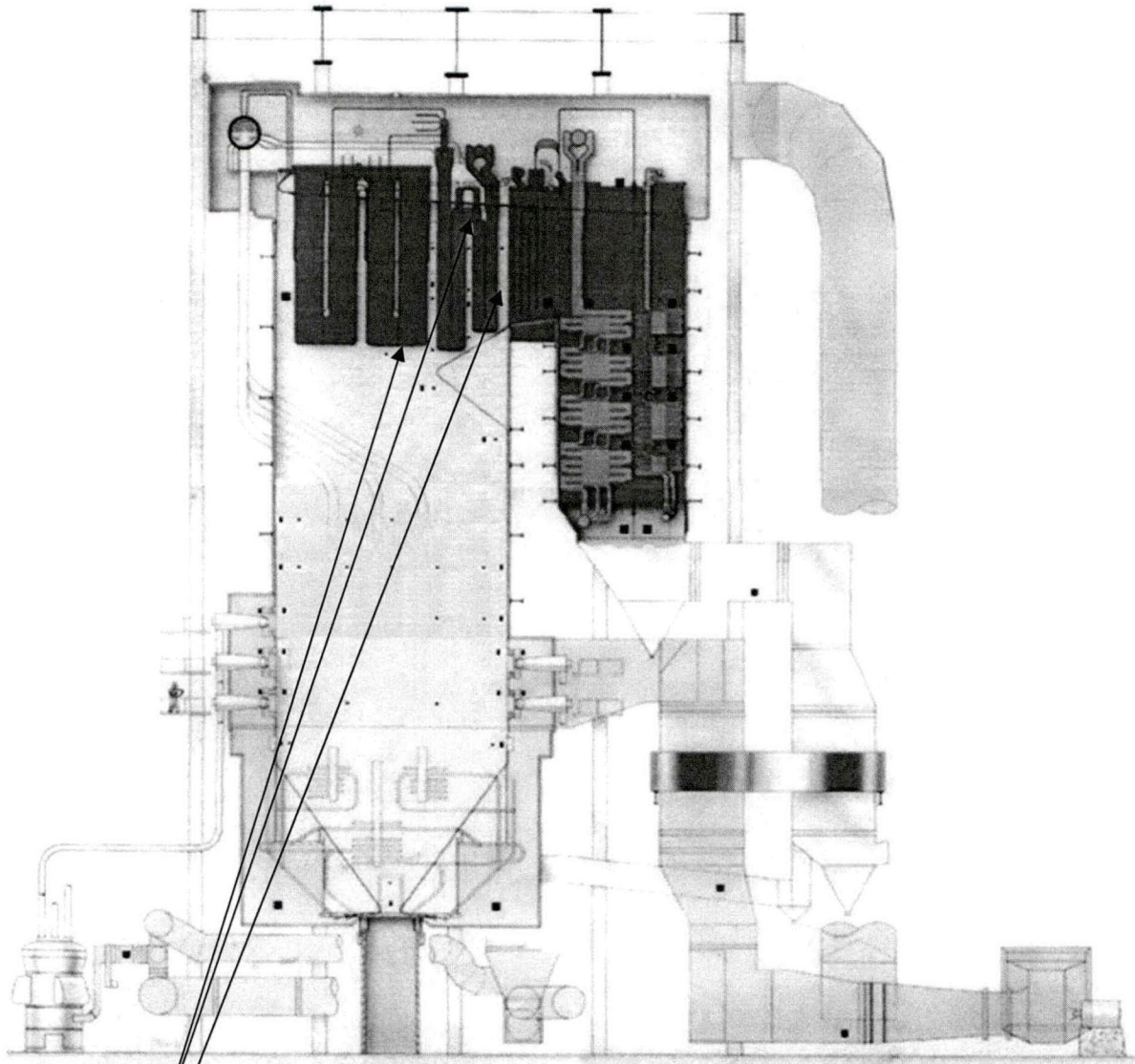
Welding Rod Used 90-SB3

Welded By: Daniel Burden, Jared Burden: Titan Contracting

## Exact Location of Leak: Be Specific

"B" Platen Superheat Section, 4<sup>th</sup> element from east wall, 1<sup>st</sup> tube in from the outside of the bundle, bottom of the loop, In the 13<sup>th</sup> floor area, elevation 562'-0".

# Forced Outage Report



**FOSTER WHEELER STEAM GENERATOR**  
FOR  
**BIG RIVERS ELECTRIC CORPORATION**  
D.B. WILSON STATION—UNITS 1 & 2  
Centertown, Kentucky

Burns and Roe—Engineers

Capacity: 3,484,000 lb/hr Design Pressure: 2950-690 psig

OPERATING CONDITIONS

Superheater Outlet Pressure: 2620 psig Temperature: 1005/1005F

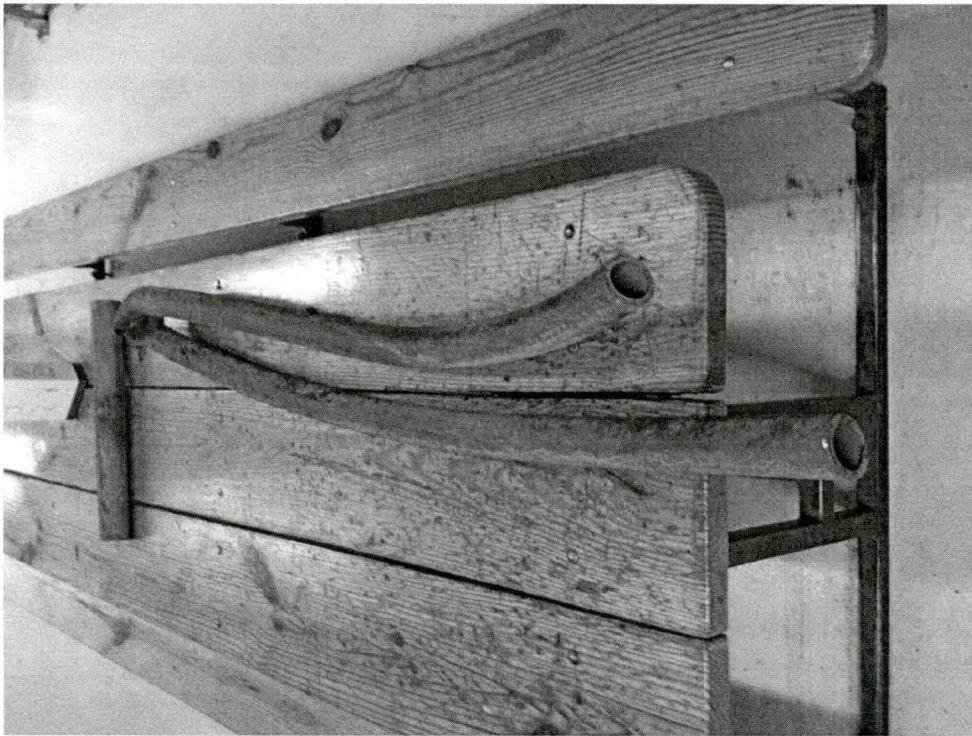
REHEAT UNIT

**Tube Leaks Here** – Finishing Superheat section 12<sup>th</sup> element from west wall, 1<sup>st</sup> tube, and crossover tube: “B” Platen Superheat Sections, 4<sup>th</sup> element from east wall, 1<sup>st</sup> tube in from the outside of the bundle, bottom of the loop. 13<sup>th</sup> floor area elevation 562’-0”

# Forced Outage Report

## PICTURES

### FINISHING SUPERHEAT TUBE LEAK



# Forced Outage Report

## B- PLATEN SUPERHEAT TUBE LEAK



# Forced Outage Report

## TOTAL OUTAGE COST

**TOTAL OUTAGE COST = \$90,635**

## Lost Opportunity

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>Wilson - W1-14-02 &amp; W1-14-03</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	1/7/14 23:16 & 1/12/14 12:48			<b>MW</b>
<b>Date &amp; Time On Line</b>	1/12/14 12:47 & 1/12/14 13:53			<b>\$/MW</b>
<b>Outage Duration</b>	109 hr. 31 min. & 1 hr. 5 min.			240
<b>Outage Code</b>	UO2 & UO1			340
<b>Outage Reason</b>	Repair tube leak in finishing superheater. Unit tripped on low load shortly after it tied on.			420
				\$ 26.43
				\$ 25.03
				\$ 24.48
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
1/7/14 (HE 24)	\$ 71.70	\$ 44.80	\$ (1,743)	\$ -
1/8/14 (HE 1-24)	\$ 96.88	\$ 77.25	\$ (526,037)	\$ -
1/9/14 (HE 1-24)	\$ 56.57	\$ 30.24	\$ -	\$ (321,153)
1/10/14 (HE 1-24)	\$ 31.67	\$ 33.95	\$ -	\$ (71,945)
1/11/14 (HE 1-24)	\$ 29.91	\$ 27.89	\$ (20,592)	\$ (22,147)
1/12/14 (HE 1-21)	\$ 28.84	\$ 30.51	\$ 123	\$ (20,997)
<b>Total</b>			\$ (548,249)	\$ (436,241)
<b>Start Up Fuel Cost</b>		<b>Total Forced Outage Cost</b>		
S/U Fuel Consumed	29,652	DART P&L	\$	(548,249)
S/U Fuel Price	\$ 2.98	Lost Opportunity	\$	(436,241)
<b>S/U Fuel Cost</b>	<b>\$ (88,505)</b>	S/U Fuel Cost	\$	(88,505)
		<b>Total</b>	\$	<b>(1,072,996)</b>

# Forced Outage Report

**To:** Bob Berry

**From:** Perry Bowley

**Date:** 7-Feb-2014

**Plant:** Green

**Unit:** 1

**GADS Class:** UO1

## Duration

Trip Time: 7-Feb-2014 06:59

Tie Time: 7-February-2014 14:18

Time Offline: 07:19

## Outage Description

Green Unit 1 tripped offline on Friday, 7-Feb-2014 at 06:59 due to a low drum level. Fires were established at 07:22. At 08:10, startup was delayed due to the B phase blade on 100-9 MOD not functioning. ET&S Technicians arrived at plant and repaired.

## Root Cause

The 1D Mill pyrite sluice water backed up through the pyrite tank into the pulverizer causing loss of flame to burners. The resulting boiler upset caused 1B Mill to trip on flame instability. Two mills off caused a low level in the boiler drum resulting in the unit trip.

## Failure History

There have been no failures of this nature recorded for Green Unit 1 in the last three years.

# Forced Outage Report

## Corrective Action

The pyrite tank was isolated from the mill and the mill was cleaned out. Fires were established at 07:22, but at 08:10, start-up was delayed because Operators discovered that the blade for B phase of the generator disconnect switch did not open when the unit tripped. ET&S Technicians were dispatched to make repairs. While they were en route, the unit was bottled up and a clearance was issued to isolate the switch for repair. Repairs to the disconnect switch were completed and the unit was returned to service at 14:18.

## Forced Outage Report

### SOE Print Out

Report Type  
Report Number  
Report Title  
Recorder Number  
Triggered on....  
Number of Event Records

Standard  
1  
SOE STANDARD  
1  
7-Feb-2014 06:59:51:906  
223

Event Time	State	AID	Tag Name	Tag Description	SER Index
7-Feb-2014 07:00:17:412	CLOSED	A	G125ANN404SOE	HEATER 5 BS ISOL VALVE CLOSED	66
7-Feb-2014 07:00:14:917	CLOSED	A	G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
7-Feb-2014 07:00:12:852	RUNNG	A	G140TGOPRUNSOE	TURN GEAR OIL PMP RUNNING<	91
7-Feb-2014 07:00:09:972	RUNG	A	G141ANN172SOE	EMGNKY BRNG OIL PMP STATUS	105
7-Feb-2014 07:00:05:228	TRIPPD	A	G133BLRTR2TRBSO	BOILER TRIP TO TCS<	229
7-Feb-2014 07:00:05:228	OPENED		G103BPASTSSOE	1B PA FAN STATUS	226
7-Feb-2014 07:00:05:228	CLOSED		G1031T2TIESTSSOE	G1 B BUS 1T2 TIE STATUS	203
7-Feb-2014 07:00:05:228	CLOSED		G1031T1TIESTSSOE	G1 A BUS 1T1 TIE STATUS	188
7-Feb-2014 07:00:05:228	OPENED		G103CPULVSTSSOE	1C PULVERIZER STATUS	186
7-Feb-2014 07:00:05:228	OPENED		G103APULVSTSSOE	1A PULVERIZER STATUS	157
7-Feb-2014 07:00:05:228	OPENED		G103APASTSSOE	1A PA FAN STATUS	212
7-Feb-2014 07:00:05:227	CLOSED	A	G132ANN328SOE	A MILL RATING DAMPER CLOSED<	94
7-Feb-2014 07:00:05:227	OPENED		G103BMNSTSSOE	G1 B MAIN STATUS	130
7-Feb-2014 07:00:05:227	OPENED		G103AMNSTSSOE	G1 A MAIN STATUS	126
7-Feb-2014 07:00:05:227	RESET		G103AMNTRPSOE	G1 A MAIN TRIP	125
7-Feb-2014 07:00:05:227	NORMAL		G132ANN288SOE	EMGNKY FURN PRS CNTRLR OPER	122
7-Feb-2014 07:00:05:227	TRIPPD	A	G133ANN319SOE	MASTER FUEL TRIP	78
7-Feb-2014 07:00:05:227	OK		G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
7-Feb-2014 07:00:05:227	CLOSED	A	G125ANN403SOE	HEATER 6 BS ISOL VALVE CLOSED	65
7-Feb-2014 07:00:05:226	TRIPPD	A	G150ANN070SOE	GEN EXCITER FLD BKR AUTO TRIP	3
7-Feb-2014 07:00:05:226	TRIPPD	A	G150ANN058SOE	GENERATOR RELAY 86G1 TRIP	2
7-Feb-2014 07:00:05:226	TRIPPD	A	G140ANN158SOE	TURBINE TRIP	41
7-Feb-2014 06:59:51:906	TRIPPD	A	G103AMNTRPSOE	G1 A MAIN TRIP	125
7-Feb-2014 06:59:44:202	ACTIVE	A	G132ANN288SOE	EMGNKY FURN PRS CNTRLR OPER	122
7-Feb-2014 06:59:35:129	NORMAL		G122ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
7-Feb-2014 06:59:29:045	ALARM	A	G125ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
7-Feb-2014 06:59:23:337	TRIPPD	A	G133ANN344SOE	DRUM LEVEL TRIP<	139
7-Feb-2014 06:59:18:594	LOW	A	G125ANN237SOE	DRUM LEVEL LOW<	46
7-Feb-2014 06:59:13:645	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
7-Feb-2014 06:59:12:392	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
7-Feb-2014 06:59:06:895	NORMAL		G1RUNDWNRQDSOI	CONTROL SYSTEM RUNDOWN REQD	220
7-Feb-2014 06:59:02:624	TRIPPD	A	H133ANN465SOE	BLR MSTR TRP TO MAN<	138
7-Feb-2014 06:59:01:372	TRIPPD	A	H133ANN463SOE	FUEL MSTR TRP TO MAN<	135
7-Feb-2014 06:59:01:122	TRIPPD	A	H132ANN464SOE	AIR FLW MSTR TRP TO MAN<	137
7-Feb-2014 06:58:29:034	CLOSED	A	G133ANN349SOE	D MILL RATING DAMPER CLOSED<	117
7-Feb-2014 06:58:27:776	NCLSD		G133ANN349SOE	D MILL RATING DAMPER CLOSED<	117
7-Feb-2014 06:57:52:757	CLOSED	A	G132ANN329SOE	B MILL RATING DAMPER CLOSED<	249
7-Feb-2014 06:57:45:227	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
7-Feb-2014 06:57:24:184	OPENED		G103BPULVSTSSOE	1B PULVERIZER STATUS	170
7-Feb-2014 06:56:41:358	LOW	A	G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
7-Feb-2014 06:56:26:845	RNDOWN	A	G1RUNDWNRQDSOI	CONTROL SYSTEM RUNDOWN REQD	220
7-Feb-2014 06:55:50:827	CLOSED	A	G133ANN349SOE	D MILL RATING DAMPER CLOSED<	117
7-Feb-2014 06:55:35:009	OPENED		G103DPULVSTSSOE	1D PULVERIER STATUS	201
7-Feb-2014 06:54:15:580	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
7-Feb-2014 06:54:14:327	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
7-Feb-2014 06:40:24:742	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
7-Feb-2014 06:40:22:488	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
7-Feb-2014 06:40:03:452	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
7-Feb-2014 06:40:03:199	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
7-Feb-2014 06:36:56:094	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
7-Feb-2014 06:36:51:334	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
7-Feb-2014 06:36:14:514	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
7-Feb-2014 06:36:13:762	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
7-Feb-2014 06:24:10:881	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
7-Feb-2014 06:24:06:874	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
7-Feb-2014 06:16:51:041	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61

to me  
out  
Flame  
Out

# Forced Outage Report

## Other Work Completed While Unit Was Offline

None

## Forced Outage Report

### Operators Event Log



#### LOG BOOK

DATE 2-7-14

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
12 M	Mus T, Hayes, Northington, Butler, O Darron, Hauer Lawrence, Combs, <del>Bo</del> Tapp, R Parker, T. Parker, Shelton
G1	Load 249 4 M:11 operation ADS in service SO <sub>2</sub> .46 NOx .25 opacity 7.5
G2	Load 240 4 M:11 operation ADS in service SO <sub>2</sub> .17 NOx .32 opacity 9.6
Slakers	G1 4on 20.6 + 20.1 #2 S:10 G2 3on 24.9 + 22.6 #4 S:10 prep 3on 56.6" #3 S:10
IU	A conveyors A&C Drums #1 S:10 25" #2 smooth 36" 25" in Tanks silos 59-26 46-0 IU 23 L 1A 16h 2A 9h E 2.5 E 2.5 1B 12h 2B 13.5h W 1.5 W 1.0
2A	1A 37.4 5" 6'9" 2A 36.1 0 6'9" 1D 40+ 10" 6'9" 2B 36.1 49 6'6"
1A	G1 PH ↓ TO 6.6 SO <sub>2</sub> .46
6:59	G1 Turbin Tripped

7:00 Fire established in G-1

252 Boiler

G1 at 0659 - lost 2 mills, fire at 0722 / unit tripped 141B, Sins out  
at 1632 WD1 - 7.32 SH - 16.68

G2 - 242

OPER	SUP'R
1ST	
2ND	
3RD	
SA-1 SS-1	SIGNED

F155.12  
R 1/93

## Forced Outage Report



### LOG BOOK

DATE 2-7-14

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

8AM-8PM

TIME	REMARKS
8 <sup>AM</sup>	Baron - Beer - Bolds - Turner - Denton - Rittmeyer - Mohan - Hurst - Bytler - Thomas (Use) Townsend - Nobigood - Strickland - Goodall - Cook
	G-1 off
	G-2 hand 242 Cap 242 4 Mill on
	Not 317 S <sup>3</sup> - 232 Opportunity 10.40
	ADS Control in Service specs out of Service
Note	100-9 Generator Disconnect broke - Getting with dispatcher to get transmission to repair
	LU in Service - A Conveyor - A + C Drums - #1 flyash Silo @ 23 tons of ash per hour - #2 Spout System @ 36% line feed rate - 25' in Hudge Tanks
	Underflow 1A) 33.9 0 6'9" 2A) 32.9 0 6'9"
	1B) off 5'6'8" 2B) 36 49+ 6'7"
	Bed 0.00 Floor — Stock Dispers OK
	Stacks #1 Building in Service 3on 25/25 #2 Silo
	#2 Building in Service 3on 22/25 #4 Silo
	Pep Building in Service 3on 52% #3 Silo

OPER	SUP'R
1ST	
2ND	Green 8A-8P
3RD	
SIGNED	

F155.12  
R 1/93

## Forced Outage Report



### LOG BOOK

DATE 2-7-14

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
9 <sup>30</sup>	W. Hunt going home
10 <sup>05</sup>	B. Beaven @ Plant
10 <sup>15</sup>	S. Boekman @ Plant
10 <sup>15</sup>	P. W. Butler going home
10 <sup>30</sup>	Transmission @ Plant
11 <sup>44</sup>	Toggled out 100-3 + 106-1 Bus Disconnects + Bus CVT
12 <sup>00</sup>	Underflows 1A) off 0 6'9" 2A) off 0 6'9" 1B) 35.9 5+ 6'8" 2B) 36.2 40+ 6'8" Bed 0.00 Flock —
12 <sup>56</sup>	Released Hold # 052 - 100-3 + 106-1 Bus Disconnect + Bus CVT
2 <sup>18</sup>	G-1 Tie on line + Out Crops in Service - Notified H/R
4 <sup>00</sup>	Underflows 1A) off 0 6'9" 2A) 39.4 0 6'9" 1B) 35.6 5+ 6'8" 2B) 37.6 42+ 6'8" Bed 0.00 Flock —

OPER	SUP'R
1ST	
2ND	Quiers - SA - Sp
3RD	
SIGNED	

F155.12  
R 1/93



DATE 2-7-14

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

TIME	REMARKS
4 <sup>30</sup>	Pulled oil out of G-3 Boiler
8 <sup>00</sup>	G-1 in ADS
8 <sup>00</sup>	Donithan, Hayes, Lawrence, Whitledge, Haver, Barron, Haver Travis, Cavan, Shelton, Tapp, Parker
5.15's	#1-52 E-1.5 W-1.5      #2-54 E-1.5 W-1 S-O G-O                      S-O F-O
Thickness	1A on 34.0 6 <sup>9</sup> 2A on 38.8 0 6 <sup>10</sup> 1B OFF 35.4 5 6 <sup>9</sup> 2B OFF 34.6 40 6 <sup>9</sup>

OPER		SUP'R
1ST		
2ND		<i>Diener 84-8p</i>
3RD		<i>[Signature]</i>
SIGNED		

F155.12  
R 1/93

# Forced Outage Report

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>Green 1 - G1-14-03</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	2/7/14 6:59			<b>MW</b>
<b>Date &amp; Time On Line</b>	2/7/14 14:18			<b>\$/MW</b>
<b>Outage Duration</b>	7 hr. 19 min.			73
<b>Outage Code</b>	UO1			181
<b>Outage Reason</b>	Unit tripped on low drum level due to boiler upset from lost of two mills			235
				\$ 28.41
				\$ 23.95
				\$ 23.46
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
2/7/14 (HE 8-22)	\$ 77.35	\$ 74.57	\$ (90,927)	\$ -
<b>Total</b>			\$ (90,927)	\$ -
<b>Start Up Fuel Cost</b>			<b>Total Forced Outage Cost</b>	
S/U Fuel Consumed	19,002		DART P&L	\$ (90,927)
S/U Fuel Price	\$ 3.10		Lost Opportunity	\$ -
<b>S/U Fuel Cost</b>	<b>\$ (58,935)</b>		S/U Fuel Cost	\$ (58,935)
			<b>Total</b>	<b>\$ (149,861)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Bob Berry

**From:** Billy Boarman

**Date:** 17-Feb-2014

**Plant:** Reid Station

**Unit:** 1

**GADS Class:** UO1

## Duration

Trip Time: 14-Feb-2014 08:12

Tie Time: 16-Feb-2014 02:37

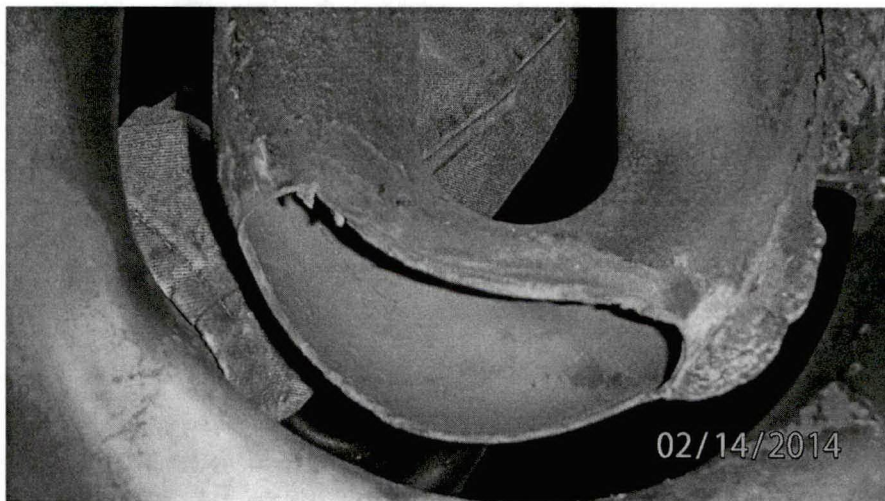
Time Offline: 42:25

## Outage Description

Reid Station Unit 1 was removed from service on Friday, 14-Feb-2014 at 08:12 due to a suspected tube leak in the High Temp Superheat Area of the boiler.

## Root Cause

Tube leak on the High Temp SH, 8<sup>th</sup> element from the east wall, inner (hair pin) loop, on the 3<sup>rd</sup> set of loops from the south wall at elevation 517' was caused by external corrosion.



# Forced Outage Report

## Failure History

6-Aug-2010	56:38	Tube leak in the Super heat in the 8th bundle from the east wall - 2nd loop at elevation 523'
11-Aug-2011	23:51	Tube leak at elevation 520' in the Hi-Temp Super heater on the 7th panel from the east
2-Jul-2012	46:10	Field Weld Failure on the 7 <sup>th</sup> Super heat element from the east, 3 <sup>rd</sup> loop from the north

## Corrective Action

A new hair pin loop was installed on the 8<sup>th</sup> element from the east wall on the 3<sup>rd</sup> set of loops from the south wall at elevation 517'. Also installed a 24" Dutchman on the 8th SH element from the east wall, 1st set of loops from the south (the tube was swollen in an area) at elevation 518'. A BMR was performed on the 8th SH element from the east wall, 3rd set of loops from the south, outer loop at elevation 516' – 5". Handcuffs were replaced on the 5<sup>th</sup>, 6<sup>th</sup>, and 8th elements from east wall.

## Other Work Completed While Unit Was Offline

- Repaired gas leaks on the bottom ash hopper seal skirt and the economizer hoppers
- Cleaned seal trough
- Precipitator inspection
- Calibrated all coal feeders
- Repaired steam leak on the platen header drain
- Burner deck inspections
- Changed oil in all FD Fan, PA Fan, and Mill motors

# Forced Outage Report

## Operators Event Log

2/14/2014	8:12AM	R-1 OFF LINE														
	8:13AM	R-1 PRECIPS OUT														
	11:50AM	R-1 BFP ON TO LOCATE LEAK - PUMP OFF AT 12:40 - LEAK LOCATED														
	NOTE	R-1 COAL FEEDERS TAGGED FOR INST DEPT TO CAL.														
	NOTE	OPENING DRAINS ON R-1 PA FANS - PLACED PLATES OVER BURNER INSPECTION PORTS FOR BOILER DE SLAG.														
	3:00PM	STARTED R-1 BOILER DE SLAG														
	NOTE	MAINTENANCE TRAINING 7B COAL CONVEYOR.														
	5:05PM	INSPECTED R-1 BOILER - NOT DONE YET - GOING TO WATER BLAST SOME MORE.														
	NOTE	COVERED R-1 P.A. FAN MOTORS.														
	5:45PM	TITAN INSPECTING R-1 BOILER.														
	5:48PM	GOING TO PULL R-1 BOTTOM ASH AND TAG.														
	NOTE	TRANSFERRED FUEL OIL TO HMPL TANK														
2/14/2014	8:00AM	CECIL, FELTY, EMBRY, HILLYARD, BLAIR, JAMES, DUVAL										A SHIFT PAYNE				
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE			
		R1		50										CTL 18.0'		
														PWTL / 25'		
		H1	165	165	153	0.382	10.8	0.063	16.5	93.3	10.45	219	3.6			
												C				
		H2	165	165	152	0.302	11	0.083	19.2	93.8	7.43	255	3.5	CTL / 15.1'		
												C				
		CT..	ON STANDBY	65												
		ALARMS:														
		R1														
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT													
	H2	EH RES LEVEL HI														
	SOOT BLOWERS TAGGED								GAUGE GLASSES		PWTL / 27		DRYING AGENT			
	R1	27R						OK				R1-0%				
	H1	30,44										H1-0%				
	H2	27,30,33,35,37,40,41,47										H2-0%				
	FUEL OIL	C.H.	HMPL	NORTH	SOUTH					SILO LVL	BOOTHE SYSTEM					
	LEVELS	10' 4"	12' 9"	10' 4"	8 5/8"					7FT	IN					
2/14/2014	8:00PM	SAFETY BRIEFING														
	8:45PM	BOOTH SYSTEM OUT														
	9:10PM	S.HALLMAN WORKING ON H1/H2 CBD SILICA. NO FLOW ON TRANSMITTERS														
	10:10PM	H1 CBD SILICA WORKING , H2 IS NOT														
	NOTE:	H2 #27 SOOTBLOWER WONT RUN														
	NOTE:	H2 #30 SOOTBLOWER KEEPS COMING OUT PAST LIMIT														
	NOTE:	WEEKLY CHECKS														
	11:00PM	B.JONES, L.BARNETT, S.HALLMAN LEAVING FOR NIGHT														
2/15/2014	2:45AM	H1 CBD SILICA NOT WORKING. WILL HAVE SOMEONE FROM LAB CHECK WHEN THEY COME IN A FEW HOURS														
	2:55AM	T.BROWN CALLED IN SICK FOR THIS MORNING														
	3:45AM	B.NICHOLS CALLED IN SICK FOR THIS MORNING														
	4:00AM	SETTING R1 BOILER UP FOR HYDRO														
	6:00AM	RANDY GENTRY HERE														
2/15/2014	8:00AM	MORRIS, DENTON, REYNOLDS, GATTON, BAKER, TATE, EDWARDS,										D SHIFT - ASKINS				
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE			
		R1	OFF	TUBE LEAK												
		H1	165	165	153	0.37	10.5	0.07	18	92	11.11	228	3.8			
		H2	165	165	152	0.33	11.2	0.07	29	93	7.6	239	3.6			
		C.T.	STANDBY	65												
												GAUGE GLASSES		DRYING AGENT		
												OK		H-1 0%		
		R1													H-2 0%	
		H1	STEAM SEAL HI/LO		BURNER MANGT.		EH PRESSURE LO/PUMP START REQ,		DRUM MAINT		R-1 0%					
		H2	EH RES LEVEL HI													
		SOOTBLOWERS TAGGED														
	R1	25L														
	H1	30,44														
	H2	27,30,33,35,37,40,41,47														
	FUEL OIL	C.H.	HMPL	NORTH	SOUTH											
	LEVELS	9' 11 1/2"	12' 9"	11' 3 3/4"	8 5/8"											

# Forced Outage Report

2/15/2014 8:00AM SAFETY BRIEFING  
 8:30AM 1000 LBS HYDRO ON R-1 BOILER  
 9:00AM R-1 HYDRO IS GOOD GOING TO SET TO FIRE  
 9:15AM CALLED J. WADLINGTON, T. ALEXANDER, A. HOGAN, J. BOWLEY, C. GRIFFIN, R. BLANKS, T. YOUNG, J. HIGGINS, L. BREEDEN, S. CUTSHAW, D. EDMONDS, T. JACKSON, M. CONN, D. CLARK. LEFT MESSAGE TO CALL PLANT - M. JOHNSON - NO ANSWER.  
 9:45AM T. JACKSON RETURNED CALL - WILL BE IN AT 8:00PM  
 NOTE NOTIFIED D. SHELTON THAT H-2 47 SOOT BLOWER NEEDS CHECKED.  
 10:30AM R-1 ECON HOPPERS AND WET SEAL ARE FINISHED - MAINTENANCE NOTIFIED.  
 11:20AM C. GRIFFIN RETURNED CALL - WILL BE IN AT 8:00PM  
 NOTE H-1 1A COOLING TOWER FAN - MOTOR TURNS, FAN DOESNT - MAINTENANCE NOTIFIED.  
 2:00PM FILLING R-1 WET SEAL  
 NOTE CLOSED UP R-1 COAL FEEDERS  
 2:22PM CALLED J. WADLINGTON, T. ALEXANDER, R. BLANKS, T. YOUNG, LEFT MESSAGE TO CALL PLANT  
 2:34PM T. YOUNG CALLED BACK WILL BE IN AT 8:00PM.  
 2:40PM ELECTRIC DEPT. RELEASED R-1 PRECIPS TO TEST.  
 3:10PM M. JOHNSON RETURNED CALL  
 5:00PM R-1 WETBOTTOM AND F.D. FANS RELEASED  
 5:20PM R-1 F.D. FAN ON FOR BOILER DOOR AIR TEST.  
 NOTE R-1 A F.D. FAN WILL NOT START - GOING TO RACK OUT BKR AND RETRY.  
 5:45PM R1 AIR TEST GOOD  
 NOTE: R1 B FD FAN SHUTOFF DAMPER ONLY COMES OPEN 30%. INST WORKING ON SAME  
 6:15PM R1 A FD FAN ON. HAD TO USE BREAKER OUT OF A BOILER FEED PUMP  
 6:53PM FIRE ESTABLISHED IN R1 BOILER  
 7:45PM FUEL OIL ALARM STUCK ON R1 TRANSFER PUMPS FUEL OIL OUT THE VENT OF THE DAY TANK. BERM IS HOLDING FUEL OIL IN. INST WORKING ON SAME

2/15/2014 8:00PM **CECIL, FELTY, EMBRY, HILLYARD, BLAIR, JAMES, DUVAL** **A SHIFT PAYNE**  
 T.JACKSON, C.GRIFFIN, T.YOUNG HERE FOR START UP  

UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
R1		50		START UP								CTL 18.0' PWTL / 25'
H1	155	165	153	0.312	10.6	0.067	11.1	93.6	10.97	220 C	3.4	
H2	155	165	152	0.247	11.1	0.063	12.1	93.9	6.91	204 C	3.4	CTL / 15.1'
CT..	ON STANDBY		65									

ALARMS:  
 R1  
 H1 BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUM/XMTR MAINT  
 H2 EH RES LEVEL HI

SOOT BLOWERS TAGGED GAUGE GLASSES PWTL / 27 DRYING AGENT  
 R1 27R OK  
 H1 30,44  
 H2 27,30,33,35,37,40,41,47  
 R1-0%  
 H1-0%  
 H2-0%

FUEL OIL	C.H.	HMPL	NORTH	SOUTH	SILO LVL	BOOTHE SYSTEM
LEVELS	9' 11 1/2"	12' 9"	11' 3 3/4"	8 5/8"	14FT	OUT

2/15/2014 8:00PM SAFETY BRIEFING  
 8:30AM BOOTH SYSTEM IN SERVICE  
 NOTE: R1 B FD FAN SHUT OFF DAMPER WILL NOT OPEN. MAINT/INST WORKING ON SAME  
 8:55PM A1,B1,B2 OIL GUNS IN. HAVING SEVERAL DRUM SWELLS  
 9:00PM R1 B FD ON. SHUTOFF DAMPER WORKING  
 9:00PM 40LBS ON R1 BOILER  
 9:15PM CLOSING R1 BOILER VENTS. 50 LBS PRESSURE  
 9:15PM R.GENTRY GOING HOME  
 9:55PM 187LBS PRESSURE R1 BOILER. DRAINS CLOSED  
 10:55PM 4B CONVEYOR CHUTE PLUG ALARM IS IN. BENDICATOR NOT TURNING. NOT BUILD UP. S.HALLMAN WORKING ON SAME  
 11:00PM R1 AT 500LBS BLOWING ELECTROMATIC  
 11:20PM DARREL BENNET GOING HOME SICK. SPOKE WITH GERALD JONES. SAID WE DIDN'T NEED ANYONE TO COME IN AT THIS TIME  
 11:25PM R1 C BOILER FEED PUMP WONT START. RACKED BREAKER OUT AND IN TWICE. NO LUCK.  
 11:30PM RUNNING ELECTRICIAN LIST- J.ARNOLD-ANSWERED. WILL BE IN  
 11:45PM R1 C BOILER FEED PUMP ON. PULLED 4160 OUT OF R1 B CONDENSATED PUMP  
 NOTE: NO 4160V BKR IN R1 A BFP OR R1 B CONDENSATE PUMP

[illegible]

# Forced Outage Report

## Boiler Tube Leak Record

Plant: Reid Station

Unit: 1

### Type of Leak:

Pin Hole ☒ Thick Lip Failure \_\_\_\_\_ Thin Lip Failure ☒

Tube Wall Thinning \_\_\_\_\_

Orientation of Rupture: Longitudinal ☒ Circumferential \_\_\_\_\_

### Probable Cause:

Stress \_\_\_\_ Overheat \_\_\_\_ Erosion \_\_\_\_ Internal Corrosion \_\_\_\_

External Corrosion ☒ Weld Failure \_\_\_\_ (Shop \_\_\_\_ Field \_\_\_\_)

Internal Obstruction to Flow \_\_\_\_ Soot blower Erosion \_\_\_\_

Other \_\_\_\_\_

### Type of Repair:

Dutchman ☒ Pad Weld ☒ Plug Tube \_\_\_\_ Short Circuit \_\_\_\_ Other  
\_\_\_\_\_

### Description of Repair:

A new hair pin loop was installed on the 8<sup>th</sup> element from the east wall on the 3<sup>rd</sup> set of loops from the south wall at elevation 517'. Also installed a 24" Dutchman on the 8th SH element from the east wall, 1st set of loops from the south (the tube was swollen in an area) at elevation 518'. A BMR was performed on the 8th SH element from the east wall, 3rd set of loops from the south, outer loop at elevation 516' – 5". Handcuffs were replaced on the 5<sup>th</sup>, 6<sup>th</sup>, and 8th elements from east wall.

# Forced Outage Report

## Exact Location of Leaks:

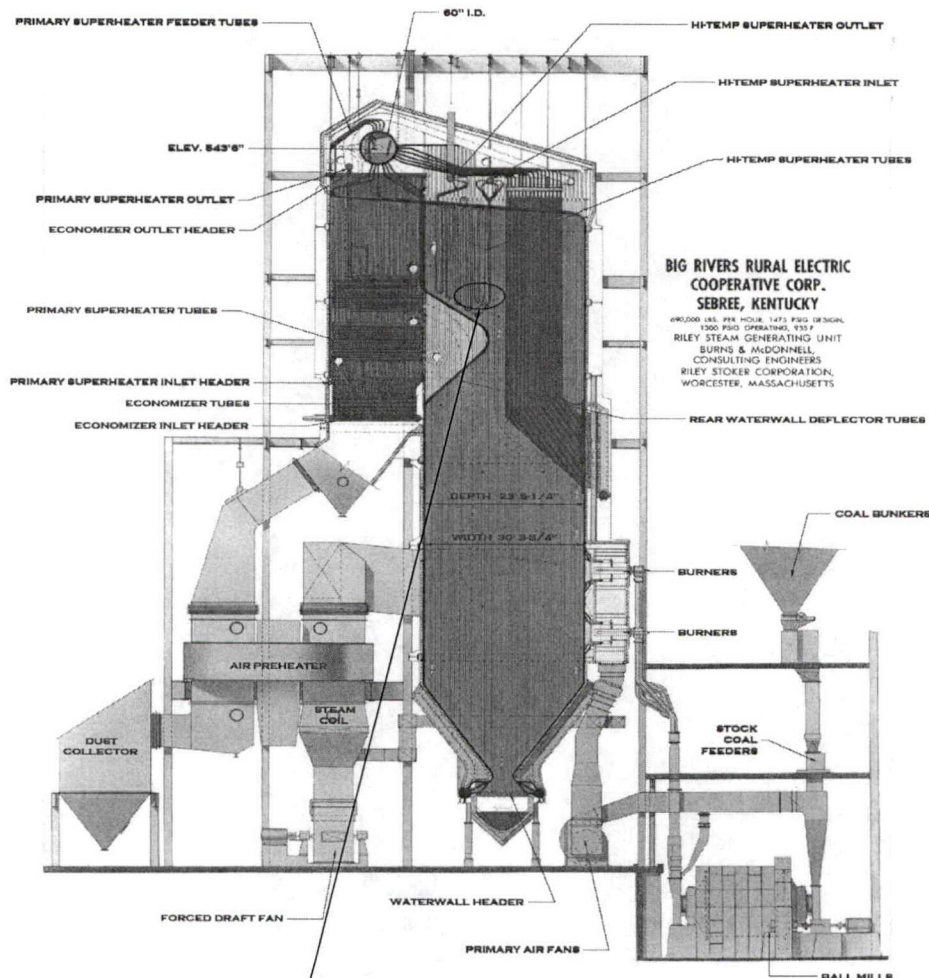
Reid Unit 1

2014

### (3) TUBES INVOLVED

Date and Time Unit Off 2/14/14 @ 0812

Date and Time Unit On 2/16/14 @ 0237



A new hair pin loop was installed on the 8<sup>th</sup> element from the east wall on the 3<sup>rd</sup> set of loops from the south wall at elevation 517'. Also installed a 24" Dutchman on the 8<sup>th</sup> SH element from the east wall, 1<sup>st</sup> set of loops from the south (the tube was swollen in an area) at elevation 518'. A BMR was performed on the 8<sup>th</sup> SH element from the east wall, 3<sup>rd</sup> set of loops from the south, outer loop at elevation 516' – 5". Handcuffs were replaced on the 5<sup>th</sup>, 6<sup>th</sup>, and 8<sup>th</sup> elements from east wall.

# Forced Outage Report

## Estimated Outage Cost

- Vacuuming Economizer Hoppers, Wash seal trough, Boiler De-Slag

Total           \$3,992.61

- Titan – SH tube leak repair

Labor           \$11,240

Material       \$408.81

Total           \$11,648.81

- Titan – Misc. repairs (Gas leaks, coal leaks, AH Repairs)

Labor           \$3,360

Material       \$300

Total           \$3,660

Grand Total       \$19,301.42

# Forced Outage Report

## Lost Sales Opportunity Report

Note: Report includes Outages R1-14-03 and R1-14-04.

FORCED OUTAGE COST ANALYSIS					
MISO DART Revenue and LOST OPPORTUNITY					
Unit		Reid 1 - R1-14-03 & R1-14-04		Production Cost	
Date & Time Off Line		2/14/14 8:12 & 2/16/14 2:46		MW	\$/MW
Date & Time On Line		2/16/14 2:37 & 2/16/14 6:03		20	\$ 31.53
Outage Duration		42 hr. 25 min. & 3 hr. 17 min.		35	\$ 30.27
Outage Code		UO2 & UO1		45	\$ 29.73
Outage Reason		Repair tube leak in superheat section. Tripped on low vacuum shortly after tying on.			
Date	DA LMP Average	RT LMP Average	DART P&L	Lost Opportunity	
2/14/14 (HE 10-24)	\$ 48.06	\$ 34.77	\$ (3,093)	\$ -	
2/15/14 (HE 1-24)	\$ 44.97	\$ 39.93	\$ -	\$ (15,367)	
2/16/14 (HE 1-11)	\$ 38.18	\$ 40.05	\$ 206	\$ (899)	
Total			\$ (2,886)	\$ (16,266)	
Start Up Fuel Cost		Total Forced Outage Cost			
S/U Fuel Consumed	7,988	DART P&L		\$ (2,886)	
S/U Fuel Price	\$ 3.11	Lost Opportunity		\$ (16,266)	
S/U Fuel Cost	\$ (24,873)	S/U Fuel Cost		\$ (24,873)	
		Total		\$ (44,025)	
NOTES:					
All negative values are money out of pocket.					
DART Revenue is calculated from differences between the DA award and RT events					
Lost Opportunity is the lost margins if the unit had stayed running					

# Forced Outage Report

**To:** Bob Berry

**From:** Billy Boarman

**Date:** 7-Feb-2014

**Plant:** HMP&L Station Two

**Unit:** 2

**GADS Class:** UO2

## Duration

Trip Time: 31-Jan-2014 19:14

Tie Time: 3-Feb-14 06:03

Time Offline: 58:49

## Outage Description

HMP&L Station Two Unit 2 was removed from service on Friday, 31-Jan-2014 at 19:14 due to a suspected tube leak in the Radiant Superheat Area of the boiler.

## Root Cause

Tube leak on the Radiant SH Outlet, 4<sup>th</sup> element from the west wall, North side of inner (hair pin) loop above the handcuff, at elevation 542' was caused by external corrosion.



# Forced Outage Report

## Failure History

5-Sep-2011	59:12	Tube leak in the high temperature superheater section caused by soot blower erosion.
23-May-2012	56:38	Tube leak in the radiant superheat section caused by soot blower erosion.
7-Sept-2012	42:7	Tube leak in the radiant superheat section caused by soot blower erosion.
5-Oct-2012	53:24	Tube leak in the radiant superheat section caused by soot blower erosion.
26-Jan-2013	33:37	Tube leak on the Radiant SH Outlet 3 <sup>rd</sup> element from the east wall, on the outer loop at elevation 537' – 5" caused by external corrosion

## Corrective Action

Installed a 22" Dutchman at the leak location (north tube) and also a 22" Dutchman on the tube in front of the leak (south tube) of the hair pin at elevation 542'

# Forced Outage Report

## SOE Print Out

Triggered on: 31-Jan-2014 19:13:51:453

31-Jan-2014 19:14:06:718	TRIP	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
31-Jan-2014 19:14:06:457	OK	H240STPVLVTRP	TURB STOP VLV CLSD TRIP
31-Jan-2014 19:14:05:775	TRIP	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
31-Jan-2014 19:14:02:748	OK	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
31-Jan-2014 19:14:02:585	TRIP	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
31-Jan-2014 19:14:02:097	OK	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
31-Jan-2014 19:14:01:875	TRIP	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
31-Jan-2014 19:13:56:447	OK	H233LMISTRP	LAST MILL IN SERVICE TRIP
31-Jan-2014 19:13:56:316	LOW	H222HTR2LVLL0	LP HEATER 2-3 LEVEL LOW
31-Jan-2014 19:13:56:248	OK	H222HTR2LVLL0	LP HEATER 2-3 LEVEL LOW
31-Jan-2014 19:13:55:624	OPEN	H250FLDBKRSTS	GEN H2 FIELD BKR STATUS
31-Jan-2014 19:13:55:619	OPEN	H250OCB186STS	OCB 0186 GEN H2 STATUS
31-Jan-2014 19:13:55:609	OPEN	H250OCB182STS	OCB 0182 GEN H2 STATUS
31-Jan-2014 19:13:55:516	OK	H250OCB186GETR	OCB 0186 GEN H2 TRIP
31-Jan-2014 19:13:55:510	OK	H250OCB182GETR	OCB 0182 GEN H2 TRIP
31-Jan-2014 19:13:55:483	TRIP	H250OCB186GETR	OCB 0186 GEN H2 TRIP
31-Jan-2014 19:13:55:482	TRIP	H250OCB182GETR	OCB 0182 GEN H2 TRIP
31-Jan-2014 19:13:55:482	LKOUT	H240STPVL086TV	TURB STOP VLV LOCKOUT (86TV3)
31-Jan-2014 19:13:52:865	LOW	H222HTR2LVLL0	LP HEATER 2-3 LEVEL LOW
31-Jan-2014 19:13:52:451	TRIP	H233LMISTRP	LAST MILL IN SERVICE TRIP
31-Jan-2014 19:13:52:022	OK	H222HTR2LVLHI	LP HEATER 2-3 LEVEL HIGH
31-Jan-2014 19:13:51:759	HIGH	H222HTR2LVLHI	LP HEATER 2-3 LEVEL HIGH
31-Jan-2014 19:13:51:703	TRIP	H233EMERBLRTRP	EMERGENCY BLR TRIP
31-Jan-2014 19:13:51:653	OK	H222HTR2LVLHI	LP HEATER 2-3 LEVEL HIGH
<b>31-Jan-2014 19:13:51:453</b>	<b>TRIP</b>	<b>H240STPVLVTRP</b>	<b>TURB STOP VLV CLSD TRIP</b>
31-Jan-2014 19:13:51:307	HIGH	H222HTR2LVLHI	LP HEATER 2-3 LEVEL HIGH

# Forced Outage Report

## Other Work Completed While Unit Was Offline

- Repaired gas leaks on the bottom ash hopper and the 'B' air heater inlet expansion joint
- Repaired air leak on the 'A' PA fan duct
- Clean 480V transformer
- Repaired packing leak on #5 high pressure heater extraction valve
- Cleaned furnace and PA Fan taps
- Cleaned Wet bottom Seal Trough
- Cleaned Scrubber Mist Eliminator panels and nozzles
- Precipitator inspection
- Back-pass inspection
- Calibrated all coal feeders.
- Changed oil in all FD Fan, PA Fan, and Mill motors
- Repaired coal leaks on "A" Mill
- Repaired coal leaks on "B" Mill
- Replaced damaged section of B4 coal pipe on 5<sup>th</sup> floor
- Replaced boiler manifold header
- Cleaned seal air fan filters
- Replaced A1 burner shroud
- Repaired coal leak on A1 burner
- Replaced 'B' seal air fan motor
- Replaced left hand governor valve cylinder
- Replaced #20 and #23 observation ports
- Replaced EH unit filters
- AH wash, 9 hr. pass
- Installed a new gate on A2 bunker gate
- BMR repairs to 4 Reheat tubes in the #36 soot blower path that were found during the back pass inspection at elevation 545' - 2"

# Forced Outage Report

## Operators Event Log

1/31/2014	8:00AM	SAFETY BRIEFING											
		NOTE: H2 DERATED 5 MW'S DUE TO PLUGGAGE OF AIR HEATERS											
		NOTE: POTABLE WATER LEAK AT COOLING TOWERS. LINE APPEARS TO GO TO ELECTRICAL SHOP. TRYING TO GET IT ISOLATED											
		NOTE: TAGGING OUT STEAM TO GAS TURBINE TRAP AT WARMING STATION											
		NOTE: MAINT SETTING PRESSURES ON H2 AIR HEATER STEAM CLEANERS											
	8:45AM	TAGGED OUT R1 CENTAC AIR COMPRESSOR TO CHANGE FILTERS											
		NOTE: ISSUED WO ON LEAK ON BLEED DISCHARGE LINE BEHIND BUILDING LEAKING. LOTS OF ICE											
	10:00AM	NEW TRAP AND STRAINER INSTALLED ON GAS TURBINE WARMING STATION											
	10:30AM	7A CONVEYOR RELEASED AND IN SERVICE											
	10:35AM	22R SOOTBLOWER ON R1 WONT BLOW. ELECTRICIANS WORKING ON SAME											
		NOTE: 27L SOOTBLOWER ON R1 BLOWING MORE STEAM OUT THAN IN AND VIBRATING BADLY. SPOKE WITH J.WEST. PARTS ON ORDER											
	1:00PM	INLAND ON SITE TO SHOOT THE DRAIN BY THE R1 STACK											
	2:00PM	H2 B RECYCLE PUMP ON , A RECYCLE PUMP OFF FOR ELECTRICIANS TO SET SUCTION VALVE LIMITS											
	2:10PM	22R SOOTBLOWER ON R1 WORKING AGAIN											
	2:30PM	R1 CENTAC BACK IN SERVICE. AIR SYSTEM SET UP NORMAL											
	2:40PM	R1 #25L HITTING SOMETHING AND BACKING OUT. NOTIFY MAINT											
	2:45PM	H2 A RECYCLE PUMP ON, B OFF. B SUCTION VALVE NOT COMPLETED											
	2:55PM	R1 #22R CHAIN BROKEN. MAINT WORKING ON SAME											
	3:00PM	MAINT GOT POTABLE WATER LINE ISOLATED AT COOLING TOWERS. A1 SEPTIC WILL BE HERE MONDAY TO REPAIR LINE											
	3:25PM	R1 25L AND 22R NOT WORKING. MAINT GONE. NOTIFY J.WEST.											
	3:35PM	T.GREY, AND J.JACKSON ARE COMING BACK IN											
	4:30PM	H2 FURNACE PRESSURE JUMPED UP TO 20.1, AH DIFF 8.8, 9.8, BACKING LOAD DOWN TO 155MW'S											
	5:45PM	RUNNING HOTWELL CHECK ON H2. LOST 5" IN TEN MINUTES. SPOKE WITH J.FRANCIS. TAKING UNIT OFF											
	6:00PM	AMMONIA TRIPPED OFF H2, TAKING UNIT OFF											
	6:11PM	CALLED EXPRO. WILL HAVE DE SLAG CREW HERE BY 3:30 - 4:00AM											
		NOTE: H-2 A-2 BUNKER GATE WILL NOT CLOSE - W.O. ISSUED											
	7:14PM	H-2 UNTIED											
	7:14PM	H-2 SCRUBBERS OUT OF SERVICE											
	7:15PM	H-2 PRECIPS OUT OF SERVICE											
1/31/2014	8:00PM	MORRIS, DENTON, REYNOLDS, BAKER, TATE, GATTON, EDWARDS											
		D SHIFT - ASKINS											
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE
		R1	48	50	45	0.45	10.9	0.41	11				
		H1	165	165	153	0.27	10.5	0.07	22	93	10.99	257	3.5
		H2	OUTAGE										
		CT..	OFF STANDBY		65								
		ALARMS:											
		R1											
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUM/MTR MAINT										
		H2	EH RES LEVEL HI										
		SOOT BLOWERS TAGGED							GAUGE GLASSES				
		R1	22R, 25L						OK		DRYING AGENT		
		H1	20, 26, 29, 30								R1-0%		
		H2	35		SILO LVL		BOOTHE SYSTEM				H1-0%		
					14FT		IN				H2-0%		
	8:00PM	SAFETY BRIEFING											
		NOTE: COULD ONLY FIND ONE FAN FOR THE PENTHOUSE ON H-2											
	8:30PM	R-1 SOOT BLOWING SYSTEM RELEASED - 25L WILL NOT BLOW - BRINGING IN LOW PRESSURE ALARM - POSSIBLE END OF LANCE IS OFF.											
	10:30PM	R-1 GRINDER LOCKED UP - OPENED DOOR - FOUND SOOTBLOWING TIP (#25L)?											
	11:50PM	H-2 F.D. FANS OFF FOR MAINTENANCE TO OPEN BOILER DOOR											
		NOTE: CHECKED H-2 AIR HTR AIR DRIVES - RAN OK.											
2/1/2014		NOTE: INLAND HERE TO VACCUUM PENTHOUSE											
	12:39AM	H-2 BOILER FEED PUMP ON - CAN NOT LOCATE THE TUBE LEAK											
	1:40AM	EXPRO AT GUARD SHACK - TWO NEED AMMONIA TRAINING.											
	2:01AM	H-2 BOILER FEED PUMP OFF, 1440 HYDRO - MAINT. FOUND LEAK, DRAINING BOILER											
	2:30AM	TITAN OPENING SCRUBBER DOORS AND REMOVING M.E. NOZZLES											
	4:30AM	EXPRO STARTED H-2 DE SLAG											
	5:20AM	TITAN HAS H-2 M.E. NOZZLES OUT											
	7:30AM	CHECKING TAGS WITH INLAND TO GET STARTED ON ME WASH											

# Forced Outage Report

2/1/2014	8:00AM	CECIL, FELTY, EMBRY, HILLYARD, BLAIR, JAMES, DUVALL										A SHIFT PAYNE		
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
		R1	48	50	45	4.6	10.8	0.44	9.5				CTL 18.0'	
		H1	165	165	153	0.298	10.7	0.079	24.6	94.7	9.7	237	PWTL / 27.2'	
		H2		165	OFF FOR TUBE LEAK								CTL / 15.1'	
		CT..	OFF STANDBY		65									
		ALARMS:												
		R1												
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT											
		H2	EH RES LEVEL HI											
		SOOT BLOWERS TAGGED						GAUGE GLASSES		PWTL / 27		DRYING AGENT		
		R1							OK				R1-0%	
		H1	20,26,29,30										H1-0%	
		H2	35										H2-0%	
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH								
		LEVELS	8' 4"	9' 5 1/2"	14' 9 1/2"	8 5/8"								
2/1/2014	8:00AM	SAFETY BRIEFING												
	NOTE:	BOILER DESLAG ONGOING												
	8:15AM	STARTED ME WASH AT SCRUBBERS (INLAND)												
	11:01AM	ISSUE HOLD ON #0189 DISCONNECT												
	11:30AM	BOILER DESLAG COMPLETE. PULLING DOWN WETBOTTOM AND TAGGING FOR ENTRY												
	11:50AM	EXPRO OFF TAGS AND LEAVING												
	12:30PM	H2 WETBOTTOM TAGGED. NOTIFY B.CHEATHAM												
	1:00PM	INLAND WORKING ON H2 ECONOMIZERS												
	NOTE:	COVERING FANS AROUND H2 WETBOTTOM												
	2:00PM	NOTIFY MAINT THEY CAN TAKE CORNER PLATES OFF OF WET BOTTOM												
	2:10PM	WORKING ON GETTING PRECIP DOOR OPEN AND CLEANED OUT												
	NOTE:	H2 ELECTROMATIC FOR H2 REPAIRED												
	2:35PM	H2 BOILER PORT AIR TAGGED OUT												
	3:00PM	H1 # 26 SOOTBLOWER BACK IN SERVICE												
	4:40PM	R1 GRINDER LOCKED UP. ELEC CHECKED MOTOR. OK USING FLUSHING JETS TO SEAL OFF GATE SO WE CAN CHECK INSIDE												
	5:00PM	H2 PRECIP HOPPERS CLEAN												
	NOTE:	H2 VOLTAGE REGULATOR FIXED												
2/1/2014	8:00PM	MORRIS, DENTON, REYNOLDS, BAKER, TATE, GATTON, EDWARDS										D SHIFT - ASKINS		
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
		R1	48	50	45	0.45	10.6	0.38	10.6					
		H1	165	165	153	0.37	10.5	0.06	22	93	8.71	260	3.8	
		H2	OUTAGE											
		CT..	OFF STANDBY		65									
		ALARMS:												
		R1												
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT											
		H2	EH RES LEVEL HI											
		SOOT BLOWERS TAGGED						GAUGE GLASSES						
		R1	22R						OK		DRYING AGENT			
		H1	20,29,30								R1-0%			
		H2	35								H1-0%			
						SILO LVL		BOOTHE SYSTEM		H2-0%				
						2' BELOW 1		IN						
	8:00PM	SAFETY BRIEFING												
	8:09PM	H-2 VACCUM PUMPS ON FOR HYDRO												
	8:45PM	H-2 VACCUM CHECK IS GOOD ON H-2												
	11:40PM	H-2 M.E. PANELS ARE FINISHED - NOTIFIED J. WEST												

# Forced Outage Report

2/2/2014	2:20AM	H-2 B BFP ON FOR HYDRO												
	3:25AM	H-2 HYDRO 1440 lbs												
	3:55AM	H-2 DRY BOILER												
	4:15AM	H-2 AIR HTR WASH STARTED												
	NOTE	WORKING ON SETTING H-2 BOILER TO FIRE												
	NOTE	REMOVED 32 BARRELS OF AIR HTR BASKET MATERIAL H-2												
2/1/2014	8:00AM	CECIL, FELTY, EMBRY, HILLYARD, BLAIR, JAMES, DUVAL												
		A SHIFT PAYNE												
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
		R1	48	50	45	4.34	10.9	0.392	10.3				CTL 18.0'	
		H1	165	165	153	0.396	10.5	0.081	19.7	92.6	8.97	256	3.1	
		H2		165	OFF FOR TUBE LEAK								CTL / 15.1'	
		CT..	OFF STANDBY		65									
		ALARMS:												
		R1												
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT											
		H2	EH RES LEVEL HI											
		SOOT BLOWERS TAGGED												
		R1							GAUGE GLASSES		PWTL / 27	DRYING AGENT		
		H1	20,26,29,30						OK			R1-0%		
		H2	35									H1-0%		
												H2-0%		
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH								
		LEVELS	8' 2 3/8"	9' 5 1/2"	14' 9 1/2"	8 5/8"	SILO LVL		BOOTHE SYSTEM					
									6.5FT		OUT			
2/2/2014	8:00AM	SAFETY BRIEFING												
	NOTE:	INLAND WORKING IN H2 ECONS AND AIR HEATER WASH												
	10:00AM	FLUSHING ME WASH HEADERS H2												
	10:30AM	ELECTRICIANS WORKING ON CLEANING 480V LOAD CENTERS												
	11:30AM	ME WASH HEADERS FLUSED. NOTIFY B.CHEATHAM												
	11:45AM	PULLING VAC ON H2 FOR MAINT												
	11:50AM	INLAND WORKING ON H2 WET SEAL. MAINT WORKING ON H2 SEAL AIR FAN. THERE WORK IS POSTPONING WET SEAL JOB												
	12:15PM	TRANSFERRED FUEL OIL TO HMPL TANK FOR START UP												
	1:15PM	H2 VAC PUMPS OFF												
	2:00PM	H2 480V LOAD CENTERS BACK IN												
	2:00PM	CALLING IN HELP FOR TONIGHT, JW WADLINGTON-LM, T.ALEXANDER-LM, A.HOGAN-LM, J.BOWLEY-LM, C.GRIFFIN-LM, D.EDMONDS-LM, T.JACKSON-LM												
		D.ONAN-CANT COME IN, AT HOSPITAL WITH FATHER IN LAW GETTING READY TO PASS												
	2:30PM	INLAND DONE PULLING HEADS OUT OF AIR HEATER. NOTIFY MAINT												
	NOTE:	WORKING WITH MAINT TRYING TO GET AIR DRIVES TO WORK FOR THEM TO WORK ON AIR HEATER BASKET												
	2:45PM	WASHING H2 STEAM COILS AND FD FANS												
	3:30PM	H2 WET SEAL COMPLETED. NOTIFY MAINT												
	3:40PM	D.EDMONDS CALLED. WILL BE IN TONIGHT AT 8PM												
	3:45PM	R1 24L SOOTBLOWER KEEPS BRINGING IN LOW PRESSURE ALARM LIKE THERE IS A HOLE IN LANCE OR END IS GONE. NOTIFY MAINT. THEY WILL GET TO IT WHEN THEY CAN												
	4:00PM	WORKING WITH INSTRUMENTATION STROKING H2 TURBINE VALVES												
	4:05PM	H2 ECONS COMPLETED												
	4:10PM	MOVING INLAND BACK INTO AIR HEATERS TO VACUUM OUT AREAS IN FRONT OF AIR HEATERS												
	4:40PM	STEAM COILS AND FD FANS CLEAN ON H2. NOTIFY MAINT												
	5:06PM	R. DENTON CALLED IN FOR PERSONAL DAY. OK												
	5:27PM	T.JACKSON CALLED BACK. WILL BE IN AT 8PM												
	5:30PM	INLAND HAVING TROUBLE WITH AIR HEATER CLEANUP. LINE KEEPS PLUGGING UP WITH METAL AND IS FREEZING UP												
	5:35PM	STROKING H2 B MILL BYPASS DAMPERS WITH INSTRUMENTATION												
	NOTE:	R. JENKINS ON VACATION MONDAY.												
2/2/2014	8:00PM	MORRIS, DENTON-P.D., REYNOLDS, BAKER, TATE, GATTON, EDWARDS												
		JACKSON, EDMONDS												
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
		R1	45	50	45	4.4	10.6	0.45	10.6					
		H1	165	165	153	0.41	10.4	0.06	33	93	10.31	236	3.8	
		H2	OUTAGE											
		CT..	OFF STANDBY		65									
		ALARMS:												
		R1												
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT											
		H2	EH RES LEVEL HI											
		SOOT BLOWERS TAGGED												
		R1	24L, 25L						GAUGE GLASSES			DRYING AGENT		
		H1	20,29,30						OK			R1-0%		
		H2	35									H1-10%		
												H2-0%		
									SILO LVL		BOOTHE SYSTEM			
									9'		OUT			

# Forced Outage Report

	8:00PM	SAFETY BRIEFING																			
	9:31PM	H-2 F.D. FANS ON FOR DOOR CHECKS																			
	9:53PM	H-2 DOORS CHECKS ARE GOOD - OK TO FIRE THE BOILER																			
	10:04PM	H-2 - FIRE IN BOILER																			
	10:40PM	RUNNING 10% DRYING AGENT TO HMPL																			
2/3/2014	11:42PM	CLOSED IN H-2 GEN DISCONNECT 0189																			
	12:20AM	CLOSED H-2 DRUM VENTS																			
	1:07AM	CLOSED H-2 PRI - SEC SUPER HEAT DRAINS.																			
	NOTE	H-2 TOOK #6 HEATER OUT OF SERVICE, POSSIBLE LEAK.																			
	3:25AM	H-2 PULLING VACUUM																			
	3:49AM	H-2 ROLLING TURBINE																			
	3:55AM	H-2 HOLDING AT 1000 RPM FOR LUBE OIL TEMPTURE																			
	6:03AM	H-2 TIED ON LINE																			
	6:04AM	H-2 PRECIPS INSERVICE																			
	7:42AM	H-2 'A' MILL ON																			
2/3/2014	8:00AM	CONN, CLARK, BREEDEN, HIGGINS, CUTSHAW, BLANKS & YOUNG														B SHIFT - PENDLEY					
		JOHNSON HERE																			
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	CTL	18'						
		R1	43	50	44	4.5	10.5	0.487	7.9					PWTL	27'						
		H1	165	165	153	0.371	10.8	0.076	31.1	92.9	10.11	215	3.9								
		H2	135	165		0.245	9.9	0.494	9.2	95.1	5.22		3.3								
		C.T. OFF STANDBY																			
		ALARMS:																			
		R1														GAUGE GLASSES					
																OK					
		H1	STEAM SEAL HI/LO BURNER MANGT. EH PRESSURE LO/PUMP START REQ, DRUM MAINT																		
		H2	EH RES LEVEL HI																		
		SOOTBLOWERS TAGGED																			
		R1														DRYING AGENT					
		H1	20,26,29,30													H-1 10%					
		H2	32,35,37													H-2 10%					
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH							SILO	BOOTHE SYSTEM							
		LEVELS	7' 10 1/4"	9' 9 1/2"	14' 1/2"	8 5/8"							14'	OUT							
	2/3/2014	8:00AM	SAFETY BRIEFING																		
		8:15AM	TRIED TO PUT H-2 SCRUBBER IN SERVICE - BOOSTER FAN TRIPPED 3 TIMES - FOUND OUT THAT 'A' BOOSTER FAN PRESSURE TRANSMITTER WAS BAD																		
		9:40AM	H-2 SCRUBBER IN SERVICE - ADDITIVE FEED ISOLATION VALVE WILL NOT OPEN - INST CHECKING																		
9:50AM		H-2 SILICA .509 - GOOD FOR 1600# DRUM																			
10:15AM		H-2 ADDITIVE FEED IN SERVICE																			
10:08AM		FUEL OIL OUT OF H-2 BOILER - NOTIFIED H/L																			
10:12AM		TRANSFERRED H-2 AUXILIARIES																			
11:16AM		H-2 SILICA .435 - GOOD FOR 1800 DRUM - RAISING SAME																			
11:25AM		MAINT RELEASED 7A CONVEYOR																			
12:32PM		GIVE H-2 SCR START SIGNAL																			
12:53PM		H-2 SILICA .391 - GOOD FOR FULL PRESSURE - RAISING SAME																			
		1:10PM	H-2 IN ADS																		
	1:42PM	H-2 'B' RECYCLE PUMP ON - 'A' OFF FOR ELECT TO SET LIMITS ON 'A' SUCTION VALVE																			
	1:50PM	H-2 #4 ECONOMIZER DUST VALVE REPAIRED																			
	2:59PM	H-2 SCR IN SERVICE - FLOWING AMMONIA - NOTIFIED H/L																			
	2:45PM	VERIFIED TUBE LEAK IN H-2 #6 HEATER																			

# Forced Outage Report

## Boiler Tube Leak Record

Plant: HMP&L Station Two

Unit: 2

### Type of Leak:

Pin Hole ☐ Thick Lip Failure ☐ Thin Lip Failure ☒

Tube Wall Thinning ☒ ( 4 RH tubes)

Orientation of Rupture: Longitudinal ☒ Circumferential ☐

### Probable Cause:

Stress ☐ Overheat ☐ Erosion ☐ Internal Corrosion ☐

External Corrosion ☒ Weld Failure ☐ (Shop ☐ Field ☐

Internal Obstruction to Flow ☐ Soot blower Erosion ☒ ( 4 RH tubes)

Other ☐

### Type of Repair:

Dutchman ☒ Pad Weld ☒ ( 4 RH tubes) Plug Tube ☐ Short

Circuit ☐ Other ☐

### Description of Repair:

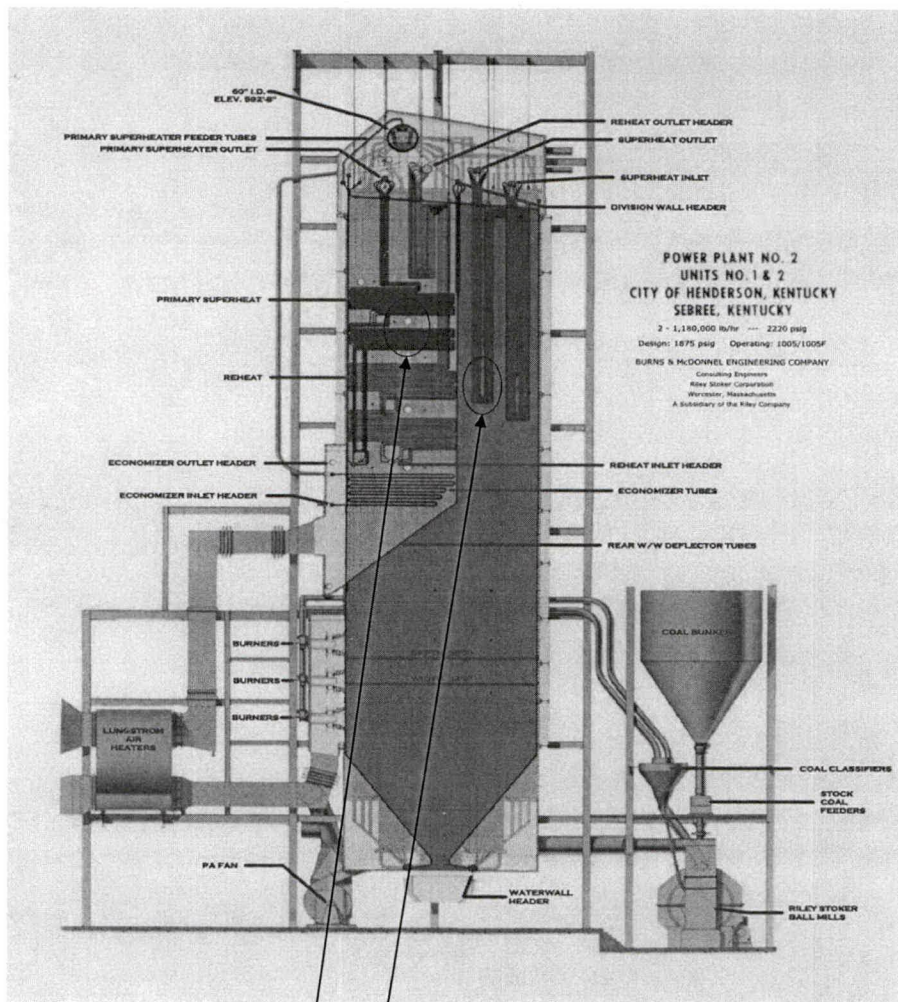
Installed a 22" Dutchman above the handcuff and hair pin at the leak location (north tube) and also a 22" Dutchman on the tube in front of the leak (south tube) due to steam cutting from the leak at elevation 542'. Also performed BMR's to 4 Reheat tubes in the #36 soot blower path that were found during the back pass inspection at elevation 545' - 2"

# Forced Outage Report

## Exact Location of Leaks:

### HMPL STATION UNIT 2 2014 (6) TUBES INVOLVED

Date and Time Unit Off 19:14 1-31-14  
Date and Time Unit On 06:03 2-3-14



Installed a 22" Dutchman above the handcuff and hair pin at the leak location (north tube) and also a 22" Dutchman on the tube in front of the leak (south tube) due to steam cutting from the leak at elevation 542'. Also performed BMR's to 4 Reheat tubes in the #36 soot blower path that were found during the back pass inspection at elevation 545' - 2"

# Forced Outage Report

## Estimated Outage Cost

- Boiler De-Slag

**Total           \$9,246.63**

- Vacuuming Economizer Hoppers, Wash seal trough, ME panels and the AH's

**Total           \$23,041.52**

- Titan – SH tube leak repair

Labor           \$16,740

Material       \$800

**Total           \$17,540**

- Titan – Misc. repairs (Gas leaks, coal leaks, AH Repairs)

Labor           \$45,240

Material       \$5,353.53

**Total           \$50,593.53**

**Grand Total       \$100,421.68**

# Forced Outage Report

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>HMP'L 2 - H2-14-01</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	1/31/14 19:14			<b>MW</b>
<b>Date &amp; Time On Line</b>	2/3/14 6:03			<b>\$/MW</b>
<b>Outage Duration</b>	58 hr. 49 min.			72
<b>Outage Code</b>	UO2			127
<b>Outage Reason</b>	Repair superheater tube leak.			149
				\$ 32.59
				\$ 29.86
				\$ 29.54
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
1/31/14 (HE 20-24)	\$ 56.01	\$ 36.74	\$ (3,948)	\$ -
2/1/14 (HE 1-24)	\$ 35.28	\$ 32.10	\$ (9,039)	\$ (689)
2/2/14 (HE 1-24)	\$ 33.27	\$ 40.19	\$ -	\$ (13,589)
2/3/14 (HE 1-15)	\$ 48.87	\$ 41.22	\$ (1,431)	\$ (17,233)
<b>Total</b>			\$ (14,419)	\$ (31,511)
<b>Start Up Fuel Cost</b>			<b>Total Forced Outage Cost</b>	
S/U Fuel Consumed	14,102		DART P&L	\$ (14,419)
S/U Fuel Price	\$ 3.11		Lost Opportunity	\$ (31,511)
<b>S/U Fuel Cost</b>	<b>\$ (43,911)</b>		S/U Fuel Cost	\$ (43,911)
			<b>Total</b>	<b>\$ (89,841)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Bob Berry

**From:** Perry Bowley

**Date:** 17-Mar-2014

**Plant:** Green

**Unit:** 1

**GADS Class:** UO2

## Duration

Trip Time: 15 Mar-2014 15:48

Tie Time: 16-Mar-2014 21:42

Time Offline: 29:54

## Outage Description

Green Unit 1 was removed from service on Saturday, 15-Mar-2014 at 15:48 by controlled shutdown due to a reheater tube leak.

## Root Cause

The Green Unit 1 intermediate reheater outlet tube 21<sup>st</sup> element from east wall 1<sup>st</sup> tube to the south failed causing the lead tube in the 22<sup>nd</sup> element to fail. These leaks caused the last tube to the south in the 21<sup>st</sup> and 22<sup>nd</sup> elements in the reheat outlet section to fail. Titan completed ultrasonic thickness testing of the area tubes. All tubes thickness looked good. Heavy coal ash corrosion on lead tube across the intermediate reheater elements caused the failure.

## Failure History

There have been four tube leaks in the intermediate reheater section in the last four years.

25-May -2010 Offline 26 hours 25 minutes

04-February -2011 Offline 38 hours 50 minutes

15-October – 2012 Offline 59 hours 20 minutes

10-July-2013 Offline 36 hours 56 minutes

# Forced Outage Report

## Corrective Action

Intermediate reheater 21<sup>st</sup> element from east 1<sup>st</sup> tube 75 inch dutchman

Intermediate reheater 22<sup>nd</sup> element from east 1<sup>st</sup> tube 75 inch dutchman

Outlet reheater 21<sup>st</sup> element from east 1<sup>st</sup> tube base metal repair (pad weld)

Outlet reheater 22<sup>nd</sup> element from east 1<sup>st</sup> tube 17 inch Dutchman

Titan completed UT of area tubes. All tube thickness looked good.

## Other Work Completed While Unit Was Offline

None

# Forced Outage Report

## SOE Print Out

Report Type Standard  
Report Number 1  
Report Title SOE  
Recorder Number STANDARD  
Triggered on.... 1  
Number of Event Records 15-Mar-2014 15:47:54:874  
230

Event Time	State	AID	Tag Name	Tag Description	SER Index
15-Mar-2014 15:49:10:404	CLOSED	A	G122ANN406SOE	HEATER 3 BS ISOL VALVE CLOSED	68
15-Mar-2014 15:48:51:989	OK		G140ANN110SOE	TURB OIL PUMP SUCTION PRS LOW	6
15-Mar-2014 15:48:50:721	RUNG	A	G148ANN130SOE	TURB LO MTR SUCT PMP STATUS	11
15-Mar-2014 15:48:40:251	LOW	A	G140ANN110SOE	TURB OIL PUMP SUCTION PRS LOW	6
15-Mar-2014 15:48:27:944	CLOSED	A	G125ANN404SOE	HEATER 5 BS ISOL VALVE CLOSED	66
15-Mar-2014 15:48:26:436	RESET		G150ANN070SOE	GEN EXCITER FLD BKR AUTO TRIP	3
15-Mar-2014 15:48:17:496	RUNNG	A	G140TGOPRUNSOE	TURN GEAR OIL PMP RUNNING<	91
15-Mar-2014 15:48:15:487	TRIPPD	A	G133ANN344SOE	DRUM LEVEL TRIP<	139
15-Mar-2014 15:48:13:644	NORMAL		G132ANN288SOE	EMGNCY FURN PRS CNTRLR OPER	122
15-Mar-2014 15:48:13:390	RUNG	A	G141ANN172SOE	EMGNCY BRNG OIL PMP STATUS	105
15-Mar-2014 15:48:10:243	LOW	A	G125ANN237SOE	DRUM LEVEL LOW<	46
15-Mar-2014 15:48:06:383	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
15-Mar-2014 15:48:03:924	TRIPPD	A	G150ANN070SOE	GEN EXCITER FLD BKR AUTO TRIP	3
15-Mar-2014 15:48:02:870	RESET		G140CVNOLOADSOE	CV #1 NO LOAD TRIP<	234
15-Mar-2014 15:48:02:870	RESET		G140MSVNOLOADSOE	MSV #2 NO LOAD TRIP<	233
15-Mar-2014 15:48:02:584	RESET		G150ANN440SOE	GEN TRP ON REVERSE POWER	86
15-Mar-2014 15:48:02:578	TRIPPD	A	G150ANN058SOE	GENERATOR RELAY 86G1 TRIP	2
15-Mar-2014 15:48:02:572	TRIPPD	A	G150ANN440SOE	GEN TRP ON REVERSE POWER	86
15-Mar-2014 15:47:57:128	TRIPPD	A	G133BLRTR2TRBSOE	BOILER TRIP TO TCS<	229
15-Mar-2014 15:47:56:613	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
15-Mar-2014 15:47:55:866	RESET		G140PBORDCSTTSOE	TURB TRIP PB OR OPER DCS TRIP	221
15-Mar-2014 15:47:55:860	ACTIVE	A	G132ANN288SOE	EMGNCY FURN PRS CNTRLR OPER	122
15-Mar-2014 15:47:55:625	TRIPPD	A	G140CVNOLOADSOE	CV #1 NO LOAD TRIP<	234
15-Mar-2014 15:47:55:625	TRIPPD	A	G140MSVNOLOADSOE	MSV #2 NO LOAD TRIP<	233

# Forced Outage Report

15-Mar-2014					
15:47:55:624	OPENED		G103APASTSSOE	1A PA FAN STATUS	212
15-Mar-2014					
15:47:55:614	OPENED		G103BPASTSSOE	1B PA FAN STATUS	226
15-Mar-2014					
15:47:55:563	TRIPPD	A	G133ANN319SOE	MASTER FUEL TRIP	78
15-Mar-2014				HEATER 6 BS ISOL VALVE	
15:47:55:307	CLOSED	A	G125ANN403SOE	CLOSED	65
15-Mar-2014				TURB TRIP PB OR OPER DCS	
15:47:54:874	TRIPPD	A	G140PBORDCSTTSOE	TRIP	221
15-Mar-2014					
>>> 15:47:54:874	TRIPPD	A	G140ANN158SOE	TURBINE TRIP	41
15-Mar-2014					
15:45:52:625	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
15-Mar-2014					
15:42:10:184	ALARM	A	G125ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
15-Mar-2014					
15:41:24:958	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:40:20:974	NORMAL		G125ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
15-Mar-2014					
15:37:42:721	NORMAL		G122ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
15-Mar-2014					
15:36:55:360	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:55:103	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:54:108	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:53:851	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:53:610	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:53:352	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:52:608	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:52:350	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:52:106	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:51:848	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:51:608	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:51:349	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:50:607	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:50:347	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:50:102	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:49:845	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:49:605	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:49:346	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:49:101	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:48:844	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014					
15:36:48:602	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43

# Forced Outage Report

15-Mar-2014	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:48:344					
15-Mar-2014	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:48:100					
15-Mar-2014	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:47:843					
15-Mar-2014	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:47:603					
15-Mar-2014	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:46:594					
15-Mar-2014	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:46:349					
15-Mar-2014	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:46:090					
15-Mar-2014	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:45:848					
15-Mar-2014	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:45:592					
15-Mar-2014	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:45:347					
15-Mar-2014	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:45:089					
15-Mar-2014	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:44:845					
15-Mar-2014	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:44:591					
15-Mar-2014	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:44:095					
15-Mar-2014	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:43:338					
15-Mar-2014	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:43:094					
15-Mar-2014	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:42:836					
15-Mar-2014	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:42:596					
15-Mar-2014	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:42:337					
15-Mar-2014	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:42:093					
15-Mar-2014	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:41:835					
15-Mar-2014	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:41:595					
15-Mar-2014	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:41:083					
15-Mar-2014	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:40:840					
15-Mar-2014	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:40:586					
15-Mar-2014	ALARM	A	G125ANN185SOE	HTR 6 LVL HI OR DRAINS BYP	116
15:36:40:429					
15-Mar-2014	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:40:341					
15-Mar-2014	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:40:082					
15-Mar-2014	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:39:840					
15-Mar-2014	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:38:331					
15-Mar-2014	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:38:088					
15-Mar-2014	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15:36:37:829					

# Forced Outage Report

15-Mar-2014 15:36:37:589	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014 15:36:36:581	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014 15:36:36:338	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
15-Mar-2014 15:35:44:272	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:44:175	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:42:613	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:42:540	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:35:474	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:35:382	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:34:053	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:33:969	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:33:222	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:33:129	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:28:184	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:28:092	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:26:969	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:26:876	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:26:143	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:26:042	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:24:714	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:24:622	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:12:130	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:35:12:051	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:34:23:372	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:34:23:302	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:34:22:923	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:34:22:829	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:34:21:592	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:34:21:525	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:34:14:303	NORMAL		G125ANN175SOE	HTR 6 LVL HI-HI BS-ISOL	25
15-Mar-2014 15:34:14:274	ALARM	A	G125ANN175SOE	HTR 6 LVL HI-HI BS-ISOL	25
15-Mar-2014 15:31:52:085	ALARM	A	G122ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115

# Forced Outage Report

15-Mar-2014 15:31:48:555	NORMAL	G122ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
15-Mar-2014 15:30:10:843	RESET	G103BMNTRPSOE	G1 B MAIN TRIP	129
15-Mar-2014 15:30:10:823	OPENED	G103BMNSTSSOE	G1 B MAIN STATUS	130
15-Mar-2014 15:30:10:789	TRIPPD A	G103BMNTRPSOE	G1 B MAIN TRIP	129
15-Mar-2014 15:30:10:011	CLOSED	G1031T2TIESTSSOE	G1 B BUS 1T2 TIE STATUS	203
15-Mar-2014 15:29:47:320	RESET	G103AMNTRPSOE	G1 A MAIN TRIP	125
15-Mar-2014 15:29:47:303	OPENED	G103AMNSTSSOE	G1 A MAIN STATUS	126
15-Mar-2014 15:29:47:260	TRIPPD A	G103AMNTRPSOE	G1 A MAIN TRIP	125
15-Mar-2014 15:29:46:397	CLOSED	G1031T1TIESTSSOE	G1 A BUS 1T1 TIE STATUS	188
15-Mar-2014 15:28:35:959	CLOSED A	G133ANN349SOE	D MILL RATING DAMPER CLOSED<	117
15-Mar-2014 15:27:19:441	OPENED	G103DPULVSTSSOE	1D PULVERIER STATUS	201
15-Mar-2014 15:19:15:928	CLOSED A	G122ANN405SOE	HEATER 4 BS ISOL VALVE CLOSED	67
15-Mar-2014 15:19:10:212	ALARM A	G125ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
15-Mar-2014 15:17:50:426	CLOSED A	G132ANN329SOE	B MILL RATING DAMPER CLOSED<	249
15-Mar-2014 15:17:39:507	NORMAL	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:17:39:468	ALARM A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
15-Mar-2014 15:15:46:484	OPENED	G103S02SWSTSSOE	S02 SOLID WASTE STATUS	238
15-Mar-2014 15:15:46:472	CLOSED	G103S02SWSTSSOE	S02 SOLID WASTE STATUS	238
15-Mar-2014 15:15:46:432	OPENED	G103BPULVSTSSOE	1B PULVERIZER STATUS	170
15-Mar-2014 15:06:50:158	ALARM A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
15-Mar-2014 15:05:23:994	NORMAL	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
15-Mar-2014 15:03:32:033	ALARM A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
15-Mar-2014 15:03:05:733	NORMAL	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
15-Mar-2014 14:56:32:985	NORMAL	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 14:56:32:487	HIGH A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH< A MILL RATING DAMPER	61
15-Mar-2014 14:55:19:363	CLOSED A	G132ANN328SOE	CLOSED<	94
15-Mar-2014 14:52:24:015	LOW A	G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
15-Mar-2014 14:50:47:596	OPENED	G103APULVSTSSOE	1A PULVERIZER STATUS	157
15-Mar-2014 14:41:33:267	OK	G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
15-Mar-2014 14:41:33:017	LOW A	G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
15-Mar-2014 14:41:32:769	OK	G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
15-Mar-2014 14:41:30:013	LOW A	G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76

# Forced Outage Report

15-Mar-2014 14:41:29:513	OK		G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
15-Mar-2014 14:39:15:256	LOW	A	G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
15-Mar-2014 14:34:33:973	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 14:34:31:215	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 14:34:30:463	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 14:34:26:959	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 14:34:26:206	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 14:34:25:204	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 14:34:06:417	TRIPPD	A	H133ANN465SOE	BLR MSTR TRP TO MAN<	138
15-Mar-2014 14:34:05:166	TRIPPD	A	H133ANN463SOE	FUEL MSTR TRP TO MAN<	135
15-Mar-2014 14:34:04:918	TRIPPD	A	H132ANN464SOE	AIR FLW MSTR TRP TO MAN<	137
15-Mar-2014 14:32:02:934	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
15-Mar-2014 14:31:49:661	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 14:31:45:902	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 14:30:58:813	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
15-Mar-2014 14:29:01:838	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
15-Mar-2014 14:28:54:825	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
15-Mar-2014 14:28:49:566	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
15-Mar-2014 14:28:21:013	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 14:28:19:758	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 14:27:40:684	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 14:27:38:680	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 12:54:21:600	CLOSED	A	G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 12:54:20:343	NCLSD		G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 11:36:47:266	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 11:36:47:014	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 11:10:35:244	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 11:10:34:741	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 10:47:16:147	CLOSED	A	G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 10:47:14:640	NCLSD		G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 10:19:05:940	CLOSED	A	G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 10:19:03:931	NCLSD		G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132

# Forced Outage Report

15-Mar-2014 10:02:54:705	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 10:02:54:200	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 09:50:48:223	CLOSED	A	G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 09:50:46:215	NCLSD		G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 09:49:05:860	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 09:49:04:857	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 09:39:25:748	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 09:39:24:244	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 09:24:13:003	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 09:24:12:501	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 09:20:05:030	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 09:20:03:777	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 09:18:48:719	CLOSED	A	G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 09:18:46:461	NCLSD		G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 08:47:04:739	CLOSED	A	G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 08:47:02:483	NCLSD		G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 08:14:30:688	CLOSED	A	G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 08:14:29:933	NCLSD		G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 08:00:01:977	OFF		G1MANTRIGSOE	MANUAL SOE TRIGGER	215
15-Mar-2014 07:59:59:733	ON	A	G1MANTRIGSOE	MANUAL SOE TRIGGER	215
15-Mar-2014 07:44:40:099	CLOSED	A	G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 07:44:37:593	NCLSD		G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 07:15:34:819	CLOSED	A	G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 07:15:34:062	NCLSD		G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 07:03:44:323	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 07:03:43:569	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 06:58:53:262	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 06:58:52:760	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
15-Mar-2014 06:46:49:815	CLOSED	A	G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 06:46:47:555	NCLSD		G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 06:17:46:287	CLOSED	A	G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
15-Mar-2014 06:17:44:027	NCLSD		G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132

## Forced Outage Report

15-Mar-2014				C MILL RATING DAMPER	
05:49:50:846	CLOSED	A	G133ANN339SOE	CLOSED<	132
15-Mar-2014				C MILL RATING DAMPER	
05:49:48:337	NCLSD		G133ANN339SOE	CLOSED<	132
15-Mar-2014				C MILL RATING DAMPER	
05:21:32:876	CLOSED	A	G133ANN339SOE	CLOSED<	132
15-Mar-2014				C MILL RATING DAMPER	
05:21:30:868	NCLSD		G133ANN339SOE	CLOSED<	132
15-Mar-2014				C MILL RATING DAMPER	
04:54:41:517	CLOSED	A	G133ANN339SOE	CLOSED<	132
15-Mar-2014				C MILL RATING DAMPER	
04:54:39:509	NCLSD		G133ANN339SOE	CLOSED<	132
15-Mar-2014				C MILL RATING DAMPER	
04:27:44:655	CLOSED	A	G133ANN339SOE	CLOSED<	132
15-Mar-2014				C MILL RATING DAMPER	
04:27:42:646	NCLSD		G133ANN339SOE	CLOSED<	132
15-Mar-2014					
04:00:39:004	RESET		H133ANN465SOE	BLR MSTR TRP TO MAN<	138
15-Mar-2014				C MILL RATING DAMPER	
04:00:13:000	CLOSED	A	G133ANN339SOE	CLOSED<	132
15-Mar-2014				C MILL RATING DAMPER	
04:00:10:991	NCLSD		G133ANN339SOE	CLOSED<	132
15-Mar-2014					
03:58:34:513	TRIPPD	A	H133ANN465SOE	BLR MSTR TRP TO MAN<	138
15-Mar-2014				C MILL RATING DAMPER	
03:32:48:599	CLOSED	A	G133ANN339SOE	CLOSED<	132
15-Mar-2014				C MILL RATING DAMPER	
03:32:46:843	NCLSD		G133ANN339SOE	CLOSED<	132

# Forced Outage Report

## Operators Event Log



Big Rivers  
ELECTRIC CORPORATION

### LOG BOOK

DATE 3-15-14

☐ REID  
☒ GREEN  
☐ COLEMAN  
☐ WILSON

☒ SHIFT SUPERVISOR  
☐ CONTROL OPERATOR  
☐ AUXILIARY OPERATOR  
☐ UTILITY OPERATOR  
☐ \_\_\_\_\_

☐ SCRUBBER SHIFT SUPERVISOR  
☐ SCRUBBER OPERATOR  
☐ SCRUBBER AUXILIARY OPERATOR  
☐ SOLID WASTE OPERATOR  
☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
12M	Hust, Hager, Northington, Butler, J Barron, Haner, Combs, Cook, R. Parker, Collins
G1	Load 251 AB&D Mills ADS in service SO <sub>2</sub> .50 Nor. 14 opacity 3.5
G2	Load 242 AB&C Mills ADS in service SO <sub>2</sub> .22 Nor. 19 opacity 7.6
Sloker, G1	4on 22.5 + 22.5 #1 + 2 s.i/o
G2	4on 20.0 + 24.6 #3 s.i/o
prop	1 on 86.7" #4 s.i/o
IU	A conveyors A&C Drums #1 s.i/o 30" #1 shoot 36"
	16" in Tanks silos 46% 48%
	1A 9kw 2A 9kw E 3.5 E 2.0 IU 23kw
	1B 11.5kw 2B 9.5kw W 2.5 W 1.0
12:30	Jim Smith - Transmission Dept finished checking Relay Voltages in control room
12:45	1A off 0° 6'10" 2A off 0° 6'10"
	1B 1' 45' 6'8" 2B 2396' 0° 6'7"
6:15	IU Down 8' in Tanks

[252]

G1 tube leak discovered at 1410,  
Started off with unit, unit  
off-line @ 1548  
SH-15.8 W02-B.2

G2 - 242

OPER	SUP'R
1ST	
2ND	
3RD	
SIGNED <u>TSZm</u>	

F155.12  
R 1/93

## Forced Outage Report



### LOG BOOK

DATE 3-15-14

- ☐ REID
- ☐ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
<u>8AM</u>	<u>Beaven, Reed, Rithmeyer, Hopkins, Berry, Mahan</u> <u>Bell, Rigdon, Gorkrell, Duvall</u>
G-1	LOAD 252 CAP 250 3 mills C=S/B SOL .44 NOX .16 capacity 3.8% ADS IN 2 Precips OUT
G-2	LOAD 242 CAP 242 3 mills D=S/B SOL .22 NOX .20 capacity 7.9% ADS IN 2 Precips OUT
	SLAKERS G-1 4 ON 25'25" #1 G-2 4 ON 24'25" #4 Prep OUT 82%
	I U OUT 14 1/2' TANKS #1 silo 52' silo+safety @ E1.5 W1.5 #2 silo 45' silo+safety @ E1.0 W1.0
<u>900</u>	1A OFF OT-6'9" 2A 34.9 (89) OT-6'10" 1B OFF 4T-6'9" 2B 33.4 (237) OT-6'9"
	STACK DRAINS OK

OPER	SUP'R
1ST	<u>W/PA-VP</u>
2ND	
3RD	
SIGNED	

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 3-15-14

- ☐ REID
- ☒ GREEN
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- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
12 <sup>30</sup>	1A OFF OT-6'9" 2A 36 (86) OT-6'10"
	1B OFF 4T-6'9" 2B 33.6 (237) 6T-6'9"
2 <sup>10</sup>	G-1 Tube Leak boiler West Pos. can NOT look inside to tell where leak is called K. WEST - called B. Vowels
2 <sup>12</sup>	STARTED dropping LOAD
2 <sup>50</sup>	A mill OFF
3 <sup>15</sup>	B mill OFF
3 <sup>27</sup>	D mill OFF
3 <sup>48</sup>	G-1 OFF LINE
4 <sup>17</sup>	ON TURNING GEAR
9:05	ID & FD Fans R/T
8:30	J Don: Than Reporting on 3-16-14 - 12N-12M
9:0	1A 28.9 0' 6'9" 2A 35.9 0' 6'9" 2B off 10' 6'9"
	1B off 4' 6'9"

OPER	SUP'R
1ST	<i>W. SA-SP</i>
2ND	
3RD	<i>B. 202</i>
SIGNED	

F155.12  
R 1/93

## Forced Outage Report



### LOG BOOK

DATE 3-16-14

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
12 M	Hust, Hayes, Northington, Butler, J Barron, Haner Combs, Cook, R. Parker, Collins
G1	Down - Tube leak
G2	Load 242 A, B & C Mills ADS in service SO <sub>2</sub> .13 Nor. 19 capacity 7.2
Slaken	G1 2 on 24.0 + 24.0 #1 s. 16 G2 3 on 23.1 + 24.5 #4 s. 16 prep out 75.7"
IU	A conveyors A & D Drums #1 s. 16 34" #1 smoot 36" 16' in Tanks s. 16 52 0/0 49 0/0 IU 15.5 hrs E 7.5 E 2.0 1A 7 hrs 2A 7.5 hrs W 7.5 W 1.0 1B 7 hrs 2B 7 hrs
1 Am	1A 35.7 0" 6.9" 2A 35.9 0" 6.9" 1B off 4" 6.9" 2B off 5" 6.9"

G1 Boiler hydro good at 1700  
fires established at 1950  
unit tied on line at 2142  
UO2 - 21.7 SH - 2.3 SA - 15.1

OPER	SUP'R
1ST	
2ND	
3RD	BZM
SIGNED	

G2-242

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 3-16-14

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
<u>PM</u>	<u>Beaven, Reed, Rittmeyer, Lawrence, Turner,</u> <u>Hopkins, Berry, Mahan</u> <u>Bell, Rigdon, Gorrell, Duvall</u>
G-1	outage - Tube leak
G-2	LOAD Cap 3 mills SO2 NOx opacity ADS IN Precip out
	Slakers G-1 2 on 23.5 23.9 #1 G-2 3 on 23.2 22.6 #4 Prep out 83.9%
	IU out 12' TANKS silo #1 - 39' silo + SAF @ E1.5 W1.0 silo #2 - 50' silo + SAF @ E1.5 W1.5
	1A OFF OT-6'8" 2A OFF OT-6'10" 1B OFF 4T-6'8" 2B OFF 2PT-6'8"
	Stack drains OK

OPER	SUP'R
1ST	<u>W/SA-8P</u>
2ND	
3RD	
SIGNED	

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 3-16-14

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

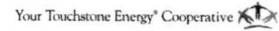
- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
9 <sup>30</sup>	IU in A COND C drum #2 Flyash 20TPH #2 smoot 187. 14' Tanks
11 <sup>20</sup>	Filling Hotwell
12 <sup>15</sup>	Relatching R/T on G-1 B.F.P.
1 <sup>00</sup>	Put COND. Pump on
1 <sup>15</sup>	G1 "A" BFP ON - Had breaker problem with IC B.F.P. Electr. working on it
1 <sup>20</sup>	G1 "B" B.F.P. ON
1 <sup>00</sup>	1A OFF OT-6'9" 2A 34.8 (87) OT-6'10" 1B OFF 4T-6'8" 2B 34.6 (223) 2BT-6'8"
2 <sup>00</sup>	IU down
3 <sup>30</sup>	IU Back in service Running B side
4 <sup>05</sup>	Lime s/o's 55/45 42/24 41/23 57/46 Dis 471"

OPER	SUP'R
1ST	RJ 8A-PP
2ND	
3RD	
SIGNED	

F155.12  
R 1/93



DATE 3-16-14

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

TIME	REMARKS
4:15	G-1 Boiler hydro 1600 Press. BFPs OFF
5:00	G-1 Dry boiler
7:30	Fires established in G-1 Boiler
9:10	B1 Turbine rolled off Gear
9:42	G-1 Tied on Line - Precips in service
10:35	1B Mill on - Second Mill
10:42	Run Back in - Gen protective relay alarm in on stator unit. Come in at 90 MW. inst checking in to problem

OPER		SUP'R
1ST		<i>HW 8A-8P</i>
2ND		
3RD		<i>BS 20h</i>
SIGNED		

# Forced Outage Report

## Boiler Tube Leak Record

Plant Green Unit 1

### Type of Leak: (Check One)

Pin Hole X Thick Lip Failure \_\_\_\_\_ Thin Lip Failure X

Tube Wall Thinning X Other Crack

### Orientation of Rupture: (Check One)

Longitudinal X Circumferential \_\_\_\_\_

### Probable Cause: (Check One)

Stress \_\_\_ Overheat \_\_\_ Erosion \_\_\_ Internal Corrosion \_\_\_

External Corrosion X Weld Failure \_\_\_\_\_ (Shop \_\_\_ Field \_\_\_)

Internal Obstruction to Flow \_\_\_\_\_ Sootblower Erosion \_\_\_\_\_

Other \_\_\_\_\_

### Type of Repair: (Check One)

Dutchman X (Length of Dutchman see below Pad Weld \_\_\_\_\_)

Plug Tube \_\_\_\_\_ Short Circuit \_\_\_\_\_ Other \_\_\_\_\_

# Forced Outage Report

## Description of Repair:

Tube Size OD 2 1/2" Wall Thickness .148" Tube Material SA213T11

Welding procedure GS-P1-1L for tube welds

Welded By: Titan

## Exact Location of Leak: Be Specific

Intermediate Reheater 21st element from East 1st tube 75 inch dutchman

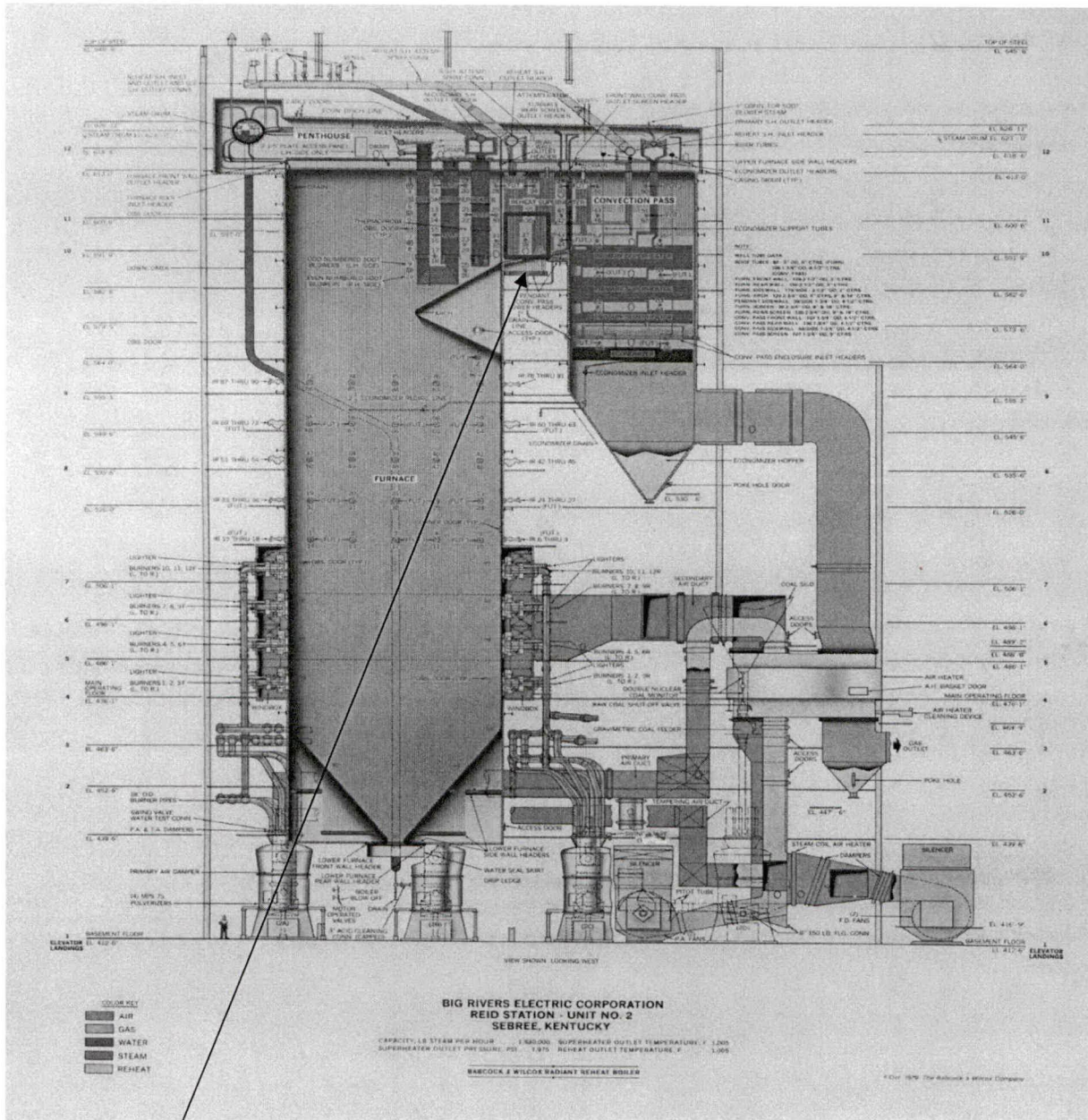
Intermediate Reheater 22nd element from East 1st tube 75 inch dutchman

Outlet Reheater 21st element from East 1st tube base metal repair (pad weld)

Outlet Reheater 22nd element from East 1st tube 17 inch dutchman

# Forced Outage Report

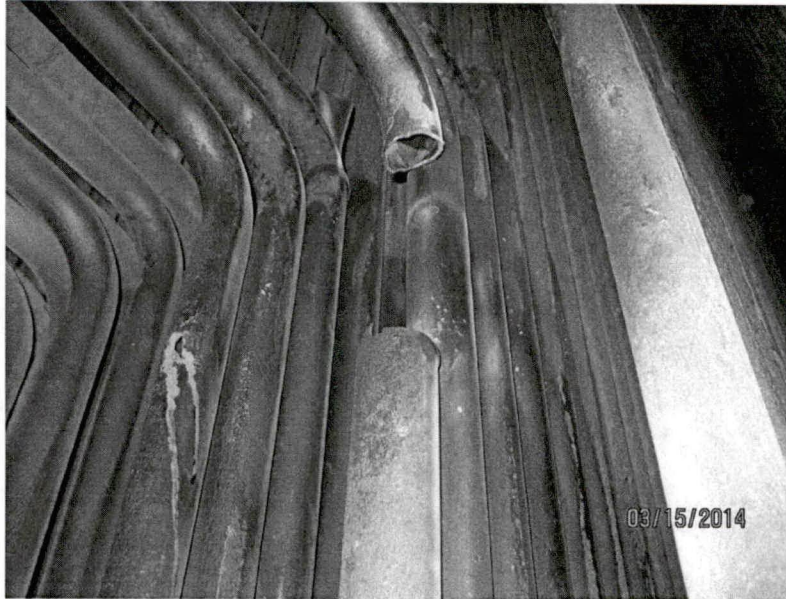
## REID STATION UNIT 1 (4) TUBES INVOLVED



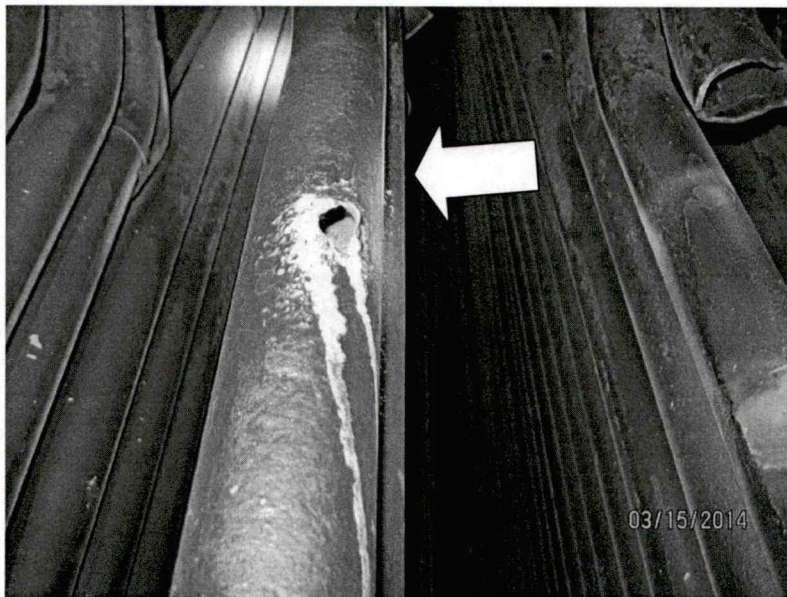
Intermediate Reheater 21<sup>st</sup> element from East 1<sup>st</sup> tube 75 inch dutchman  
 Intermediate Reheater 22<sup>nd</sup> element from East 1<sup>st</sup> tube 75 inch dutchman  
 Outlet Reheater 21<sup>st</sup> element from East 1<sup>st</sup> tube base metal repair (pad weld)  
 Outlet Reheater 22<sup>nd</sup> element from East 1<sup>st</sup> tube 17 inch dutchman

# Forced Outage Report

## Pictures

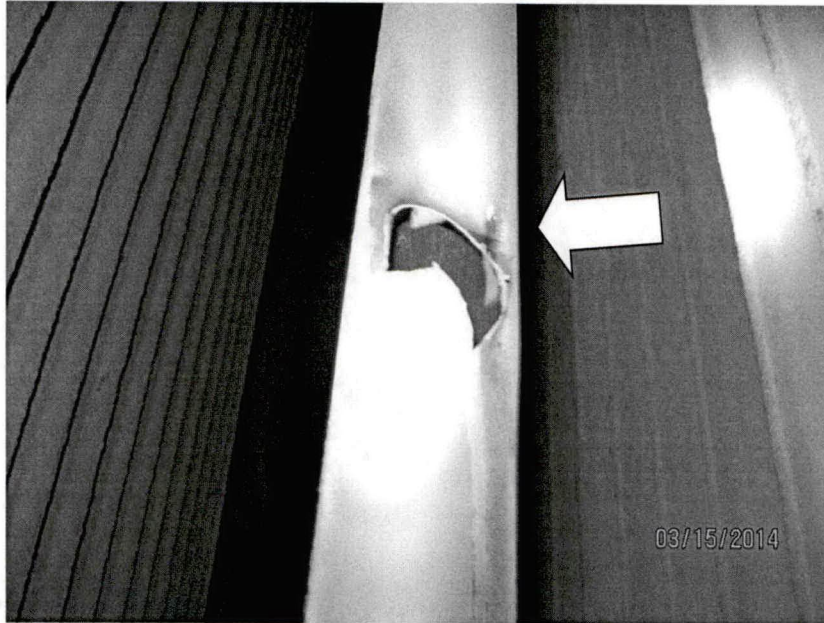


Intermediate Reheater South 21st element from East 1<sup>st</sup> Tube

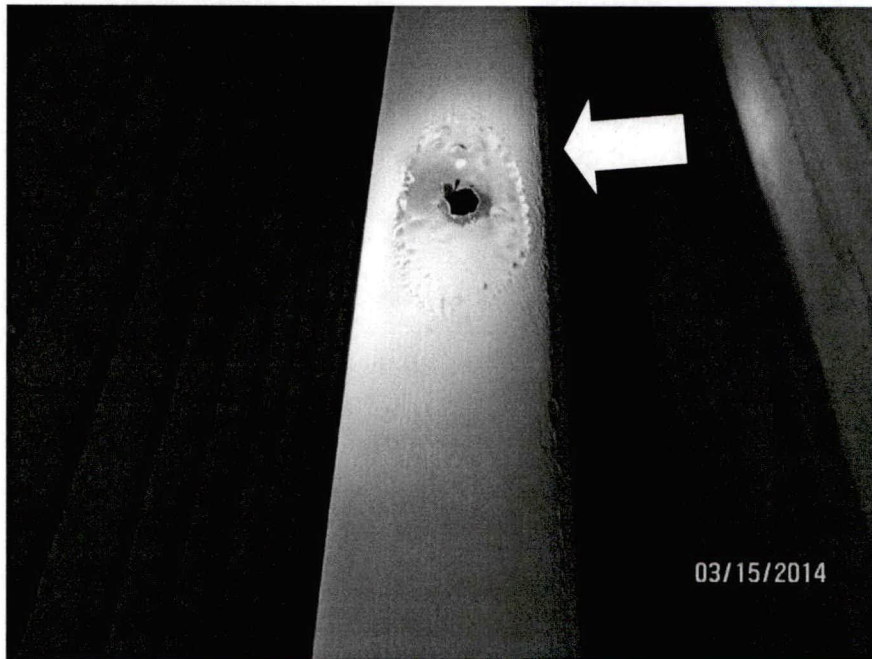


Intermediate Reheater South 22<sup>nd</sup> element from East 1<sup>st</sup> Tube

## Forced Outage Report



Outlet Reheater South 22<sup>nd</sup> element from East 1<sup>st</sup> Tube



Outlet Reheater South 21<sup>nd</sup> element from East 1<sup>st</sup> Tube

# Forced Outage Report

## O&M Costs

**Materials:**                **\$575**

**Outside Labor**   **\$19,747**

**Total**                    **\$20,322**

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>Green 1 - G1-14-05</b>		<b>Production Cost</b>	
<b>Date &amp; Time Off Line</b>	3/15/14 15:48		<b>MW</b>	<b>\$/MW</b>
<b>Date &amp; Time On Line</b>	3/16/14 21:42		73	\$ 29.18
<b>Outage Duration</b>	29 hr. 54 min.		181	\$ 24.82
<b>Outage Code</b>	U02		235	\$ 24.34
<b>Outage Reason</b>	Repair intermediate reheater tube leak.			
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
3/15/14 (HE 14-24)	\$ 30.50	\$ 33.00	\$ (22,692)	\$ -
3/16/14 (HE 1-24)	\$ 35.92	\$ 64.27	\$ (219,391)	\$ -
3/17/14 (HE 1-3)	\$ 34.31	\$ 31.41	\$ 2,599	\$ (6,907)
<b>Total</b>			<b>\$ (239,484)</b>	<b>\$ (6,907)</b>
<b>Start Up Fuel Cost</b>			<b>Total Forced Outage Cost</b>	
S/U Fuel Consumed	11,335		DART P&L	\$ (239,484)
S/U Fuel Price	\$ 3.13		Lost Opportunity	\$ (6,907)
<b>S/U Fuel Cost</b>	<b>\$ (35,449)</b>		S/U Fuel Cost	\$ (35,449)
			<b>Total</b>	<b>\$ (281,840)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Bob Berry

**From:** Perry Bowley

**Date:** 19-Mar-2014

**Plant:** Green

**Unit:** 1

**GADS Class:** UO2

## Duration

Trip Time: March-2014 04:20

Tie Time: 18-March-2014 15:58

Time Offline: 35:38

## Outage Description

Green Unit 1 was removed from service on Monday, 17-Mar-2014 at 04:20 via controlled shutdown due to a primary superheater tube leak.

## Root Cause

The Green Unit 1 primary superheater top section, 1<sup>st</sup> tube from east, bottom tube in element failed. This is a loop tube down to the primary superheater middle section top tube. The top tube of the middle section 2<sup>nd</sup> element from east also failed.

## Failure History

There have been five previous primary superheater tube leaks since 2007.

15-August -2009 Offline 37 hours 18 minutes

29-December -2009 Offline 40 hours 53 minutes

2-January – 2010 Offline 31 hours 1 minute

21-June -2011 Offline 49 hours 13 minutes

13-August -2012 Offline 31 hours 24 minutes

# Forced Outage Report

## Corrective Action

Titan installed five dutchman: Primary Superheater Top Bank bottom tube into Middle Primary and 1<sup>st</sup> tube from East wall and Middle Primary top tube 2<sup>nd</sup> element.

(1) 6' 10" long, (2) 5' 3" long, one, (3) 27 ½ "long, (4) 1 half loop, 15 ¼" long

(5) 1 half loop, 15 ¼" long

## Other Work Completed While Unit Was Offline

G1 #2 Heater tube leak repaired

# Forced Outage Report

## SOE Print Out

Report Type Standard  
Report Number 1  
Report Title SOE  
Recorder Number STANDARD  
Triggered on.... 1  
Number of Event Records 17-Mar-2014 04:20:43:671  
234

Event Time	State	AID	Tag Name	Tag Description	SER Index
17-Mar-2014 04:21:20:239	DSABLD	A	G125ANN283SOE	DRUM LEVEL TRIP DISABLED<	60
17-Mar-2014 04:21:20:225	RESET		G133ANN344SOE	DRUM LEVEL TRIP<	139
17-Mar-2014 04:21:18:102	ALARM	A	G122ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
17-Mar-2014 04:21:08:970	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014 04:21:08:716	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014 04:21:08:208	TRIPPD	A	G133ANN344SOE	DRUM LEVEL TRIP<	139
17-Mar-2014 04:21:07:462	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014 04:21:06:965	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014 04:21:06:712	NORMAL		G132ANN288SOE	EMGNCY FURN PRS CNTRLR OPER	122
17-Mar-2014 04:21:01:967	LOW	A	G125ANN237SOE	DRUM LEVEL LOW<	46
17-Mar-2014 04:21:01:957	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014 04:21:01:201	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014 04:21:00:954	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014 04:21:00:701	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014 04:20:59:954	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014 04:20:59:446	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014 04:20:59:199	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014 04:20:54:600	NORMAL		G122ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
17-Mar-2014 04:20:52:792	TRIPPD	A	G150ANN070SOE	GEN EXCITER FLD BKR AUTO TRIP	3
17-Mar-2014 04:20:52:168	RESET		G140MSVNOLOADSOE	MSV #2 NO LOAD TRIP<	233
17-Mar-2014 04:20:52:167	RESET		G140CVNOLOADSOE	CV #1 NO LOAD TRIP<	234
17-Mar-2014 04:20:51:750	RESET		G150ANN440SOE	GEN TRP ON REVERSE POWER	86
17-Mar-2014 04:20:51:746	TRIPPD	A	G150ANN058SOE	GENERATOR RELAY 86G1 TRIP	2
17-Mar-2014	TRIPPD	A	G150ANN440SOE	GEN TRP ON REVERSE POWER	86

# Forced Outage Report

04:20:51:739					
17-Mar-2014					
04:20:47:599	OK		G143ANN153SOE	EHC FLUID PRESSURE LOW	19
17-Mar-2014					
04:20:45:675	TRIPPD	A	G133BLRTR2TRBSOE	BOILER TRIP TO TCS<	229
17-Mar-2014					
04:20:44:673	TRIPPD	A	G140MSVNOLOADSOE	MSV #2 NO LOAD TRIP<	233
17-Mar-2014					
04:20:44:672	TRIPPD	A	G140CVNOLOADSOE	CV #1 NO LOAD TRIP<	234
17-Mar-2014					
04:20:44:671	ACTIVE	A	G132ANN288SOE	EMGNCY FURN PRS CNTRLR OPER	122
17-Mar-2014					
04:20:44:662	RESET		G140PBORDCSTTSOE	TURB TRIP PB OR OPER DCS TRIP	221
17-Mar-2014					
04:20:44:431	TRIPPD	A	G133ANN319SOE	MASTER FUEL TRIP	78
17-Mar-2014					
04:20:44:306	LOW	A	G143ANN153SOE	EHC FLUID PRESSURE LOW	19
17-Mar-2014					
04:20:43:671	TRIPPD	A	G140PBORDCSTTSOE	TURB TRIP PB OR OPER DCS TRIP	221
17-Mar-2014					
>>> 04:20:43:671	TRIPPD	A	G140ANN158SOE	TURBINE TRIP	41
17-Mar-2014					
04:19:54:121	OK		G125ANN227SOE	DRUM LEVEL HIGH<	45
17-Mar-2014					
04:19:51:118	ENABLD		G125ANN283SOE	DRUM LEVEL TRIP DISABLED<	60
17-Mar-2014					
04:19:34:285	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:37:681	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:37:175	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:36:427	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:35:926	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:35:678	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:35:172	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:33:922	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:33:674	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:33:421	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:32:419	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:31:670	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:30:667	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:30:415	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:28:265	DSABLD	A	G125ANN283SOE	DRUM LEVEL TRIP DISABLED<	60
17-Mar-2014					
04:18:12:882	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:12:381	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:11:879	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:11:126	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53

# Forced Outage Report

04:18:09:628					
17-Mar-2014					
04:18:07:873	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:01:613	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:01:107	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:18:00:105	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:17:58:856	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:17:58:101	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:17:57:854	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:17:57:352	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:17:57:098	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:17:52:843	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:17:47:586	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:17:46:832	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:17:45:582	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:17:45:076	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:17:43:827	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:17:43:326	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:17:05:908	HIGH	A	G125ANN227SOE	DRUM LEVEL HIGH<	45
17-Mar-2014					
04:17:03:148	OK		G125ANN227SOE	DRUM LEVEL HIGH<	45
17-Mar-2014					
04:17:02:554	ALARM	A	G122ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
17-Mar-2014					
04:17:02:153	HIGH	A	G125ANN227SOE	DRUM LEVEL HIGH<	45
17-Mar-2014					
04:16:57:608	NORMAL		G122ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
17-Mar-2014					
04:16:06:889	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:16:06:584	LOW	A	G155ANN312SOE	MAIN STEAM TEMP LOW<	75
17-Mar-2014					
04:16:06:139	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:16:04:886	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:16:04:136	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:16:03:636	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:16:03:134	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:16:02:132	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:15:41:751	RUNNG	A	G140TGOPRUNSOE	TURN GEAR OIL PMP RUNNING<	91
17-Mar-2014					
04:15:41:492	STOPPD		G140TGOPRUNSOE	TURN GEAR OIL PMP RUNNING<	91
17-Mar-2014					
	RUNNG	A	G140TGOPRUNSOE	TURN GEAR OIL PMP RUNNING<	91

# Forced Outage Report

04:15:41:251					
17-Mar-2014					
04:15:32:824	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:15:31:074	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:15:29:571	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:15:28:068	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:15:26:315	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:15:24:060	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:15:23:310	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:15:20:777	RUNG	A	G148ANN130SOE	TURB LO MTR SUCT PMP STATUS	11
17-Mar-2014					
04:13:47:378	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:46:623	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:44:871	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:42:615	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:39:061	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
17-Mar-2014					
04:13:38:960	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
17-Mar-2014					
04:13:37:110	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:36:604	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:36:107	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:31:711	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
17-Mar-2014					
04:13:31:613	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
17-Mar-2014					
04:13:30:788	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
17-Mar-2014					
04:13:30:707	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
17-Mar-2014					
04:13:30:350	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
17-Mar-2014					
04:13:30:240	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
17-Mar-2014					
04:13:17:312	CLOSED	A	G125ANN403SOE	HEATER 6 BS ISOL VALVE CLOSED	65
17-Mar-2014					
04:13:17:063	NORMAL		G125ANN175SOE	HTR 6 LVL HI-HI BS-ISOL	25
17-Mar-2014					
04:13:17:008	ALARM	A	G125ANN175SOE	HTR 6 LVL HI-HI BS-ISOL	25
17-Mar-2014					
04:13:14:562	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:14:315	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:13:560	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:11:059	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:10:807	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53

# Forced Outage Report

04:13:10:057					
17-Mar-2014					
04:13:09:805	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:07:801	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:06:798	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:05:544	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:03:541	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:02:292	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:02:042	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:01:041	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:00:288	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:13:00:039	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:12:59:785	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:12:59:534	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:12:59:286	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:12:58:035	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:12:57:781	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:12:51:519	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:12:51:271	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:10:58:556	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:10:58:302	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:10:56:804	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:10:50:039	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:10:49:790	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:10:49:285	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:10:46:032	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:10:45:782	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:10:45:530	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:10:45:277	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:10:43:026	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:10:41:775	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:10:37:767	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:10:37:015	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53

# Forced Outage Report

04:10:36:766					
17-Mar-2014					
04:10:36:514	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:10:29:500	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:10:27:997	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:07:58:696	CLOSED	A	G133ANN349SOE	D MILL RATING DAMPER CLOSED<	117
17-Mar-2014					
04:07:41:097	OPENED		G103BPASTSSOE	1B PA FAN STATUS	226
17-Mar-2014					
04:07:38:102	OPENED		G103APASTSSOE	1A PA FAN STATUS	212
17-Mar-2014					
04:07:24:401	CLOSED	A	G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
17-Mar-2014					
04:07:21:893	NCLSD		G133ANN339SOE	C MILL RATING DAMPER CLOSED<	132
17-Mar-2014					
04:06:45:804	OPENED		G103DPULVSTSSOE	1D PULVERIER STATUS	201
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:53:275	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:53:028	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014					
04:05:44:958	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:05:44:707	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:44:263	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014					
04:05:43:956	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014					
04:05:43:705	ALARM	A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:43:012	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014					
04:05:42:704	NORMAL		G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:42:261	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:41:262	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:40:008	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:39:260	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:38:506	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:37:507	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:36:756	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014					
04:05:36:051	ALARM	A	G122ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:34:504	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:32:751	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:32:000	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:31:245	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:30:247	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
	OK		G122ANN225SOE		113

# Forced Outage Report

04:05:27:491				HIGH<	
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:26:994	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:25:989	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:25:745	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:24:988	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:21:486	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:05:20:735	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:28:838	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:28:085	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:24:334	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:24:080	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:22:584	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:22:328	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:20:077	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:19:824	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:17:825	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:17:071	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:16:322	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:14:819	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:13:820	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:12:568	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:11:816	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:08:310	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:07:811	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:05:054	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:04:307	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:03:053	OK		G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
04:03:02:559	HIGH	A	G122ANN225SOE	HIGH<	113
17-Mar-2014				CONDENSER HOTWELL LEVEL	
03:59:54:940	NORMAL		G122ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
17-Mar-2014					
03:59:05:742	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
17-Mar-2014					
03:59:05:498	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
17-Mar-2014					
03:59:04:741	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
17-Mar-2014	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43

# Forced Outage Report

03:58:32:957					
17-Mar-2014					
03:58:32:698	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
17-Mar-2014					
03:58:32:457	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
17-Mar-2014					
03:57:37:847	OPENED		G103BBFPSTSSOE	1B BFP STATUS	258
17-Mar-2014					
03:56:29:540	RESET		G103AMNTRPSOE	G1 A MAIN TRIP	125
17-Mar-2014					
03:56:29:522	OPENED		G103AMNSTSSOE	G1 A MAIN STATUS	126
17-Mar-2014					
03:56:29:480	TRIPPD	A	G103AMNTRPSOE	G1 A MAIN TRIP	125
17-Mar-2014					
03:56:28:080	CLOSED		G1031T1TIESTSSOE	G1 A BUS 1T1 TIE STATUS	188
17-Mar-2014					
03:56:14:239	RESET		G103BMNTRPSOE	G1 B MAIN TRIP	129
17-Mar-2014					
03:56:14:219	OPENED		G103BMNSTSSOE	G1 B MAIN STATUS	130
17-Mar-2014					
03:56:14:185	TRIPPD	A	G103BMNTRPSOE	G1 B MAIN TRIP	129
17-Mar-2014					
03:56:13:387	CLOSED		G1031T2TIESTSSOE	G1 B BUS 1T2 TIE STATUS	203
17-Mar-2014					
03:55:34:310	CLOSED	A	G132ANN329SOE	B MILL RATING DAMPER CLOSED<	249
17-Mar-2014					
03:54:24:179	OPENED		G103BPULVSTSSOE	1B PULVERIZER STATUS	170
17-Mar-2014					
03:47:26:033	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
17-Mar-2014					
03:47:25:932	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
17-Mar-2014					
03:47:21:860	CLOSED	A	G122ANN405SOE	HEATER 4 BS ISOL VALVE CLOSED	67
17-Mar-2014					
03:47:15:651	NORMAL		G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
17-Mar-2014					
03:47:15:573	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27

# Forced Outage Report

## Operators Event Log



### LOG BOOK

DATE 3-17-14

- ☐ REID
- ☐ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

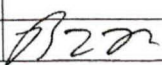
- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
12 M	HUST, Hayes, Doni Than, Northington, Butler, J Barron, Haner, Hoover
G 1	Start up in progress
G 2	Load 242 A, D & C Mills ADS in service SO <sub>2</sub> 114 Nuc 19 opal 77 7.6
Slakers	G1 Jon 25.5 & 25.0 #1 s/o G2 Jon 19 & 23.2 #4 s/o prop out 70.2"
I V	B conveyors C Drum #2 s/o 20T #2 smoot 18" 22' siles 41 0/0 S2 0/0 I V 20.5 hrs E 2.0 E 2.5 1A 5 hrs 2A 6 hrs W 1.5 W 1.0 1B 4.5 hrs 2B 13.5 hrs
12:40	1A Mill on - 3 Mills on
1:20	Jeff Doni Than going home
1:20	Mark Hoover going home

G1 Bore off-line at 0420 due to  
primary superheater tube leak  
SH - 4.33 402-19.67

G2 max load - 242

OPER	SUP'R
1ST	
2ND	
3RD	
SIGNED 	

F155.12  
R 1/93



DATE 3-17-14

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

OPER		SUP'R
1ST		
2ND		
3RD		<i>B2m</i>
SIGNED		

12

# Forced Outage Report



## LOG BOOK

DATE 3/17/14

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

8A-8P

THIS FORM TO BE COMPLETED IN INK

Monday

TIME	REMARKS
8AM	D Barron, Geer, Bolds, Turner, Denton, Mahan-Vac Rittmeyer, Thomas, Townsend, Strickland, Tapp, Hobgood-Vac
6-1	Unit off line for primary superheater tube leak. Fanning boiler down tagging equipment.
6-2	Load - 242 Cap - 242 20 Million standby SO <sub>2</sub> - .20 NOx - .20 Opacity - 8.5% A.D.S. in service. Precips out - 2
Slakers	Green 1 - 3 on. 25.6' / 26.1' (#1 Silo) Green 2 - 2 on. 22.1 / 22.3' (#4 Silo) Prep Bldg. - 1 on. 79.9% (#3 Silo)
I.U.	Remains in service w/B Conveyors, C Drum, ash from #2 silo @ 24 fph, #2 Smoot @ 16%, 22' in tanks
8:05A	Underflows: 1A-off Ø 6'9" 2A-off Ø 6'10" 1B-30.6 5 6'9" 2B-off Ø 6'9"
Note:	Both stack drains are open.

OPER	SUP'R
1ST	West
2ND	
3RD	
SIGNED	

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 3/17/14

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

Monday

TIME	REMARKS
8:45A	Flyash Silos #1) 47' #2) 50'
8:45A	Sullair Compressor red tagged to change out oil filter. Released + back on at 1:30PM
9:13A	G-1 Equipment signed on to repair tube leak
11:08A	Load of Sodium Bi-Sulfite here. Will put in G-2 Thickener Return Tank per Keith Ballard
12:00N	Underflows: 1A - 28.2 Ø 6'10" 2A - Off Ø 6'10" 1B - 29.0 5 6'9" 2B - 33.3 Ø 6'9"
1:15P	1A Mill Lube Oil Pump red tagged to replace pump. Released + on @ 4:45PM
2:10P	Maintenance replaced 2C3 Slaker Grit Conveyor.
—	G-1 Auxiliary Operator added EHC Fluid to EHC Unit. Level @ +1.1
7:00P	G-1 #2 Heater tube leak repaired.

OPER	SUP'R
1ST	West
2ND	
3RD	
SIGNED	

F155.12  
R 1/93



DATE 3/17/14

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

OPER		SUP'R
1ST		
2ND		
3RD		
SIGNED		

## Forced Outage Report

Big Rivers  
ELECTRIC CORPORATION

### LOG BOOK

DATE 3/18/14

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> REID             | <input checked="" type="checkbox"/> SHIFT SUPERVISOR | <input type="checkbox"/> SCRUBBER SHIFT SUPERVISOR   |
| <input checked="" type="checkbox"/> GREEN | <input type="checkbox"/> CONTROL OPERATOR            | <input type="checkbox"/> SCRUBBER OPERATOR           |
| <input type="checkbox"/> COLEMAN          | <input type="checkbox"/> AUXILIARY OPERATOR          | <input type="checkbox"/> SCRUBBER AUXILIARY OPERATOR |
| <input type="checkbox"/> WILSON           | <input type="checkbox"/> UTILITY OPERATOR            | <input type="checkbox"/> SOLID WASTE OPERATOR        |
|   | <input type="checkbox"/>                             | <input type="checkbox"/> SCRUBBER UTILITY OPERATOR   |

THIS FORM TO BE COMPLETED IN INK

TIME	REMARKS
1200	
G1	Cap outage load outage 502 NOR opac
G2	Cap 242 load 242 502 184 NOV. 210 opac 7.4
slakers	G1 2 21/25 G2 2 23/20 P 93%
Thickners	1A on 40r 0 6' 10" 2A on 38.4 0 6' 10" 1B on 38.6 5 6' 10" 2B on 36 0 6'
IV	In Service, B side, A - Drums, # 2 - 16T Tanks - 15' # 1 - 18%
Run Time	IV - 1A 3.25 2A 9.5 1B 3.25 2B 11
140	B. Townsend called for Personal Day - Granted.
710	Filling G-1 Boiler

G1 oil lines in at 1248, unit  
tied on line at 1558, all lines  
out at 1800. U02-15.97  
SH-B.03 SA-1 SS-1

G2 - 242

OPER	SUP'R
1ST	<i>[Signature]</i>
2ND	
3RD	
SIGNED	

F155.12  
R 1/93

## Forced Outage Report



### LOG BOOK

DATE 3/18/14

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

8A-8P

THIS FORM TO BE COMPLETED IN INK

Tuesday

TIME	REMARKS
8Am	D. Barron, Geer, Bolds, Hayes, Turner, Denton, Butler, Mahan, Thomas, Townsend - P/Day, Hobgood - Vac, Strickland, Tapp, Bell
G-2	Load - 242 Cap - 242 2D Mill on standby SO <sub>2</sub> - .23 NO <sub>x</sub> - .23 Opacity - 8% A.D.S. in service Precip out - 2
G-1	Unit down for tube leak repair. Filling G-1 boiler for hydro.
Sakers	Green 1 - 3 on. 25.3' / 26.0' (#2 Silo) Green 2 - 2 on. 23.4' / 21.1' (#4 Silo) Prep Bldg. - 1 on. 74.4% (#3 Silo)
I.U.	Remains in service w/B Conveyors, A Drum, ash from #2 silo @ 18 tph, #1 Smoot @ 18%, 18' in tanks
—	G-2 Stack drain open. (G-1 Unit off line)
8:30A	Flyash silo levels #1) 42' #2) 48'
9:25A	G-1 Drum pressure @ 1600psi. Notified Maint.

OPER	SUP'R
1ST	West
2ND	
3RD	
SIGNED	

F155.12  
R 1/93

# Forced Outage Report



## LOG BOOK

DATE 3/18/14

- ☐ REID
- ☒ GREEN
- ☐ COLEMAN
- ☐ WILSON

- ☒ SHIFT SUPERVISOR
- ☐ CONTROL OPERATOR
- ☐ AUXILIARY OPERATOR
- ☐ UTILITY OPERATOR
- ☐ \_\_\_\_\_

- ☐ SCRUBBER SHIFT SUPERVISOR
- ☐ SCRUBBER OPERATOR
- ☐ SCRUBBER AUXILIARY OPERATOR
- ☐ SOLID WASTE OPERATOR
- ☐ SCRUBBER UTILITY OPERATOR

THIS FORM TO BE COMPLETED IN INK

Tuesday

TIME	REMARKS
10:22A	Maintenance reports G-1 Boiler is dry. Notified N. Hankins. Setting up G-1 Boiler for unit start up.
12:48P	Oil Fires established in G-1 Boiler for unit start up.
3:58P	G-1 tied on line. 1D Mill on. Precips in.
4:36P	1B Mill on. Continuing start up.
5:10P	1C Mill on for 3 mill operation
6:00P	Oil fires out of G-1 boiler. Start up complete. Load at 200mw's. Drum @ 1600psi due to silica. Notified Hotline of all things G-1 Start Up.

OPER	SUP'R
1ST	West
2ND	
3RD	
SIGNED	

F155.12  
R 1/93

# Forced Outage Report

## Boiler Tube Leak Record

Plant Green Unit 1

### Type of Leak: (Check One)

Pin Hole X Thick Lip Failure \_\_\_\_\_ Crack \_\_\_\_\_ Thin Lip Failure \_\_\_\_\_

Tube Wall Thinning X Other \_\_\_\_\_

### Orientation of Rupture: (Check One)

Longitudinal X Circumferential \_\_\_\_\_

### Probable Cause: (Check One)

Stress \_\_\_\_\_ Overheat \_\_\_\_\_ Erosion X Internal Corrosion \_\_\_\_\_

External Corrosion X Weld Failure \_\_\_\_\_ (Shop \_\_\_\_\_ Field \_\_\_\_\_)

Internal Obstruction to Flow \_\_\_\_\_ Sootblower Erosion \_\_\_\_\_

Other \_\_\_\_\_

### Type of Repair: (Check One)

Dutchman X (Length of Dutchman see below Pad Weld \_\_\_\_\_)

Plug Tube \_\_\_\_\_ Short Circuit \_\_\_\_\_ Other \_\_\_\_\_

## Forced Outage Report

### Description of Repair:

Tube Size OD 2" Wall Thickness .165" Tube Material SA209T1A

Welding procedure GS-P1-1L for tube welds

Welded By: Titan

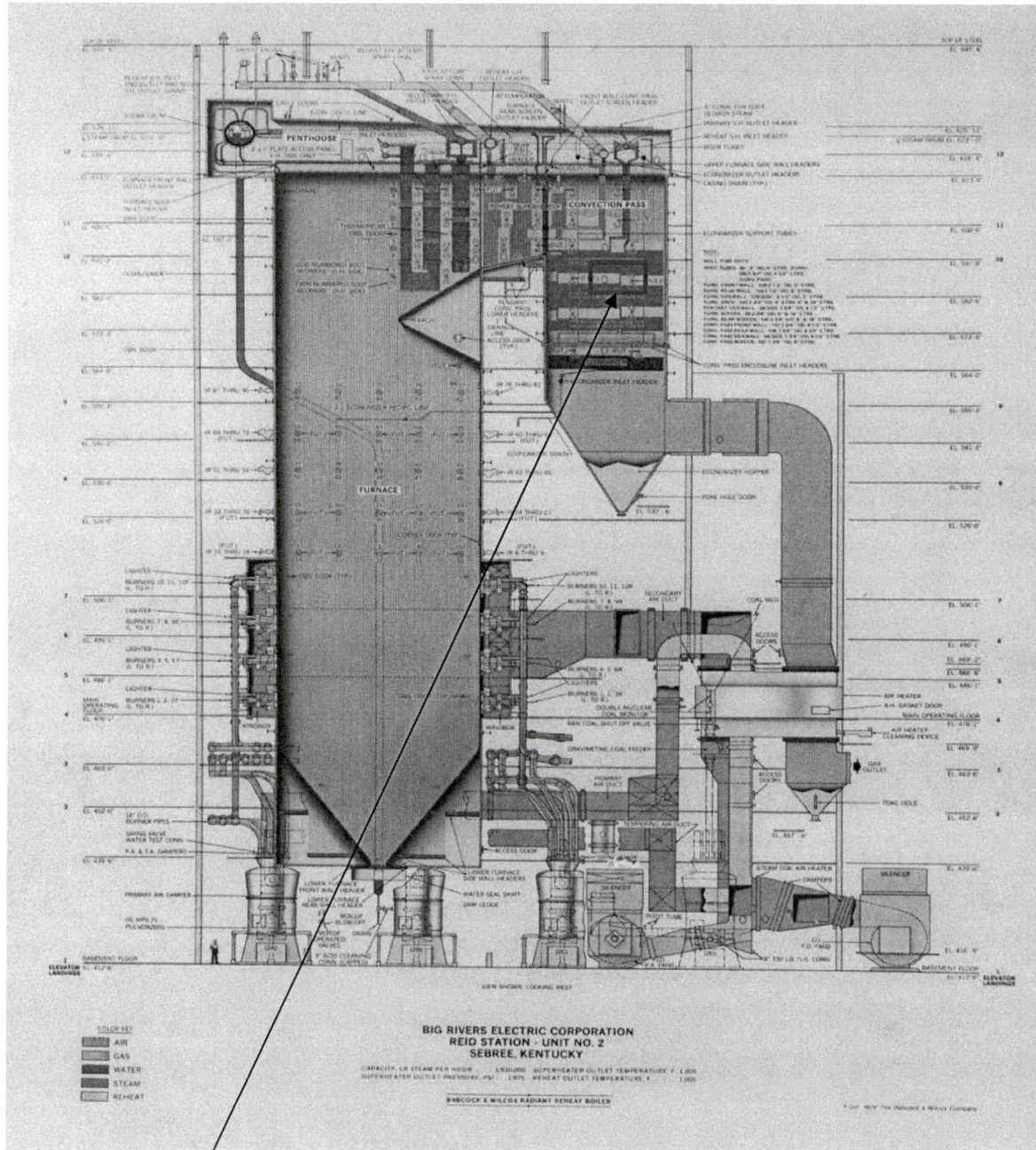
### Exact Location of Leak: Be Specific

Titan installed five dutchman: Primary superheater top section bottom tube into the middle primary section 1<sup>st</sup> tube from east wall and middle primary top tube 2<sup>nd</sup> element. (1) One dutchman 6' 10" long, (2) one dutchman 5' 3" long, (3) one dutchman 27 ½" long, (4) one half loop, 15 ¼" long, (5) one half loop, 15 ¼" long

## Forced Outage Report

### GREEN STATION UNIT 1

### (2) TUBES INVOLVED

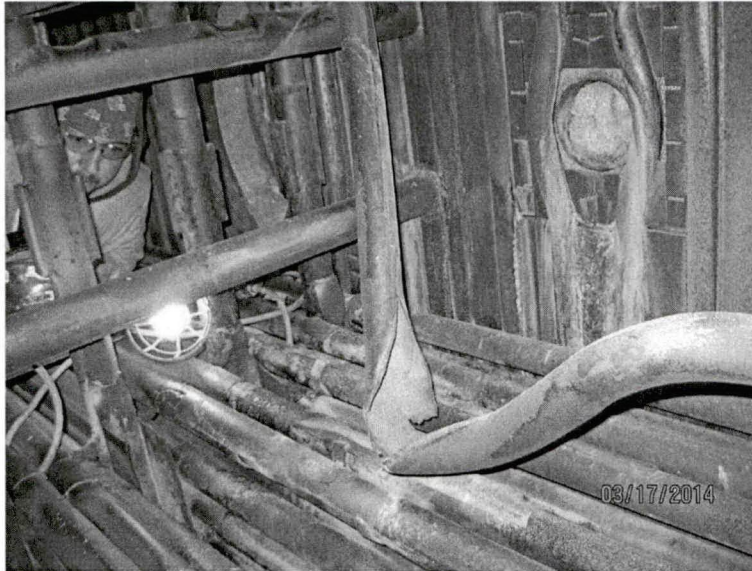


Installed five dutchman: Primary superheater top section bottom tube into middle primary section 1<sup>st</sup> tube from East wall and middle primary top tube 2<sup>nd</sup> element (1) 6' 10" long, (2) 5' 3" long, one, (3) 27 1/2 "long, (4) 1 half loop, 15 1/4" long (5) 1 half loop, 15 1/4" long

# Forced Outage Report

## Pictures

Primary Superheater Top Bank bottom tube

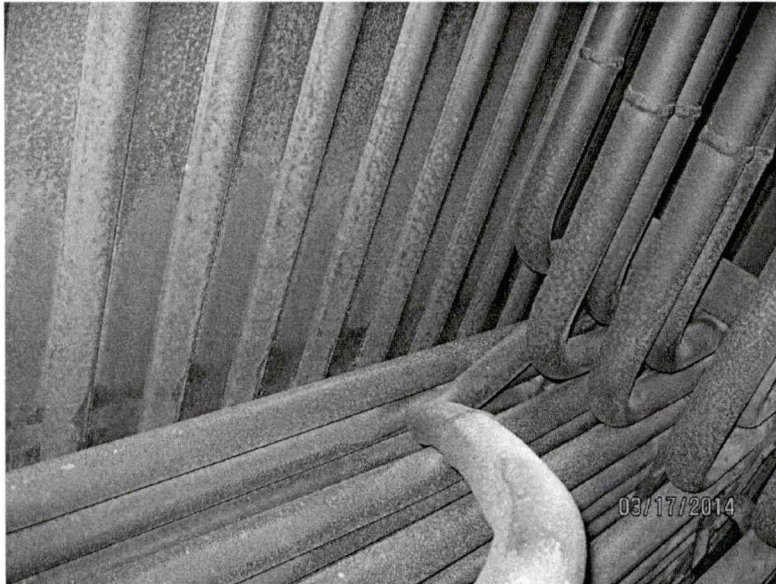


Middle Primary 2<sup>nd</sup> element top tube



# Forced Outage Report

Bottom Tube of top primary before replacement



# Forced Outage Report

## O&M Costs

Materials: \$ 803

Outside Labor \$19,367

Total \$20,170

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>Green 1 - G1-14-06</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	3/17/14 4:20			<b>MW</b>
<b>Date &amp; Time On Line</b>	3/18/14 15:58			<b>\$/MW</b>
<b>Outage Duration</b>	35 hr. 38 min.			91
<b>Outage Code</b>	UO2			199
<b>Outage Reason</b>	Repair superheater tube leak			235
				\$ 28.14
				\$ 24.53
				\$ 24.34
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
3/17/14 (HE 4-24)	\$ 47.44	\$ 51.46	\$ (91,970)	\$ (36,104)
3/18/14 (HE 1-24)	\$ 40.47	\$ 42.15	\$ 4,353	\$ (89,418)
3/19/14 (HE 1-2)	\$ 24.99	\$ 20.64	\$ 133	\$ -
<b>Total</b>			<b>\$ (87,485)</b>	<b>\$ (125,522)</b>
<b>Start Up Fuel Cost</b>		<b>Total Forced Outage Cost</b>		
S/U Fuel Consumed	13,006	DART P&L	\$	(87,485)
S/U Fuel Price	\$ 3.13	Lost Opportunity	\$	(125,522)
<b>S/U Fuel Cost</b>	<b>\$ (40,675)</b>	S/U Fuel Cost	\$	(40,675)
		<b>Total</b>	\$	<b>(253,681)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Jim Garrett

**From:** Perry Bowley

**Date:** 8-May-2014

**Plant:** Green

**Unit:** 1

**GADS Class:** UO1

## Duration

Trip Time: 3-May-2014 23:59

Tie Time: 5-May-2014 22:06

Time Offline: 46:07

## Outage Description

Green Unit 1 tripped on low drum level due to a water wall tube leak. The leak was two tubes south of previously installed panels. This tube was weld overlaid with alloy 33.

## Root Cause

The Green Unit 1 east water wall, south side, near sootblower IR 2, failed due to wall thinning before overlay.

## Failure History

There have been six water wall tube leaks since 2007:

- 21-Feb-2007 Offline 17 hours 50 minutes
- 3-Jun- 2007 Offline 66 hours 37 minutes
- 17-Dec-2008 Offline 18 hours 47 minutes
- 29-May-2010 Offline 19 hours 5 minutes
- 8-Nov-2012 Offline 65 hours 13 minutes
- 2-Dec-2013 Offline 23 hours 31 minutes

# Forced Outage Report

## Corrective Action

Titan Contracting inspected the tubes around the leak area and installed a 72" dutchman.

## Other Work Completed While Unit Was Offline

Replaced #6 heater shell vent isolation valve at #4 Heater (DA)

Replaced Generator stator cooling water low pressure switch (Runback)

Replaced Generator stator cooling water differential switch (Runback)

Repacked #4 RCV shaft

Reseated reheat spray regulator

Inspected boiler tube shields-repaired 2 shields

Inspected recycle nozzles- were clean; all header cleanout plates were intact

Inspected demister panels, were in good condition, cleaned panels while down

# Forced Outage Report

## SOE

Report Type Standard  
Report Number 1  
Report Title SOE  
STANDARD  
Recorder Number 1  
Triggered on.... 4-May-2014 23:59:32:757  
Number of Event Records 267

Event Time	State	AID	Tag Name	Tag Description	SER Index
4-May-2014 00:01:31:750	NORMAL		G122ANN189SOE	HTR 2 LVL HI OR DRAINS BYP	49
4-May-2014 00:01:31:593	ALARM	A	G122ANN189SOE	HTR 2 LVL HI OR DRAINS BYP	49
4-May-2014 00:01:30:031	CLOSED	A	G122ANN407SOE	HEATER 2 BS ISOL VALVE CLOSED	69
4-May-2014 00:01:27:800	NORMAL		G122ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
4-May-2014 00:01:27:339	ALARM	A	G122ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
4-May-2014 00:01:26:173	NORMAL		G122ANN189SOE	HTR 2 LVL HI OR DRAINS BYP	49
4-May-2014 00:01:26:154	ALARM	A	G122ANN189SOE	HTR 2 LVL HI OR DRAINS BYP	49
4-May-2014 00:01:25:719	NORMAL		G122ANN189SOE	HTR 2 LVL HI OR DRAINS BYP	49
4-May-2014 00:01:25:620	ALARM	A	G122ANN189SOE	HTR 2 LVL HI OR DRAINS BYP	49
4-May-2014 00:01:23:854	TRIPPD	A	G133ANN344SOE	DRUM LEVEL TRIP<	139
4-May-2014 00:01:19:613	LOW	A	G125ANN237SOE	DRUM LEVEL LOW<	46
4-May-2014 00:01:18:526	NORMAL		G122ANN189SOE	HTR 2 LVL HI OR DRAINS BYP	49
4-May-2014 00:01:18:495	ALARM	A	G122ANN189SOE	HTR 2 LVL HI OR DRAINS BYP	49
4-May-2014 00:01:09:580	CLOSED	A	G122ANN405SOE	HEATER 4 BS ISOL VALVE CLOSED	67
4-May-2014 00:01:07:953	ALARM	A	G122ANN180SOE	HTR1 DC LVL HI-HI ISOLATION	30
4-May-2014 00:01:04:287	ALARM	A	G122ANN190SOE	HTR 1 DC LVL HI OR DRAINS BYP	36
4-May-2014 00:01:00:893	NORMAL		G122ANN189SOE	HTR 2 LVL HI OR DRAINS BYP	49
4-May-2014 00:01:00:859	ALARM	A	G122ANN189SOE	HTR 2 LVL HI OR DRAINS BYP	49
4-May-2014 00:00:50:822	OK		G125ANN237SOE	DRUM LEVEL LOW<	46
4-May-2014 00:00:46:067	LOW	A	G125ANN237SOE	DRUM LEVEL LOW<	46
4-May-2014 00:00:45:062	OK		G125ANN237SOE	DRUM LEVEL LOW<	46
4-May-2014 00:00:33:268	OK		G140ANN110SOE	TURB OIL PUMP SUCTION PRS LOW	6
4-May-2014 00:00:32:789	RESET		G133ANN344SOE	DRUM LEVEL TRIP<	139
4-May-2014	RUNG	A	G148ANN130SOE	TURB LO MTR SUCT PMP	11

# Forced Outage Report

00:00:32:451				STATUS	
4-May-2014				TURB OIL PUMP SUCTION PRS	
00:00:28:414	LOW	A	G140ANN110SOE	LOW	6
4-May-2014					
00:00:17:100	LOW	A	G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
4-May-2014					
00:00:06:145	ALARM	A	G125ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
4-May-2014					
00:00:06:050	NORMAL		G122ANN189SOE	HTR 2 LVL HI OR DRAINS BYP	49
4-May-2014					
00:00:06:015	ALARM	A	G122ANN189SOE	HTR 2 LVL HI OR DRAINS BYP	49
4-May-2014				HEATER 5 BS ISOL VALVE	
00:00:05:944	CLOSED	A	G125ANN404SOE	CLOSED	66
4-May-2014				EMGNCY FURN PRS CNTRLR	
00:00:00:570	NORMAL		G132ANN288SOE	OPER	122
3-May-2014					
23:59:58:253	NORMAL		G122ANN189SOE	HTR 2 LVL HI OR DRAINS BYP	49
3-May-2014					
23:59:57:860	ALARM	A	G122ANN189SOE	HTR 2 LVL HI OR DRAINS BYP	49
3-May-2014					
23:59:57:401	RUNNG	A	G140TGOPRUNSOE	TURN GEAR OIL PMP RUNNING<	91
3-May-2014					
23:59:56:922	RUNG	A	G141ANN172SOE	EMGNCY BRNG OIL PMP STATUS	105
3-May-2014				B MILL RATING DAMPER	
23:59:52:570	CLOSED	A	G132ANN329SOE	CLOSED<	249
3-May-2014					
23:59:45:791	NORMAL		G132ANN286SOE	FURNACE VACUUM HIGH<	246
3-May-2014					
23:59:44:789	HIGH	A	G132ANN286SOE	FURNACE VACUUM HIGH<	246
3-May-2014				GEN EXCITER FLD BKR AUTO	
23:59:42:341	TRIPPD	A	G150ANN070SOE	TRIP	3
3-May-2014					
23:59:41:598	RESET		G140MSVNOLOADSOE	MSV #2 NO LOAD TRIP<	233
3-May-2014					
23:59:41:597	RESET		G140CVNOLOADSOE	CV #1 NO LOAD TRIP<	234
3-May-2014					
23:59:41:462	CLOSED		G1031T1TIESTSSOE	G1 A BUS 1T1 TIE STATUS	188
3-May-2014					
23:59:41:342	RESET		G103AMNTRPSOE	G1 A MAIN TRIP	125
3-May-2014					
23:59:41:340	CLOSED		G1031T2TIESTSSOE	G1 B BUS 1T2 TIE STATUS	203
3-May-2014					
23:59:41:335	RESET		G103BMNTRPSOE	G1 B MAIN TRIP	129
3-May-2014					
23:59:41:323	OPENED		G103AMNSTSSOE	G1 A MAIN STATUS	126
3-May-2014					
23:59:41:315	OPENED		G103BMNSTSSOE	G1 B MAIN STATUS	130
3-May-2014				GENERATOR DIFF RLY (87G)	
23:59:41:286	RESET		G150ANN425SOE	TRIP	81
3-May-2014					
23:59:41:285	RESET		G150ANN440SOE	GEN TRP ON REVERSE POWER	86
3-May-2014					
23:59:41:281	TRIPPD	A	G103AMNTRPSOE	G1 A MAIN TRIP	125
3-May-2014					
23:59:41:281	TRIPPD	A	G103BMNTRPSOE	G1 B MAIN TRIP	129
3-May-2014					
23:59:41:278	TRIPPD	A	G150ANN058SOE	GENERATOR RELAY 86G1 TRIP	2
3-May-2014					
23:59:41:272	TRIPPD	A	G150ANN440SOE	GEN TRP ON REVERSE POWER	86
3-May-2014				GENERATOR DIFF RLY (87G)	
23:59:41:272	TRIPPD	A	G150ANN425SOE	TRIP	81
3-May-2014					
23:59:36:276	NORMAL		G132ANN285SOE	FURNACE PRESSURE HIGH<	62
3-May-2014	TRIPPD	A	G133ANN344SOE	DRUM LEVEL TRIP<	139

# Forced Outage Report

23:59:35:964						
3-May-2014						
23:59:34:103	TRIPPD	A	G133BLRTR2TRBSOE	BOILER TRIP TO TCS<		229
3-May-2014						
23:59:33:603	TRIPPD	A	G140MSVNOLOADSOE	MSV #2 NO LOAD TRIP<		233
3-May-2014						
23:59:33:602	TRIPPD	A	G140CVNOLOADSOE	CV #1 NO LOAD TRIP<		234
3-May-2014						
23:59:33:521	TRIPPD	A	H132ANN464SOE	AIR FLW MSTR TRP TO MAN<		137
3-May-2014				HEATER 6 BS ISOL VALVE		
23:59:33:264	CLOSED	A	G125ANN403SOE	CLOSED		65
3-May-2014				EMGNCY FURN PRS CNTRLR		
23:59:33:019	ACTIVE	A	G132ANN288SOE	OPER		122
3-May-2014						
23:59:32:851	TRIPPD	A	G140ANN158SOE	TURBINE TRIP		41
3-May-2014						
23:59:32:841	OPENED		G103BPULVSTSSOE	1B PULVERIZER STATUS		170
3-May-2014						
23:59:32:814	OPENED		G103APASTSSOE	1A PA FAN STATUS		212
3-May-2014						
23:59:32:807	OPENED		G103BPASTSSOE	1B PA FAN STATUS		226
3-May-2014						
>>> 23:59:32:757	TRIPPD	A	G133ANN319SOE	MASTER FUEL TRIP		78
3-May-2014						
23:59:32:210	RESET		G133ANN344SOE	DRUM LEVEL TRIP<		139
3-May-2014						
23:59:26:512	NORMAL		G125ANN186SOE	HTR 5 LVL HI OR DRAINS BYP		93
3-May-2014						
23:59:21:805	NORMAL		G122ANN190SOE	HTR 1 DC LVL HI OR DRAINS BYP		36
3-May-2014				D MILL RATING DAMPER		
23:59:20:960	CLOSED	A	G133ANN349SOE	CLOSED<		117
3-May-2014						
23:59:17:741	HIGH	A	G132ANN285SOE	FURNACE PRESSURE HIGH<		62
3-May-2014						
23:59:17:332	ALARM	A	G125ANN186SOE	HTR 5 LVL HI OR DRAINS BYP		93
3-May-2014						
23:59:11:684	TRIPPD	A	G133ANN344SOE	DRUM LEVEL TRIP<		139
3-May-2014						
23:59:08:723	TRIPPD	A	H133ANN463SOE	FUEL MSTR TRP TO MAN<		135
3-May-2014						
23:59:05:218	NORMAL		G132ANN285SOE	FURNACE PRESSURE HIGH<		62
3-May-2014				A MILL RATING DAMPER		
23:59:02:226	CLOSED	A	G132ANN328SOE	CLOSED<		94
3-May-2014						
23:58:59:527	OPENED		G103DPULVSTSSOE	1D PULVERIER STATUS		201
3-May-2014						
23:58:52:922	LOW	A	G125ANN237SOE	DRUM LEVEL LOW<		46
3-May-2014						
23:58:51:443	TRIPPD	A	H133ANN465SOE	BLR MSTR TRP TO MAN<		138
3-May-2014						
23:58:46:682	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<		61
3-May-2014						
23:58:41:812	OPENED		G103APULVSTSSOE	1A PULVERIZER STATUS		157
3-May-2014						
23:58:33:909	HIGH	A	G132ANN285SOE	FURNACE PRESSURE HIGH<		62
3-May-2014						
23:58:32:156	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<		61
3-May-2014						
23:55:19:036	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<		61
3-May-2014						
23:55:18:534	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<		61
3-May-2014				C MILL RATING DAMPER		
23:39:21:143	CLOSED	A	G133ANN339SOE	CLOSED<		132
3-May-2014	NCLSD		G133ANN339SOE	C MILL RATING DAMPER		132

# Forced Outage Report

23:39:20:136				CLOSED<	
3-May-2014					
23:11:48:777	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
3-May-2014					
23:11:47:776	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
3-May-2014				C MILL RATING DAMPER	
23:05:56:769	CLOSED	A	G133ANN339SOE	CLOSED<	132
3-May-2014				C MILL RATING DAMPER	
23:05:55:761	NCLSD		G133ANN339SOE	CLOSED<	132
3-May-2014					
22:35:54:395	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
3-May-2014					
22:35:53:392	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
3-May-2014				C MILL RATING DAMPER	
22:31:57:853	CLOSED	A	G133ANN339SOE	CLOSED<	132
3-May-2014				C MILL RATING DAMPER	
22:31:56:596	NCLSD		G133ANN339SOE	CLOSED<	132

# Forced Outage Report

5/3/2014 1200AM

<u>UNITS</u>	<u>LOAD</u>	<u>CAP.</u>	<u>SO2</u>	<u>NOX</u>	<u>OPACITY</u>	<u>MILLS</u>	<u>PRECIPITS</u>
						1C ON	<u>OUT</u>
G-1	248	250	0.358	0.153	4.1	S/B	3
G-2	240	242	0.14	0.259	7.1	2D ON S/B	2

<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
1A	ON		29.6	0	6' 11"
1B	OFF			4	6' 9"
2A	ON		34.4	0	6' 11"
2B	OFF		31.2	0	6' 9"

Both stack drains  
OK

<u>SLAKERS</u>	<u>IN/OUT</u>	<u># ON</u>	<u>TANK LEVELS</u>	<u>SILO</u>
G-1	IN	3	23/21	1
G-2	IN	3	23/24	4
PREP	OUT	2	86	3

<u>I.U.</u>	<u>CONV.</u>	<u>DRUMS</u>	<u>F/A SILO</u>	<u>F/A TONS</u>	<u>SMT. RATE</u>	<u>SLG. TANKS</u>
IN	B	A&B	2	28	1	30
						18

500AM

<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
1A	OFF			0	6' 11"
1B	ON		33.2	4	6' 9"
2A	OFF			0	6' 11"
2B	ON		30	0	6' 9"

5/3/2014 8AM D. BARRON, GEER, TURNER, DENTON, MAHAN, HOPKINS  
DALE G. THOMAS, TOWNSEND, HOBGOOD, STRICKLAND

C SHIFT	<u>UNITS</u>	<u>LOAD</u>	<u>CAP.</u>	<u>SO2</u>	<u>NOX</u>	<u>OPACITY</u>	<u>MILLS</u>	<u>PRECIPITS</u>
							1C ON	<u>OUT</u>
	G-1	249	250	0.229	0.173	4.4	S/B	3

# Forced Outage Report

G-2	240	242	0.135	0.248	7.6	2D ON S/B	2
<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>		
1A	OFF			0	6' 10"		
1B	OFF			4	6' 9"		
2A	OFF			0	6' 10"		
2B	OFF			0	6' 9"		

Both stack drains  
OK

<u>SLAKERS</u>	<u>IN/OUT</u>	<u># ON</u>	<u>TANK LEVELS</u>	<u>SILO</u>
G-1	IN	4	25/24	1
G-2	IN	2	24/24	4
PREP	IN	3	87	3

<u>I.U.</u>	<u>CONV.</u>	<u>DRUMS</u>	<u>F/A SILO</u>	<u>F/A TONS</u>	<u>SMOOT</u>	<u>SMT. RATE</u>	<u>SLG. TANKS</u>
IN	B	B	2	25	1	15	18'
<u>F/A SILOS</u>	<u>LEVEL</u>	<u>EAST</u>	<u>WEST</u>	<u>SILO</u>	<u>SAFETY</u>		
#1 F/A SILO	48	3.5	2.5	0	0		
#2 F/A SILO	29	1.5	0.5	0	0		

8AM HAVING JOB BRIEFING

12noon	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
	1A	ON	63	1.166	0	6' 10"
	1B	OFF			4	6' 9"
	2A	ON	82	30	0	6' 10"
	2B	OFF			0	6' 9"

1:00

P.M. MAINTENANCE REPAIRING OIL LEAK ON G-1 "B" MILL. CLEANING UP OIL AROUND MILL.

2:00 G-2 COOLING TOWER OPENED UP ON ( A,B,C ) CELLS ON BOTH SIDES AND CLOSED (H) CELL TO THREE

# Forced Outage Report

P.M.

INCHES OF WATER ON FLOOR ( EAST ) SIDE

4:00

P.M.

<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
1A	ON	63	1.153	0	6' 10"
1B	OFF			4	6' 9"
2A	ON	82	30.4	0	6' 10"
2B	OFF			0	6' 9"

4:00

P.M.

LIME SILO'S

#1	65/48
#2	16/18
#3	14/4
#4	40/26
DIGITAL	28'6"

5 .014 8PM DONITHAN-VAC, FARLEY, BACHMAN, WHITLEDGE, HOOVER, TRAVIS, LOVAN, TAPP, T. PARKER  
ERIC S. SHELTON-S/L J. BARRON FOR U/O, J. POILES FOR C/O  
B SHIFT

<u>F/A SILOS</u>	<u>LEVEL</u>	<u>EAST</u>	<u>WEST</u>	<u>SILO</u>	<u>SAFETY</u>
#1 F/A SILO	44	3	2	0	0
#2 F/A SILO	38	2	1	0	0

<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
1A	OFF			0	6' 11"
1B	OFF			4	6' 10"
2A	OFF		29.8	0	6' 11"
2B	OFF			0	6' 9"

11:59PM G-1 BOILER TRIPPED DUE TO A WATER WALL TUBE LEAK, BOILER TRIPPED ON LOW DRUM LEVEL.  
NOTE TUBE LEAK ON WATERWALL, EAST SIDE MID BOILER JUST ABOVE 7TH FLOOR

5/4/2014	1200AM	<u>UNITS</u>	<u>LOAD</u>	<u>CAP.</u>	<u>SO2</u>	<u>NOX</u>	<u>OPACITY</u>	<u>MILLS</u>	<u>PRECIPS OUT</u>
	OFF LINE	G-1	0	250	0	0	0	0	3
		G-2	240	242	0.14	0.259	7.1	2D ON	2

# Forced Outage Report

S/B

<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
1A	OFF			0	6' 11"
1B	OFF			4	6' 9"
2A	OFF		29.2	0	6' 11"
2B	OFF			0	6' 9"

Both stack drains  
OK

<u>SLAKERS</u>	<u>IN/OUT</u>	<u># ON</u>	<u>TANK LEVELS</u>	<u>SILO</u>
G-1	OUT	0	22/23	1
G-2	IN	2	22/24	4
PREP	OUT	2	89	3

<u>I.U.</u>	<u>CONV.</u>	<u>DRUMS</u>	<u>F/A SILO</u>	<u>F/A TONS</u>	<u>SMOOT</u>	<u>SMT. RATE</u>	<u>SLG. TANKS</u>
IN	B	A&B	1	20	2	30	10

12:15AM CALLED HOTLINE  
1:30AM IU DOWN 8'  
1:40AM CALLED EXPRO AND WAITING ON A CALL BACK  
2:00AM G-1 #5 HEATER ISOLATED  
2:04AM EXPRO CALLED BACK AND HEADED THIS WAY  
3:00AM G-1 MILLS SWIRLED OUT

	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
5:00AM	1A	OFF			0	6' 11"
	1B	OFF		32.6	4	6' 9"
	2A	OFF		31.4	0	6' 11"
	2B	ON		33	10	6' 9"

6:40AM EXPRO CALLED OFF, BUT WILL BE IN HOTEL ON HOT STAND-BY IN HENDERSON

# Forced Outage Report

## Boiler Tube Leak Record

Plant: Green

Unit: 1

### Type of Leak: (Check One)

Pin Hole \_\_\_\_\_ Thick Lip Failure \_\_\_\_\_ Crack \_\_\_\_\_ Thin Lip Failure \_\_\_\_\_

Tube Wall thinning X Other \_\_\_\_\_

### Orientation of Rupture: (Check One)

Longitudinal X Circumferential \_\_\_\_\_

### Probable Cause: (Check One)

Stress \_\_\_\_\_ Overheat \_\_\_\_\_ Erosion \_\_\_\_\_ Internal Corrosion \_\_\_\_\_

External Corrosion \_\_\_\_\_ Weld Failure \_\_\_\_\_ (Shop \_\_\_\_\_ Field \_\_\_\_\_)

Internal Obstruction to Flow \_\_\_\_\_ Sootblower Erosion \_\_\_\_\_

Other Tube thinning before weld overlay

### Type of Repair: (Check One)

Dutchman X (Length of Dutchman 72") Pad Weld \_\_\_\_\_

Plug Tube \_\_\_\_\_ Short Circuit \_\_\_\_\_ Other \_\_\_\_\_

# Forced Outage Report

## Description of Repair:

Tube Size OD 2 ½" Wall Thickness .203 Tube Material SA 210A1

Welding procedure GS-P1-1L

Welded By: Titan

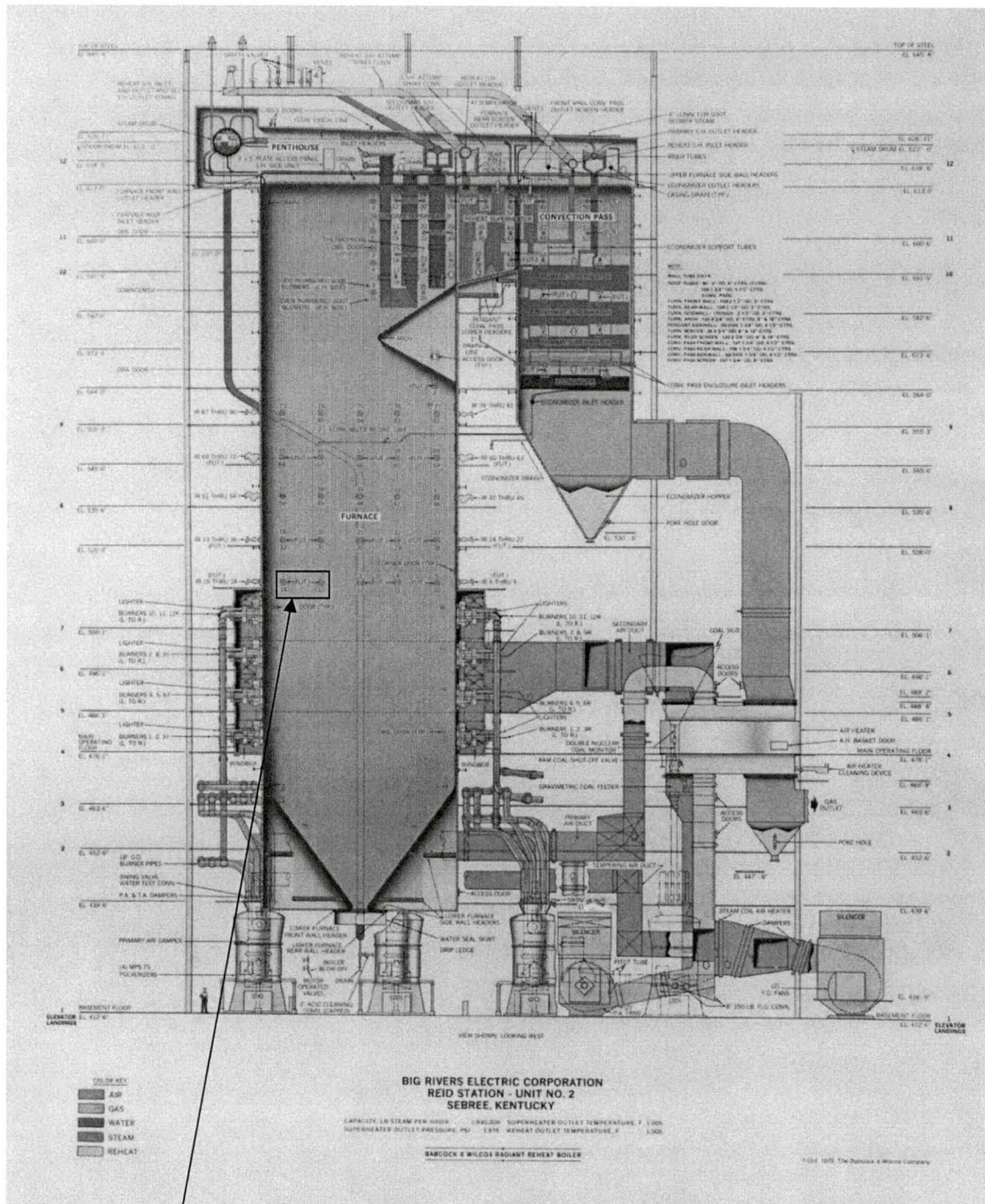
## Exact Location of Leak: Be Specific

East water wall, south side, near soot blower IR 2 at approximate elevation 516'

# Forced Outage Report

## GREEN STATION UNIT 1

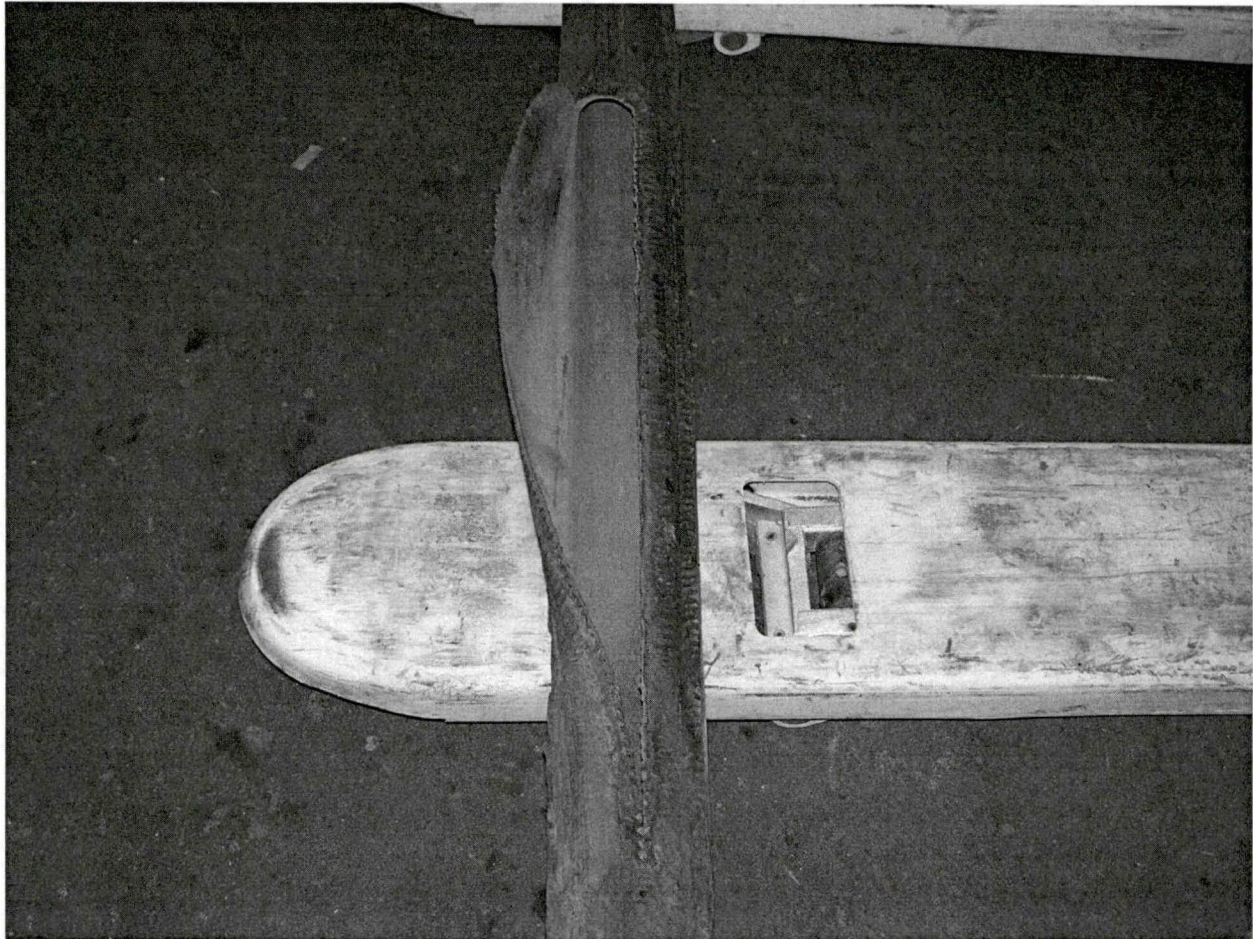
### (1) TUBE INVOLVED



East Wall South Side near IR #2 - appx. Elev. 516' - Installed 72" dutchman

# Forced Outage Report

Failed Water wall tube



## Forced Outage Report

### Estimated Outage Cost

Material Cost	\$2,914
Outside Labor Cost	<u>\$19,293</u>
Total Non-Labor O&M	\$22,207

# Forced Outage Report

## Lost Sales Opportunity Report

FORCED OUTAGE COST ANALYSIS					
MISO DART Revenue and LOST OPPORTUNITY					
Unit		Green 1 - G1-14-08		Production Cost	
Date & Time Off Line		5/3/14 23:59		MW	\$/MW
Date & Time On Line		5/5/14 22:06		163	\$ 28.26
Outage Duration		46 hr. 7 min.		199	\$ 27.47
Outage Code		UO1		235	\$ 27.25
Outage Reason		Unit tripped on low drum level due to waterwall tube leak.			
Date	DA LMP Average	RT LMP Average	DART P&L	Lost Opportunity	
5/4/14 (HE 1-24)	\$ 33.93	\$ 27.83	\$ (3,218)	\$ -	
5/5/14 (HE 1-24)	\$ 38.14	\$ 36.63	\$ (1,841)	\$ (52,467)	
5/6/14 (HE 1-18)	\$ 39.54	\$ 29.52	\$ (5,031)	\$ -	
Total			\$ (10,090)	\$ (52,467)	
Start Up Fuel Cost		Total Forced Outage Cost			
S/U Fuel Consumed	11,217		DART P&L	\$	(10,090)
S/U Fuel Price	\$ 3.20		Lost Opportunity	\$	(52,467)
S/U Fuel Cost	\$ (35,948)		S/U Fuel Cost	\$	(35,948)
			Total	\$	(98,505)
NOTES:					
All negative values are money out of pocket.					
DART Revenue is calculated from differences between the DA award and RT events					
Lost Opportunity is the lost margins if the unit had stayed running					

# Forced Outage Report

**To:** Jim Garrett

**From:** Perry Bowley

**Date:** 18-Sep-2014

**Plant:** Green

**Unit:** 2

**GADS Class:** UO1

## Duration

Trip Time 23-May-2014 21:32

Tie Time: 24-May-2014 05:58

Time Offline: 08:26

## Outage Description

Green Unit 2 tripped off line on Friday, 23-May-2014 at 21:32 due to failure of the internal diaphragm plate on #6 feed water heater while being pressure tested by maintenance technicians.

## Root Cause

Maintenance technicians were pressure testing the #6 feed water heater internal diaphragm plate when it failed resulting in a boiler upset causing the unit to trip off line.

## Failure History

In the period from 2007 – 2014 there have been no similar failures documented.

## Corrective Action

The unit was returned to service with no other issues

# Forced Outage Report

## Other Work Completed While Unit Was Offline

None

# Forced Outage Report

## SOE Print Out

Report Type                      Standard  
Report Number                  1  
Report Title                    SOE STANDARD  
Recorder Number               1  
Triggered on....               23-May-2014 21:33:35:763  
Number of Event Records      229

Event Time	State	AID	Tag Name	Tag Description	SER Index
23-May-2014 21:35:21:890	ALARM	A	G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:35:17:635	NORMAL		G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:35:17:532	ALARM	A	G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:35:17:488	NORMAL		G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:35:14:015	ALARM	A	G222ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
23-May-2014 21:35:08:829	NORMAL		G222ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
23-May-2014 21:35:08:575	ALARM	A	G222ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
23-May-2014 21:35:04:136	NORMAL		G222ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
23-May-2014 21:35:03:753	ALARM	A	G222ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
23-May-2014 21:34:53:252	ALARM	A	G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:34:51:893	NORMAL		G222ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
23-May-2014 21:34:51:606	ALARM	A	G222ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
23-May-2014 21:34:49:383	NORMAL		G225ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
23-May-2014 21:34:49:266	ALARM	A	G225ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
23-May-2014 21:34:49:255	NORMAL		G225ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
23-May-2014 21:34:49:102	NORMAL		G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:34:49:079	ALARM	A	G225ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
23-May-2014 21:34:39:234	NORMAL		G222ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
23-May-2014 21:34:39:075	ALARM	A	G222ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
23-May-2014 21:34:30:667	NORMAL		G222ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
23-May-2014 21:34:30:467	ALARM	A	G222ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
23-May-2014 21:34:21:705	NORMAL		G222ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
23-May-2014 21:34:21:649	ALARM	A	G222ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
23-May-2014 21:34:13:288	NORMAL		G222ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
23-May-2014 21:34:13:182	ALARM	A	G222ANN188SOE	HTR 3 LVL HI OR DRAINS BYP	115
23-May-2014 21:33:56:492	TRIPPD	A	G233DRMLVLRPSC	DRUM LEVEL TRIP<	138
23-May-2014 21:33:49:494	HIGH	A	G225ANN227SOE	DRUM LEVEL HIGH<	45
23-May-2014 21:33:35:790	LOW	A	G222ANN235SOE	CONDENSER HOTWELL LEVEL LOW<	114
>> 23-May-2014 21:33:35:763	TRIPPD	A	G233ANN319SOE	MASTER FUEL TRIP	78
23-May-2014 21:33:35:763	OK		G256ANN304SOE	REHEAT OUTLET TEMP HIGH<	71
23-May-2014 21:33:35:763	HIGH	A	G255ANN303SOE	MAIN STEAM PRESSURE HIGH<	70
23-May-2014 21:33:35:763	CLOSED	A	G222ANN406SOE	HEATER 3 BS ISOL VALVE CLOSED	68
23-May-2014 21:33:35:763	CLOSED	A	G222ANN405SOE	HEATER 4 BS ISOL VALVE CLOSED	67
23-May-2014 21:33:35:763	CLOSED	A	G225ANN403SOE	HEATER 6 BS ISOL VALVE CLOSED	65
23-May-2014 21:33:31:995	ALARM	A	G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:33:30:141	NORMAL		G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:33:29:989	ALARM	A	G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:33:29:812	NORMAL		G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:33:29:643	OK		G222ANN235SOE	CONDENSER HOTWELL LEVEL LOW<	114
23-May-2014 21:33:29:364	LOW	A	G222ANN235SOE	CONDENSER HOTWELL LEVEL LOW<	114
23-May-2014 21:33:29:314	ALARM	A	G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:33:28:648	NORMAL		G225ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
23-May-2014 21:33:28:557	NORMAL		G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:33:28:540	ALARM	A	G225ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
23-May-2014 21:33:28:280	ALARM	A	G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:33:28:255	NORMAL		G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:33:27:973	ALARM	A	G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:33:21:178	NORMAL		G225ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
23-May-2014 21:33:20:992	ALARM	A	G225ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
23-May-2014 21:33:20:473	NORMAL		G225ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
23-May-2014 21:33:20:456	NORMAL		G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:33:20:439	ALARM	A	G225ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
23-May-2014 21:33:20:152	ALARM	A	G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:33:15:963	NORMAL		G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:33:15:726	ALARM	A	G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:33:15:554	NORMAL		G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29

# Forced Outage Report

23-May-2014 21:33:15:389	ALARM	A	G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:33:14:254	NORMAL		G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:33:14:201	NORMAL		G225ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
23-May-2014 21:33:14:093	ALARM	A	G225ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
23-May-2014 21:33:14:091	ALARM	A	G222ANN179SOE	HTR 2 LVL HI-HI BS-ISOL	29
23-May-2014 21:33:13:967	ALARM	A	G222ANN189SOE	HTR 2 LVL HI OR DRAINS BYP	49
23-May-2014 21:32:48:759	TRIPPD	A	G202ANN056SOE	161 KV OCB 0116 AUTO TRIP	218
23-May-2014 21:32:48:759	TRIPPD	A	G202ANN057SOE	161 KV OCB 0100 AUTO TRP	217
23-May-2014 21:32:48:759	RESET		G233DRMLVLRPSC	DRUM LEVEL TRIP<	138
23-May-2014 21:32:48:758	OK		G225ANN237SOE	DRUM LEVEL LOW<	46
23-May-2014 21:32:48:757	TRIPPD	A	G250ANN070SOE	GEN EXCITER FLD BKR AUTO TRIP	3
23-May-2014 21:32:48:757	TRIPPD	A	G250ANN058SOE	GENERATOR RELAY 86G1 TRIP	2
23-May-2014 21:32:23:541	HIGH	A	G232ANN286SOE	FURNACE VACUUM HIGH<	246
23-May-2014 21:32:15:153	NORMAL		G232ANN286SOE	FURNACE VACUUM HIGH<	246
23-May-2014 21:32:12:755	CLOSED		G2032T2T1ESTSSOE	G2 B BUS 2T2 TIE STATUS	203
23-May-2014 21:32:12:755	CLOSED		G2032T1T1ESTSSOE	G2 A BUS 2T1 TIE STATUS	188
23-May-2014 21:32:12:754	TRIPPD	A	G233DRMLVLRPSC	DRUM LEVEL TRIP<	138
23-May-2014 21:32:12:754	OPENED		G203BMNSTSSOE	G2 B MAIN STATUS	130
23-May-2014 21:32:12:754	RESET		G243ANN446SOE	HYDR FLUID LOW PRS TRP<	148
23-May-2014 21:32:12:754	OPENED		G203AMNSTSSOE	G2 A MAIN STATUS	126
23-May-2014 21:32:12:754	CLOSED	A	G233ANN349SOE	D MILL RATING DAMPER CLOSED<	117
23-May-2014 21:32:12:754	CLOSED	A	G232ANN328SOE	A MILL RATING DAMPER CLOSED<	94
23-May-2014 21:32:12:753	OK		G243ANN153SOE	EHC FLUID PRESSURE LOW	19
23-May-2014 21:32:12:753	LOW	A	G225ANN237SOE	DRUM LEVEL LOW<	46
23-May-2014 21:32:12:753	TRIPPD	A	G240ANN158SOE	TURBINE TRIP	41
23-May-2014 21:31:47:286	TRIPPD	A	G243ANN446SOE	HYDR FLUID LOW PRS TRP<	148
23-May-2014 21:31:44:731	LOW	A	G243ANN153SOE	EHC FLUID PRESSURE LOW	19
23-May-2014 21:31:44:209	OK		G255ANN258SOE	COLD RH DRIP POT 2 LVL HI-HI	245
23-May-2014 21:31:44:173	HIHI	A	G255ANN258SOE	COLD RH DRIP POT 2 LVL HI-HI	245
23-May-2014 21:31:43:886	RUNG		G241ANN192SOE	BEARING OIL PUMP STATUS	179
23-May-2014 21:31:43:708	RUNG	A	G241ANN172SOE	EMGNCY BRNG OIL PMP STATUS	105
23-May-2014 21:31:43:534	TROUBL	A	G243ANN174SOE	EMERGENCY TRIP SYSTEM TROUBLE<	50
23-May-2014 21:31:43:437	OK		G255ANN258SOE	COLD RH DRIP POT 2 LVL HI-HI	245
23-May-2014 21:31:43:370	NORMAL		G222ANN189SOE	HTR 2 LVL HI OR DRAINS BYP	49
23-May-2014 21:31:43:363	HIHI	A	G255ANN258SOE	COLD RH DRIP POT 2 LVL HI-HI	245
23-May-2014 21:31:43:339	OK		G255ANN258SOE	COLD RH DRIP POT 2 LVL HI-HI	245
23-May-2014 21:31:43:288	CLOSED	A	G240ANN441SOE	ALL GOV VALVES CLOSED	103
23-May-2014 21:31:43:238	OK		G255ANN257SOE	COLD RH DRIP POT 1 LVL HI-HI	54
23-May-2014 21:31:43:012	NORMAL		G232ANN330SOE	CCS PS A OR B FAILURE<	145
23-May-2014 21:31:42:977	OPENED		G203APASTSSOE	2A PA FAN STATUS	212
23-May-2014 21:31:42:969	OPENED		G203BPASTSSOE	2B PA FAN STATUS	226
23-May-2014 21:31:42:909	HIHI	A	G255ANN257SOE	COLD RH DRIP POT 1 LVL HI-HI	54
23-May-2014 21:31:42:859	OK		G255ANN257SOE	COLD RH DRIP POT 1 LVL HI-HI	54
23-May-2014 21:31:42:617	HIHI	A	G255ANN257SOE	COLD RH DRIP POT 1 LVL HI-HI	54
23-May-2014 21:31:42:599	OK		G255ANN257SOE	COLD RH DRIP POT 1 LVL HI-HI	54
23-May-2014 21:31:42:576	HIHI	A	G255ANN257SOE	COLD RH DRIP POT 1 LVL HI-HI	54
23-May-2014 21:31:42:520	OK		G255ANN257SOE	COLD RH DRIP POT 1 LVL HI-HI	54
23-May-2014 21:31:42:335	HIHI	A	G255ANN257SOE	COLD RH DRIP POT 1 LVL HI-HI	54
23-May-2014 21:31:41:606	HIGH	A	G232ANN286SOE	FURNACE VACUUM HIGH<	246
23-May-2014 21:31:40:248	OPENED		G203APULVSTSSOE	2A PULVERIZER STATUS	157
23-May-2014 21:31:40:248	ALARM	A	G232ANN330SOE	CCS PS A OR B FAILURE<	145
23-May-2014 21:31:39:288	NORMAL		G232ANN325SOE	ELECTRIC DRIVE POWER FAILURE<	247
23-May-2014 21:31:38:808	TRIPPD	A	G233ANN465SOE	BLR MSTR TRP TO MAN<	137
23-May-2014 21:31:38:482	CLOSED	A	G232ANN329SOE	B MILL RATING DAMPER CLOSED<	249
23-May-2014 21:31:38:128	OPENED		G203DPULVSTSSOE	2D PULVERIZER STATUS	201
23-May-2014 21:31:37:246	OPENED		G203CPULVSTSSOE	2C PULVERIZER STATUS	186
23-May-2014 21:31:37:062	TRIPPD	A	G233ANN463SOE	FUEL MSTR TRP TO MAN<	86
23-May-2014 21:31:36:713	TRIPPD	A	G232ANN464SOE	AIR FLW MSTR TRP TO MAN<	135
23-May-2014 21:31:36:024	NCLSD		G232ANN329SOE	B MILL RATING DAMPER CLOSED<	249
23-May-2014 21:31:35:659	ALARM	A	G232ANN325SOE	ELECTRIC DRIVE POWER FAILURE<	247
23-May-2014 21:31:35:476	OPENED		G203BACSTSSOE	2B AIR COMPRESSOR STATUS	189
23-May-2014 21:31:35:169	OK		G205ANN141SOE	VITAL POWER PANEL TROUBLE	12
23-May-2014 21:31:34:891	TROUBL	A	G205ANN141SOE	VITAL POWER PANEL TROUBLE	12
23-May-2014 21:31:34:847	NORMAL		G225ANN175SOE	HTR 6 LVL HI-HI BS-ISOL	25
23-May-2014 21:31:34:747	ALARM	A	G225ANN175SOE	HTR 6 LVL HI-HI BS-ISOL	25
23-May-2014 21:31:34:679	NORMAL		G225ANN175SOE	HTR 6 LVL HI-HI BS-ISOL	25
23-May-2014 21:31:34:577	ALARM	A	G225ANN175SOE	HTR 6 LVL HI-HI BS-ISOL	25
23-May-2014 20:18:27:765	OK		G255ANN257SOE	COLD RH DRIP POT 1 LVL HI-HI	54
23-May-2014 20:18:27:728	HIHI	A	G255ANN257SOE	COLD RH DRIP POT 1 LVL HI-HI	54
23-May-2014 20:11:36:739	OK		G255ANN257SOE	COLD RH DRIP POT 1 LVL HI-HI	54

# Forced Outage Report

## Operators Event Log

5/23/2014 8PM BEAVEN, REED, RITTMAYER, LAWRENCE, HOPKINS, BERRY, BELL, RIGDON, GORRELL, DUVA  
TIM W. REED S/L, W. HUST STAYING TILL MN, J.POILES 12A-8A, BERRY VAC, T.PARKER HERE  
D SHIFT

	<u>UNITS</u>	<u>LOAD</u>	<u>CAP.</u>	<u>SO2</u>	<u>NOX</u>	<u>OPACITY</u>	<u>MILLS</u>	<u>PREC</u> <u>OU</u>
	G-1	251	250	0.14	0.17	8.40%	C=R/T	3
	G-2	220	242	0.116	0.255	10.90%	B=S/B	2
8PM	<u>SLAKERS</u>	<u>IN/OUT</u>	<u># ON</u>	<u>TANK</u> <u>LEVELS</u>	<u>SILO</u>			
	G-1	IN	3	21.5/24.1	2			
	G-2	IN	3	22.6/23.1	4			
	PREP	IN	2	82.30%	3			
8PM	<u>I.U.</u>	<u>CONV.</u>	<u>DRUMS</u>	<u>F/A SILO</u>	<u>F/A</u> <u>TONS</u>	<u>SMOOT</u>	<u>SMT.</u> <u>RATE</u>	<u>SLC</u> <u>TAN</u>
	IN	A	C	1	21	1	15	21
8PM	<u>F/A SILOS</u>	<u>LEVEL</u>	<u>EAST</u>	<u>WEST</u>	<u>SILO</u>	<u>SAFETY</u>		
	#1 F/A SILO	40	2	1.5	0	0		
	#2 F/A SILO	40	1	0	0	0		
8PM	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED</u> <u>LEVEL</u>		
	1A	OFF			0	6' 10"		
	1B	ON	217	34.1	2	6' 9"		
	2A	ON	78	34.2	0	6'9"		
	2B	ON	169	33.4	12	6'8"		
	STACK DRAINS							
	G-1	OPEN						
	G-2	OPEN						

9:32PM G-2 TRIPPED OFF DUE TO TRYING TO PRESSURIZE HEATER FOR MAINT. TO FIND  
LEAK TO REPAIR. HEATER BLEW DIAPHRAM OUT THE END, HEAD WENT THRU WALL.  
UPSET THE BOILER WHICH WE HAD FLAME OUT TRIP.

# Forced Outage Report

11:53PM CALLED HOTLINE

5/24/2014 12:00AM UNDERFLOW RUN TIMES

1A	15HRS.	
1B	13HRS.	30MIN.
2A	12HRS.	30MIN.
2B	19HRS.	

IU RUN 24HRS.

	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
1:00AM	1A	ON	65	33.9	0	6'9"
	1B	OFF			2	6'9"
	2A	OFF			0	6'9"
	2B	ON	145	34.4	12	6'8"

3:12AM G-2 ESTABLISHED OIL FIRES IN BOILER, CALLED HOTLINE

4:55AM FIXATION  
LIME 23'

	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
5:00AM	1A	OFF			0	6'9"
	1B	ON	221	34.3	2	6'9"
	2A	OFF			0	6'9"
	2B	ON	178	33.9	8	6'8"
	PH'S	1A	1B	2A	2B	
		6.78	6.69	6.7	6.95	

5:58AM G-2 TIED ON LINE "B" MILL ON

6:05AM PRECIPS IN SERVICE

6:29AM CALLED HOTLINE

6:36AM 2D MILL ON

# Forced Outage Report

## Estimated Outage Costs

None

## Lost Sales Opportunity Report

FORCED OUTAGE COST ANALYSIS					
MISO DART Revenue and LOST OPPORTUNITY					
Unit		Green 2 - G2-14-03		Production Cost	
Date & Time Off Line		5/23/14 21:32		MW	\$/MW
Date & Time On Line		5/24/14 5:58		89	\$ 31.58
Outage Duration		8 hr. 26 min.		191	\$ 27.06
Outage Code		UO1		225	\$ 26.88
Outage Reason		Unit tripped from boiler upset caused by ruptured diaphragm on #6 heater			
Date	DA LMP Average	RT LMP Average	DART P&L	Lost Opportunity	
5/23/14 (HE 22-24)	\$ 30.13	\$ 27.87	\$ (1,407)	\$ -	
5/24/14 (HE 1-16)	\$ 30.46	\$ 32.70	\$ 3,746	\$ -	
Total			\$ 2,338	\$ -	
Start Up Fuel Cost			Total Forced Outage Cost		
S/U Fuel Consumed	11,808		DART P&L	\$	2,338
S/U Fuel Price	\$ 3.20		Lost Opportunity	\$	-
S/U Fuel Cost	\$ (37,842)		S/U Fuel Cost	\$	(37,842)
			Total	\$	(35,504)
NOTES:					
All negative values are money out of pocket.					
DART Revenue is calculated from differences between the DA award and RT events					
Lost Opportunity is the lost margins if the unit had stayed running					

# Forced Outage Report

**To:** Jim Garrett

**From:** Billy Boarman

**Date:** 5-Jun-2014

**Plant:** HMP&L Station Two

**Unit:** 2

**GADS Class:** UO3

## Duration

Trip Time: 30-May-2014 19:40

Tie Time: 2-Jun-14 00:49

Time Offline: 53:09

## Outage Description

HMP&L Station Two Unit 2 was removed from service on Friday, 30-May-2014 at 19:40 due to a suspected tube leak in the penthouse area of the boiler.

## Root Cause

Tube leaks were discovered on the 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> roof tubes from the west wall between #3 and #5 riser tube elements to Primary SH outlet header, at elevation 579' 8". The leaks were caused by flue gas erosion.



# Forced Outage Report

## Failure History

During the 5-Oct-2012, unscheduled outage on H-2 a leak was discovered on a roof tube between the 10th and 11th primary super heater elements. It was the east roof tube at Elev. 579' 8", 56<sup>th</sup> tube from the east wall. This leak was not the result of the outage in this case.

## Corrective Action

Tube leaks on the 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> from west roof tubes between #3 and #5 riser tube elements to Primary SH outlet header, at elevation 579' 8" were all repaired via base metal repairs.

## SOE Print Out

Triggered on: 30-May-2014 19:40:25:972

30-May-2014 19:40:47:245	TRIP	H225DRMTRP	BOILER DRUM LEVEL TRIP
30-May-2014 19:40:43:000	TRIP	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
30-May-2014 19:40:41:387	TRIP	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
30-May-2014 19:40:40:980	OK	H240STPVLVTRP	TURB STOP VLV CLSD TRIP
30-May-2014 19:40:40:743	OK	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
30-May-2014 19:40:39:242	TRIP	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
30-May-2014 19:40:36:894	OK	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
30-May-2014 19:40:36:649	TRIP	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
30-May-2014 19:40:35:718	OK	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
30-May-2014 19:40:35:429	TRIP	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
30-May-2014 19:40:34:404	LOW	H225DRMLVLLOW	BOILER DRUM LEVEL LOW
30-May-2014 19:40:30:969	OK	H233LMISTRP	LAST MILL IN SERVICE TRIP
30-May-2014 19:40:30:077	TRBLE	H246XFERTOMAN	VOLTAGE REG TROUBLE
30-May-2014 19:40:29:962	OPEN	H250FLDBKRSTS	GEN H2 FIELD BKR STATUS
30-May-2014 19:40:29:953	OPEN	H250OCB186STS	OCB 0186 GEN H2 STATUS
30-May-2014 19:40:29:943	OPEN	H250OCB182STS	OCB 0182 GEN H2 STATUS
30-May-2014 19:40:29:851	OK	H250OCB186GETR	OCB 0186 GEN H2 TRIP
30-May-2014 19:40:29:849	OK	H250OCB182GETR	OCB 0182 GEN H2 TRIP
30-May-2014 19:40:29:823	LKOUT	H240STPVLVLO86TV	TURB STOP VLV LOCKOUT (86TV3)
30-May-2014 19:40:29:819	TRIP	H250OCB182GETR	OCB 0182 GEN H2 TRIP
30-May-2014 19:40:29:819	TRIP	H250OCB186GETR	OCB 0186 GEN H2 TRIP
30-May-2014 19:40:28:697	OPEN	H203BFP3ASTS	4160 BKR BFP H2A STATUS
30-May-2014 19:40:26:973	TRIP	H233LMISTRP	LAST MILL IN SERVICE TRIP
30-May-2014 19:40:26:223	TRIP	H233EMERBLRTRP	EMERGENCY BLR TRIP
<b>30-May-2014 19:40:25:972</b>	<b>TRIP</b>	<b>H240STPVLVTRP</b>	<b>TURB STOP VLV CLSD TRIP</b>

# Forced Outage Report

## Other Work Completed While Unit Was Offline

- Repaired gas leaks in the boiler penthouse and also the economizer dead air space.
- Clean 480V transformer
- Cleaned furnace and PA Fan taps
- Cleaned Wet bottom Seal Trough
- Cleaned Scrubber Mist Eliminator panels and nozzles
- Precipitator inspection
- Back-pass inspection
- Calibrated all coal feeders.
- Changed oil in all FD Fan, PA Fan, and Mill motors
- Repaired coal leaks on "A" Mill
- Repaired coal leaks on "B" Mill
- Cleaned seal air fan filters



# Forced Outage Report

5/31/2014	8:00AM	JACKSON, EDMONDS, GRIFFIN, BOWLEY, HOGAN, WADLINGTON, ALEXANDER										C SHIFT PAYNE			
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	49	50	42	4.51	10.3	0.453	6.2					CTL 17.2'	
		H1	165	165	153	0.471	10.4	0.127	64	91.1	36.6	217	2.9		
		H2		165										CTL 15.0'	
		CT..	ON STANBY		57										
		ALARMS:													
		R1													
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E. H. START REQUIRED												
		H2	EH RES LEVEL HI												
		SOOT BLOWERS TAGGED						GAUGE GLASSES		PWTL / 25.5'		DRYING AGENT			
		R1							OK				R1-0%		
		H1	1/24, 42,										H1-0%		
		H2	9, 41, 46 / 38, 45										H2-0%		
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH					SILO LVL	BOOTHE SYSTEM			
		LEVELS	9' 4"	10' 4"	12' 9 3/4"	6 1/2"					14FT	IN			
5/31/2014	8:00AM	SAFETY BRIEFING													
	8:27AM	RUNDOWN ACTIVE ON H1 DUE TO AIR, OUT OF ADS CONTROL													
	8:30AM	H1 BACK IN ADS													
	8:33AM	RUNDOWN ACTIVE ON H1 DUE TO AIR, OUT OF ADS CONTROL													
	9:00AM	H1 STABLE AND AT 160MW'S. BACK IN ADS CONROL													
	9:15AM	SPOKE WITH DARREL PRATHER. HE'S LOOKING IT OVER. HE WANTS TO TRY AND TAKE IT BACK TO 165MW 1 MW AT A TIME AND SEE HOW IT DOES. HE THINKS THE BTU COMPENSATOR HAS GOTTEN WOUND OUT AND IS SLOWLY WORKING ITSELF BACK													
	10:00AM	EXPRO DONE WITH DESLAG, MAINT INSPECTING													
	10:20AM	EXPRO NOT DONE WITH DESLAG. GOING BACK IN BOILER													
	10:30AM	DEBUSK VACUMING IN PENTHOUSE NORTH SIDE													
	11:00AM	DEBUSK STARTING ON H2 ECONS													
	11:30AM	DEBUSK DONE WITH PANELS AT SCRUBBERS. MAINT GOING TO TAKE OUT NOZZLES AND END PLATES													
	11:45AM	H1 BACK IN ADS CONTROL AND GOOD FOR FULL LOAD.													
	1:30PM	BLASTING COMPLETED ON H2 BOILER													
	1:40PM	EXPRO LEAVING													
	2:19PM	H2 WETBOTTOM TAGGED. NOTIFY MAINT													
	2:25PM	DEBUSK MOVING TO SOUTH SIDE PENTHOUSE PER MAINT													
	2:30PM	MIKE PENCE (COAL HANDLING) CALLED IN SICK FOR TONIGHT													
	3:43PM	RUNNING LIST FOR OVERTIME TOMORROW AND TOMORROW NIGHT													
	3:45PM	B. BLAIR-LM, J. HILLYARD-LM, R. BEAN-LM, B. DUVALL-LM, J. GATTON, J. BAKER, J. TATE													
	4:10PM	H2 WETBOTTOM PLATES OFF													
	4:30PM	V. BRADDOCK, J. TAUL, T. WOODS LEAVING													
	6:15PM	MAINT RELEASED H2 B BFP													
	6:25PM	H2 B BFP ON FOR HYDRO													
	NOTE:	TRANSFERRING FUEL OIL TO HMPL TANK													
	7:45PM	ELECTRICIANS RUNNING AIR TEST ON H-2 PRECIPS													
5/31/2014	8:00PM	CONN, CLARK, BREEDEN, HIGGINS, CUTSHAW, BLANKS & YOUNG										B SHIFT PENDLEY			
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	50	50	42	4.5	10.6	0.44	13				2.6	CTL 18'	
		H1	165	165	153	0.572	10.6	0.081	28.5	89	11.24	217	2.7		
		H2	OFF - TUBE LEAK												
		CT..	STAND BY		57									CTL 14'	
		ALARMS:													
		R1													
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E. H. START REQUIRED/DRUM TRANS/ C.T. LEVEL												
		H2	EH RES LEVEL HI												
		SOOT BLOWERS TAGGED						GAUGE GLASSES		PWTL		DRYING AGENT			
		R1							OK		27'		R1- 0%		
		H1	1/24, 42,										H1- 0%		
		H2	9, 41, 46 / 38, 45										H2- 0%		
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH					SILO LVL	BOOTH SYSTEM			
		LEVELS	9' 4"	14' 1 1/4"	12' 2 1/2"	6 1/2"					6'	IN			

# Forced Outage Report

5/31/2014	8:00PM	SAFETY BRIEFING														
	8:02PM	H-2 BOILER FEED PUMP OFF - 1440LBS														
	8:03PM	STARTED H-2 CONDENSER VACUUM PUMPS														
	8:20PM	H-2 PRECIP AIR TEST DONE														
	8:20PM	NOTIFIED K. BROOKS THAT THEY CAN RESUME WORK IN ECONOMIZERS, PENTHOUSE & AIRHEATERS														
	8:30PM	DEBUSK STARTING ON 3RD ECONOMIZER HOPPER														
	8:30PM	T. WEST, J. GLASSCO & J. ARNOLD LEAVING														
	8:50PM	TITAN REMOVING H-2 M.E. NOZZLES & PLATES														
	9:55PM	STARTED H-2 A.H. WASH														
	10:03PM	DRAINING H-2 BOILER WATERWALLS DOWN BELOW LEAK IN PENTHOUSE														
	10:50PM	B. BLAIR-L/M, J. HILLYARD-LM, R. BEAN-LM, B. DUVALL-LM, J. GATTON, J. BAKER, J. TATE														
	10:55PM	B. BLAIR RETURNED CALL - CAN COME IN AT 12N TOMORROW														
	6/1/2014	2:15AM	MAINT RELEASED H-2 BFP FOR HYDRO													
		2:20AM	H-2 BFP ON FOR HYDRO													
2:50AM		PULLED DEBUSK OUT OF PENTHOUSE & ECONOMIZER - HYDROING BOILER														
3:24AM		H-2 BFP OFF														
3:30AM		TOOK BOOTHE SYSTEM OUT - SILO 5'														
3:44AM		DEBUSK BACK IN PENTHOUSE & ECONOMIZERS														
3:45AM		DRY BOILER - BLOWING OFF PRESSURE - DRAINING TO FIRING LEVEL														
	5:00AM	H-2 BOILER IS SET TO FIRE														
	6:30AM	J. ARNOLD HERE														
														</		

# Forced Outage Report

6/1/2014	8:00PM	CONN, CLARK, BREEDEN, HIGGINS, CUTSHAW, BLANKS & YOUNG TATE & JOHNSON HERE										B SHIFT    PENDLEY				
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE			
		R1	51	50	42	4.5	10.6	0.417	6.4				2.7	CTL 19'		
		H1	165	165	153	0.389	10.7	0.081	25.1	93.1	10.08	230	3.05			
		H2	FIRING BOILER												CTL 15.5'	
		CT..	STAND BY		60											
		ALARMS:														
		R1														
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL													
		H2	EH RES LEVEL HI													
		SOOT BLOWERS TAGGED							GAUGE GLASSES		PWTL	DRYING AGENT				
		R1								OK	28'	R1- 0% H1- 0% H2- 0%				
		H1	1/24, 42,													
		H2	9, 41, 46 / 38, 45													
		FUEL OIL		C.H.	HMPL	NORTH	SOUTH					SILO LVL	BOOTH SYSTEM			
		LEVELS		9' 1"	10' 4"	12' 2 1/4"	6 1/2"					14'	OUT			
6/1/2014	8:00PM	SAFETY BRIEFING														
	8:25PM	MAINT CHANGED OUT FULLERS EARTH FILTERS & POLISHING FILTERS ON H-2 E.H. UNIT														
	10:20PM	SEAL AND PULL VAC ON H2														
	10:52PM	ROLLING H2 TURBINE														
	11:23PM	AT TRANSFER SPEED ON H2 TURBINE. WAITING ON TEMPS														
	12:24AM	TRANSFERRING VALVES ON H2 TURBINE														
	12:49AM	H2 TIED ON LINE														
	2:00AM	H-2 SCRUBBER IN SERVICE														
	2:15AM	COAL LEAK ON H-2 A1 BURNER HEAD - MAINT CHECKING														
	3:10AM	TRANSFERRED H-2 AUXILIARIES														
	NOTE	MAINT REPAIRED COAL LEAK ON H-2 A1 COAL PIPE ON 5TH FLOOR														
4:00AM	WARMING H-2 SCR															
5:40AM																
5:51AM	R. JAMES CALLED - REQUESTED VACATION DAY FOR TODAY - I OK'D															
6/2/2014	8:00AM	FELTY, CECIL, EMBRY, BLAIR, HILLYARD, DUVALL, JAMES VAC										A SHIFT    TOW				
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE			
		R1	50	50	42	4.518	10.5	0.415	11.9				2.74	CTL 18' PWTL / 26'		
		H1	165	165	153	0.418	10.8	0.076	30	92.3	10.09	233	3.5			
		H2	164	165	152	1.928	11	0.375	79.7	66.5	4.69	OOS	4.3	CTL 15'		
		CT..	OFF STANDBY		57							C				
		ALARMS:														
		R1														
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL/A & B PA FAN MOTOR/B BFP AUX OIL													
		H2	EH RES LEVEL HI													
		SOOT BLOWERS TAGGED							GAUGE GLASSES		DRYING AGENT					
		R1	22R							H-1 EAST OUT	R1-0% H1 0% H2-0%					
		H1	27, 29, 30, 31, 33, 42, 43, 44													
		H2	37, 41, 46													
		FUEL OIL		C.H.	HMPL	NORTH	SOUTH					SILO LVL	BOOTHE SYSTEM			
		LEVELS		8' 10 7/8"	11' 2"	12' 2 1/4"	6 1/2"					16.9'	BSO			

# Forced Outage Report

## Boiler Tube Leak Record

Plant: HMP&L Station Two

Unit: 2

### Type of Leak:

Pin Hole ✓ ( 4 Roof tubes) Thick Lip Failure \_\_\_\_\_ Thin Lip Failure \_\_\_\_\_

Tube Wall Thinning \_\_\_\_\_

Orientation of Rupture: Longitudinal ✓ Circumferential \_\_\_\_\_

### Probable Cause:

Stress \_\_\_\_ Overheat \_\_\_\_ Erosion ✓ Internal Corrosion \_\_\_\_\_

External Corrosion \_\_\_\_ Weld Failure \_\_\_\_\_ (Shop \_\_\_\_ Field \_\_\_\_)

Internal Obstruction to Flow \_\_\_\_ Soot blower Erosion \_\_\_\_\_

Other Flue gas erosion

### Type of Repair:

Dutchman \_\_\_\_ Pad Weld ✓ (4 Roof tubes) Plug Tube \_\_\_\_\_ Short

Circuit \_\_\_\_\_ Other \_\_\_\_\_

### Description of Repair:

Tube leaks on the 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> from west roof tubes between #3 and #5 riser tube elements to Primary SH outlet header, at elevation 579' 8" were all repaired via BMR's.

# Forced Outage Report

## Exact Location of Leaks:

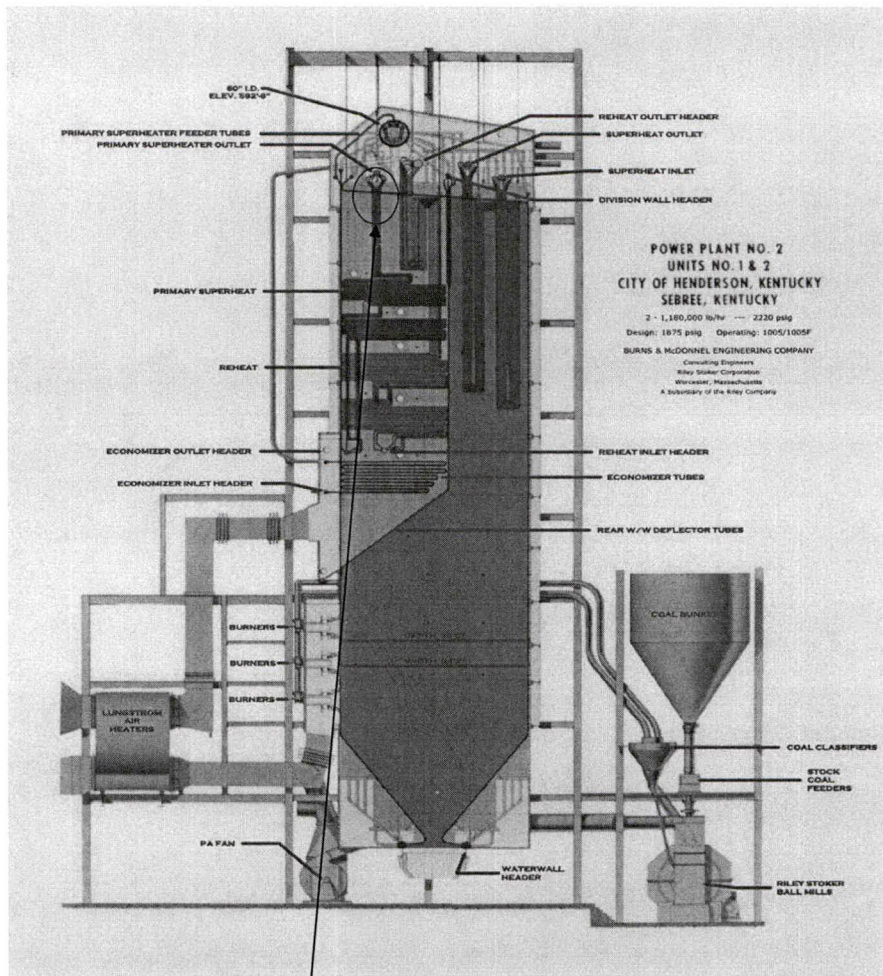
HMPL STATION UNIT 2

2014

(4) TUBES INVOLVED

Date and Time Unit Off 19:40 5-30-14

Date and Time Unit On 00:49 6-2-14



Tube leaks on the 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> from west roof tubes between #3 and #5 riser tube elements to Primary SH outlet header, at elevation 579' 8" were all repaired via BMR's.

# Forced Outage Report

## Estimated Outage Cost

Boiler De-Slag

**Total            \$16,246.00**

Vacuuming Economizer Hoppers, ME panels and the AH's

**Total            \$16,024.36**

Titan –tube leak repair

Labor            \$10,200

Material        \$106

**Total            \$10,306**

Titan and Global – Misc. repairs (Gas leaks, coal leaks, etc.) and scaffolding/insulation

Labor            \$13,520

Material        \$1,800

**Total            \$15,320**

**Grand Total        \$57,896.36**

# Forced Outage Report

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>HMP'L 2 - H2-14-03</b>		<b>Production Cost</b>	
<b>Date &amp; Time Off Line</b>	5/30/14 19:40		<b>MW</b>	<b>\$/MW</b>
<b>Date &amp; Time On Line</b>	6/2/14 0:49		72	\$ 33.04
<b>Outage Duration</b>	53 hr. 9 min.		127	\$ 30.31
<b>Outage Code</b>	UO3		149	\$ 29.99
<b>Outage Reason</b>	Repair tube leak in penthouse			

<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
5/30/14 (HE 19-24)	\$ 32.93	\$ 37.39	\$ (3,733)	\$ -
5/31/14 (HE 1-24)	\$ 39.53	\$ 43.30	\$ (47,241)	\$ -
6/1/14 (HE 1-24)	\$ 34.98	\$ 34.07	\$ -	\$ (18,776)
6/2/14 (HE 1-12)	\$ 34.28	\$ 33.45	\$ 39	\$ -
<b>Total</b>			\$ (50,935)	\$ (18,776)

<b>Start Up Fuel Cost</b>		<b>Total Forced Outage Cost</b>	
S/U Fuel Consumed	9,407	DART P&L	\$ (50,935)
S/U Fuel Price	\$ 3.20	Lost Opportunity	\$ (18,776)
<b>S/U Fuel Cost</b>	<b>\$ (30,122)</b>	S/U Fuel Cost	\$ (30,122)
		<b>Total</b>	<b>\$ (99,833)</b>

**NOTES:**

All negative values are money out of pocket.

DART Revenue is calculated from differences between the DA award and RT events

Lost Opportunity is the lost margins if the unit had stayed running

# Forced Outage Report

**To:** Jim Garrett

**From:** Perry Bowley

**Date:** 22-Sep-2014

**Plant:** Green

**Unit:** 1

**GADS Class:** UO2

## Duration

Trip Time: 16-Jun-2014 06:26

Tie Time: 19-Jun-2014 17:33

Time Offline: 83:07 Minutes

## Outage Description

Green Unit 1 was removed from service on Monday, 16-Jun-2014 at 06:26 due to the main shaft failure on "A" ID Fan.

## Root Cause

The Green Unit 1 "A" ID Fan Shaft broke in half causing major damage to the fan.

## Failure History

There have been no reported failures of this type in the period between 2001 - 2014. A crack was discovered in this fan shaft during an inspection in 1993, and the shaft was removed and sent to a welding shop for repair.

## Corrective Action

The unit was set up for half load service. Titan completed the ductwork repairs and sealed off the dampers. The unit was returned to service at half load status. A second outage was scheduled for July 15, 2014 to install MATS Equipment and install the new fan shaft.

# Forced Outage Report

## Other Work Completed While Unit Was Offline

Inspected B Side recycle nozzles- were clean; all header cleanout plates were intact

Inspected B Side demister panels, were in good condition, cleaned panels while down

Washed B Air Heater

Inspected boiler tube shields

Rebuilt top control valve EH actuator cylinder

Repaired a tube in leak in G1 # 2 Heater

Cleaned the flyash hoppers

Repaired "B" side Precipitator fields as required

# Forced Outage Report

## SOE

Report Type Standard  
Report Number 1  
Report Title SOE STANDARD  
Recorder Number 1  
Triggered on.... 16-Jun-2014 06:26:01:166  
Number of Event Records 245

Event Time	State	AID	Tag Name	Tag Description	SFR Index
16-Jun-2014 06:27:16:755	CLOSED	A	G122ANN406SOE	HEATER 3 BS ISOL VALVE CLOSED	68
16-Jun-2014 06:27:04:502	NORMAL		G132ANN286SOE	FURNACE VACUUM HIGH<	248
16-Jun-2014 06:26:54:612	OK		G140ANN110SOE	TURB OIL PUMP SUCTION PRS LOW	6
16-Jun-2014 06:26:52:974	RUNG	A	G148ANN130SOE	TURB LO MTR SUCT PMP STATUS	11
16-Jun-2014 06:26:52:237	OK		G132ANN326SOE	AIR FLOW LOW TRIP<	250
16-Jun-2014 06:26:51:490	LOW	A	G132ANN326SOE	AIR FLOW LOW TRIP<	250
16-Jun-2014 06:26:49:887	ALARM	A	G125ANN177SOE	DEAERATOR LVL HI-HI BS-ISOL	27
16-Jun-2014 06:26:44:050	LOW	A	G140ANN110SOE	TURB OIL PUMP SUCTION PRS LOW	6
16-Jun-2014 06:26:37:952	HIGH	A	G132ANN286SOE	FURNACE VACUUM HIGH<	248
16-Jun-2014 06:26:34:281	CLOSED	A	G125ANN404SOE	HEATER 5 BS ISOL VALVE CLOSED	66
16-Jun-2014 06:26:30:388	CLOSED	A	G133ANN349SOE	D MILL RATING DAMPER CLOSED<	117
16-Jun-2014 06:26:28:131	NCLSD		G133ANN349SOE	D MILL RATING DAMPER CLOSED<	117
16-Jun-2014 06:26:22:776	RUNNG	A	G140TGOPRUNSOE	TURN GEAR OIL PMP RUNNING<	91
16-Jun-2014 06:26:18:916	NORMAL		G132ANN288SOE	EMGNCY FURN PRS CNTRLR OPER	122
16-Jun-2014 06:26:13:868	CLOSED	A	G133ANN349SOE	D MILL RATING DAMPER CLOSED<	117
16-Jun-2014 06:26:10:986	NORMAL		G122ANN190SOE	HTR 1 DC LVL HI OR DRAINS BYP	36
16-Jun-2014 06:26:09:605	TRIPPD	A	G150ANN070SOE	GEN EXCITER FLD BKR AUTO TRIP	3
16-Jun-2014 06:26:08:661	RESET		G140CVNOLOADSOE	CV #1 NO LOAD TRIP<	234
16-Jun-2014 06:26:08:661	RESET		G140MSVNOLOADSOE	MSV #2 NO LOAD TRIP<	233
16-Jun-2014 06:26:08:498	RESET		G150ANN425SOE	GENERATOR DIFF RLY (87G) TRIP	81
16-Jun-2014 06:26:08:497	RESET		G150ANN440SOE	GEN TRP ON REVERSE POWER	86
16-Jun-2014 06:26:08:493	TRIPPD	A	G150ANN058SOE	GENERATOR RELAY 86G1 TRIP	2
16-Jun-2014 06:26:08:486	TRIPPD	A	G150ANN440SOE	GEN TRP ON REVERSE POWER	86
16-Jun-2014 06:26:08:486	TRIPPD	A	G150ANN425SOE	GENERATOR DIFF RLY (87G) TRIP	81
16-Jun-2014 06:26:08:860	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:26:08:804	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:26:03:420	TRIPPD	A	G133BLRTR2TRBSO	BOILER TRIP TO TCSC<	229
16-Jun-2014 06:26:03:355	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:26:03:097	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:26:02:854	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:26:02:599	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:26:02:354	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:26:02:157	RESET		G140PBORDCSTTSC	TURB TRIP PB OR OPER DCS TRIP	221
16-Jun-2014 06:26:02:136	ACTIVE	A	G132ANN288SOE	EMGNCY FURN PRS CNTRLR OPER	122
16-Jun-2014 06:26:02:096	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:26:01:918	TRIPPD	A	G140CVNOLOADSOE	CV #1 NO LOAD TRIP<	234
16-Jun-2014 06:26:01:917	TRIPPD	A	G140MSVNOLOADSOE	MSV #2 NO LOAD TRIP<	233
16-Jun-2014 06:26:01:889	OPENED		G103APASTSSOE	1A PA FAN STATUS	212
16-Jun-2014 06:26:01:874	OPENED		G103BPASTSSOE	1B PA FAN STATUS	226
16-Jun-2014 06:26:01:853	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:26:01:825	TRIPPD	A	G133ANN319SOE	MASTER FUEL TRIP	78
16-Jun-2014 06:26:01:628	CLOSED	A	G125ANN403SOE	HEATER 6 BS ISOL VALVE CLOSED	65
16-Jun-2014 06:26:01:598	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:26:01:353	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:26:01:186	TRIPPD	A	G140ANN158SOE	TURBINE TRIP	41
16-Jun-2014 06:26:01:165	TRIPPD	A	G140PBORDCSTTSC	TURB TRIP PB OR OPER DCS TRIP	221
16-Jun-2014 06:26:01:095	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:26:00:102	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:59:842	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:59:601	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:59:342	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:59:098	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:58:841	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:58:601	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:58:341	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:58:099	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43

# Forced Outage Report

16-Jun-2014 06:25:57:840	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:57:601	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:57:338	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:57:098	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:53:783	OK		G141ANN209SOE	BFP B LUBE OIL PRESSURE LOW	34
16-Jun-2014 06:25:52:698	LOW	A	G141ANN209SOE	BFP B LUBE OIL PRESSURE LOW	34
16-Jun-2014 06:25:49:713	LOW		G122ANN166SOE	CONDENSER LOW VACUUM	23
16-Jun-2014 06:25:49:180	OPENED		G103BBFPSTSSOE	1B BFP STATUS	258
16-Jun-2014 06:25:46:578	OK		G125ANN227SOE	DRUM LEVEL HIGH<	45
16-Jun-2014 06:25:15:791	HIGH	A	G125ANN227SOE	DRUM LEVEL HIGH<	45
16-Jun-2014 06:25:10:278	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:10:036	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:07:024	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:06:781	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:06:527	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:05:780	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:05:271	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:04:778	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:04:524	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:04:028	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:03:769	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:01:528	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:25:01:266	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:23:11:628	LOW	A	G122ANN235SOE	CONDENSER HOTWELL LEVEL LOW<	114
16-Jun-2014 06:22:51:105	LOW	A	G155ANN312SOE	MAIN STEAM TEMP LOW<	75
16-Jun-2014 06:22:21:914	OPENED		G103DPULVSTSSOE	1D PULVERIER STATUS	201
16-Jun-2014 06:22:08:799	HIGH	A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:20:20:330	RESET		G103BMNTRPSOE	G1 B MAIN TRIP	129
16-Jun-2014 06:20:20:310	OPENED		G103BMNSTSSOE	G1 B MAIN STATUS	130
16-Jun-2014 06:20:20:275	TRIPPD	A	G103BMNTRPSOE	G1 B MAIN TRIP	129
16-Jun-2014 06:20:19:689	CLOSED		G1031T2TIESTSSOE	G1 B BUS 1T2 TIE STATUS	203
16-Jun-2014 06:20:11:192	RESET		G103AMNTRPSOE	G1 A MAIN TRIP	125
16-Jun-2014 06:20:11:173	OPENED		G103AMNSTSSOE	G1 A MAIN STATUS	126
16-Jun-2014 06:20:11:131	TRIPPD	A	G103AMNTRPSOE	G1 A MAIN TRIP	125
16-Jun-2014 06:20:10:552	CLOSED		G1031T1TIESTSSOE	G1 A BUS 1T1 TIE STATUS	188
16-Jun-2014 06:17:41:192	OK		G122ANN236SOE	DEAERATOR LEVEL LOW<	44
16-Jun-2014 06:17:38:943	OK		G122ANN225SOE	CONDENSER HOTWELL LEVEL HIGH<	113
16-Jun-2014 06:16:21:093	LOW	A	G122ANN236SOE	DEAERATOR LEVEL LOW<	44
16-Jun-2014 06:16:20:840	OK		G122ANN236SOE	DEAERATOR LEVEL LOW<	44
16-Jun-2014 06:16:20:594	LOW	A	G122ANN236SOE	DEAERATOR LEVEL LOW<	44
16-Jun-2014 06:16:04:242	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:16:02:239	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:12:37:848	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:12:36:345	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:12:06:540	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:12:04:032	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:12:03:783	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:12:02:780	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:11:57:270	NORMAL		G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:11:51:760	HIGH	A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:11:44:245	NORMAL		G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 06:11:29:469	NORMAL		G133ANN335SOE	CONTROL SYSTEM RUNBACK REQD<	177
16-Jun-2014 06:10:47:389	HIGH	A	G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 06:10:45:386	NORMAL		G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 06:08:05:199	HIGH	A	G122ANN225SOE	CONDENSER HOTWELL LEVEL HIGH<	113
16-Jun-2014 06:08:04:942	OK		G122ANN225SOE	CONDENSER HOTWELL LEVEL HIGH<	113
16-Jun-2014 06:08:04:444	HIGH	A	G122ANN225SOE	CONDENSER HOTWELL LEVEL HIGH<	113
16-Jun-2014 06:08:04:196	OK		G122ANN225SOE	CONDENSER HOTWELL LEVEL HIGH<	113
16-Jun-2014 06:08:02:441	HIGH	A	G122ANN225SOE	CONDENSER HOTWELL LEVEL HIGH<	113
16-Jun-2014 06:04:18:988	OPENED		G103AIDSTSSOE	1A ID FAN STATUS	290
16-Jun-2014 06:04:12:635	HIGH	A	G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 06:04:11:131	NORMAL		G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 06:03:56:856	RNBACK	A	G133ANN335SOE	CONTROL SYSTEM RUNBACK REQD<	177
16-Jun-2014 06:03:54:409	OPENED		G103AFDSTSSOE	1A FD FAN STATUS	183
16-Jun-2014 06:03:45:835	HIGH	A	G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 06:03:42:327	NORMAL		G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 06:03:34:563	HIGH	A	G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 06:03:01:753	NORMAL		G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 06:03:01:250	HIGH	A	G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 06:03:00:800	OK		G125ANN226SOE	DEAERATOR LEVEL HIGH<	43

# Forced Outage Report

16-Jun-2014 06:03:00:498	NORMAL	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:02:59:549	HIGH A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:02:59:294	OK	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:02:58:804	HIGH A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:02:58:747	HIGH A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:02:58:543	OK	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:02:37:455	NORMAL	G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 06:02:36:452	NORMAL	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:02:35:200	HIGH A	G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 06:02:34:448	HIGH A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:02:32:944	NORMAL	G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 06:02:32:445	NORMAL	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:02:23:759	HIGH A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:02:23:497	OK	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:02:22:758	HIGH A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:02:22:496	OK	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:02:22:254	HIGH A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:02:21:749	OK	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:02:21:502	HIGH A	G125ANN226SOE	DEAERATOR LEVEL HIGH<	43
16-Jun-2014 06:01:40:845	HIGH A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:01:38:592	NORMAL	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:01:26:569	HIGH A	G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 06:01:23:313	HIGH A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:01:02:773	NORMAL	G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 06:00:56:010	NORMAL	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:00:54:758	HIGH A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 06:00:51:752	HIGH A	G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 05:59:44:375	NORMAL	G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 05:59:42:371	HIGH A	G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 05:58:42:759	NORMAL	G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 05:58:10:697	NORMAL	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 05:58:10:196	HIGH A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 05:56:47:140	NORMAL	G125ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
16-Jun-2014 05:55:43:933	NORMAL	G1RUNDWNRQDSOI	CONTROL SYSTEM RUNDOWN REQD	220
16-Jun-2014 05:55:39:663	TRIPPD A	H133ANN465SOE	BLR MSTR TRP TO MAN<	138
16-Jun-2014 05:55:38:663	RESET	H133ANN465SOE	BLR MSTR TRP TO MAN<	138
16-Jun-2014 05:55:38:411	TRIPPD A	H133ANN463SOE	FUEL MSTR TRP TO MAN<	135
16-Jun-2014 05:55:38:161	TRIPPD A	H132ANN464SOE	AIR FLW MSTR TRP TO MAN<	137
16-Jun-2014 05:55:12:110	TRIPPD A	H133ANN465SOE	BLR MSTR TRP TO MAN<	138
16-Jun-2014 05:55:11:875	RNDOWN A	G1RUNDWNRQDSOI	CONTROL SYSTEM RUNDOWN REQD	220
16-Jun-2014 05:55:08:103	RESET	H133ANN465SOE	BLR MSTR TRP TO MAN<	138
16-Jun-2014 05:55:07:866	NORMAL	G1RUNDWNRQDSOI	CONTROL SYSTEM RUNDOWN REQD	220
16-Jun-2014 05:54:17:638	ALARM A	G125ANN186SOE	HTR 5 LVL HI OR DRAINS BYP	93
16-Jun-2014 05:53:06:873	TRIPPD A	H133ANN465SOE	BLR MSTR TRP TO MAN<	138
16-Jun-2014 05:53:06:639	RNDOWN A	G1RUNDWNRQDSOI	CONTROL SYSTEM RUNDOWN REQD	220
16-Jun-2014 05:52:44:595	CLOSED A	G132ANN329SOE	B MILL RATING DAMPER CLOSED<	249
16-Jun-2014 05:52:32:039	OPENED	G103BPULVSTSSOE	1B PULVERIZER STATUS	170
16-Jun-2014 05:49:03:705	ALARM A	G132ANN325SOE	ELECTRIC DRIVE POWER FAILURE<	247
16-Jun-2014 05:47:32:999	OPENED	G103CPULVSTSSOE	1C PULVERIZER STATUS	186
16-Jun-2014 05:46:55:678	LOW A	G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
16-Jun-2014 05:46:54:425	OK	G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
16-Jun-2014 05:46:53:924	LOW A	G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
16-Jun-2014 05:43:06:998	OK	G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
16-Jun-2014 05:42:44:958	ALARM A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
16-Jun-2014 05:41:53:111	NORMAL	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
16-Jun-2014 05:41:50:855	ALARM A	G130ANN256SOE	IGNITION OIL PRESS HIGH/LOW<	53
16-Jun-2014 05:38:17:451	NORMAL	G131ANN336SOE	FUEL-AIR HIGH/LOW LIMITING<	244
16-Jun-2014 05:34:01:714	LOW A	G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
16-Jun-2014 05:34:01:465	OK	G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
16-Jun-2014 05:33:58:209	LOW A	G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
16-Jun-2014 05:33:57:207	OK	G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
16-Jun-2014 05:33:56:205	LOW A	G155ANN313SOE	MAIN STEAM PRESSURE LOW<	76
16-Jun-2014 05:32:55:840	ALARM A	G131ANN336SOE	FUEL-AIR HIGH/LOW LIMITING<	244
16-Jun-2014 05:32:48:826	NORMAL	G131ANN336SOE	FUEL-AIR HIGH/LOW LIMITING<	244
16-Jun-2014 05:32:33:048	ALARM A	G131ANN336SOE	FUEL-AIR HIGH/LOW LIMITING<	244
16-Jun-2014 05:32:26:785	NORMAL	G131ANN336SOE	FUEL-AIR HIGH/LOW LIMITING<	244
16-Jun-2014 05:32:15:763	ALARM A	G131ANN336SOE	FUEL-AIR HIGH/LOW LIMITING<	244
16-Jun-2014 05:20:04:629	HIGH A	G132ANN285SOE	FURNACE PRESSURE HIGH<	62
16-Jun-2014 05:20:04:377	NORMAL	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61
16-Jun-2014 05:19:53:356	HIGH A	G132ANN284SOE	SEC AIR DUCT PRESSURE HIGH<	61

# Forced Outage Report

## Operators Event Log

6/16/2014 12:00 AM UNDERFLOW RUN TIMES

1A	12HRS.
1B	11HRS.
2A	12HRS.
2B	20HRS.

IU RUN 24HRS 15MIN

	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
1:00AM	1A	ON	65	40+	0	6'10"
	1B	OFF			8	6'10"
	2A	ON	85	32.3	0	6'10"
	2B	ON	215	35.1	7	6'8"

1:30AM G-1 MAGNET MOTOR IS TRIPPED AND WILL NOT RESET. RUNNING G-2 SIDE ONLY

4:15AM WEEKLY DIESEL FIRE PUMP CHECK. OK

	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
4:30AM	1A	ON	66	40+	0	6'10"
	1B	ON	188	35.4	8	6'10"
	2A	ON	80	34	0	6'10"
	2B	ON	189	35.2	6	6'8"

5:20AM G-1 BOILER WENT POSITIVE. FOUND 1A ID FAN DESTROYED. TAKING UNIT OFF LINE

6:26AM G-1 TRIPPED OFF LINE DUE TO ID FAN. ALL OIL FIRES OUT OF BOILER  
CALLED HOT LINE

6/16/2014 8AM BEAVEN, REED, RITTMAYER, LAWRENCE, HOPKINS, BERRY, BELL, RIGDON, GORRELL, D  
TIM W. SMITH IN TRAINING UTILITY  
D SHIFT

<u>UNITS</u>	<u>LOAD</u>	<u>CAP.</u>	<u>SO2</u>	<u>NOX</u>	<u>OPACITY</u>	<u>MILLS</u>
G-1	OUTAGE					

# Forced Outage Report

G-2 240 242 0.13 0.22 13.20% C=S/B

8AM	<u>SLAKERS</u>	<u>IN/OUT</u>	<u># ON</u>	<u>TANK LEVELS</u>	<u>SILO</u>
	G-1	OUT		25.1/26.4	
	G-2	IN	2	25.7/24.9	3
	PREP	IN	2	86.40%	4

8AM	<u>I.U.</u>	<u>CONV.</u>	<u>DRUMS</u>	<u>F/A SILO</u>	<u>F/A TONS</u>	<u>SMOOT</u>	<u>SMT. RATE</u>
	OUT						

8AM	<u>F/A SILOS</u>	<u>LEVEL</u>	<u>EAST</u>	<u>WEST</u>	<u>SILO</u>	<u>SAFETY</u>
	#1 F/A SILO	30'	0	0	0	0
	#2 F/A SILO	34'	1	0.5	0	0

8AM	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
	1A	OFF			0	6'9"
	1B	OFF			14	6'9"
	2A	OFF			0	6'9"
	2B	OFF			7	6'8"

## STACK DRAINS

G-1  
G-2 OPEN

1:00PM THOMPSON VACUUMING OUT G-1 AIR HEATER HOPPERS

1:00PM	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
	1A	OFF			0	6'9"
	1B	OFF			12	6'9"
	2A	OFF			0	6'9"
	2B	OFF			8	6'8"

3:00PM I.U. IN SERVICE 23' TANKS

2:58PM G-1 "B" SIDE FANS ARE OFF AND RED TAAGING OUT.

5:00PM	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED</u>
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# Forced Outage Report

						<u>LEVEL</u>
1A	ON	63	40+	0		6'9"
1B	ON	83	34.6	16		6'9"
2A	ON	85	33.1	0		6'9"
2B	ON	173	35.6	10		6'8"

6/16/2014 8:00PM HUST, HAYES, NORTHINGTON, BUTLER, BARRON, HANER, COMBS, COOK, R. PARKER, C  
BRIAN  
M. HUST- VAC BOLDS HERE  
A SHIFT

<u>UNITS</u>	<u>LOAD</u>	<u>CAP.</u>	<u>SO2</u>	<u>NOX</u>	<u>OPACITY</u>	<u>MILLS</u>
G-1	OUTAGE					

G-2	240	242	0.09	0.27	9.9	2D ON S/B
-----	-----	-----	------	------	-----	--------------

	<u>SLAKERS</u>	<u>IN/OUT</u>	<u># ON</u>	<u>TANK LEVELS</u>	<u>SILO</u>
8:00PM	G-1	OUT		20.2/25.7	
	G-2	IN	4	23.6/23.6	3
	PREP	IN	1	82.0%	4

	<u>I.U.</u>	<u>CONV.</u>	<u>DRUMS</u>	<u>F/A SILO</u>	<u>F/A TONS</u>	<u>SMOOT</u>	<u>SMT. RATE</u>
8:00PM	IN	B	B&C	2	23	1	28%

	<u>F/A SILOS</u>	<u>LEVEL</u>	<u>EAST</u>	<u>WEST</u>	<u>SILO</u>	<u>SAFETY</u>
8:00PM	#1 F/A SILO	30	1.5	1	0	0
	#2 F/A SILO	27	1.5	1.5	0	0

	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
9:00PM	1A	ON	57	40+	0	6' 11"
	1B	ON	142	35.2	9	6' 8"
	2A	ON	76	34.3	0	6' 10"
	2B	ON	142	36.4	14	6' 8"

11:40PM RED TAGGED G-1 GENERATOR DISCONNECT 0100-9

# Forced Outage Report

12:00  
6/17/2014 AM UNDERFLOW RUN TIMES

1A	9HRS.	30MIN
1B	13HRS.	30MIN
2A	8HRS.	
2B	13HRS.	
IU RUN	15HRS	

	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
1:00AM	1A	OFF			0	6' 10"
	1B	OFF			9	6' 8"
	2A	OFF			0	6' 10"
	2B	ON	206	32.6	13	6' 8"

5:15AM RELEASED AIR DRIVES ON AIR HEATERS FOR THOMPSON TO START WASH

5:21AM JOHN LEE CALLED IN SICK

**NOTE** SWAPPED VALVES AT ASH POND TO IW POND

6/17/2014 8AM BEAVEN, REED, RITTMAYER, LAWRENCE, HOPKINS, BERRY, BELL, RIGDON, GORRELL, D  
TIM W. SMITH IN TRAINING UTILITY  
D SHIFT

<u>UNITS</u>	<u>LOAD</u>	<u>CAP.</u>	<u>SO2</u>	<u>NOX</u>	<u>OPACITY</u>	<u>MILLS</u>
G-1	OUTAGE					
G-2	240	242	0.11	0.22	12.00%	C=S/B

	<u>SLAKERS</u>	<u>IN/OUT</u>	<u># ON</u>	<u>TANK LEVELS</u>	<u>SILO</u>
8AM	G-1	OUT		25.2/25.2	
	G-2	IN	4	23.2/23.8	3
	PREP	IN	3	75.60%	4

	<u>I.U.</u>	<u>CONV.</u>	<u>DRUMS</u>	<u>F/A SILO</u>	<u>F/A TONS</u>	<u>SMOOT</u>	<u>SMT. RATE</u>
8AM	IN	B	A&B	1	20	1	30

# Forced Outage Report

8AM	<u>F/A SILOS</u>	<u>LEVEL</u>	<u>EAST</u>	<u>WEST</u>	<u>SILO</u>	<u>SAFETY</u>
	#1 F/A SILO	22'	0	0	0	0
	#2 F/A SILO	31'	1.5	0.5	0	0

8AM	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
	1A	ON	97	1.163	0	6'9"
	1B	OFF			8	6'9"
	2A	ON	68	34	0	6'9"
	2B	ON	229	32.7	5	6'8"

## STACK DRAINS

G-1

G-2 OPEN

9:00AM IU SWAPPED OVER TO #2 SILO

10:30AM UNPLUGGED DRAIN LINE BY THE FAR EAST AIR HEATER HOPPER

1:00PM	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
	1A	OFF			0	6'9"
	1B	OFF			8	6'9"
	2A	OFF			0	6'9"
	2B	OFF			5	6'8"

3:30PM INSPECTED G-1 S.H AND R.H. SECTION BOILER 10TH FLOOR VERY LITTLE BUILD UP, NO BIG CLINKERS PRETTY GOOD SHAPE.

5:00PM G-1 "A" SIDE PRECIP HOPPERS CLEANED OUT

5:30PM CALLING IN ELECTRICIAN TO OPEN UP "A" SIDE PRECIP DOORS AT BELLY  
CHRIS DENTON COMING IN

6:05PM CHRIS DENTON HERE

6/17/2014 8:00PM HUST, HAYES, NORTINGTON, BUTLER, BARRON, HANER, COMBS, COOK, R. PARKER, C  
BRIAN  
M. HUST- VAC DONITHAN HERE  
A SHIFT

UNITS LOAD CAP. SO2 NOX OPACITY MILLS

# Forced Outage Report

G-1 OUTAGE

G-2	240	242	0.07	0.2	10.8	2D ON S/B
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	<u>SLAKERS</u>	<u>IN/OUT</u>	<u># ON</u>	<u>TANK LEVELS</u>	<u>SILO</u>
8:00PM	G-1	IN	1	21.2/25.5	1
	G-2	IN	4	24.0/22.7	3
	PREP	IN	1	83.2%	4

	<u>I.U.</u>	<u>CONV.</u>	<u>DRUMS</u>	<u>F/A SILO</u>	<u>F/A TONS</u>	<u>SMOOTH</u>	<u>SMT. RATE</u>
8:00PM	IN	B	A	2	14	1	14%

	<u>F/A SILOS</u>	<u>LEVEL</u>	<u>EAST</u>	<u>WEST</u>	<u>SILO</u>	<u>SAFETY</u>
8:00PM	#1 F/A SILO	24			0	0
	#2 F/A SILO	22	1.5	0	0	0

	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
8:30PM	1A	OFF			0	6' 10"
	1B	OFF			9	6' 8"
	2A	OFF			0	6' 10"
	2B	OFF			0	6' 8"

8:30PM MAINT DONE WITH G1 #2 HEATER. SETTING UP NORNAL  
ALSO BYPASSED #5 HEATER

10:45PM MAINT RELEASED CONDENSATE PUMPS AND BOILER FEED PUMPS

11:29PM CONDENSATE AND FEED PUMPS ON. FILLING BOILER FOR HYDRO

<b>6/18/2014</b>	12:MN	UNDERFLOW RUN TIMES			
		1A	5HRS.		
		1B	5HRS.		
		2A	11HRS.	30MIN	
		2B	17HRS.		
		IU RUN	24HRS		

# Forced Outage Report

	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
12:30AM	1A	OFF			0	6' 10"
	1B	OFF			9	6' 8"
	2A	OFF			0	6' 10"
	2B	OFF			0	6' 8"

12:44AM THOMPSON OUT OF AIR HEATERS. SWAPPING VALVES AT ASH POND BACK TO ASH PON

1:00AM IU DOWN 7' IN TANKS

2:45AM HYDRO COMPLETE. BOILER IS OK PER NEIL WATSON

6/18/2014

8:00AM D. BARRON, GEER, BOLDS, TURNER(VAC), DENTON, MAHAN, RITTMAYER, SMITH, STRIC  
DALE G. THOMAS, TOWNSEND, HOBGOOD, GORRELL  
C SHIFT

<u>UNITS</u>	<u>LOAD</u>	<u>CAP.</u>	<u>SO2</u>	<u>NOX</u>	<u>OPACITY</u>	<u>MILLS</u>
OFF						

G-2	240	242	0.124	0.224	11.4	2C ON S/B
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<u>SLAKERS</u>	<u>IN/OUT</u>	<u># ON</u>	<u>TANK LEVELS</u>	<u>SILO</u>
G-1	IN	1	21.7/25.5	1
G-2	IN	3	23.3/21.1	3
PREP	IN	1	73.5%	4

<u>I.U.</u>	<u>CONV.</u>	<u>DRUMS</u>	<u>F/A SILO</u>	<u>F/A TONS</u>	<u>SMOOT</u>	<u>SMT. RATE</u>
OUT						

<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
1A	OFF			0	6'10"
1B	OFF			10	6'10"
2A	ON	67	33.9	0	6'10"
2B	OFF			8	6'
	12				

# Forced Outage Report

## STACK DRAINS

G-1 OPEN  
G-2 OPEN

<u>F/A SILOS</u>	<u>LEVEL</u>	<u>EAST</u>	<u>WEST</u>	<u>SILO</u>	<u>SAFETY</u>
#1 F/A SILO	32	off			
#2 F/A SILO	29	off	off	0	0

9:20 AM IW POND SET BACK UP FOR PRECP. WASH  
9:24 AM THOMPSON WASHING IN PRECP  
NOTE TAGGING OUT G-1 AIR HEATER SOOTBLOWERS TO REPAIR CONDUIT  
9:52 AM PUT ON G-1 E.H. PUMP FOR MAINTENANCE TO CHECK LEAK ON CYLINDER LEAKING TO  
11:10 AM  
AM SHUT OFF E.H. PUMP ( MAINTENANCE ORDERING PARTS )

<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
1A	ON	88	28.2	0	6'10"
1B	ON	229	28.4	8	6'10"
2A	ON	68	34	0	6'10"
2B	ON	219	30.6	8	6'2"

1:05 PM STARTED G-1 A DIRECT COOLING WATER PUMP ( B OFF)  
1:10 PM SHUT OFF 1B STATOR COOLING WATER PUMP( BACK ON)  
1:15 PM OPENED 4160 FEEDER BREAKER 1B1 FEEDING 1B11  
1:41 PM ELECTRIC DEPT. RELEASED 1B11 (BACK IN SERVICE)

	<u>I.U.</u>	<u>CONV.</u>	<u>DRUMS</u>	<u>F/A SILO</u>	<u>F/A TONS</u>	<u>SMOOT</u>	<u>SMT. RATE</u>
2:00 PM	IN	A	A&B	1	18	1	30%

NOTE SETTING G-1 BOILER TO FIRE

<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
1A	ON	74	37.3	0	6'10"
1B	ON	225	28.8	8	6'10"
2A	ON	63	33.8	0	6'10"
2B	ON	160	35.2	8	6'2"

# Forced Outage Report

6/18/2014

8PM  
ERIC S  
B SHIFT

DONITHAN, FARLEY, BACHMAN, WHITLEDGE, HOOVER, TRAVIS, LOVAN, TAPP, T. PAR  
HANER HERE

	<u>UNITS</u>	<u>LOAD</u>	<u>CAP.</u>	<u>SO2</u>	<u>NOX</u>	<u>OPACITY</u>	<u>MILLS</u>
STARTUP	G-1	0	250	0	0	0	1D OFF

	G-2	180	240	0.21	0.221	10.9	2A OFF
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<u>SLAKERS</u>	<u>IN/OUT</u>	<u># ON</u>	<u>TANK LEVELS</u>	<u>SILO</u>
G-1	IN	1	25/24	2
G-2	IN	3	25/25	3
PREP	IN	1	86.00%	4

<u>I.U.</u>	<u>CONV.</u>	<u>DRUMS</u>	<u>F/A SILO</u>	<u>F/A TONS</u>	<u>SMOOT</u>	<u>SMT. RATE</u>
IN	A	A,B	1	19	1	28

<u>F/A SILOS</u>	<u>LEVEL</u>	<u>EAST</u>	<u>WEST</u>	<u>SILO</u>	<u>SAFETY</u>
#1 F/A SILO	25	RT	RT	0	0
#2 F/A SILO	32	1	2	0	0

<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
1A	OFF	91		0	6' 11"
1B	OFF	248		8	6' 10"
2A	ON	74	32.2	0	6' 11"
2B	ON	163	29.6	10	6' 8"

## STACK DRAINS

G-1	OUTAGE
G-2	OPEN

10:00PM AFTER STARTING FANS ON G1 WE FOUND LOTS OF DUST BLOWING OUT TOP OF THE PF  
IVESTIGATION IS ON GOING AS TO WHY

12:00AM	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED</u>
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# Forced Outage Report

			<u>LEVEL</u>
1A	OFF	0	6' 11"
1B	OFF	8	6' 10"
2A	OFF	0	6' 11"
2B	OFF	8	6' 8"

12:30AM SWAPPED WASTE WATER BACK TO ASH POND UNTIL PRECIP WASH BEGINS  
 3:00AM 1A SIDE AIR HEATER OUTLET DUCT DAMPER NOT CLOSING OFF, MAINT TO CUT IT LOOSE  
 CLOSE, IF THEY DO THEY WILL BE WELDED SHUT  
 3:00AM SENT THOMPSON HOME, WE WON'T BE READY FOR THEM TO START WASH UNTIL THEN

	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
12:00AM	1A	OFF	92		0	6' 11"
	1B	OFF	242		8	6' 10"
	2A	OFF	89	28	0	6' 11"
	2B	OFF	180	31.6	8	6' 8"

6/19/2014 8:00AM D. BARRON, GEER, BOLDS, TURNER(VAC), DENTON, MAHAN, SMITH, STRICKLAND, NOBLE  
 DALE G. THOMAS, TOWNSEND, HOBGOOD, PARKER  
 C SHIFT

<u>UNITS</u>	<u>LOAD</u>	<u>CAP.</u>	<u>SO2</u>	<u>NOX</u>	<u>OPACITY</u>	<u>MILLS</u>
OFF						

G-2	240	242	0.243	0.23	11.4	2C ON S/B
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<u>SLAKERS</u>	<u>IN/OUT</u>	<u># ON</u>	<u>TANK LEVELS</u>	<u>SILO</u>
G-1	IN	1	21.7/25.5	1
G-2	IN	3	23.3/21.1	3
PREP	IN	1	73.5%	4

<u>I.U.</u>	<u>CONV.</u>	<u>DRUMS</u>	<u>F/A SILO</u>	<u>F/A TONS</u>	<u>SMOOT</u>	<u>SMT. RATE</u>
OUT						

# Forced Outage Report

<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
1A	ON	63	40+	0	6'10"
1B	ON	221	29.7	10	6'10"
2A	ON	82	30.2	0	6'11"
2B	ON	45	32.8	10	6'6"

## STACK DRAINS

G-1	OPEN
G-2	OPEN

<u>F/A SILOS</u>	<u>LEVEL</u>	<u>EAST</u>	<u>WEST</u>	<u>SILO</u>	<u>SAFETY</u>
#1 F/A SILO	30	off			
#2 F/A SILO	31	1.5	0	0	0

9:01 AM G-1 B F.D. FAN ON  
 9:28 AM G-1 A IGNITION OIL PUMP ON  
 NOTE STARTED PUMP @ IW POND  
 NOTE GOT AN ALARM IN ON G-1 BURNER DECK GETTING INST. TO ASSIST  
 12:09 PM GOT A FIRE IN G-1 BOILER NOTIFIED H/L

12 NOON	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
	1A	ON	61	40+	0	6'10"
	1B	ON	226	28.2	8	6'10"
	2A	ON	79	28.4	0	6'11"
	2B	ON	138	31.6	10	6'6"

2:50 PM ELLIOT BERRY CALLED OFF FOR 8P-8A SHIFT TONITE

NOTE CLOSED ALL DOORS ON "A" SIDE DUCT EXCEPT 2 TOP AND 1 BOTTOM AIR HEATER DOO

3:36 PM STARTED "A" AIR HEATER ELECTRIC DRIVE  
 4:50 PM RELEASING HOLD #310 ON GENERATOR DISCONNECT 100-9  
 5:33 PM G-1 TIED ON LINE AND PRECP'S IN SERVICE AND NOTIFIED H/L  
 6:00 PM G-1 CROSS OVER TEMPERATURE @ 350 DEGREES 1 HOUR HOLD

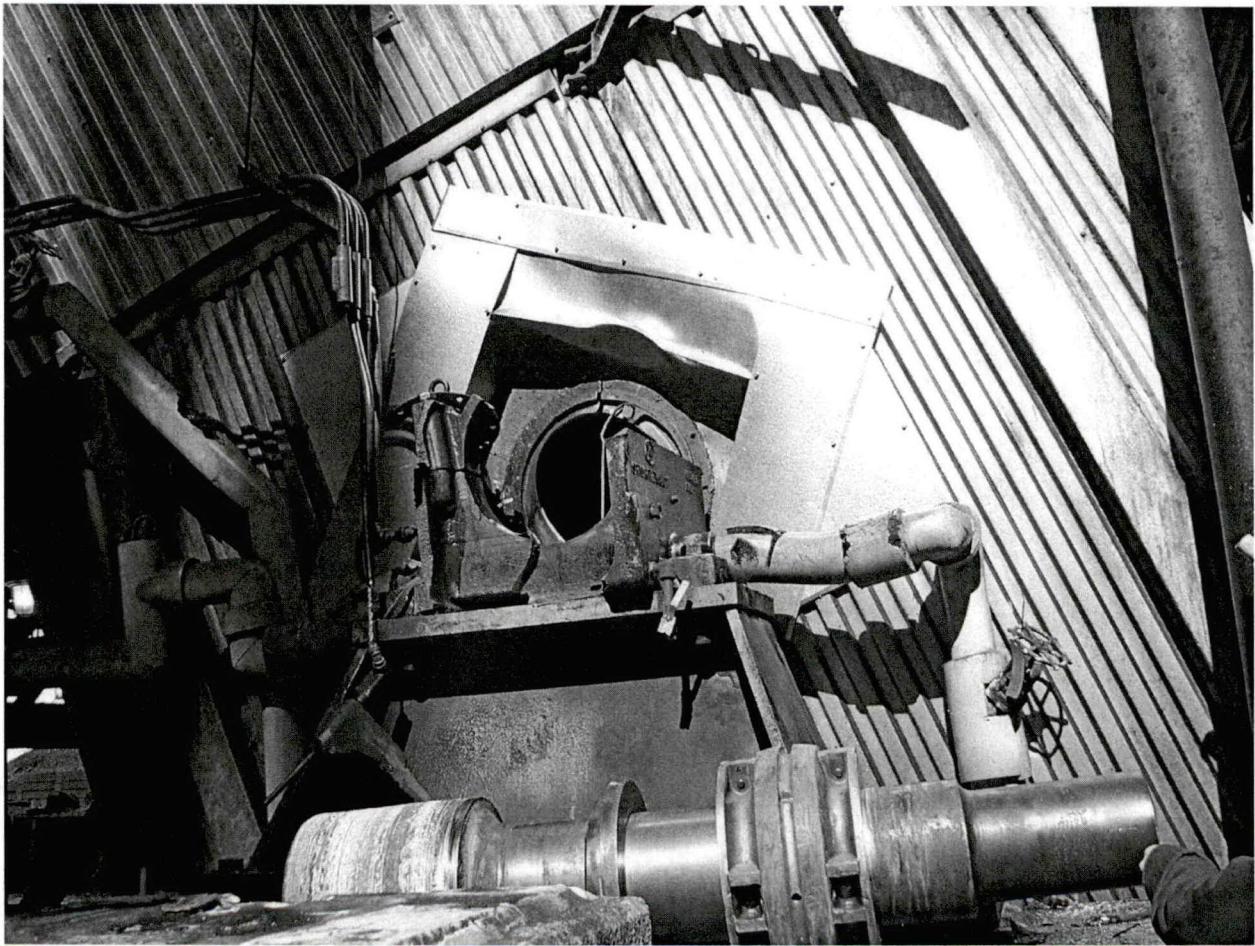
6:00 PM	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
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# Forced Outage Report

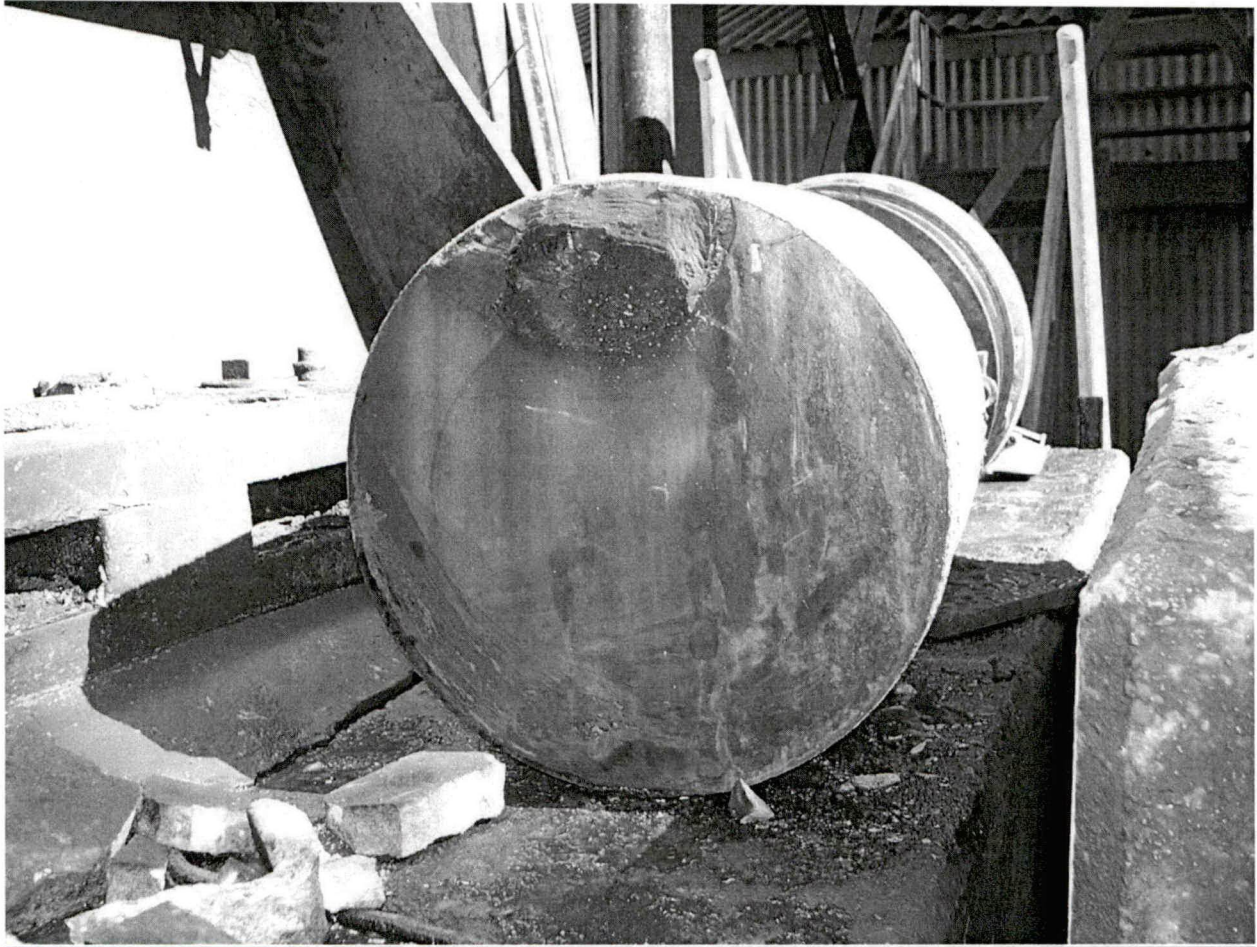
1A	OFF			0	6'10"
1B	OFF			8	6'10"
2A	ON	79	28	0	6'11"
2B	ON	188	29.6	10	6'6"

7:18PM G1 D MILL IN SERVICE

## Pictures



# Forced Outage Report



# Forced Outage Report

## Estimated Outage Cost

All Costs we captured on Capital Project BP14G089F

Big Rivers Labor \$14,502

Material and Outside Labor \$949,000

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>Green 1 - G1-14-09</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	6/16/14 6:26			<b>MW</b>
<b>Date &amp; Time On Line</b>	6/19/14 17:33			<b>\$/MW</b>
<b>Outage Duration</b>	83 hr. 7 min.			91
<b>Outage Code</b>	U02			181
<b>Outage Reason</b>	A ID fan rotor failed; installed blanks in duct work; started unit up at half load			235
				\$ 29.88
				\$ 26.25
				\$ 25.72
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
6/16/14 (HE 6-24)	\$ 41.26	\$ 78.95	\$ (234,025)	\$ -
6/17/14 (HE 1-24)	\$ 45.51	\$ 58.74	\$ -	\$ (109,707)
6/18/14 (HE 1-24)	\$ 56.26	\$ 35.09	\$ -	\$ (169,330)
6/19/14 (HE 1-24)	\$ 45.06	\$ 57.08	\$ (56,987)	\$ (74,476)
<b>Total</b>			\$ (291,012)	\$ (353,513)
<b>Start Up Fuel Cost</b>			<b>Total Forced Outage Cost</b>	
S/U Fuel Consumed	20,043		DART P&L	\$ (291,012)
S/U Fuel Price	\$ 3.21		Lost Opportunity	\$ (353,513)
S/U Fuel Cost	\$ (64,380)		S/U Fuel Cost	\$ (64,380)
			<b>Total</b>	<b>\$ (708,904)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Jim Garrett

**From:** Billy Boarman

**Date:** 30-Jun-2014

**Plant:** HMP&L Station Two

**Unit:** 2

**GADS Class:** UO1

## Duration

Trip Time: 18-Jun-2014 06:00

Tie Time: 22-Jun-14 01:37

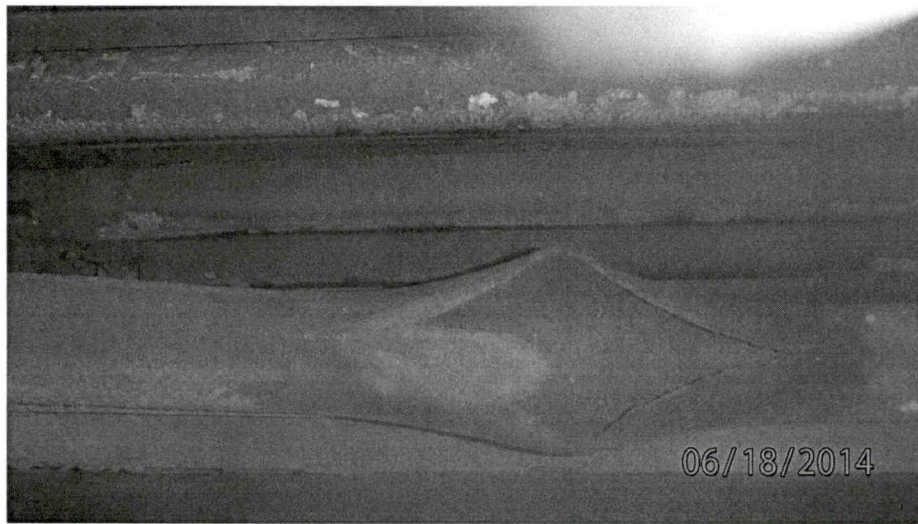
Time Offline: 91:37

## Outage Description

HMP&L Station Two Unit 2 was removed from service on Friday, 18-Jun-2014 at 06:00 due to a suspected tube leak in the primary superheater area.

## Root Cause

Tube leak in the top tube in the 37<sup>th</sup> element from the east wall in the primary superheat section of the boiler at elevation 560'.



# Forced Outage Report

## Failure History

17-May-2011

HMP&L Station II Unit 2 was removed from service at 09:51 on Tuesday, 17-May-2011 due to a high furnace pressure MFT. Tube leak on the 10<sup>th</sup> element-top tube from the west wall in the primary superheat section of the boiler. Duration 34:39

## Corrective Action

Titan installed a 5' 5" dutchman in the 37<sup>th</sup> element-top tube. The 37<sup>th</sup> element-2<sup>nd</sup> tube and 3<sup>rd</sup> tube also had 2' 4" dutchmen installed due to them being kinked from the leak in the top tube. Sample of the top tube will be sent out for further analysis to determine failure cause.

## SOE Print Out

Triggered on: 18-Jun-2014 05:58:20:157

18-Jun-2014 05:59:16:234	OPEN	H250OCB182STS	OCB 0182 GEN H2 STATUS
18-Jun-2014 05:59:16:147	OK	H250OCB182GETR	OCB 0182 GEN H2 TRIP
18-Jun-2014 05:59:16:146	OK	H250OCB186GETR	OCB 0186 GEN H2 TRIP
18-Jun-2014 05:59:16:118	TRIP	H250OCB182GETR	OCB 0182 GEN H2 TRIP
18-Jun-2014 05:59:16:118	TRIP	H250OCB186GETR	OCB 0186 GEN H2 TRIP
18-Jun-2014 05:59:06:330	LOW	H222HTR2LVLL0	LP HEATER 2-3 LEVEL LOW
18-Jun-2014 05:58:54:182	OK	H225DRMTRP	BOILER DRUM LEVEL TRIP
18-Jun-2014 05:58:51:440	TRIP	H225DRMTRP	BOILER DRUM LEVEL TRIP
18-Jun-2014 05:58:35:663	OK	H240STPVLVTRP	TURB STOP VLV CLSD TRIP
18-Jun-2014 05:58:35:587	LOW	H225DRMLVLLOW	BOILER DRUM LEVEL LOW
18-Jun-2014 05:58:24:652	OK	H232FURNPRSTRP	FURNACE PRESSURE HIGH TRIP
18-Jun-2014 05:58:24:651	OK	H233LMISTRP	LAST MILL IN SERVICE TRIP
18-Jun-2014 05:58:21:152	LOW	H245SEALSTMLOW	TURBINE SEAL STEAM PRESS
18-Jun-2014 05:58:20:657	TRIP	H233LMISTRP	LAST MILL IN SERVICE TRIP
18-Jun-2014 05:58:20:655	TRIP	H240STPVLVTRP	TURB STOP VLV CLSD TRIP
18-Jun-2014 05:58:20:237	OK	H203M3ATRP	4160 BKR MILL H2A TRIP
18-Jun-2014 05:58:20:227	OPEN	H203M3BSTS	4160 BKR MILL H2B STATUS
18-Jun-2014 05:58:20:218	TRIP	H203M3ATRP	4160 BKR MILL H2A TRIP
18-Jun-2014 05:58:20:218	OPEN	H203M3ASTS	4160 BKR MILL H2A STATUS
18-Jun-2014 05:58:20:215	OPEN	H203PAF3BSTS	4160 BKR PA FAN H2B STATUS
18-Jun-2014 05:58:20:211	CLOSED	H203M3BSTS	4160 BKR MILL H2B STATUS
<b>18-Jun-2014 05:58:20:157</b>	<b>TRIP</b>	<b>H233EMERBLTRP</b>	<b>EMERGENCY BLR TRIP</b>
18-Jun-2014 05:58:19:906	TRIP	H232FURNPRSTRP	FURNACE PRESSURE HIGH TRIP
17-Jun-2014 21:15:24:937	OK	H243HYDOILHITE	TURB HYD FLUID HIGH TEMP

# Forced Outage Report

## Other Work Completed While Unit Was Offline

- Repaired gas leaks in the boiler penthouse and also the economizer hopper area
- Clean 480V transformer
- Checked battery charger connections
- Cleaned furnace taps
- Repaired SCR Seal Air Fan ducting
- Cleaned Wet bottom Seal Trough
- Back-pass inspection
- Boiler Reheat vacuum check
- Repaired coal leaks on "A" Mill
- Repaired coal leaks on "B" Mill
- Cleaned seal air fan filters
- Performed high pressure wash on the economizer tubes due to ash accumulation
- Repaired boiler roof refractory in between the reheat outlet and screen wall tubes
- From the initial boiler hydro-test, it was discovered that the initial repairs on the primary superheat tubes were good but there were also leaks in the Superheat outlet elements the 3<sup>rd</sup> and 6<sup>th</sup> from the east wall. Leak in the 3<sup>rd</sup> element was in the 3<sup>rd</sup> loop from the inner at elevation at 539', this loop was replaced. While the 6<sup>th</sup> element was on the inner (hair pin) loop on the north side at elevation 549'-6", this was repaired via installation of a 5' 4" Dutchman.

# Forced Outage Report

## Operators Event Log

6/18/2014	12:00AM	J.ARNOLD, A.YOUNG LEAVING													
	12:44AM	WARMING H1 SCR													
	2:26AM	FLOWING AMMONIA ON H1													
	2:45AM	TRANSFERRING FUEL OIL TO HMPL OIL TANK													
	NOTE:	DOING ERT CHECKS FOR JIM ED													
	6:00AM	H2 TRIPPED HIGH FURNACE PSI / APPERANT TUBE LEAK AROUND #28 SOOTBLOWER													
	7:33AM	DRAINING H2 BOILER													
	NOTE:	R1,H1,H2 & BOOTHE SYSTEM R/T TO REPAIR BOOTHE SYSTEM B SIDE EQUALIZING LINE													
	6/18/2014	8:00AM	EDMONDS,JACKSON ,GRIFFIN,BOWLEY, HOGAN ,ALEXANDER,WADLINGTON,KURZ										C SHIFT CARTER		
			LEE,JONES JOHNSON												
			UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
			R1	50	50	42	4.67	10.7	0.385	9.8					
		H1	165	165	153	0.164	11.1	0.063	25.5	96.7	10.23	216/C	3.3		
		H2		165	152	OUTAGE TUBE LEAK									
		CT..	65	57	ON STANDBY										
		ALARMS:													
		R1													
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT												
		H2	EH RES LEVEL HI												
		SOOT BLOWERS TAGGED													
		R1	16,,19,28,29,30,31/22R					GAUGE GLASSES		PWTL 26.0'		DRYING AGENT			
		H1	1- 24 ,42,44 / 27,29,30,31,33,34,43					OK				R1-0%			
		H2	9,41,46/37									H1-0%			
		FUEL OIL C.H. HMPL NORTH SOUTH										SILO LVL		H2-0%	
		LEVELS	10' 1"	14'	12' 4 1/4"	6 1/2"					BOOTHE SYSTEM				
											IN				
		8:00AM	SAFETY BRIEFING												
		NOTE	AUXILIARY FOUND H1 -B2 COAL FEEDER BELT IN BAD SHAPE / B.SHARTUNG NOTIFIED												
		9:00AM	R1 HEAT RATE TEST STARTED												
		NOTE	OPENING H2SCR MID LAYER DOORS FOR INSPECTION												
		NOTE	TAGGING OUT H2 BLEED PUMPS												
		12:33PM	DEBUSK HERE / SETTING UP TO VACUM H2 PENTHOUSE												
		1:25pm	R1,H1,H2 & BOOTHE SYSTEM RELEASED												
		1:40PM	BOOTHE SYSTEM IN & HMPL FLYASH												
		2:10PM	H2 BOILER SET FOR HYDRO & VACUM CHECK												
		NOTE	W/O ON 6A CONV PLOW TO R1 BUNKERS												
		2:25PM	CALLED MURPHY ELEVATOR HMPL ELEVATOR STOPPING ON EVERY FLOOR												
		NOTE	DEBUSK HAS 2 MORE VACUM TRUCKS COMING BY 7PM												
		NOTE	EXPRO ON STANDBY AT HOTEL												
		5:00PM	HMPL ELEVATOR GOING												
		NOTE	CALLING THRU LIST FOR OPERATORS A SHIFT L/M												
		6:45PM	DRAINING H2 WET SEAL												
		7:20PM	CALLING THRU LIST FOR OPERATORS D SHIFT L/M												
6/18/2014	8:00PM	CLARK, BREEDEN, HIGGINS, BLANKS, YOUNG										B SHIFT PENDLEY			
		CONN & CUTSHAW VAC - ONAN HERE													
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	49	50	42	4.6	10.8	0.383	6.5				3.68		
		H1	144	165	153	0.196	10.5	0.063	17.8	96.3	6.14	207	3		
		H2	OFF TUBE LEAK												
		CT..	STAND BY												
		ALARMS:													
		R1													
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL												
		H2	EH RES LEVEL HI												
		SOOT BLOWERS TAGGED													
		R1	22R					GAUGE GLASSES		PWTL		DRYING AGENT			
		H1	27,29,30,31,33,34,42,43,44					OK		27'		R1- 0%			
		H2	37,41,46									H1- 0%			
		FUEL OIL C.H. HMPL NORTH SOUTH										SILO LVL		H2- 0%	
		LEVELS	10' 1"	14'	12' 4 1/4"	6 1/2"					BOOTH SYSTEM				
									11'		IN				



## Forced Outage Report

ALARMS:													
R1													
H1 BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL													
H2 EH RES LEVEL HI													
SOOT BLOWERS TAGGED													
R1 22R													
H1 27,29,30,31,33,34,42,43,44													
H2 37,41,46													
FUEL OIL C.H. HMPL NORTH SOUTH													
LEVELS 9' 10 1/2" 14' 16' 1 3/4" 6 1/2"													
SILO LVL 15'													
DRYING AGENT													
R1- 0%													
H1- 0%													
H2- 0%													
BOOTH SYSTEM													
OUT													
6/19/2014	8:00PM	SAFETY BRIEFING											
	NOTE	A' ELLIOT AIR COMPRESSOR BACK IN STANDBY											
	8:19PM	H-2 'A' BFP OFF - VENTS CLOSED											
	8:29PM	H-2 'A' BFP ON TO SQUEEZE											
	8:42PM	STARTED 10 MINUTE HOLD - 'A' BFP OFF AT 8:52											
	NOTE	FOUND 2 LEAKS IN SUPERHEATER											
	9:10PM	DEBUSK STARTED WASHING H-2 FIN TUBES - PULLED PEOPLE OFF OF DESSICANT AIR DRYER TO START WASH											
	9:35PM	DRAINING H-2 BOILER - EVERYTHING											
	9:47PM	CALLED EXPRO FOR DE-SLAG - SAID BE HERE IN ABOUT AN HOUR											
	10:35PM	MOVED DEBUSK OUT OF ECONOMIZER & PENTHOUSE - SENT 1 CREW TO VACUUM REST OF DESSICANT & SEND THE REST OF THEM HOME											
	10:40PM	CALLED K. BROOKS (DEBUSK) WILL HAVE 2 CREWS IN AT 5AM TOMORROW MORNING FOR ECONOMIZER WASH & PENTHOUSE VACUUM											
	10:40PM	EXPRO AT GUARD SHACK - TAKING AMMONIA TEST											
	10:51PM	STARTED H-2 'A' F.D. FAN											
	11:15PM	EXPRO SETTING UP											
6/20/2014	12:35AM	DEBUSK FINISHED VACUUMING DESSICANT AIR DRYER											
	12:40AM	EXPRO SET OFF FIRST CHARGE											
	1:00AM	DEBUSK LEAVING											
	1:55AM	EXPRO INFORMED ME THEY HAVE TO SHUT DOWN BECAUSE OF VISIBLE LIGHTNING - THEY ARE GOING TO SHOOT EYEBROWS OFF OF BURNERS											
	2:15AM	PUT 2 BARRELS OF BALLS IN H-1 'B' MILL											
	2:52AM	EXPRO RESUMED BLASTING											
	3:00AM	A. YOUNG LEAVING - M. PEYTON & N. STIFF HERE											
	5:10AM	TITAN INSPECTING H-2 BOILER											
	NOTE	GREEN STATION TRANSFERRED FUEL OIL											
	5:00AM	DEBUSK HERE - TOLD JEFF GARDNER DE-SLAG STILL GOING ON - BE READY TO GO IN WHEN I CALL THEM											
	5:59AM	CALLED JEFF GARDNER - TOLD HIM THEY COULD GO TO WORK IN ECONOMIZER FIN TUBES											
	6:35AM	DEBUSK FINALLY SHOWED UP AT THE FIN TUBES - AFTER THEY FINISHED THEIR COFFEE - I WAS ON THE BOILER WATCHING											
6/20/2014	8:00AM	FELTY,CECIL,EMBRY, BLAIR, HILLYARD, DUVALL,JAMES											
		LEE, JONES											
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE
		R1	49	48	42	4.625	10.4	0.42	9.3				3.56
		H1	165	165	153	0.256	10.8	0.063	19.6	95.1	6.37	263	2.6
		H2	UNIT OFF 155		142								
		CT..	ON STANDBY		56								
ALARMS:													
R1													
H1 BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL/A & B PA FAN MOTOR/B BFP AUX OIL													
H2 EH RES LEVEL HI, GEN. MAIN STEPUP													
SOOT BLOWERS TAGGED													
R1 22R													
H1 27,29,30,31,33,34,42,43,44													
H2 37,41,46													
FUEL OIL C.H. HMPL NORTH SOUTH													
LEVELS 9' 3 1/2" 14' 15'10 5/8" 6 1/2"													
SILO LVL 16.7'													
DRYING AGENT													
R1-0%													
H1 0%													
H2-0%													
BOOTHE SYSTEM													
BSO													
	8:00AM	SAFETY BRIEFING											
	8:00AM	DEBUSK WASHING FIN TUBES											
	8:00AM	DEBUSK WAITING ON CREW TO VACUUM PENTHOUSE											
	8:10AM	H-2 BOILER CLEAN PULLING WET BOTTOM THEN TAGGING											
	NOTE	CLOSED R-1 COND BYPASS OUTLET VALVES 30 AND 40 PERCENT OPEN											
	10:00AM	NOT ENOUGH WATER GOING THRU ECON DRAIN LINE STAYING PLUGGED HOOKING UP 2" FIRE HOSE											
	11:45AM	WASHING AGAIN IN H-2 ECONS											

## Forced Outage Report

	11:55AM	#3 FLYASH VACUUM OIL LEVEL AT 1/2 SIGHT GALSS WATCHING TO SEE HOW MUCH LEAKING													
	NOTE	GOT TWO FUEL OIL TRUCKS TODAY													
	1:25AM	MOVING TO NORTH SIDE OF PENTHOUSE SOUTH GOOD (DEBUSK)													
	NOTE	GREEN TRANSFERRED FUEL OIL													
	3:15PM	CHARGING H-2 COND TOP EAST BOTTOM EAST LEAKING GOT TOP EAST TO SEAL DRAINING BACK DOWN TO RESEAL BOTTOM EAST													
	3:58PM	H-2 BFP ON TO FILL BOILER CANT FIND LEAK													
	5:12PM	H-2 BFP OFF GETTING EVERYONE OUT OF BOILER TO SQUEEZE													
	5:15PM	TOP WEST ALSO LEAKING BOING TO TRY TO TIGHTEN													
	5:25PM	H-2 BPF ON													
	5:27PM	H-2 BPF OFF AT 1500 LBS													
	5:29PM	NATHAN PRUITT CALLED IN SICK FOR 8P-8A TONIGHT													
	6:20PM	ISSUED C/W FOR SLUICE WATER STRAINER AREA													
	6:20PM	J GATTON CALLED FOR P.D. OKED													
	6:35PM	FOUND LEAKS IN SPERHEATERS DRAINING BOILER DEBUSK GOING BACK TO WORK													
	6:48PM	T ALEXANDER COMING IN													
6/20/2014	8:00PM	MORRIS, DENTON, REYNOLDS, GATTON-P.D., BAKER, EDWARDS, TATE, CALHOUN										D SHIFT	ASKINS		
		ALEXANDER													
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	48	50	42	4.66	10.5	0.42	11.3						
		H1	165	165	153	0.21	10.9	0.066	16	96	6.41	280	2.6		
		H2				OUTAGE TUBE LEAK									
		CT..	65	56		ON STANDBY									
		ALARMS:													
		R1													
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT												
		H2	EH RES LEVEL HI												
		SOOT BLOWERS TAGGED							GAUGE GLASSES		DRYING AGENT				
		R1	22R						OK		R1-0%				
		H1	42,44 / 27,29,30,31,33,43												
		H2	41,46/37												
											SILO LVL	BOOTHE SYSTEM			
											18'	OUT			
	8:00PM	SAFETY BRIEFING													
	8:30PM	BOOTHE IN SERVICE													
	9:30PM	DEBUSK WASHING BOTTOM SIDE OF FIN TUBES													
	NOTE	H-1 GRINDER HAS METAL IN IT													
	NOTE	H-1 # 34 SOOTBLOWER IS BACK IN SERVICE													
	NOTE	SETTING H-2 FOR A VACUUM CHECK													
6/21/2014	1:20AM	H-2 VACUUM PUMPS ON FOR REHEAT CHECK													
	2:00AM	H-2 REHEAT CHECK IS GOOD													
	NOTE	HELD WEEKLY SAFETY MEETING													
	NOTE	H-2 IS SET FOR HYDRO													
	4:00AM	J. HILLYARD OFF SICK TODAY													
	NOTE	R-1 SYSTEM AIR PRESSURE DROPPING DOWN TO 65 LBS., HAS DONE THIS TWICE – INVESTIGATING.													
	5:30AM	BOILER FEED PUMP ON FOR HYDRO													
	7:20AM	H-2 BFP OFF AT 1500 LBS													
6/21/2014	8:00AM	FELTY,CECIL,EMBRY, BLAIR, HILLYARD S/L, DUVALL, JAMES										A SHIFT	TOW		
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	49	48	42	4.54	10.3	0.442	10.7				3.52		
		H1	148	165	153	0.194	10.7	0.57	13.7	96.3	5.72	245	2.1		
		H2	UNIT OFF 155 142												
		CT..	ON STANDBY 56												
		ALARMS:													
		R1													
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL/A &B PA FAN MOTOR/B BFP AUX OIL												
		H2	EH RES LEVEL HI, GEN. MAIN STEPUP												
		SOOT BLOWERS TAGGED							GAUGE GLASSES		DRYING AGENT				
		R1	22R						OK		R1-0%				
		H1	27,29,30,31,33,34,42,43,44												
		H2	37,41,46												
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH								SILO LVL	BOOTHE SYSTEM
		LEVELS	8' 11 1/2"	14' 3/8"	13'3 1/2"	6 1/2"								13.6'	BSI

# Forced Outage Report

	8:00AM	SAFETY BRIEFING													
	8:02AM	H-2 DRY BOILER INSIDE CHECKING BEHIND INSULATION BY #4 SB													
	8:05AM	DRAINING BOILER COMPLETE FOR HEAT													
	8:05AM	DEBUSK GOING BACK IN FINTUBES													
	9:15AM	A AIR COMP OFF CROSSTIE CLOSED													
	10:15AM	DEBUSK FINISHED ON FINTUBES WASHED OUT ECONS AND UNDER PVC LINE NOTIFIED MAINT TO TEAR DOWN LINE REPLACE HOPPERS GATES													
	11:54AM	COMBUSTION TURBINE FIRED													
	12:17PM	COMBUSTION TURBINE TIED TOOK TO 56 MW THEN PLACED IN ADS PER ACES													
	12:37PM	COMBUSTION TURBINE IN ADS													
	NOTE	CT WOULD NOT TIE AT FIRST SLOWED DOWN SPED UP STILL NO LUCK CALLED ELECT AND INST BUT BEFORE THEY GOT THERE CT TIED ON AFTER SEVERAL TRIED AT ABOUT 5 OR 6 TILL ON CLOCK													
	1:10PM	H-2 COND VALVES SET AT 50% OUTLET 100 % INLET D CT CIR ON													
	1:25PM	H-2 FD FAN ON FOR BOILER COOLING													
	1:25PM	CALLED D PENDLEY TO SIGN HIM OFF 459887,459875,459886 CALLED P CARTER FOR SAME LEFT MESSAGE													
	1:30PM	SETTING H-2 BOILER TO FIRE NOT ALL DOORS CLOSED YET AND CANT PUMP UP BOILER YET													
	2:30PM	PUTTING HOSE IN H-2 WET SEAL FOR AIR TEST AND GOING OVER OIL GUNS H-2 BURNER CECK													
	2:30PM	RUNNING LIST FOR UTIL AND AUX FOR 8P FOR STARTUP													
	NOTE	H-2 B FD FAN SHUT OFF DAMPER OPEN LIMIT HAS A WASHER WIRED TO IT HOUSING MOUND RUSTED AWAY WO ISSUED IF DAMPER CLOSES IT WILL SHOW OPEN AND CLOSED LIGHT													
	3:00PM	WORKING ON R-1 FLYASH HOPPERS OPACITY GOING HOME FOUND 15 16 HOPPER SEG VALVE NOT OPENING INST GOT GOING													
	3:30PM	P CARTER CALLED OKED SIGNING HIM OFF 459875,459877, 459889, 459866													
	3:52PM	H-2 BFP ON TO PUMP BOILER TO FIRING LEVEL													
	NOTE	TRIED OTHER BKRS WITH SAME RACKING DEVICE AS A BFP HAVING TO STEAL BKR OUT OF A ASH SLUICE PUMP TO GET A BFP TO RUN													
	4:30PM	H-2 WET BOTTOM SET UP													
	NOTE	WASHING MUD FROM AROUND DRAIN BY STACK													
	4:55PM	H-2 FD FANS ON FOR AIR TEST													
	6:15PM	OIL AND AIR RELEASED ON H-2 BURNER DECK SETTING UP SAME													
	6:20PM	RUNNING LIST FOR AUX AND UTILFOR 8P													
	6:30PM	FIRE ESTABLISHED IN H-2 BOILER													
	7:43PM	COMBUSTION TURBINE UNTIED													
6/21/2014	8:00PM	MORRIS, DENTON, REYNOLDS, GATTON, BAKER, EDWARDS, TATE, CALHOUN										D SHIFT ASKINS			
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	48	50	42	4.5	10.5	0.45	15						
		H1	165	165	153	0.21	10.9	0.07	20	96	5.88	275	2.9		
		H2				OUTAGE TUBE LEAK									
		CT..	65	56		ON STANDBY									
		ALARMS:													
		R1													
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT												
		H2	EH RES LEVEL HI												
		SOOT BLOWERS TAGGED						GAUGE GLASSES				DRYING AGENT			
		R1	22R											R1-0%	
		H1	42,44 / 27,29,30,31,33,43											H1-0%	
		H2	41,46/37											H2-0%	
											SILO LVL	BOOTHE SYSTEM			
											18'	OUT			
	8:00PM	SAFETY BRIEFING													
	8:09PM	H-2 CLOSED BOILER VENTS													
	8:24PM	LEFT MESSAGE FOR N. DENTON TO CALL THE PLANT, TO RELEASE HIM OFF OF PERMIT # 459777 #3 VACUUM PUMP ON THE DRY FLY ASH SYSTEM													
	8:45PM	N. DENTON RETURNED CALL AND GAVE OK TO RELEASE HIM OFF OF PERMIT # 459777													
	9:20PM	H-1 PRI-INLET, OUT, SEC INLET AND MASS BLOW DOWN CLOSED													
	9:40PM	H-1 A F.D. FAN OUTBOARD BRG CAME OFF THE FAN - TRIPPED FAN AND PULLED TWO COAL VALVES - NOTIFIED J. FRANCIS													
	NOTE	H-1 GOOD FOR 105 NET													
	10:13PM	H-1 AMMONIA OUT - TEMP LOW.													
	11:12PM	H-2 PULLING VACUUM													
6/22/2014	12:03AM	ROLLING H-2 TURBINE- ROLLED OFF AT 24.5 VACUUM BEFORE RESETTNG TURBINE													
	NOTE	#1 DRY ASH VACUUM PUMP RELEASED AND RUNNING													
	1:37AM	H-2 TIED. UNIT WOULD NOT TIE WITH 182 PCB HAD TIE WITH 186 PCB													

# Forced Outage Report

## Boiler Tube Leak Record

Plant: HMP&L Station Two

Unit: 2

### Type of Leak:

Pin Hole \_\_\_\_\_ Thick Lip Failure ✓ Thin Lip Failure \_\_\_\_\_

Tube Wall Thinning \_\_\_\_\_ Other \_\_\_\_\_

Orientation of Rupture: Longitudinal ✓ Circumferential \_\_\_\_\_

### Probable Cause:

Stress ✓ Overheat \_\_\_\_\_ Erosion \_\_\_\_\_ Internal Corrosion \_\_\_\_\_

External Corrosion \_\_\_\_\_ Weld Failure \_\_\_\_\_ (Shop \_\_\_\_\_ Field \_\_\_\_\_)

Internal Obstruction to Flow \_\_\_\_\_ Soot blower Erosion \_\_\_\_\_

Other Tube samples were sent out for failure analysis

### Type of Repair:

Dutchman ✓ (Length: 1 - 5' - 5" on 37<sup>th</sup> element top tube, 2 - 2' - 4" in 2<sup>nd</sup> & 3<sup>rd</sup> tubes) Pad Weld \_\_\_\_\_ Plug Tube \_\_\_\_\_ Short Circuit \_\_\_\_\_

Other \_\_\_\_\_

# Forced Outage Report

## Description of Repair:

Tube Size OD 2 ½" Wall Thickness .300" Tube Material SA-210

Welding procedure GS-P5-5L

Welded By: Titan

Titan installed a 5' 5" dutchman in the 37<sup>th</sup> element-top tube. The 37<sup>th</sup> element-2<sup>nd</sup> tube and 3<sup>rd</sup> tube also had 2' 4" dutchmen installed due to them being kinked from the leak in the top tube. Sample of the top tube will be sent out for further analysis to determine failure cause.

From the initial boiler hydro-test, it was discovered that the initial repairs on the primary superheat tubes were good but there were also leaks in the Superheat outlet elements the 3<sup>rd</sup> and 6<sup>th</sup> from the east wall. Leak in the 3<sup>rd</sup> element was in the 3<sup>rd</sup> loop from the inner at elevation at 539', this loop was replaced. While the 6<sup>th</sup> element was on the inner (hair pin) loop on the north side at elevation 549'-6", this was repaired via installation of a 5' 4" Dutchman.

# Forced Outage Report

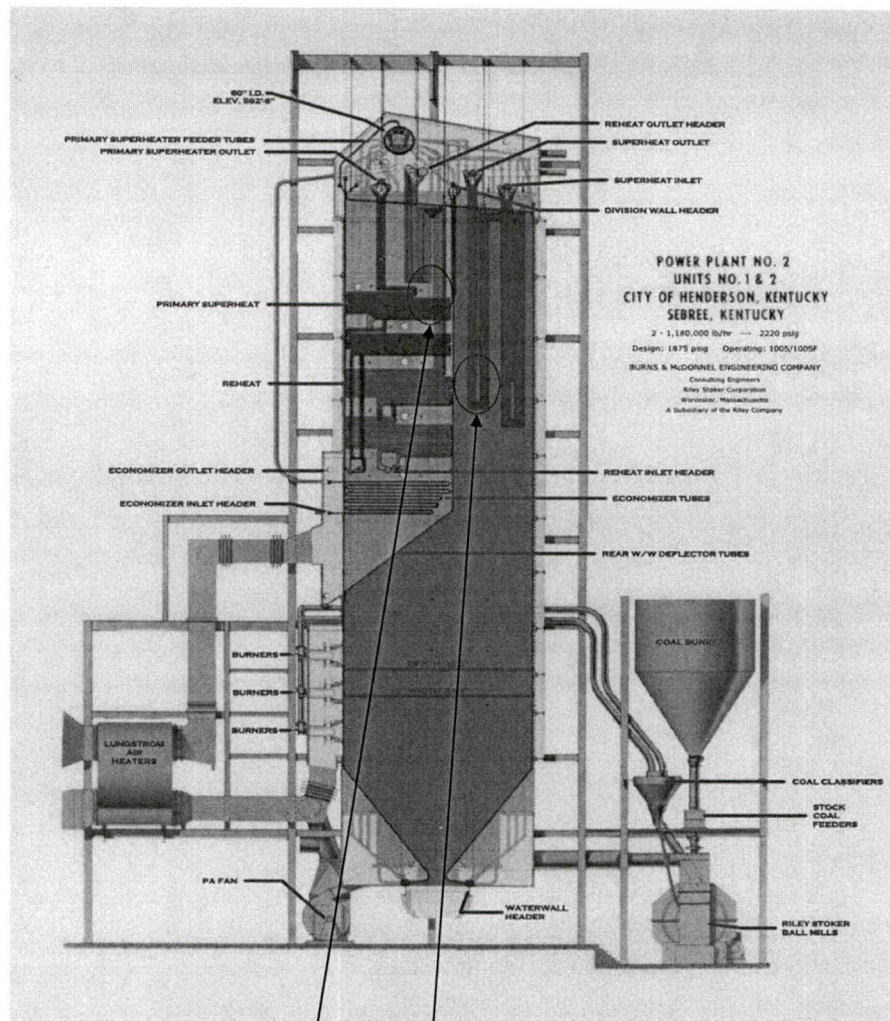
## Exact Location of Leaks:

HMPL STATION UNIT 2

2014

(5) TUBES INVOLVED

Date and Time Unit Off 05:58 6-18-14  
Date and Time Unit On 01:37 6-22-14



•Installed a 5' 5" dutchman on the 37<sup>th</sup> primary superheat element-top tube at elevation 560'. The 37<sup>th</sup> element-2<sup>nd</sup> tube and 3<sup>rd</sup> tube also had 2' 4" dutchman's installed on each due to them being kinked from the leak on the top tube. Sample of the top tube will be sent out for further analysis to determine failure cause. From the initial boiler it was discovered the initial repairs on the primary superheat tubes were good but there was also leaks on the 3<sup>rd</sup> and 6<sup>th</sup> Superheat outlet elements from the east wall. Leak on the 3<sup>rd</sup> element was on the 3<sup>rd</sup> loop from the inner at elevation at 539', this loop was replaced. While the 6<sup>th</sup> element was on the inner (hair pin) loop on the north side at elevation 549'-6", this was repaired via installation of a 5' 4" Dutchman.

# Forced Outage Report

## Estimated Outage Cost

- Boiler De-Slag

**Total            \$18,128.60**

- Vacuuming Economizer Hoppers, ME panels and the AH's

**Total            \$31,054**

- Titan – tube leak repair and misc. repairs

Labor            \$89,660

Material        \$2,483.95

**Total            \$92,143.95**

- RTW – Refractory Repairs

Labor            \$11,932.41

Material        \$4,721.20

**Total            \$16,653.61**

**Grand Total        \$157,980.16**

# Forced Outage Report

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>HMP'L 2 - H2-14-04</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	6/18/14 6:00			<b>MW</b>
<b>Date &amp; Time On Line</b>	6/22/14 1:37			<b>\$/MW</b>
<b>Outage Duration</b>	91 hr. 37 min.			105
<b>Outage Code</b>	UO1			127
<b>Outage Reason</b>	Repair primary superheater tube leaks			149
				\$ 30.80
				\$ 30.05
				\$ 29.73
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
6/18/14 (HE 6-24)	\$ 64.29	\$ 37.88	\$ (23,136)	\$ -
6/19/14 (HE 1-24)	\$ 45.06	\$ 57.08	\$ -	\$ (56,277)
6/20/14 (HE 1-24)	\$ 36.04	\$ 35.76	\$ 863	\$ (23,676)
6/21/14 (HE 1-24)	\$ 39.28	\$ 41.65	\$ -	\$ (36,172)
6/22/14 (HE 1-11)	\$ 21.13	\$ 23.84	\$ (272)	\$ -
<b>Total</b>			\$ (22,546)	\$ (116,125)
<b>Start Up Fuel Cost</b>			<b>Total Forced Outage Cost</b>	
S/U Fuel Consumed	9,871		DART P&L	\$ (22,546)
S/U Fuel Price	\$ 3.20		Lost Opportunity	\$ (116,125)
<b>S/U Fuel Cost</b>	<b>\$ (31,608)</b>		S/U Fuel Cost	\$ (31,608)
			<b>Total</b>	<b>\$ (170,279)</b>

### NOTES:

All negative values are money out of pocket.

DART Revenue is calculated from differences between the DA award and RT events

Lost Opportunity is the lost margins if the unit had stayed running

# Forced Outage Report

**To:** Jim Garrett

**From:** Billy Boarman

**Date:** 5-Jun-2014

**Plant:** HMP&L Station Two

**Unit:** 2

**GADS Class:** UO3

## Duration

Trip Time: 30-May-2014 19:40

Tie Time: 2-Jun-14 00:49

Time Offline: 53:09

## Outage Description

HMP&L Station Two Unit 2 was removed from service on Friday, 30-May-2014 at 19:40 due to a suspected tube leak in the penthouse area of the boiler.

## Root Cause

Tube leaks were discovered on the 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> roof tubes from the west wall between #3 and #5 riser tube elements to Primary SH outlet header, at elevation 579' 8". The leaks were caused by flue gas erosion.



# Forced Outage Report

## Failure History

During the 5-Oct-2012, unscheduled outage on H-2 a leak was discovered on a roof tube between the 10th and 11th primary super heater elements. It was the east roof tube at Elev. 579' 8", 56<sup>th</sup> tube from the east wall. This leak was not the result of the outage in this case.

## Corrective Action

Tube leaks on the 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> from west roof tubes between #3 and #5 riser tube elements to Primary SH outlet header, at elevation 579' 8" were all repaired via base metal repairs.

## SOE Print Out

Triggered on: 30-May-2014 19:40:25:972

30-May-2014 19:40:47:245	TRIP	H225DRMTRP	BOILER DRUM LEVEL TRIP
30-May-2014 19:40:43:000	TRIP	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
30-May-2014 19:40:41:387	TRIP	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
30-May-2014 19:40:40:980	OK	H240STPVLVTRP	TURB STOP VLV CLSD TRIP
30-May-2014 19:40:40:743	OK	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
30-May-2014 19:40:39:242	TRIP	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
30-May-2014 19:40:36:894	OK	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
30-May-2014 19:40:36:649	TRIP	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
30-May-2014 19:40:35:718	OK	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
30-May-2014 19:40:35:429	TRIP	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
30-May-2014 19:40:34:404	LOW	H225DRMLVLLOW	BOILER DRUM LEVEL LOW
30-May-2014 19:40:30:969	OK	H233LMISTRP	LAST MILL IN SERVICE TRIP
30-May-2014 19:40:30:077	TRBLE	H246XFERTOMAN	VOLTAGE REG TROUBLE
30-May-2014 19:40:29:962	OPEN	H250FLDBKRSTS	GEN H2 FIELD BKR STATUS
30-May-2014 19:40:29:953	OPEN	H250OCB186STS	OCB 0186 GEN H2 STATUS
30-May-2014 19:40:29:943	OPEN	H250OCB182STS	OCB 0182 GEN H2 STATUS
30-May-2014 19:40:29:851	OK	H250OCB186GETR	OCB 0186 GEN H2 TRIP
30-May-2014 19:40:29:849	OK	H250OCB182GETR	OCB 0182 GEN H2 TRIP
30-May-2014 19:40:29:823	LKOUT	H240STPVLVLO86TV	TURB STOP VLV LOCKOUT (86TV3)
30-May-2014 19:40:29:819	TRIP	H250OCB182GETR	OCB 0182 GEN H2 TRIP
30-May-2014 19:40:29:819	TRIP	H250OCB186GETR	OCB 0186 GEN H2 TRIP
30-May-2014 19:40:28:697	OPEN	H203BFP3ASTS	4160 BKR BFP H2A STATUS
30-May-2014 19:40:26:973	TRIP	H233LMISTRP	LAST MILL IN SERVICE TRIP
30-May-2014 19:40:26:223	TRIP	H233EMERBLRTRP	EMERGENCY BLR TRIP
30-May-2014 19:40:25:972	TRIP	H240STPVLVTRP	TURB STOP VLV CLSD TRIP

# Forced Outage Report


## Other Work Completed While Unit Was Offline

- Repaired gas leaks in the boiler penthouse and also the economizer dead air space.
- Clean 480V transformer
- Cleaned furnace and PA Fan taps
- Cleaned Wet bottom Seal Trough
- Cleaned Scrubber Mist Eliminator panels and nozzles
- Precipitator inspection
- Back-pass inspection
- Calibrated all coal feeders.
- Changed oil in all FD Fan, PA Fan, and Mill motors
- Repaired coal leaks on "A" Mill
- Repaired coal leaks on "B" Mill
- Cleaned seal air fan filters

## Operators Event Log

4

# Forced Outage Report

Your Touchstone Energy® Cooperative 

5/31/2014	8:00AM	JACKSON, EDMONDS, GRIFFIN, BOWLEY, HOGAN, WADLINGTON, ALEXANDER										C SHIFT PAYNE					
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE				
		R1	49	50	42	4.51	10.3	0.453	6.2					CTL 17.2'			
		H1	165	165	153	0.471	10.4	0.127	64	91.1	36.6	217	2.9				
		H2		165				RAPPERS NOT WORKING						CTL 15.0'			
		CT..	ON STANBY		57												
		ALARMS:															
		R1															
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E. H. START REQUIRED														
		H2	EH RES LEVEL HI														
		SOOT BLOWERS TAGGED						GAUGE GLASSES			PWTL / 25.5'	DRYING AGENT					
		R1							OK			R1-0%					
		H1	1/24, 42,									H1-0%					
		H2	9, 41, 46 / 38, 45									H2-0%					
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH									SILO LVL	BOOTHE SYSTEM	
		LEVELS	9' 4"	10' 4"	12' 9 3/4"	6 1/2"					14FT	IN					
5/31/2014	8:00AM	SAFETY BRIEFING															
	8:27AM	RUNDOWN ACTIVE ON H1 DUE TO AIR, OUT OF ADS CONTROL															
	8:30AM	H1 BACK IN ADS															
	8:33AM	RUNDOWN ACTIVE ON H1 DUE TO AIR, OUT OF ADS CONTROL															
	9:00AM	H1 STABLE AND AT 160MW'S. BACK IN ADS CONROL															
	9:15AM	SPOKE WITH DARREL PRATHER. HE'S LOOKING IT OVER. HE WANTS TO TRY AND TAKE IT BACK TO 165MW 1 MW AT A TIME AND SEE HOW IT DOES. HE THINKS THE BTU COMPENSATOR HAS GOTTEN WOUND OUT AND IS SLOWLY WORKING ITSELF BACK															
	10:00AM	EXPRO DONE WITH DESLAG, MAINT INSPECTING															
	10:20AM	EXPRO NOT DONE WITH DESLAG. GOING BACK IN BOILER															
	10:30AM	DEBUSK VACUMING IN PENTHOUSE NORTH SIDE															
	11:00AM	DEBUSK STARTING ON H2 ECONS															
	11:30AM	DEBUSK DONE WITH PANELS AT SCRUBBERS. MAINT GOING TO TAKE OUT NOZZLES AND END PLATES															
	11:45AM	H1 BACK IN ADS CONTROL AND GOOD FOR FULL LOAD.															
	1:30PM	BLASTING COMPLETED ON H2 BOILER															
	1:40PM	EXPRO LEAVING															
	2:19PM	H2 WETBOTTOM TAGGED. NOTIFY MAINT															
	2:25PM	DEBUSK MOVING TO SOUTH SIDE PENTHOUSE PER MAINT															
	2:30PM	MIKE PENCE (COAL HANDLING) CALLED IN SICK FOR TONIGHT															
	3:43PM	RUNNING LIST FOR OVERTIME TOMORROW AND TOMORROW NIGHT															
	3:45PM	B. BLAIR-L/M, J. HILLYARD-LM, R. BEAN-LM, B. DUVALL-LM, J. GATTON, J. BAKER, J. TATE															
	4:10PM	H2 WETBOTTOM PLATES OFF															
	4:30PM	V. BRADDOCK, J. TAUL, T. WOODS LEAVING															
	6:15PM	MAINT RELEASED H2 B BFP															
	6:25PM	H2 B BFP ON FOR HYDRO															
	NOTE:	TRANSFERRING FUEL OIL TO HMPL TANK															
	7:45PM	ELECTRICIANS RUNNING AIR TEST ON H-2 PRECIPS															
5/31/2014	8:00PM	CONN, CLARK, BREEDEN, HIGGINS, CUTSHAW, BLANKS & YOUNG										B SHIFT PENDLEY					
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE				
		R1	50	50	42	4.5	10.6	0.44	13				2.6	CTL 18'			
		H1	165	165	153	0.572	10.6	0.081	28.5	89	11.24	217	2.7				
		H2	OFF - TUBE LEAK											CTL 14'			
		CT..	STAND BY		57												
		ALARMS:															
		R1															
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E. H. START REQUIRED/DRUM TRANS/ C.T. LEVEL														
		H2	EH RES LEVEL HI														
		SOOT BLOWERS TAGGED						GAUGE GLASSES			PWTL	DRYING AGENT					
		R1							OK			27'	R1- 0%				
		H1	1/24, 42,										H1- 0%				
		H2	9, 41, 46 / 38, 45										H2- 0%				
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH									SILO LVL	BOOTH SYSTEM	
		LEVELS	9' 4"	14' 1 1/4"	12' 2 1/2"	6 1/2"					6'	IN					

[illegible]

# Forced Outage Report

6/1/2014	8:00PM	CONN, CLARK, BREEDEN, HIGGINS, CUTSHAW, BLANKS & YOUNG TATE & JOHNSON HERE										B SHIFT			PENDLEY	
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	CTL		
		R1	51	50	42	4.5	10.6	0.417	6.4				2.7	19'		
		H1	165	165	153	0.389	10.7	0.081	25.1	93.1	10.08	230	3.05			
		H2	FIRING BOILER											CTL 15.5'		
		CT..	STAND BY 60													
		ALARMS:														
		R1														
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL													
		H2	EH RES LEVEL HI													
		SOOT BLOWERS TAGGED										GAUGE GLASSES		PWTL	DRYING AGENT	
		R1											OK		26'	R1- 0%
		H1	1/24,42,													H1- 0%
		H2	9,41,46 / 38,45													H2- 0%
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH						SILO LVL	BOOTH SYSTEM			
		LEVELS	9' 1"	10' 4"	12' 2 1/4"	6 1/2"						14'	OUT			
6/1/2014	8:00PM	SAFETY BRIEFING														
	8:25PM	MAINT CHANGED OUT FULLERS EARTH FILTERS & POLISHING FILTERS ON H-2 E.H. UNIT														
	10:20PM	SEAL AND PULL VAC ON H2														
	10:52PM	ROLLING H2 TURBINE														
	11:23PM	AT TRANSFER SPEED ON H2 TURBINE. WAITING ON TEMPS														
	12:24AM	TRANSFERRING VALVES ON H2 TURBINE														
	12:49AM	H2 TIED ON LINE														
	2:00AM	H-2 SCRUBBER IN SERVICE														
	2:15AM	COAL LEAK ON H-2 A1 BURNER HEAD - MAINT CHECKING														
	3:10AM	TRANSFERRED H-2 AUXILIARIES														
	NOTE	MAINT REPAIRED COAL LEAK ON H-2 A1 COAL PIPE ON 5TH FLOOR														
	4:00AM	WARMING H-2 SCR														
	5:40AM															
	5:51AM	R. JAMES CALLED - REQUESTED VACATION DAY FOR TODAY - I OK'D														
6/2/2014	8:00AM	FELTY, CECIL, EMBRY, BLAIR, HILLYARD, DUVALL, JAMES VAC										A SHIFT			TOW	
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	CTL		
		R1	50	50	42	4.518	10.5	0.415	11.9				2.74	18'		
		H1	165	165	153	0.418	10.8	0.076	30	92.3	10.09	233	3.5	PWTL / 26'		
		H2	164	165	152	1.928	11	0.375	79.7	66.5	4.69	C	4.3	CTL 15'		
		CT..	OFF STANDBY 57													
		ALARMS:														
		R1														
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL/A & B PA FAN MOTOR/B BFP AUX OIL													
		H2	EH RES LEVEL HI													
		SOOT BLOWERS TAGGED										GAUGE GLASSES		DRYING AGENT		
		R1	22R										H-1 EAST OUT		R1-0%	
		H1	27,29,30,31,33,42,43,44												H1 0%	
		H2	37,41,46												H2-0%	
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH						SILO LVL	BOOTH SYSTEM			
		LEVELS	8' 10 7/8"	11' 2"	12' 2 1/4"	6 1/2"						16.9'	BSO			

# Forced Outage Report

## Boiler Tube Leak Record

Plant: HMP&L Station Two

Unit: 2

### Type of Leak:

Pin Hole ✓ ( 4 Roof tubes) Thick Lip Failure \_\_\_\_\_ Thin Lip Failure \_\_\_\_\_

Tube Wall Thinning \_\_\_\_\_

Orientation of Rupture: Longitudinal ✓ Circumferential \_\_\_\_\_

### Probable Cause:

Stress \_\_\_\_ Overheat \_\_\_\_ Erosion ✓ Internal Corrosion \_\_\_\_\_

External Corrosion \_\_\_\_ Weld Failure \_\_\_\_\_ (Shop \_\_\_\_ Field \_\_\_\_)

Internal Obstruction to Flow \_\_\_\_ Soot blower Erosion \_\_\_\_\_

Other Flue gas erosion

### Type of Repair:

Dutchman \_\_\_\_ Pad Weld ✓ (4 Roof tubes) Plug Tube \_\_\_\_\_ Short

Circuit \_\_\_\_ Other \_\_\_\_\_

### Description of Repair:

Tube leaks on the 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> from west roof tubes between #3 and #5 riser tube elements to Primary SH outlet header, at elevation 579' 8" were all repaired via BMR's.

# Forced Outage Report

## Exact Location of Leaks:

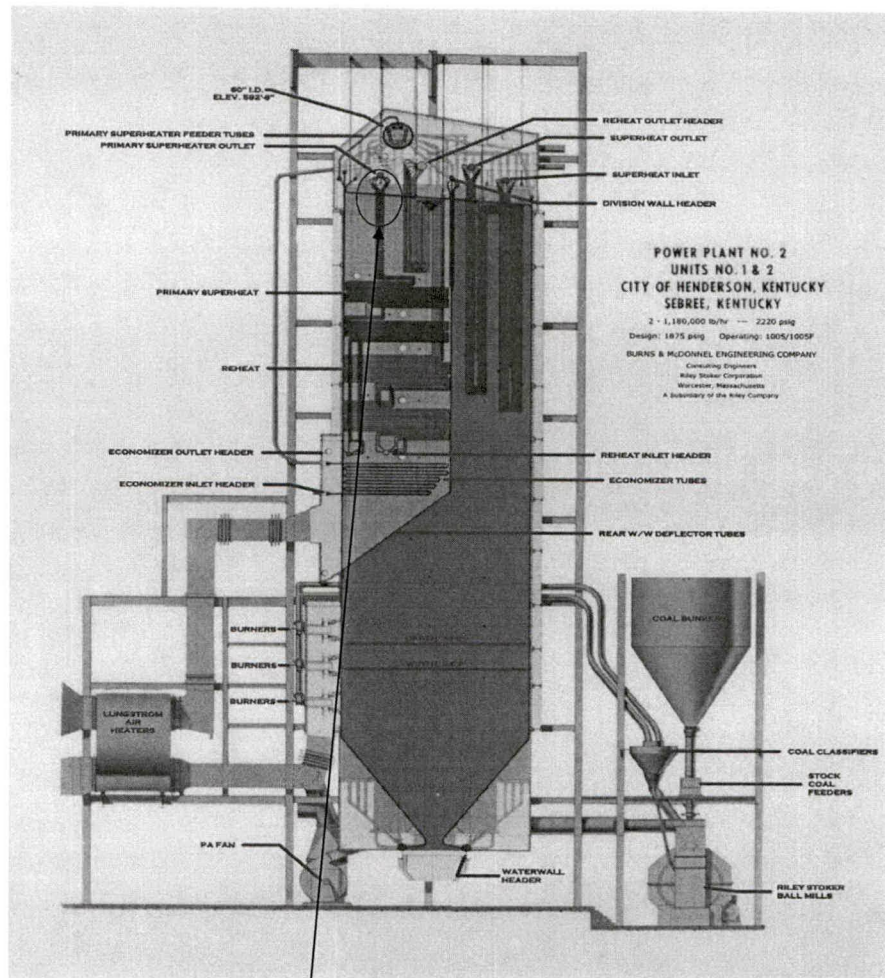
HMPL STATION UNIT 2

2014

(4) TUBES INVOLVED

Date and Time Unit Off 19:40 5-30-14

Date and Time Unit On 00:49 6-2-14



Tube leaks on the 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> from west roof tubes between #3 and #5 riser tube elements to Primary SH outlet header, at elevation 579' 8\" were all repaired via BMR's.

# Forced Outage Report

## Estimated Outage Cost

Boiler De-Slag

**Total           \$16,246.00**

Vacuuming Economizer Hoppers, ME panels and the AH's

**Total           \$16,024.36**

Titan –tube leak repair

Labor           \$10,200

Material       \$106

**Total           \$10,306**

Titan and Global – Misc. repairs (Gas leaks, coal leaks, etc.) and scaffolding/insulation

Labor           \$13,520

Material       \$1,800

**Total           \$15,320**

**Grand Total       \$57,896.36**

# Forced Outage Report

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>HMP'L 2 - H2-14-03</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	5/30/14 19:40			<b>MW</b>
<b>Date &amp; Time On Line</b>	6/2/14 0:49			<b>\$/MW</b>
<b>Outage Duration</b>	53 hr. 9 min.			72
<b>Outage Code</b>	U03			127
<b>Outage Reason</b>	Repair tube leak in penthouse			149
				\$ 33.04
				\$ 30.31
				\$ 29.99
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
5/30/14 (HE 19-24)	\$ 32.93	\$ 37.39	\$ (3,733)	\$ -
5/31/14 (HE 1-24)	\$ 39.53	\$ 43.30	\$ (47,241)	\$ -
6/1/14 (HE 1-24)	\$ 34.98	\$ 34.07	\$ -	\$ (18,776)
6/2/14 (HE 1-12)	\$ 34.28	\$ 33.45	\$ 39	\$ -
<b>Total</b>			\$ (50,935)	\$ (18,776)
<b>Start Up Fuel Cost</b>			<b>Total Forced Outage Cost</b>	
S/U Fuel Consumed	9,407		DART P&L	\$ (50,935)
S/U Fuel Price	\$ 3.20		Lost Opportunity	\$ (18,776)
<b>S/U Fuel Cost</b>	<b>\$ (30,122)</b>		S/U Fuel Cost	\$ (30,122)
			<b>Total</b>	<b>\$ (99,833)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Jim Garrett

**From:** Billy Boarman

**Date:** 19-Jun-2014

**Plant:** Reid Station

**Unit:** 1

**GADS Class:** UO1/MO

## Duration

Trip Time: 11-Jun-2014 11:08      Switched to Maintenance Outage: 13-Jun-2014 20:40

Time Offline for Forced Outage: 57:22

Tie Time: 16-Jun-2014 01:42

Time Offline for Maintenance Outage: 53:02

Total Time Offline: 110:24

## Outage Description

Reid Station Unit 1 tripped due to loss of burner flame detection on Wednesday, 11-Jun-2014 at 11:08.

## Root Cause

Steam from the tube leaks in the wet bottom area, all at elevation 440', caused the flame scanner lenses to fog and loose detection of the burner flames. One leak was located on the west water wall 4<sup>th</sup> tube from the north and the other was located on the north water wall 4<sup>th</sup> tube from the west. The leak on the west wall was caused by external corrosion and this leak sprayed on the north wall causing the other tube to leak.

## Failure History

No failures of this nature have occurred on this unit in the last three years.

## Corrective Action

Base metal repairs were made on the tubes identified above.

# Forced Outage Report

## Other Work Completed While Unit Was Offline

- Repaired gas leaks on the bottom ash hopper seal skirt, the economizer hoppers ductwork, the boiler penthouse, around soot blowers and also around the Air Heater
- Cleaned seal trough
- Repaired Air Heater Steam Cleaning device
- Replaced hot well level controller
- Repaired leaking boiler seal air piping
- Replaced hydro-ejector and discharge piping
- Inspected and repair wet bottom flushing jets
- Repaired refractory cooling water headers
- Repaired coal leaks on A1 coal pipe
- Replaced 2 steam coils
- Changed oil in all FD Fan, PA Fan, and Mill motors
- During the boiler hydro additional tube leaks were identified. The first tube in the second bundle from the east wall in the Hi Temp Superheat area of the boiler at elevation 519' was leaking. The first tube in the economizer at elevation 504' north-west side was leaking at a tube clip. In the wet bottom on the north knee slope at elevation, 440' the twentieth tube from the east wall a weeper was discovered. In addition, it was discovered that the base metal repair to the leak on the fourth knee tube from the west wall on the north side was leaking and required more pad welding due to tube wall thinning. All leaks were repaired via base metal repairs.


# Forced Outage Report

## Operators Event Log

6/11/2014	8:00AM	SAFETY BRIEFING											
	8:00AM	FULL LOAD PARTICULATE TEST H-1											
	8:30AM	J KENNEDY HERE											
	9:50AM	RAISED H-1 VOLTAGE TO 18.5 FOR NERC REACTIVE TEST											
	10:00AM	TOOK DRYING AGENT OFF HMPL											
	11:10AM	RUNNING HOTWELL CK ON H-2 LSOT 2 1/2 INCHES IN ONE HOUR											
	11:18AM	R-1 TRIPPED LOST OF FLAME SUSPECT TUBE LEAK											
	11:45AM	LOWERED H-1 VOLTAGE TO 17.5 REACTIVE TEST											
	11:48AM	PRECIPIS OUT ON R-1											
	NOTE	GETTING FUEL OIL TRUCKS											
	NOTE	H-1 FLYASH STILL HAVING TROUBLE WITH											
	NOTE	DRYING AGENT CONV NOT WORKING											
	2:50AM	FULL LOAD TEST OVER ON H-1											
	NOTE	EAST A DRUM LEVEL LEAKING READING OUT THE TOP INST IN TONIGHT TO REPAIR											
	3:15PM	TRIED STARTING H-1 A RECYCLE PUMP TWICE AMPS CAME UP THAN PUMP TRIPPED HAVE TO WAIT 55 MINS TO TRY AGAIN											
	3:45PM	GOT DRYING AGENT GOING INTO HOPPER BUT VERY SLOW											
	4:00PM	THOMPSON HERE TO SET UP TO DESLAG BOILER											
4:20PM	R-1 FD FANS OFF GAS IN 107 MAINT PUTTING SKILLITS IN BURNER DECK WE ARE PULLING PLATES ON NORTH SIDE OF BOILER												
4:25PM	H-1 A RECYCLE PUMP BACK ON												
NOTE	PULLED AND RODDED ON R-1 WET BOTTOM GOT SOME OUT PULLING FLYASH HOPPERS WISLL HAVE TO GO BACK TO H-1 BEFORE FINISHED												
5:14PM	H-1 CEM HOURLY DATA BASE NOT COLLECTING ALARM IN N STIFF COMING IN FOR SAME												
6:07PM	J GLASSCO CALLED TAKING P.D. 6-12-14												
6:15PM	TOMPSON HAVE TO BRING ANOTHER TRUCK OUT OF OWENSBORO ELECTRIC SYSTEM DEAD ON THIS ONE												
7:00PM	N STIFF LEAVING												
7:05PM	THOMPSON STARTING ON R1 DESLAG												
6/11/2014	8:00PM	MORRIS, DENTON, REYNOLDS, BAKER, EDWARDS, TATE										D SHIFT PAYNE	
		GATTON-F/L											
	UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
	R1		50	42									CTL
			UNIT OFF										18'
	H1	165	165	153	0.145	10.9	0.072	26	97.1	9.77	274	3.3	
	H2	162	165	142	0.165	10.7	0.037	21.7	97	7.66	265	4	CTL
	CT..	STAND BY		59									15'
		ALARMS:											
	R1												
	H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL											
	H2	EH RES LEVEL HI											
		SOOT BLOWERS TAGGED											
	R1												
	H1	27,29,30,31,33,34,42,43,44											
	H2	37,41,46											
		FUEL OIL											
	C.H.	HMPL	NORTH	SOUTH									
	LEVELS	6' 2"	13' 8 1/2"	13' 6 7/8"	6 1/2"								
						SILO LVL	BOOTH SYSTEM						
						11FT	IN						
6/11/2014	8:00PM	SAFETY BRIEFING											
	9:45PM	THOMPSON HAD HOSE BLOW APART. WORKING TO GET IT FIXED											
	10:00PM	ALLEN YOUNG HERE TO WORK ON H1 DRUM TRANSMITTER											
	10:15PM	THOMPSON WORKING AGAIN ON BURNERS											
	10:20PM	H1 DRUM TRANSMITTER ISOLATION VALVES WILL NOT ISOLATE. GETTING MAINT TO WORK ON SAME											
	11:40PM	J JACKSON AND J.TAUL LEAVING											
	11:45PM	R1 BURNERS DONE, MOVING TO KNEES, BRIDGED ON WEST SIDE											
	NOTE:	WAITING FOR H1 EAST SIDE DRUM TRANSMITTER TO BLEED OFF											
6/12/2014	12:30AM	SEVERAL ALARMS CAME IN ON H2, MILLS, PA FANS, COOLING WATER PUMPS, SUPPORT BEARINGS, THEN CLEARED. HAD ALLEN YOUNG LOOK AT IT. ALL ON SAME											
		CARD. DOES NOT SEE ANYTHING WRONG. OK											
	12:31AM	VAC 3 ON FRONT STANDARD MANIFOLD DEVIATION CAME INTO ALARM. READING 25.9, 1 & 2 READING 27.3, INHIBITED AND TAKE OUT OF SCAN, STILL ALARMING, PUT BACK IN											
	12:45AM	H2 PARTICULATE MONITOR NOT WORKING. ALLEN YOUNG WORKING ON SAME											
	1:00AM	HOTWELL CHECK ON H1. 1 3/4 " IN ONE HOUR											
	1:30AM	THOMPSON STILL WORKING ON WEST SIDE AT KNEES. BRIDGED. COMING OUT SLOWLY											
	2:15AM	HMPL ELEVATOR NOT WORKING. CALLING MURPHY											
	2:25AM	R1 SET FOR HYDRO											
	2:30AM	WEST SIDE OF R1 BOILER AT KNEES STILL BRIDGED. GOING TO MOVE THOMPSON DOWN TO WETBOTTOM TO START ON IT. WILL GO BACK TO IT											
	2:35AM	PRESSURE ON EAST SIDE OF H1 BOILER TRANSMITTER WILL NOT BLEED OFF ENOUGH TO TAKE LINE OFF. GOING TO LEAVE EAST SIDE VALVED OUT FOR NOW											
	3:30AM	MURPHY ELEVATOR HERE											
	4:30AM	WETBOTTOM 90% CLEAN. MOVING THOMPSON BACK UP TO KNEES											
	7:30AM	KNEES CLEAN ON R-1											
	7:30AM	H-1 OPACITY EXCESS EMISSION (ACA PARTICULATE TEST) PRECIPIS DETUNED											

5/12/2014	8:00AM	FELTY, CECIL, EMBRY, BLAIR, HILLIARD, DUVALL, JAMES										A SHIFT TOW			
		LEE, KURZ, CALHOUN, JONES, KENNEDY, JOHNSON													
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	UNIT OFF	50	42									CTL 18'	
		H1	165	165	153	0.128	10.7	0.071	74.2	97.4	34.28	280	3.1		
		H2	152	155	142	0.143	10.3	0.067	16.7	97.5	8.06	211	3.5	CTL 15.1'	
		CT..	OFF STANDBY		57										
		ALARMS:													
		R1													
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E H. START REQUIRED/DRUM TRANS/ C.T. LEVEL/A & B PA FAN MOTOR/B BFP AUX OIL												
		H2	EH RES LEVEL HI GEN. MAIN STEPUP												
		SOOT BLOWERS TAGGED										GAUGE GLASSES	PWTL / 26'	DRYING AGENT	
		R1	22R											R1-0%	
		H1	27, 29, 30, 31, 33, 34, 42, 43, 44											H1-0%	
		H2	37, 41, 46											H2-0%	
		FUEL OIL C.H. HMPL NORTH SOUTH										SILO LVL	BOOTHE SYSTEM		
		LEVELS	11' 6 1/2"	13' 8 1/2"	13' 11 5/8"	6 1/2"					13.4'		BSI		
	8:00AM	SAFETY BRIEFING													
	8:40AM	A AIR DRYER IN B OUT NO LOST OF AIR													
	9:00AM	R-1 WET BOTTOM CLEAN TAGGING SAME													
	9:00AM	THOMPSON RIGGING UP FOR ECONS													
	9:00AM	R-1 COND SYSTEM OUT HOTWELL DRAINING													
	10:30AM	R-1 BFP ON TO FIND LEAK													
	NOTE	GETTING FUEL OIL TRUCKS													
	10:40AM	R-1 BFP OFF FOUND LEAK													
	NOTE	R-1 ECONS CLEAN													
	1:45PM	BACKWASHING R-1 COND 6 HOURS													
	2:55PM	PUMPING UP R-1 BOILER FOR HYDRO													
	3:00PM	R-1 EH UNIT TAGGED AND DRAINED DOWN TO CHANGE FILTERS													
	3:30PM	H-1 ACA PARTICULATE COMPLETE PRECIPIS SET BACK UP													
	3:30PM	RIGGING UP TO R-1 PENT HOUSE													
	3:48PM	D MORRIS CALLED IN SICK													
	4:15PM	R-1 AT 1000 LBS PRESSURE													
	NOTE	H-1 EAST GRINDER GEAR BOX BAD MAINT CHANGING SAME													
	4:22PM	RUNNING LIST FOR AUX FOR TONIGHT C GRIFFIN COMING IN													
	5:00PM	LOST H-1 B-2 COAL FEEDER BUNKER EMPTY SHOWED FULL AT 4:18 PM													
	5:25PM	STARTING ON R-1 WET SEAL													
	6:00PM	REPUMPING R-1 BOILER 6:04 FEED PUMP OFF AT 1000 LBS													
	6:11PM	H-1 FLYASH BACK IN													
	NOTE	RUNNING 10% DRYING AGENT TO H-1 THIS RUN DUE TO ALL THE FINES GOING INTO #4 BUNKER													
	6:20PM	DRAINING R-1 BOILER													
	6:35PM	KW'S SWINGING ON H1 B MILL WILDLY													
	6:40PM	OIL IN H1 BOILER. UNIT UNSTABLE													
	6:50PM	H1 TRIPPED A START UP 4160 BUS DID NOT AUTO TIE, LOST EVERYTHING ON A BUS													
	7:00PM	WET SEAL COMPLETED. THOMPSON VACUUMING OUT PIT AND TRENCH FOR MAINT TO MAKE REPAIRS TO PIPING													
	7:15PM	H1 PRECIPIS OUT													
	7:26PM	OIL BACK IN H1													
	7:33PM	H1 TRIP ON HIGH DRUM LEVEL													
	7:34PM	H1 TURBINE RESET AND ROLLING													
6/12/2014	8:00PM	DENTON, REYNOLDS, BAKER, EDWARDS, TATE, JOHNSON, JAMES, CECIL										D SHIFT PAYNE			
		GATTON-FIL., MORRIS -SICK													
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	UNIT OFF	50	42									CTL 18'	
		H1	165												
		H2	162	165	142	0.185	10.9	0.067	23.7	97	9.66	265	4.2	CTL 15'	
		CT..	STAND BY		59										
		ALARMS:													
		R1													
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E H. START REQUIRED/DRUM TRANS/ C.T. LEVEL												
		H2	EH RES LEVEL HI												
		SOOT BLOWERS TAGGED										GAUGE GLASSES	PWTL	DRYING AGENT	
		R1									27'			R1- 0%	
		H1	27, 29, 30, 31, 33, 34, 42, 43, 44											H1- 0%	
		H2	37, 41, 46											H2- 0%	
		FUEL OIL C.H. HMPL NORTH SOUTH										SILO LVL	BOOTH SYSTEM		
		LEVELS	11' 6 1/2"	13' 8 1/2"	13' 11 5/8"	6 1/2"					9FT		IN		
6/12/2014	8:00PM	SAFETY BRIEFING													
	8:10PM	TRIPPED ON EX-HAUST HOOD TEMPERATURE													
	8:11PM	PURGING H1 BOILER													
	8:18PM	FUEL OIL IN ON H1 BOILER													
	8:26PM	RESET H1 TURBINE													
	8:37PM	TRIPPED H1 TURBINE B/C RIGHT INTERCEPT VALVE WILL NOT COME OPEN													
	8:38PM	H1 BOILER PURGED													
	8:42PM	FUEL OIL IN ON H1 BOILER													
	8:46PM	RESET H1 TURBINE													
	9:00PM	NATHAN STIFF													

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# Forced Outage Report

6/14/2014	8:00AM	CONN, CLARK, BREEDEN, HIGGINS, CUTSHAW, BLANKS, YOUNG										B SHIFT PENDLEY			
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	OFF TUBE LEAK											CTL 18'	
		H1	153	165	153	0.142	10.9	0.064	20.4	97.3	4.95	222	2.6		
		H2	141	165	152	0.135	10.6	0.071	9.8	97.4	5.17	208	3.1	CTL 15.4'	
		CT..	STAND BY		59										
		ALARMS:													
		R1													
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL												
		H2	EH RES LEVEL HI												
		SOOT BLOWERS TAGGED													
		R1 22R													
		H1	27,29,30,31,33,34,42,43,44												
		H2	37,41,46												
		FUEL OIL C.H. HMPL NORTH SOUTH										SILO LVL		BOOTH SYSTEM	
		LEVELS	11' 1/2"	12' 8 1/4"	14' 9"	6 1/2"					9'		IN		
6/14/2014	8:00AM	SAFETY BRIEFING													
	9:30AM	PUTTING FLUID BACK IN R-1 E.H. UNIT													
	10:05AM	CALLED J. HILLYARD, B. BLAIR, B. DUVALL & R. JAMES L/M													
	10:18AM	B. DUVALL RETURNED CALL - WILL BE IN AT 4PM TOMORROW													
	10:30AM	MAKING CAKE ON R-1 E.H. UNIT													
	11:20AM	J. DAVIS & CLEANING CREW LEAVING													
	NOTE	TAGGED OUT R-1 CLINKER GRINDER TO REPAIR SEAL													
	NOTE	CHECKED R-1 WETBOTTOM FLUSHING LINES - ALL OK													
	NOTE	PUT R-1 CONDENSATE SYSTEM IN SERVICE - ADJUSTED HOTWELL LEVEL - MAKE UP & DUMP REGULATORS WORKING													
	NOTE	PICKED UP RELEASED PERMITS													
	3:00PM	TAGGED OUT R-1 EAST DRUM GAUGE GLASS TO REPLACE - NONE IN STOCK - B. BOARMAN GETTING ONE FROM COLEMAN													
	NOTE	ELECTRICIAN WORKING ON R-1 'A' BFP - WONT START													
	7:05PM	CALLED C. PAYNE TO RELEASE HIM OFF R1 FUEL OIL OKED/ T.TOW L/M													
6/14/2014	8:00PM	EDMONDS, JACKSON, GRIFFIN, BOWLEY, HOGAN, ALEXANDER, WADLINGTON, KURZ										C SHIFT CARTER			
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	OUTAGE	50	42									CTL/17.5'	
		H1	143	165	153	0.125	10.9	0.064	14.1	97.6	5.17	191/C	2.3		
		H2	143	165	152	0.122	11.1	0.07	7.6	97.6	2.24	204/C	3	CTL/15.2'	
		CT..		65	59	ON STANDBY									
		ALARMS:													
		R1													
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT												
		H2	EH RES LEVEL HI												
		SOOT BLOWERS TAGGED													
		R1	16, 19, 28, 29, 30, 31/22R												
		H1	1- 24, 42, 44 / 27, 29, 30, 31, 33, 34, 43												
		H2	9, 41, 46/37												
		FUEL OIL C.H. HMPL NORTH SOUTH										SILO LVL		BOOTH SYSTEM	
		LEVELS	11' 1/2"	12' 8 1/4"	14' 9"	6 1/2"					15'		IN /A -SIDE ONLY		
	7:09PM	CALLED D.PENDLEY RELEASE HIM OFF PERMIT #459835													
	7:50pm	T.TOW CALLED GIVE PERMISSION TO RELEASE HIM OFF R1 FUEL OIL PERMIT													
	8:00PM	SAFETY BRIEFING													
	NOTE	VALVING OUT R1 SLUICE WATER VALVE IN BASEMENT FOR MAINT TO REPAIR LEAK ON WETBOTTOM DISCHARGE LINE BEFORE HYDROJECTOR													
	10:12PM	CALLED J.HILLYARD FOR R1 START-UP L/M													
	10:15PM	R1 BOILER SET TO FIRE AND @ FIRING LEVEL													
	10:50PM	CALLED J.ARNOLD RELEASE HIM OFF R1-A FD FAN #459809 & R1-B FD FAN #459827 PERMITS FOR AIR TEST / OKED													
6/15/2014	12:19AM	H2 OUT OF ADS FOR TV-GV TEST													
	12:30AM	R1 FD FANS ON FOR AIR TEST													
	12:46AM	H2 BACK IN ADS TV-GV TEST COMPLETE													
	1:19AM	R1 AIR TEST COMPLETE													
	NOTE	CLEANED R1 FD FANS & PEDASTALS													
	NOTE	PICKING UP PERMITS													
	3:50am	WEEKLY SAFETY MEETING													
	NOTE	H1-B4 OIL GUN HAS BAD RETRACT LIMIT SWITCH WO#6131742													
	6:30AM	J.ARNOLD HERE													
6/15/2014	8:00AM	CONN, CLARK, BREEDEN, HIGGINS, CUTSHAW, BLANKS, YOUNG										B SHIFT PENDLEY			
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	OFF TUBE LEAK											CTL 18'	
		H1	162	165	153	0.131	11.1	0.077	19	97.4	7.07	232	3.25		
		H2	151	165	152	0.153	11.3	0.075	19	97.1	12.65	217	3.8	CTL 15.5	
		CT..	STAND BY		59										
		ALARMS:													
		R1													
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL												
		H2	EH RES LEVEL HI												
		SOOT BLOWERS TAGGED													
		R1 22R													
		H1	27,29,30,31,33,34,42,43,44												
		H2	37,41,46												
		FUEL OIL C.H. HMPL NORTH SOUTH										SILO LVL		BOOTH SYSTEM	
		LEVELS	10' 11 1/2"	12' 8 1/4"	14' 9"	6 1/2"					9'		IN		

# Forced Outage Report

6/15/2014	8:00AM	SAFETY BRIEFING												
	8:10AM	GOT IN TOUCH WITH JEREMY OSBORNE WITH THOMPSON TO SIGN HIM OFF OF R-1 FUEL OIL PERMIT												
	8:15AM	R. DENTON CALLED - REQUESTED VACATION DAY TOMORROW (6-16-14) 8A -8P - I OK'D												
	9:00AM	N. STIFF HERE												
	NOTE	WORKING ON H-2 PARTICULATE MONITOR												
	10:43AM	BREC DISPATCH CALLED - REQUESTED WE PUT HMPL SCRUBBER ON BACK UP FEED - HE HAS A LOW GAS PRESSURE ALARM ON 01182 OCB. TOOK H-1 'B' & H-2 'B' RECYCLE PUMPS OFF - CLOSED IN 21-1 EMERGENCY FEED - 11-1 NORMAL FEED AUTOMATICALLY OPENED - DISPATCH OPENED 01182 OCB												
	10:45AM	INST PUT R-1 SCANNERS IN												
	11:30AM	CLEANED R-1 OIL GUNS												
	12:04PM	BREC DISPATCH CLOSED 01182 OCB - WE CLOSED 11-1 SCRUBBER NORMAL FEED - 21-1 EMERGENCY FEED AUTOMATICALLY OPENED UP.												
	12:10PM	H-1 'B' & H-2 'B' RECYCLE PUMPS BACK ON												
	NOTE	MAINT CHANGED OIL IN R-1 'A' F.D. FAN & 'A' & 'B' P. A. FANS												
	NOTE	MAINT FIXED LEAK ON BOOTHE SYSTEM EQUALIZING LINE												
	2:30PM	R-1 EAST DRUM GAUGE GLASS IN SERVICE												
	2:14PM	H-2 'A' RECYCLE PUMP TRIPPED - REASON UNKNOWN - ELECTRICIAN CHECKING												
	NOTE	ELECTRICIAN CHANGED H-2 'A' MASS FLOW CONVEYOR SPEED SWITCH												
	3:00PM	J. JACKSON & V. BRADDOCK LEAVING												
	3:00PM	B. BLAIR HERE												
	4:00PM	B. DUVALL HERE												
	4:00PM	A. YOUNG HERE												
	4:00PM	BOOTHE SYSTEM OUT OF SERVICE												
	4:00PM	STARTED PUTTING EQUIPMENT ON R-1 FOR START UP												
	NOTE	2 GAS BURNER SHROUDS WOULD NOT MOVE - HAD TO HAND CRANK - AND PLC WATCHDOG SYSTEM WAS TRIPPED - COULD NOT GET PURGE												
	4:44PM	H-2 'A' RECYCLE PUMP BACK ON												
	5:00PM	FIRE IN R-1 BOILER - NOTIFIED H/L - HAD 2 BAD IGNITOR RODS AND 2 BAD RETRACT SWITCHES												
	NOTE	ELECTRICIAN WIRED UP R-1 SOOTBLOWERS & PUT NEW SOLENOID ON WEST BOOTHE SYSTEM EQUALIZING VALVE												
7:00PM	J. ARNOLD LEAVING													
6/15/2014	8:00PM	EDMONDS,JACKSON ,GRIFFIN,BOWLEY, HOGAN ,ALEXANDER,WADLINGTON,KURZ											C SHIFT CARTER	
		BLAIR,DUVALL												
	UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
	R1		50	42	238 DRUM PSI							CTL/17.8'		
	H1	161	165	153	0.122	10.8	0.071	26.7	97.5	7.34	239/C	3.3		
	H2	161	165	152	0.168	11.5	0.069	20.3	96.9	12.66	269/C	4.1		
	CT..	65	57	ON STANDBY										
	ALARMS:													
	R1													
	H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT												
	H2	EH RES LEVEL HI												
	SOOT BLOWERS TAGGED													
	R1	16,,19,28,29,30,31/22R						GAUGE GLASSES		PWTL 26.1'		DRYING AGENT		
	H1	1- 24 ,42,44 / 27,29,30,31,33,34,43						OK				R1-0%		
	H2	9,41,46/37										H2-0%		
	FUEL OIL													
	C.H.	HMPL	NORTH	SOUTH					SILO LVL	BOOTHE SYSTEM				
	LEVELS	10' 11 1/2"	12' 8 1/4"	14' 9"	6 1/2"					12'	OUT			
	NOTE	FIRING R1 BOILER												
	8:00PM	SAFETY BRIEFING												
	8:35PM	R1 PULLED B1 OIL GUN / BLOWING ELECTROMATIC												
	9:18pm	R1 SEALING TURBINE & PULLING VACUM												
	10:15PM	R1 TURBINE 25.7" VACUM /E.H. PSI 1700 CANNOT GET STOP VALVE TO OPEN TO WARM STEAM CHEST CALLED D. PRATHER SAID TO HAVE A.YOUNG CHECK VOLTAGE AT SOLENOID NOT GETTING VOLTAGE AT STOP VALVE SOLENOID. GOING TO CHECK VOLTAGE AT RELAYS IN PINK ROOM. ALL RELAYS NOT MARKED A.YOUNG NOT SURE WHICH ONE. STILL TROUBLESHOOTING .												
	11:30PM	D.PRATHER COMING OUT												
	11:30PM	J.FRANCIS NOTIFIED ABOUT R1 TURBINE												
6/16/2014	12:19am	GOT R1 TURBINE STOP VALVE OPEN / WARMING STEAM CHEST												
	12:57AM	ROLLING R1 TURBINE												
	1:05AM	R1 TURNIE @ 1000 RPM												
	1:15AM	ROLLING R1 TURBINE TO 3600 RPM												
	1:28AM	R1 TURBIINE @ 3600 RPM												
	1:42AM	R1 GENERATOR TIED ON LINE												
	1:43AM	R1 PRECIPS IN												
	1:44AM	R1-B MILL ON												
	3:00AM	B.BLAIR & A. YOUNG GOING HOME / N.STIFF HERE												
	3:16am	R1-A MILL ON												
	3:28AM	R1 SILICA .816 GOOD FOR 1000 DRUM												
	3:42AM	R1 AUX TRANSFERRED												
	4:00AM	B.DUVALL												
	4:42am	R1 FUEL OUT OF BOILER												
	5:45AM	R1 SILICA 1.496 GOOD FOR 1000 DRUM												

# Forced Outage Report

## Boiler Tube Leak Record

Plant: Reid Station

Unit: 1

### Type of Leak:

Pin Hole ✓ Thick Lip Failure \_\_\_\_\_ Thin Lip Failure \_\_\_\_\_

Tube Wall Thinning ✓

Orientation of Rupture: Longitudinal ✓ Circumferential \_\_\_\_\_

### Probable Cause:

Stress \_\_\_\_ Overheat \_\_\_\_ Erosion \_\_\_\_ Internal Corrosion \_\_\_\_

External Corrosion ✓ Weld Failure \_\_\_\_ (Shop \_\_\_\_ Field \_\_\_\_)

Internal Obstruction to Flow \_\_\_\_ Soot blower Erosion \_\_\_\_

Other \_\_\_\_\_

### Type of Repair:

Dutchman \_\_\_\_ Pad Weld ✓ Plug Tube \_\_\_\_ Short Circuit \_\_\_\_ Other  
\_\_\_\_\_

### Description of Repair:

Tube leaks in the wet bottom area all at elevation 440'. One leak was located on the west water wall 4<sup>th</sup> tube from the north and the other was located on the north water wall 4<sup>th</sup> tube from the west. The leak on the west wall was caused by external corrosion, this leak sprayed on to the north wall causing that leak, both repaired via BMR's.

During boiler hydro additional tube leaks were identified: 1<sup>st</sup> tube on the 2<sup>nd</sup> panel from the east wall in the Hi Temp Superheat area of the boiler at elevation 519'. First tube in the economizer at elevation 504', north-west side on a tube clip. Wetbottom north knee slope at elevation 440', 20<sup>th</sup> tube from the east wall a weeper was discovered. In addition, it was discovered the leak on the fourth knee tube from the west wall on the north side, the leak required more BMR due to tube wall thinning. All leaks were repaired via BMR's

# Forced Outage Report

## Exact Location of Leaks:

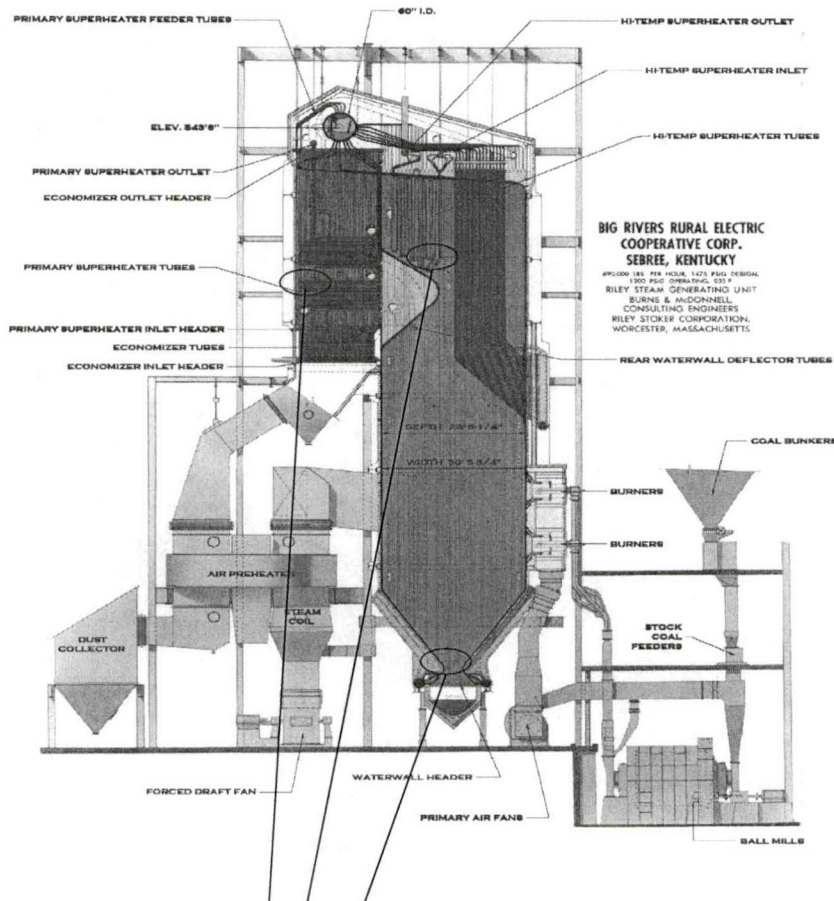
Reid Unit 1

2014

### (5) TUBES INVOLVED

Date and Time Unit Off 6/11/14 @ 1108

Date and Time Unit On 6/13/14 @ 2040



Tube leaks in the wet bottom area all at elevation 440'. One leak was located on the west water wall 4<sup>th</sup> tube from the north and the other was located on the north water wall 4<sup>th</sup> tube from the west. The leak on the west wall was caused by external corrosion, this leak sprayed on to the north wall causing that leak, both repaired via BMR's.

After boiler hydro additional tube leaks were identified: 1<sup>st</sup> tube on the 2<sup>nd</sup> panel from the east wall in the Hi Temp Superheat area of the boiler at elevation 519' : 1<sup>st</sup> tube in the economizer at elevation 504', north-west side on a tube clip : Wet bottom north knee tube at elevation 440', 20<sup>th</sup> tube from the east wall a weeper was discovered : Also it was discovered the leak on the 4<sup>th</sup> knee tube on the north side from the west wall, the leak required more BMR due to tube wall thinning. All leaks were repaired via BMR's

# Forced Outage Report

## Estimated Outage Cost

- Vacuuming Economizer Hoppers, Wash seal trough, Vacuum Boiler Penthouse, Boiler De-Slag

Cleaning Total        \$20,238

- Titan – tube leak repairs, gas leak repairs and misc. repairs

Labor                    \$45,980

Material                \$4,165

Titan Total             \$50,145

Grand Total            \$70,383

# Forced Outage Report

## Lost Sales Opportunity Report

FORCED/MAINTENANCE OUTAGE COST ANALYSIS					
MISO DART Revenue and LOST OPPORTUNITY					
Unit		Reid 1 - R1-14-08		Production Cost	
Date & Time Off Line		6/11/14 11:08 & 6/13/14 20:40		MW	\$/MW
Date & Time On Line		6/13/14 20:40 & 6/16/14 1:42		25	\$ 30.78
Outage Duration		57 hr. 22 min. & 53 hr. 2 min.		40	\$ 29.69
Outage Code		UO1 & MO		50	\$ 29.27
Outage Reason		Repair waterwall tube leaks			
Date	DA LMP Average	RT LMP Average	DART P&L	Lost Opportunity	
6/11/14 (HE 12-24)	\$ 36.87	\$ 35.50	\$ (3,145)	\$ -	
6/12/14 (HE 1-24)	\$ 31.88	\$ 26.64	\$ 3,071	\$ -	
6/13/14 (HE 1-24)	\$ 27.97	\$ 24.34	\$ -	\$ -	
6/14/14 (HE 1-24)	\$ 24.87	\$ 16.03	\$ -	\$ -	
6/15/14 (HE 1-24)	\$ 21.96	\$ 18.25	\$ -	\$ -	
6/16/14 (HE 1-13)	\$ 30.08	\$ 46.89	\$ 390	\$ -	
Total			\$ 316	\$ -	
Start Up Fuel Cost			Total Forced Outage Cost		
S/U Fuel Consumed	7,511		DART P&L	\$ 316	
S/U Fuel Price	\$ 3.20		Lost Opportunity	\$ -	
S/U Fuel Cost	\$ (24,051)		S/U Fuel Cost	\$ (24,051)	
			Total	\$ (23,735)	
NOTES:					
All negative values are money out of pocket.					
DART Revenue is calculated from differences between the DA award and RT events					
Lost Opportunity is the lost margins if the unit had stayed running					

# Forced Outage Report

**To:** Jim Garrett

**From:** Billy Boarman

**Date:** 7-Jul-2014

**Plant:** Reid Station

**Unit:** 1

**GADS Class:** UO3/UO0

## Duration

Trip Time: 30-Jun-2014 15:37

Placed on 12-Hour Standby: 2-Jul-2014 23:00

Offline UO3: 26:06

Offline UO0: 28:57

Total Time Offline: 55:03

## Outage Description

Reid Station Unit 1 was removed from service on Monday, 30-Jun-2014 at 15:37 due to a possible fire in 'B1' Coal Pipe. The coal pipe was cleared and a fire was established for start-up on Tuesday, 1-Jul-2014 at 10:03. The outage classification was changed to a starting failure (UO0) at 18:03 when the unit did not return to service within the allotted timeframe due to trouble with the turning gear. The unit was placed on 12-hr reserve stand-by on Wednesday, 2-Jul-2014 at 23:00.

## Root Cause

"B" Mill became unstable and had to be removed from service. When it was placed back into service apparently hot coal got stuck in the horizontal run on 'B1' coal pipe allowing the pipe to get excessively hot.

# Forced Outage Report

## Failure History

On 28-Jul-2012 R1 "B" mill was tripped due to a fire in the outlet. The unit then tripped due to loss of flame.

## Corrective Action

Removed both "B" Mill burner spinners for inspection and both were badly burned up. Maintenance replaced both "B" burner spinners. Maintenance opened the doors on "B" Mill, PA duct, classifier, reject chute door, riffle box access doors under the coal valves, mill inlet and outlet doors, and the access door to the hot and cold air dampers for inspection. Found the hot air damper was only closing about 40% due to binding on the drive side. Disassembled the damper and cleaned out the bushing assembly, lubricated the shaft and bushings, re-connected and test stroked the damper. The damper is now opening and closing 100%. Cycled it two times and it worked the same both times. Cut a window in the "B1" coal pipe on second floor and found burning coal in the bottom of the pipe. Operations washed out the coal pipe from the burner end and got the pipe clean. Found some very hot coal in the outlet end of the mill. Operations cleaned out and washed the classifier and the outlet of end the mill. All smoking embers and hot coal was removed.

## Other Work Completed While Unit Was Offline

- Replaced "A1" burner spinner
- Replaced "B" Coal feeder belt
- Performed boiler hydro, no leaks were discovered
- Replaced Superheat Spray Regulator control valve
- Calibrated Feed water control valve

## Forced Outage Report

- Found the turbine turning gear drive was malfunctioning and not engaging properly. The turning gear assembly was removed from the front standard and transported to the Central Machine Shop for disassembly and inspection. The inner flange had eight 1/4"-20 bolts broken off and the pieces were jamming up in the bottom of the unit. All burrs were removed and the bolts were replaced. The unit was reassembled with new fasteners and thread-lock. The unit was transported back to the plant, re-installed, and tested. Test run was successful.

# Forced Outage Report

## Operators Event Log

6/30/2014	8:00AM	FELTY, CECIL, EMBRY, BLAIR, HILLYARD, DUVAL, JAMES, LEE, JONES VAC ONAN GOODMAN										A SHIFT	TOW	
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
		R1	19	48	42	4.463	6.3	0.502	3.5				2.44	
													CTL 18'	
		H1	161	165	153	0.388	10.6	0.058	28	97	9.31	237	3.5	
		H2	159	165	152	1.174	10.8	0.062	45.2	79.9	10.12	C	3.9	
												C	CTL 15.2'	
		CT..	ON STANDBY		56									
		ALARMS:												
		R1	VOLTAGE REG											
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E. H. START REQUIRED/DRUM TRANS/ C.T. LEVEL/A & B PA FAN MOTOR/B BFP AUX OIL											
		H2	EH RES LEVEL HI, GEN. MAIN STEPUP											
		SOOT BLOWERS TAGGED							GAUGE GLASSES		PWTL / 26'			
		R1	22L, 22R							OK		DRYING AGENT		
		H1	27, 30, 31, 33, 43, 44									R1-0%		
		H2	37, 41, 42									H1 0%		
												H2-0%		
		FUEL OIL				C.H.	HMPL	NORTH	SOUTH	SILO LVL		BOOTHE SYSTEM		
		LEVELS				6' 2 3/4"	10' 2"	14' 9 5/8"	6 1/2"	11.8'		BSI		
	8:00AM	SAFETY BRIEFING												
	8:00AM	GETTING FUEL OIL TRUCKS												
	8:00AM	R-1 B MILL OFF												
	8:10AM	R-1 B MILL LIFT PUMP PRESSURE 320 HAS TO BE 350 TO START MILL MAINT TRYING TO BRING PRESSURE UP												
	8:15AM	MISNT WORKING ON H-2 B MILL PINION												
	8:55AM	MAINT COULD NOT GET ANY MORE PRESSURE OUT OF R-1 B MILL LIFT LO SIDE DROPPING PERMISSIVE DOWN TO BELOW 320												
	NOTE	R-1 B MILL COAL PIPE STILL HOT GOING TO WAIT TILL COOLS DOWN TO PUT MILL ON LIFT PUMP PRESSURE LOWERED SO MILL WILL START												
	2:40PM	H-2 EH UNIT OIL TEMP ALARMING PUT TWO MORE FANS ON												
	2:50PM	RAN CALL OUT LIST FOR AUX DAYS TOMORROW												
	3:30PM	RICKY DENTON CALLED IN SICK FOR TONIGHT												
	3:26PM	OIL IN R-1 BOILER SHUTTING UNIT DOWN												
	3:57PM	TRIPPED R-1 TURBINE OIL OUT OF BOILER												
	3:02PM	R-1 PRECIPS OUT												
	3:17PM	R-1 FD FANS OFF BOTTLED BOILER												
	4:40PM	R-1 TURBINE WONT GO ON GEAR CALLED INST AND ELECT ELECT TOKD TO TRY BYPASS SWITCH WHICH AUX ALREADY TRIED AGAIN												
		NO HELP CALLED ELECT BACK WILL BE IN												
	5:15PM	TRIED PUTTING DC OIL PUMP ON ON R-1 NO HELP TRIED PUTTING OTHER AC OIL PUMP ON NO HELP TRIED A TWO INCH STRAP BROKE STRAP												
		TRING ANOTHER STRAP												
	8:00PM	MORRIS, DENTON SICK, REYNOLDS, GATTON, BAKER-, EDWARDS, TATE, CALHOUN,										D SHIFT	PAYNE, STERLING	
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
		R1	OFF											
		H1	160	165	153	0.66	10.8	0.055	18.8	88	7.61	226	3.8	
		H2	160	165	152	1.394	10.9	0.77	31	73	16.91	236	4.4	
		CT..	ON STANDBY											
		ALARMS:												
		R1	1B MILL GEARBOX OIL TEMP HIGH											
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E. H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT											
		H2	EH RES LEVEL HI											
		SOOT BLOWERS TAGGED							GAUGE GLASSES		DRYING AGENT			
		R1	22L							OK		R1-0%		
		H1	27									H1-0%		
		H2	41, 46/37									H2-0%		
		FUEL OIL				C.H.	HMPL	NORTH	SOUTH	SILO LVL		BOOTHE SYSTEM		
		LEVELS				6' 1/2"	10'	14' 9 5/8"	6 1/2"	13'		IN		
6/30/2014	8:00PM	SAFETY BRIEFING												
	8:15PM	R1 B COAL FEEDER TAGGED TO CHANGE BELT												
	9:20PM	CALLED NATHAN STIFF TO COME IN AT 3:00AM TO CALIBRATE FEEDERS HE WILL BE IN.												
	9:26PM	A YOUNG CALLED BACK AND LEFT MESSAGE ON MACHINE. NOT NEEDED AT THIS TIME												
	11:15PM	R1 TURBINE ON GEAR												
	11:30PM	WASHED OUT B2 COAL PIPE FROM BURNER. HAVE SPINNERS PULLED WILL BE REPLACED.												
	11:30PM	TITAN CUT WINDOW OUT OF B2 COAL PIPE ABOVE COAL VALVE WASHED OUT												
7/1/2014	12:30AM	TITAN TAKING PRIMARY AIR DUCT DOOR OFF TO B MILL.												
	2:00AM	R1 B MILL HAS STOPPED SMOKING MAINT. CHANGING OUT B MILL FEEDER BELT.												
	2:30AM	MAINT. HAS R1 B MILL HOT AND COLD AIR DAMPERS FREED UP AND WORKING PROPERLY.												
	3:00AM	WORKING ON CLEANING OUT R1 WETBOTTOM												
	3:00AM	IDEPT HERE TO CALIBRATE R1 B MILL FEEDER.												
	4:00AM	OVER RODE R1 B1 COAL PIPE TO LET WATER DRAIN OUT THAT WE PUT IN COAL PIPE												
	4:30AM	CALLED BILL STERLING FROM THOMPSON TO BRING CREW OUT TO CLEAN R1 WETBOTTOM. NOT HAVING ANY LUCK AFTER RODDING BOTH ENDS WITH FORK TRUCK AND SHOTGUN IN BOTH ENDS. EXPECTED ARRIVAL TIME OF 7:15AM												

# Forced Outage Report

7/1/2014	8:00AM	FELTY, CECIL, EMBRY, HILLYARD, DUVAL, JAMES, LEE, JONES VAC ONAN GOODMAN										A SHIFT		TOW		
		BREEDEN														
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE			
		R1		48	42									CTL 18'		
		H1	159	165	153	0.577	10.7	0.055	30.7	89.1	7.97	250	3.6			
		H2	161	165	152	1.009	11	0.078	22.5	81	10.15	216	4	CTL 15.5'		
		CT..	ON STANDBY		56											
		ALARMS:														
		R1	VOLTAGE REG													
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL/A & B PA FAN MOTOR/B BFP AUX OIL													
		H2	EH RES LEVEL HI, GEN. MAIN STEPUP													
		SOOT BLOWERS TAGGED							GAUGE GLASSES		PWTL / 27'		DRYING AGENT			
		R1	22L						OK					R1-0%		
		H1	30,31,33											H1 0%		
		H2	37,39,41,42											H2-0%		
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH					SILO LVL	BOOTHE SYSTEM				
		LEVELS	5'11 1/2"	9' 11 3/4	15'6 7/8"	6 1/2"					16.6'	BSO				
	8:00AM	SAFETY BRIEFING														
	8:00AM	DEBUSCK SETTING UP TO VACUUM MIDDLE BURNER DECK AREA														
	8:20AM	THOMPSON WORKING ON R-1 WET BOTTOM														
	8:25AM	RELEASING TAGGS R-1 PULLING SETTING UP SAME														
	9:00AM	R-1 WET BOTTOM FINISHED														
	9:10AM	H-2 SOOT BLOWING SYSTEM BACK IN														
	9:18AM	R-1 FD FANS ON														
	9:33AM	PURGE COMPLETE														
	9:50AM	REPURGE DID NOT OIL FIRE IN BOILER														
	10:03AM	FIRES IN R-1 BOILER														
	10:14AM	LOST FIRE IN R-1 BOILER														
	10:20AM	FIRES IN R-1 BOILER														
	11:30AM	OIL OUT OF R-1 BOILER														
	11:40AM	R-1 FD FANS OFF														
	12:00PM	LOST BOTH AIR COMP ON HMPL RENTAL AUTO STARTED LOST WATER TO SLUICE PUMPS STRAINER LEFT CLOSED														
		C ASH SLUICE PUMP SEALS LEAKING H-2 B AUX AIR COMP WATER PUMP SEAL LEAKING														
		NOTE	WHEN A AIR COMP TRIPPED OFF B WOULD NOT AUTO START (MAIN DRIVE MOTOR TURBINE FAULT TRIP) ELECT CHECKING SAME													
			HAD RUN OUT OF STARTS WILL HAVE TO WAIT TO CHECK OUT													
	12:45PM	DEBUSCK GOING HOME														
		NOTE	STOP BUTTON ON RENTAL AIR COMP LEAVE IN THE POSITION IT IS NOW AND IT WILL SHUT DOWN AUTO													
	1:35PM	C ASH SLUICE PUMP TAGGED														
	1:47PM	BACKWASHING 1 3 SIDE R-1 COND														
		NOTE	GREEN PUTIN A LOAD OF SBS SHOULD HELP WITH SCRUBBING BUT TOMORROW PUTTING IN A LOAD OF SULFUR WHICH IN THE BEGINNING WILL HURT SCRUBBING													
	3:45PM	SETTING R-1 BOILER FOR HYDRO														
		NOTE	B AIR COMP WILL RUN NOW AND IN AUTO (BAD BKR)													
	4:25PM	R-1 FD FANS ON TO COOL BOILER														
	5:15PM	C.H. CALLED BARGE UNLOADER NOT REPAIRED CALLED BAYLOR MAN COMING IN														
	5:45PM	RAN LIST FOR ELECT C ASH SLUICE PUMP SHUTTER BRACKET BROKE OFF NO LUCK R. PARKER OKED RUNNING A ASH SLUICE PUMP IN AN EMERGENCY														
	6:20PM	J GLASSCO CALLED BACK WILL BE IN														
		NOTE	NOTE CANT RUN A ASH SLUICE PART MISSING ON THE BKR													
	7:40PM	T.WEST HERE FOR GLASCO														
	8:00PM	MORRIS, DENTON VAC, REYNOLDS, GATTON, BAKER-, EDWARDS, TATE, CALHOUN,										D SHIFT		PAYNE, STERLING		
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE			
		R1	OFF													
		H1	160	165	153	0.378	10.8	0.055	24.8	92.8	7.9	235	3.8			
		H2	160	165	152	0.8	11.3	0.063	18.9	82.8	15.38	236	3.3			
		CT..			ON STANDBY											
		ALARMS:														
		R1														
		H1														
		H2	EH RES LEVEL HI B PA FAN MTR.HIGH TEMP													
		SOOT BLOWERS TAGGED							GAUGE GLASSES				DRYING AGENT			
		R1	22L						OK					R1-0%		
		H1	27											H1-0%		
		H2	41,46/37											H2-0%		
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH					SILO LVL	BOOTHE SYSTEM				
		LEVELS	11'2 1/2"	10'	14'9 5/8"	6 1/2"					18'	IN				

# Forced Outage Report

7/1/2014	8:00PM	SAFETY BRIEFING													
	8:05PM	WEEKLY SAFETY MEETING													
	9:30PM	HAVE DRYING AGENT STAGED AND FILLING HOPPER IF NEEDED.													
	11:00PM	SWAPPED OVER TO B AMMONIA TANK. A TANK OUT OF SERVICE.													
7/2/2014	1:15AM	ELECT HAS BREAKER CHANGED OUT IN C ASH SLUICE PUMP PUMP IS RUNNING.													
	2:00AM	R1 IS SET TO HYDRO													
	6:00AM	R-1 CONDENSER BACK TO NORMAL													
	7:18AM	R-1 F.D. FANS OFF													
7/2/2014	8:00AM	CONN, CLARK, BREEDEN, HIGGINS, CUTSHAW, BLANKS, YOUNG													
		GOODMAN HERE - PAYNE VACATION													
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	OFF											CTL 17'	
		H1	160	165	153	0.436	10.7	0.057	24.6	96%	9.27	223	3.4		
		H2	160	165	152	1.048	10.8	0.079	13.2	81%	15.4	192	3.5	CTL 14.7'	
		CT..	ON STANDBY		56										
		ALARMS:													
		R1	VOLTAGE REG												
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL/A & B PA FAN MOTOR/B BFP AUX OIL												
		H2	EH RES LEVEL HI, GEN. MAIN STEPUP												
		SOOT BLOWERS TAGGED							GAUGE GLASSES		PWTL / 26'		DRYING AGENT		
		R1	22L, 22R				OK						R1-0%		
		H1	27, 30, 31, 33, 43, 44										H1 0%		
		H2	37, 41, 42										H2-0%		
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH									
		LEVELS	11' 1/2"	9' 9 1/4"	15' 11 1/2"	6 3/4"									
									SILO LVL		12FT		BOOTHE SYSTEM		
													IN		
7/2/2014	8:00AM	SAFETY BRIEFING													
	8:00AM	R-1'B' BFP ON TO SQUEEZE BOILER													
	8:00AM	R-1 WETBOTTOM TAGGED OUT													
	8:03AM	R-1 BFP OFF - 1050 LBS													
	8:45AM	DRAINING R-1 BOILER TO FIRING LEVEL													
	9:30AM	R-1 BOILER SET TO FIRE													
	9:37AM	H-2 'A' GLAND EXHAUSTER TRIPPED - WILL NOT RESTART - PUT 'B' ON - ISSUED W/O													
	9:15AM	R-1 TURBINE OFF GEAR - TAGGED TURNING GEAR													
	9:45AM	LUBE OIL OFF OF R-1 TURBINE - TURNED 3 WAY VALVE 1/4 TURN COUNTER CLOCKWISE - HANDLE TO THE 3 O'CLOCK POSITION													
	10:11AM	R-1 F.D. FANS OFF													
	NOTE	DRYING AGENT AUGER IS WORKING - OVERLOADS WERE TRIPPED													
	2:30PM	MAINT RELEASED R-1 WETBOTTOM													
	3:00PM	PUT 'A' AIR DRYER IN SERVICE - DEW POINT UP TO 57 DEGREES ON 'B'													
	NOTE	MAINT INSTALLED A NEW SUPERHEAT REGULATOR ON R-1													
	4:00PM	L. BREEDEN LEAVING - 4 HRS VACATION													
	5:45PM	LUBE OIL BACK ON R-1 TURBINE - D.C. LUBE OIL PUMP WILL NOT SHUT OFF - INSTRUMENT CHECKING													
	6:00PM	R-1 TURBINE ON GEAR -													
7/2/2014	8:00PM	EDMONDS, JACKSON, GRIFFIN, BOWLEY, HOGAN, ALEXANDER, WADLINGTON, KURZ											C SHIFT CARTER		
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	OFF	50	42	12 HR STANDBY								CTL/17.8'	
		H1	162	165	153	0.639	11	0.065	20.1	87.1	8.84	245/c	3.1		
		H2	160	165	152	1.713	10.6	0.07	23.3	68.8	11.84	244/c	3.5	CTL 15.4'	
		CT..	65	56	ON STANDBY										
		ALARMS:													
		R1	DECS COMMOM 300												
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT												
		H2	EH RES LEVEL HI												
		SOOT BLOWERS TAGGED							GAUGE GLASSES		PWTL 26.0'		DRYING AGENT		
		R1	16,,19,28,29,30,31/22L				OK						R1-0%		
		H1	1- 24 ,,44 / 31,33,39,44										H1-0%		
		H2	41,42/37,39										H2-0%		
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH									
		LEVELS	11' 1/2"	9' 9 1/4"	15' 11 1/2"	6 3/4"									
									SILO LVL		13'		BOOTHE SYSTEM		
													IN		
	8:00PM	SAFETY BRIEFING													
	NOTE	INST DEPT WORKING ON R1 DC L.O. PUMP/ 32PSI @ TANK & 24.5@ TURBINE FRONT STANDARD													
	10:30PM	R1 TURBINE OFF GEAR													
	10:40PM	TOOK L.O. OFF R1 TURBINE WITH 3-WAY VALVE THEN VALVED BACK IN / TEST RUN D.C. OIL PUMP TEST OFF GEAR & ON GEAR DID FINE & PUT IN STANDBY													
	11:00PM	R1 TURBINE ON GEAR													
	11:00PM	R1 ON 12HR STANDBY /R.PARKER EMAIL & ACES NOTIFIED													
	11:07PM	CALLED N.STIFF COME IN AT NORMAL TIME													
	11:15PM	M.PEYTON GOING HOME													

# Forced Outage Report

7/6/2014	1:00AM	WEEKLY SAFETY MEETING													
	3:45AM	RAN MONTHLY H-2 FRONT STANDARD TEST ALL PASS OVERSPEED AT 38													
	8:00AM	MORRIS, DENTON , REYNOLDS, GATTON, BAKER-, EDWARDS, TATE, CALHOUN,										D SHIFT STERLING			
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1		48	42		12 HR STANDBY								
		H1	143	165	153	0.138	11	0.06	13	97.8	4.62	188	2.5		
		H2	143	165	152	0.372	10	0.09	9	93	11.18	209	3		
		CT.. STANDBY													
		ALARMS:													
		R1													
		H1													
		H2 EH RES LEVEL HI B PA FAN MTR.HIGH TEMP													
		SOOT BLOWERS TAGGED													
		R1	22L							GAUGE GLASSES		DRYING AGENT			
		H1	30,31,33							OK		R1-0%			
		H2	41,42, 39, 37									H1-0%			
														H2-0%	
												SILO LVL		BOOTHE SYSTEM	
												17"		IN	
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH									
		LEVELS	11'2 1/2"	10'	14'9 5/8"	6 1/2"									
	9:30AM	SCRUBBER STACK ELEVATOR IS NOT WORKING. CALLED AMERICAN SERVICE GROUP THEY ARE ON THERE WAY.													
	10:30AM	H1 A2 MILL FEEDER CLEANOUT HAS SHEARED PIN. REDTAGGING FOR MAINT. TO REPAIR.													
	11:30AM	H1 A2 CLEANOUT KEY IS WOLLERED OUT MAINT WELDING SHAFT WILL HAVE TO REPLACE NEXT OUTAGE. ANDY HOLT HERE FOR STARTUP													
	1:00PM	AMERICAN SERVICE GROUP HAS SCRUBBER ELEVATOR RUNNING.													
	2:00PM	H2 WETBOTTOM WEST SIDE SLIDE GATE HAS GAS BLOWING OUT AROUND ROLLER BRG													
	4:00PM	JAY HIGGINS HERE FOR STARTUP SUPPORT.													
	4:10PM	FIRE IN R1 BOILER													
	5:00PM	CLOSED DRUM VENTS													
	7:40PM	PULLING VACUUM ON R-1													
7/6/2014	8:00PM	FELTY,CECIL,EMBRY,HILLYARD,DUVALL,JAMES,LEE,JONES VAC										HOGAN,HIGGINS.BREI		A SHIFT TOW	
		BOWLEY													
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	FIRING	48	42								CTL 18'		
		H1	165	165	153	0.137	10.9	0.065	24.4	97.2	5.98	262	2.9		
												C			
		H2	160	165	152	0.387	11	0.043	28.7	92.1	12.59	240	3.3		
												C	CTL 15.5'		
		CT.. ON STANDBY 59													
		ALARMS:													
		R1 VOLTAGE REG													
		H1 BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL/A &B PA FAN MOTOR/B BFP AUX OIL													
		H2 EH RES LEVEL HI													
		SOOT BLOWERS TAGGED													
		R1	22L							GAUGE GLASSES		PWTL / 28'			
		H1	30,31,33							OK		DRYING AGENT			
		H2	37,39,41,42									R1-0%			
														H1 0%	
														H2-0%	
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH									
		LEVELS	11'2 1/2"	10'	14'9 5/8"	6 1/2"									
												SILO LVL		BOOTHE SYSTEM	
												11.3'		BSI	
	8:00PM	SAFETY BRIEFING													
	8:00PM	PULLING VACUUM ON R-1 2 OIL GUNS IN D.P.900 ST. TEMP. 645 SUPERHEAT 115													
	8:05PM	TESTED BEARING OIL PUMPS ON R-1													
	9:00PM	J GOODMAN CALLED FOR VAC. DAY 8A-4P 7-7-14 OKED													
	9:00PM	A HOGAN GOING HOME													
	9:16PM	ROLLING R-1 TURBINE													
	9:53PM	R-1 TIED ON LINE													
	10:00PM	R-1 PRECIPS IN SERVICE													
	10:17PM	R-1 A MILL TRIPPED LOST OF FLAME DETECTION													
	10:22PM	R-1 B MILL ON TO DRY OUT HAD TROUBLE WITH BKR													
	10:27PM	R-1 A MILL ON													
	10:36PM	TRIPPED R-1 TURBINE HAD VALVED IN SH SPRAYS REG WAS SHOWING CLOSED BUT STILL SPRAYING SUPER HEAT GOT DOWN TO 5 DEGREES FROM SATURATION TEMP													
	10:45PM	R-1 PRECIPS OUT													
	10:53PM	FIRES BACK IN R-1 BOILER													
		NOTE DID NOT BREAK VACUUM ON R-1 TURBINE NEVER LOST SUPERHEAT COMPLETELY WAITING ON 100 DEGREES SUPERHEAT TO ROLL AGAIN													
7/7/2014	12:52AM	R-1 TIED ONLINE													
	1:00AM	R-1 PRECIPS IN SERVICE													
	1:30AM	CANT GET ANY COAL OUT OF A-1 COAL PIPE HOLDING UNIT ON WITH JUST A-2 COAL PIPE TILL B MILL DRY'S OUT													
		NOTE SHOT COAL PIPE ALL THE WAY FROM 2ND FLOOR TO BURNER HEAD HIGHEST TEMP 130 DEGREES BELOW FLANGE AT BURNER HEAD BURNER HEAD 400 DEGREES													
	3:44AM	R-1 TURBINE OFF LINE MILL INSPECTION													
	3:46AM	R-1 PRECIPS OUT OF SERVICE													
	4:15AM	R-1 FD FANS OFF													

# Forced Outage Report

## Estimated Outage Cost

Wash wet bottom and Boiler De-Slag

Cleaning Total	\$1,929.97
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Titan – boiler hydro and Mill/coal pipe/burner inspections

Labor	\$3,120
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<u>Material</u>	<u>\$1,828.11</u>
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Total	\$4,948.11
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Turning Gear Repairs

Total	\$3,600
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Grand Total	\$10,478.08
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# Forced Outage Report

## Lost Sales Opportunity Report

FORCED OUTAGE COST ANALYSIS				
MISO DART Revenue and LOST OPPORTUNITY				
<b>Unit</b>	<b>Reid 1 - R1-14-09</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	6/30/14 15:57			<b>MW</b>
<b>Date &amp; Time On Line</b>	7/2/14 23:00			<b>\$/MW</b>
<b>Outage Duration</b>	55 hr. 3 min.			25
<b>Outage Code</b>	UO3 (26 hr. 6 min.), SF (28 hr. 57 min.)			40
<b>Outage Reason</b>	Unit removed from service due to B-1 coal pipe plugged and getting hot. Starting failure due to turbine turning gear problems. Turning gear repaired and unit placed in reserve standby at 2300 on 7/2/14.			50
				\$ 30.78
				\$ 29.69
				\$ 29.27
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
6/30/14 (HE 16-24)	\$ 57.86	\$ 37.24	\$ (2,550)	\$ -
7/1/14 (HE 1-24)	\$ 50.57	\$ 30.30	\$ (1,446)	\$ (8,869)
7/2/14 (HE 1-23)	\$ 34.21	\$ 30.84	\$ -	\$ (4,371)
<b>Total</b>			\$ (3,996)	\$ (13,239)
<b>Start Up Fuel Cost</b>			<b>Total Forced Outage Cost</b>	
S/U Fuel Consumed	0	Unit placed in reserve standby		DART P&L
S/U Fuel Price	\$ -			\$ (3,996)
S/U Fuel Cost	\$ -			Lost Opportunity
				\$ (13,239)
				S/U Fuel Cost
				\$ -
				<b>Total</b>
				\$ (17,235)
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Jim Garrett

**From:** Eric Anderson

**Date:** 15-Aug-2014

**Plant:** Wilson

**Unit:** 1

**GADS Class:** UO2

## Duration

Trip Time: 08-Jul-2014 02:10

Tie Time: 09-Jul-2014 17:56

Time Offline: 39:46

## Outage Description

Wilson Station was removed from service on Saturday, 08-Jul-2014 at 02:10 due to a tube leak in the soot-blowing lane (18<sup>th</sup> element West to East) of the lower Reheat section at door #9. Titan Contracting replaced two-36" sections of tube in this area. Titan also pad welded one adjacent tube in this area and the (#8 tube West to East) that UT tested lower than acceptable minimum wall thickness and installed 29 tube shields. The tube being replaced was 2.5" O.D. x 0.180" MW, SA178 material.

## Root Cause

Tube shields had come loose from the leaking tube and the adjacent tube allowing the soot blower to erode the tube wall.

## Failure History

The last tube leak at Wilson Station in this area was on March 30, 2012 in the reheat area of the back pass on the HRA sidewall. This tube leak was located in the reheat area on the east wall in the south corner next to IKEL-42 soot blower at elevation 516'-3". The March 30, 2012 tube leak was due to wall blower erosion from a poppet valve that was stuck in the open position.

# Forced Outage Report

## Corrective Action

All soot blower lanes in the reheat section were checked visually and ultrasonically for flat spotting and wall thinning. Twenty-nine (29) additional tube shields were installed on tubes that showed some wear but were within the minimum wall standard. Wilson Station will check this area visually and ultrasonically during future outages to ensure wear is not accelerating.

## Other Work Completed While Unit Was Offline

### ELECTRICAL

- #1 ID Fan Oil Cooler
- 12B Tie Breaker
- Plant Air Dryer
- FGD 480Volt Breaker Maintenance

### INSTRUMENTATION

- #4 Governor Valve Control
- #5 Coal Mill Instrumentation
- Igniter Trip Solenoid
- Coal Valves
- Oil Guns and Spark Rods
- Flame Scanners

### MECHANICAL

- Stroke all coal valves
- Repaired 1A coal valve
- Repaired 1D coal valve
- Repaired 3A coal valve
- Repaired 4E coal valve
- Inspected #2 BFP recirculation valve and ordered new nuts and studs for the valve body.

# Forced Outage Report

## Operators Event Log

7/8/2014	12:00AM	
	2:10AM	Unit off line due to tube leak.H/L notified
	7:00am	Todd in, Owens out
		McIntyre, Tichenor, Piper, Carmen, Lindsey, Drake, Barrett in
	8:00am	Safety Briefing
	7:42am	Hydro @ 1800psi
	7:00pm	Owens in Todd out
		H.Roby,Mcelwain,Caldwell,Tivitt,KennedyJones,Worley in.McCarty on S/L.S.Roby on VAC.Wilson on VAC
		Safety briefing
		Outage
		I/M working on coal valves
7/9/2014	12:00AM	
		Working on flyash system
	4:15am	Put vaccum on reheater
	5:00am	No leaks on reheater
	7:00am	Mattingly in,Owens out
	8:00am	Tichenor,Grey, Daughtery,Stovall,Hunt,Render,Linsey,McINTYRE,Gray in Blandford on vacA/T submitted
		Preparing for start up
	10:30am	Sean Emertson called in sick A/T submitted
	7:00PM	Cooper Todd,in Mattingly Owens out
		MW KPPH SO2 NOX.. OPAC REMOV CO2 4 MILLS 4 MODULES 16 CIRC PUMPS
		VARS SLURRY FEED TANKS CO Sludge tanks VOLTAGE BED LEVEL 96"
	8:00AM	Roby VAC ,Stewart P/D , Payne VAC, Poore VAC ,Emberton S/L, Jones, Calhoun, McElwain, Caldwell, Piper Tivitt, Kennedy, Carman
	10:57am	Fire in boiler
		Saftey/job briefing
	7:09PM	#2 mill on
	7:35PM	Tranfer Aux

# Forced Outage Report

## Boiler Tube Leak Record

### Lower Reheat Section

Plant: Wilson

Unit: 1

#### Type of Leak: (Check One)

Pin Hole \_\_\_\_\_ Thick Lip Failure \_\_\_\_\_ Thin Lip Failure \_\_\_\_\_

Tube Wall Thinning X    Other: It appears that the failure originated from soot blower erosion that thinned the tube leaving a large hole that washed the adjacent tube.

#### Orientation of Rupture: (Check One)

Longitudinal \_\_\_\_\_ Circumferential X

#### Probable Cause: (Check One)

Stress \_\_\_\_\_ Overheat \_\_\_\_\_ Erosion \_\_\_\_\_ Internal Corrosion \_\_\_\_\_

External Corrosion \_\_\_\_\_ Weld Failure \_\_\_\_\_ (Shop \_\_\_\_\_ Field \_\_\_\_\_)

Internal Obstruction to Flow \_\_\_\_\_ Sootblower Erosion X

Other: \_\_\_\_\_

# Forced Outage Report

## Type of Repair: (Check One)

Dutchman   X   (Length of Dutchman 2 @ 36") Pad Weld   X  

Plug Tube        Short Circuit        Other                     

## Description of Repair:

Tube Size OD   2.50"   Wall Thickness   .180"   MW        Tube Material   SA178-C  

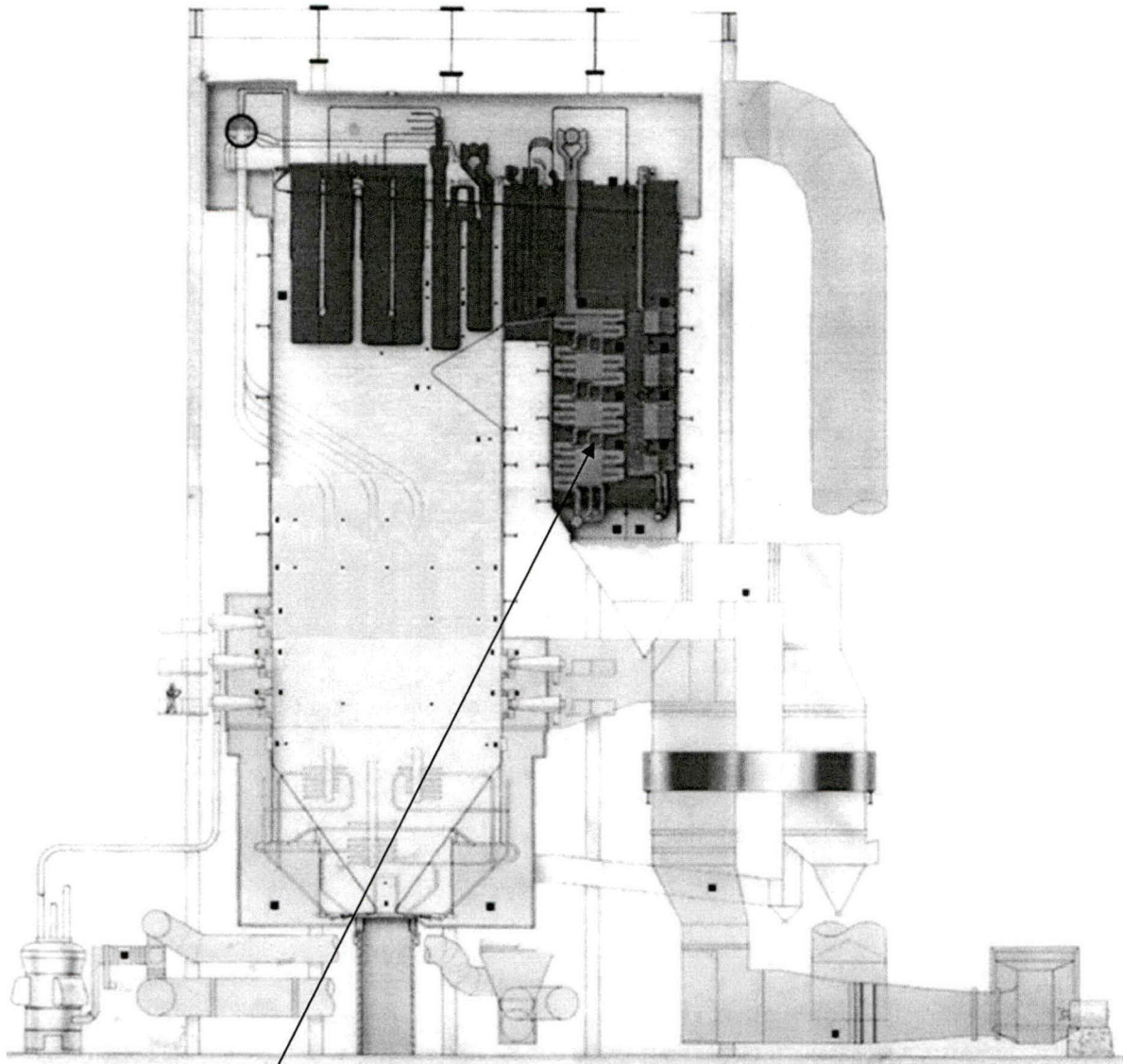
Welding Rod Used   E7018 A1  

Welded By:       Titan      

## Exact Location of Leak: Be Specific

Soot-blowing lane in the Lower Reheat section, 18<sup>th</sup> element West to East, at door #9

# Forced Outage Report



**FOSTER WHEELER STEAM GENERATOR**  
FOR  
**BIG RIVERS ELECTRIC CORPORATION**  
D.B. WILSON STATION—UNITS 1 & 2  
Center town, Kentucky

Burns and Roe—Engineers

Capacity: 3,484,000 lb/hr Design Pressure: 2950-690 psig

OPERATING CONDITIONS

Superheater Outlet Pressure: 2620 psig Temperature: 1005-1005F  
REHEAT UNIT

Tube Leak Here – Lower Reheat Section 18<sup>th</sup> element West to East at Door #9

# Forced Outage Report

## Estimated Outage Cost

Contract Labor Cost = \$45,116.67

Material Cost = \$1,949.85

Total Non-Labor Cost = \$47,066.52

## Lost Sales Opportunity Report

FORCED OUTAGE COST ANALYSIS					
MISO DART Revenue and LOST OPPORTUNITY					
Unit		Wilson - W1-14-06		Production Cost	
Date & Time Off Line		7/8/14 2:10		MW	\$/MW
Date & Time On Line		7/9/14 17:56		280	\$ 24.95
Outage Duration		39 hr. 46 min.		340	\$ 24.14
Outage Code		UO2		420	\$ 23.53
Outage Reason		Repair reheat tube leak			
Date	DA LMP Average	RT LMP Average	DART P&L	Lost Opportunity	
7/8/14 (HE 1-24)	\$ 36.80	\$ 31.21	\$ (76,939)	\$ -	
7/9/14 (HE 1-24)	\$ 33.83	\$ 37.20	\$ 7,398	\$ (103,049)	
7/10/14 (HE 1-5)	\$ 24.13	\$ 22.20	\$ (451)	\$ -	
Total			\$ (69,992)	\$ (103,049)	
Start Up Fuel Cost				Total Forced Outage Cost	
S/U Fuel Consumed	28,472			DART P&L	\$ (69,992)
S/U Fuel Price	\$ 2.98			Lost Opportunity	\$ (103,049)
S/U Fuel Cost	\$ (84,804)			S/U Fuel Cost	\$ (84,804)
				Total	\$ (257,845)
NOTES:					
All negative values are money out of pocket.					
DART Revenue is calculated from differences between the DA award and RT events					
Lost Opportunity is the lost margins if the unit had stayed running					

# Forced Outage Report

**To:** Jim Garrett

**From:** Billy Boarman

**Date:** 11-Jul-2014

**Plant:** HMP&L Station Two

**Unit:** 2

**GADS Class:** UO2

## Duration

Trip Time: 10-Jul-2014 13:21

Tie Time: 10-Jul-14 22:17

Time Offline: 8:56

## Outage Description

HMP&L Station Two Unit 2 was removed from service on Thursday, 10-Jul-2014 at 13:21 due to failure of the #19 wall blower penetration allowing boiler flue gas and heat to exit the boiler.

## Root Cause

#19 Wall Blower wall box failed allowing it to be burned up.



# Forced Outage Report

## Failure History

In May, 2011 #14 wall blower wall box failed, leading to a forced outage of 17.6 hours.

In May, 2012 #9 wall blower wall box failed, leading to a forced outage of 14.24 hours.

## Corrective Action

Removed the wall blower and repaired the wall box and refractory.

## SOE Print Out

Triggered on: 10-Jul-2014 13:20:06:804

10-Jul-2014 13:21:51:401	OK	H225DRMTRP	BOILER DRUM LEVEL TRIP
10-Jul-2014 13:21:43:402	TRIP	H225DRMTRP	BOILER DRUM LEVEL TRIP
10-Jul-2014 13:21:32:030	LOW	H225DRMLVLLOW	BOILER DRUM LEVEL LOW
10-Jul-2014 13:21:17:543	HIGH	H240EXHOODTEHI	TURB EXH HOOD HIGH TEMP
10-Jul-2014 13:21:08:223	OK	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
10-Jul-2014 13:21:07:848	TRIP	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
10-Jul-2014 13:21:06:909	OK	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
10-Jul-2014 13:21:06:613	TRIP	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
10-Jul-2014 13:21:03:212	LOW	H222HTR3LVLLO	LP HEATER 3-3 LEVEL LOW
10-Jul-2014 13:21:03:149	OK	H222HTR3LVLLO	LP HEATER 3-3 LEVEL LOW
10-Jul-2014 13:21:03:138	LOW	H222HTR3LVLLO	LP HEATER 3-3 LEVEL LOW
10-Jul-2014 13:21:01:480	TRBLE	H246XFERTOMAN	VOLTAGE REG TROUBLE
10-Jul-2014 13:21:01:416	OPEN	H250FLDBKRSTS	GEN H2 FIELD BKR STATUS
10-Jul-2014 13:21:01:406	OPEN	H250OCB186STS	OCB 0186 GEN H2 STATUS
10-Jul-2014 13:21:01:396	OPEN	H250OCB182STS	OCB 0182 GEN H2 STATUS
10-Jul-2014 13:21:01:305	OK	H250OCB182GETR	OCB 0182 GEN H2 TRIP
10-Jul-2014 13:21:01:305	OK	H250OCB186GETR	OCB 0186 GEN H2 TRIP
10-Jul-2014 13:21:01:278	LKOUT	H240STPVLO86TV	TURB STOP VLV LOCKOUT (86TV3)
10-Jul-2014 13:21:01:274	TRIP	H250OCB182GETR	OCB 0182 GEN H2 TRIP
10-Jul-2014 13:21:01:274	TRIP	H250OCB186GETR	OCB 0186 GEN H2 TRIP
10-Jul-2014 13:20:54:000	OK	H225DRMLVLLOW	BOILER DRUM LEVEL LOW
10-Jul-2014 13:20:38:693	LOW	H222HTR2LVLLO	LP HEATER 2-3 LEVEL LOW
10-Jul-2014 13:20:22:309	OK	H240STPVLVTRP	TURB STOP VLV CLSD TRIP
10-Jul-2014 13:20:20:993	LOW	H225DRMLVLLOW	BOILER DRUM LEVEL LOW
10-Jul-2014 13:20:10:546	OK	H233LMISTRP	LAST MILL IN SERVICE TRIP
10-Jul-2014 13:20:07:680	LOW	H245SEALSTMLOW	TURBINE SEAL STEAM PRESS
10-Jul-2014 13:20:07:304	TRIP	H240STPVLVTRP	TURB STOP VLV CLSD TRIP
<b>10-Jul-2014 13:20:06:804</b>	<b>TRIP</b>	<b>H233EMERBLRTRP</b>	<b>EMERGENCY BLR TRIP</b>
10-Jul-2014 13:20:06:552	TRIP	H233LMISTRP	LAST MILL IN SERVICE TRIP

# Forced Outage Report

## Other Work Completed While Unit Was Offline

- Repaired 480V soot blower power feed that got burnt up when the wall box failed
- Repaired coaxial cable for the east side drum gauge camera that got burnt up when the wall box failed

# Forced Outage Report

## Operators Event Log

7/10/2014	8:00AM	SAFETY BRIEFING											
	8:00AM	RATA TEST ON H-1											
	8:35AM	H-2 42 SOOT BLOWER BACK INSERVICE											
	8:35AM	TESTED R-1 A BFP BKR PUMP STARTED											
	12:30PM	R-1 OPACITY GOING UP BEATING DOWN 15 AND 16 AND PRECIPS ADJ AIR RESTERS LOWERED AIR CLEANED LENS OPACITY COMING DOWN											
	1:10PM	FIRE COMING OUT AROUND #19 SOOTBLOWER H-2											
	1:20PM	TRIPPED H-2 PA FANS HAD ALREADY TRANSFERRED AUX											
	1:23PM	GEN TRIPPED OR REVERSE POWER PRIMARY DID TAKE IT OUT											
	1:23PM	H-2 PRECIPS OUT											
	1:48PM	H-2 FD FANS OFF BOILER VOTTLED											
	2:08PM	H-1 RATA TEST COMPLETE											
	2:37PM	H-2 TURBINE ON GEAR											
	NOTE	LOST H-2 EAST DRUM CAMERA PICTURE URGENT WO# 6133568											
	2:55PM	RUNNING LIST FOR HELP TONIGHT											
	3:25PM	S KURZ CALLED WILL BE IN AT 6P											
	NOTE	SOME OF THE PHONE SYSTEM WAS DAMAGED BY THE BOILER HOLE SOME PHONES WORK SOME DON'T											
	5:10PM	RELEASING H-2 BOILER											
	5:22PM	H-2 FD FANS ON CAN NOT PURGE FUSE BLOWN IN BURNER MANAGEMENT SYSTEM											
	6:05PM	SHUT H-2 FD FANS BACK OFF CANT GET WEST END WET BOTTOM SAH GATE DOOR TO CLOSE HAD DOG HOUSE DOOR OPEN OPENED AND CLOSED DOOR A COUPLE OF TIMES DOOR CLOSING OK NOW CLOSING DOG HOUSE											
	6:05PM	FUSE REPAIRED IN BURNER MANAGEMENT PANEL											
	6:23PM	C GRIFFIN CALLED WILL BE IN											
	6:25PM	H-2 FD FANS ON 6:25 PURGING H-2 BOILER											
	6:38PM	FIRES ESTABLISHED IN H-2 BOILER DRUM PRESS 302 STEAM TEMP 884 LUBE OIL 115 A-1 A-2 A-3 OIL GUNS IN ECC 9.2											
	7:30PM	OIL IN R-1 BOILER TAKING MILL OFF											
	7:53PM	R-1 B MILL OFF OPENING UP FEEDER BELT WONT TURN											
	8:00PM	MORRIS, DENTON , REYNOLDS, GATTON, BAKER-, EDWARDS, TATE FMLA, CALHOUN,										D SHIFT STERLING	
	UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
	R1	30	48	42	3.54	7.2	0.33	5				3.4	
	H1	165	165	153	0.133	11	0.094	23.5	90.2	7.72	230	2.7	
	H2	OFF											
	CT..	STANDBY											
	ALARMS:												
	R1												
	H1	B PA FAN MTR HIGH TEMP	BOILER DRUM LEVEL TRANS MAINT.										
	H2	EH RES LEVEL HI											
	SOOT BLOWERS TAGGED							GAUGE GLASSES			DRYING AGENT		
	R1	22R							OK	R1-0%			
	H1	31,33								H1-0%			
	H2	41,42, 39, 37								H2-0%			
										SILO LVL	BOOTHE SYSTEM		
										13'	IN		
			FUEL OIL	C.H.	HMPL	NORTH	SOUTH						
			LEVELS	8'5"	10' 2"	17'5"	6 1/2"						
	8:30PM	R1 B MILL BACK ON HAD ROCK ON FEEDER.											
	8:45PM	WARMING SEALS ON H2 TURBINE H2 BOILER DRUM PRESS. 788 STEAM TEMP. 630 LUBE OIL TEMP 116 ECCENTRICITY 9.0 3 OIL GUNS IN.											
	8:47PM	PULLING VAC ON H2											
	9:30PM	H2 BOILER DRUM PRESSURE 900 STEAM TEMP. 633 LUBE OIL TEMP 116 3 BURNERS IN ECC. 9.0											
	9:51PM	ROLLING H2 TURBINE											
	10:17PM	TIED H2 ON LINE											
	10:24PM	H2 PRICIPS ARE IN CALLED HOTLINE											
11:25PM	H2 A BLEED PUMP ON												
11:35PM	H2 BOOSTER FAN ON												
11:42PM	BYPASS DAMPER CLOSED H2 GOING THROUGH SCRUBBER. CALLED HOTLINE												
11:50PM	SCR STARTED												
7/11/2014	3:00AM	H2 IS GOOD FOR FULL PRESSURE											
	3:30AM	H2 THICKNER RETURN MAKEUP REG. HAS SPLIT IN AIR LINE. W.O.# 6133615											
	3:30AM	R1 FLYASH ECON. HEADER HAS HOLE IN LINE AT #1 HOPPER. W.O.# 6133582											
	3:40AM	FLOWING AMMONIA IN H2 SCR											
	5:00AM	H2 SAMPLE SINK IS PLUGGED. W.O.# 6133618											
6:50AM	R1 SOOTBLOWING IS REDTAGGED												

### Estimated Outage Cost

- |              |                |
|--------------|----------------|
| <b>Total</b> | <b>\$2,760</b> |
|--------------|----------------|

## MISO DART Revenue and LOST OPPORTUNITY

Lost Opportunity is the lost margins if the unit had stayed running

# Forced Outage Report

**To:** Jim Garrett

**From:** Billy Boarman

**Date:** 18-Jul-2014

**Plant:** HMP&L Station Two

**Unit:** 2

**GADS Class:** UO2

## Duration

Trip Time: 17-Jul-2014 10:09

Tie Time: 17-Jul-14 16:28

Time Offline: 6:19

## Outage Description

HMP&L Station Two Unit 2 was removed from service on Thursday, 17-Jul-2014 at 10:09 due to a broken inspection port glass on B4 burner.

## Root Cause

The west side inspection glass on B4 burner blew out allowing boiler gas and combustibles to exit the boiler. We suspect that a hole in the burner barrel could be the cause of the glass overheating we will confirm this the next time unit is off line.

## Failure History

No failures of this nature have been reported on this unit for the last three years.

## Corrective Action

Replaced the inspection port glass.

# Forced Outage Report

## SOE Print Out

Triggered on: 17-Jul-2014 10:08:29:422

17-Jul-2014 10:08:36:704	OPEN	H250FLDBKRSTS	GEN H2 FIELD BKR STATUS
17-Jul-2014 10:08:36:692	OPEN	H250OCB186STS	OCB 0186 GEN H2 STATUS
17-Jul-2014 10:08:36:678	OPEN	H250OCB182STS	OCB 0182 GEN H2 STATUS
17-Jul-2014 10:08:36:591	OK	H250OCB186GETR	OCB 0186 GEN H2 TRIP
17-Jul-2014 10:08:36:590	OK	H250OCB182GETR	OCB 0182 GEN H2 TRIP
17-Jul-2014 10:08:36:561	TRIP	H250OCB182GETR	OCB 0182 GEN H2 TRIP
17-Jul-2014 10:08:36:561	TRIP	H250OCB186GETR	OCB 0186 GEN H2 TRIP
17-Jul-2014 10:08:36:559	LKOUT	H240STPVLO86TV	TURB STOP VLV LOCKOUT (86TV3)
17-Jul-2014 10:08:36:129	LOW	H222HTR3LVLLO	LP HEATER 3-3 LEVEL LOW
17-Jul-2014 10:08:36:112	OK	H222HTR3LVLLO	LP HEATER 3-3 LEVEL LOW
17-Jul-2014 10:08:35:999	LOW	H222HTR3LVLLO	LP HEATER 3-3 LEVEL LOW
17-Jul-2014 10:08:35:976	OK	H222HTR3LVLLO	LP HEATER 3-3 LEVEL LOW
17-Jul-2014 10:08:35:894	LOW	H222HTR3LVLLO	LP HEATER 3-3 LEVEL LOW
17-Jul-2014 10:08:35:853	OK	H222HTR3LVLLO	LP HEATER 3-3 LEVEL LOW
17-Jul-2014 10:08:35:797	LOW	H222HTR3LVLLO	LP HEATER 3-3 LEVEL LOW
17-Jul-2014 10:08:35:728	OK	H222HTR3LVLLO	LP HEATER 3-3 LEVEL LOW
17-Jul-2014 10:08:35:697	LOW	H222HTR3LVLLO	LP HEATER 3-3 LEVEL LOW
17-Jul-2014 10:08:35:540	OK	H222HTR3LVLLO	LP HEATER 3-3 LEVEL LOW
17-Jul-2014 10:08:35:501	LOW	H222HTR3LVLLO	LP HEATER 3-3 LEVEL LOW
17-Jul-2014 10:08:34:417	OK	H233LMISTRP	LAST MILL IN SERVICE TRIP
17-Jul-2014 10:08:30:422	TRIP	H233LMISTRP	LAST MILL IN SERVICE TRIP
17-Jul-2014 10:08:29:925	TRIP	H240STPVLVTRP	TURB STOP VLV CLSD TRIP
17-Jul-2014 10:08:29:480	OPEN	H203PAF3BSTS	4160 BKR PA FAN H2B STATUS
<b>17-Jul-2014 10:08:29:422</b>	<b>TRIP</b>	<b>H233EMERBLRTRP</b>	<b>EMERGENCY BLR TRIP</b>
17-Jul-2014 10:08:29:172	TRIP	H225DRMTRP	BOILER DRUM LEVEL TRIP

# Forced Outage Report

## Other Work Completed While Unit Was Offline

- Found two other inspection port glasses that were cracked (A1 east and B4 east) only had one inspection glass in warehouse removed cracked glass and replaced with cap.

# Forced Outage Report

## Operators Event Log

7/17/2014	7:00AM	DEBUSK HERE FOR VACUMING @ SOUTH COOLING TOWER RISER LINE FOR MAINT													
	7:24AM	S.CUTSHAW REQUESTED VACTION FOR TONITE 8P-8A OKED													
	8:00AM	SAFETY BRIEFING													
	9:00AM	AUX FOUND H2 B4 COAL BURNER INSPECTION PORT HAD BURNT THRU CAP													
	9:11AM	H2 OUT OF ADS													
	9:28AM	H2 AUXILIARYS TRANSFERRED													
	NOTE	R1 OPACITY GETTING HIGH PULLED R1 PRECIPS MANUALLY & BEAT DOWN ADJUSTED BURNERS STILL TRENDING UP													
	9:31AM	H2 SCR SHUT DOWN SIGNAL													
	9:40AM	H2 FUEL OIL IN BOILER													
	10:07AM	H2-A MILL OFF													
	10:09AM	H2 OFF LINE & SCRUBBERS OUT & SCR OUT/ TRIPPED ON LOW DRUM LEVEL													
	10:13AM	H2 PRECIPS OUT													
	10:26AM	FD FANS OFF													
	NOTE	H1 A C.T. CWP OFF FOR MAINT ON SOUTH COOLING TOWER RISER LINE REPAIR													
	10:51AM	H2 TURBINE BREAKING VACUM													
	11:17AM	H2 TURBINE ON GEAR													
	12:05PM	MAINT DONE WITH H2 B4 & A1 BURNER INSPECTION PORTS													
	12:10PM	H2-B FD FAN SHUT OFF DAMPER WILL NOT OPEN OR CLOSE FOUND THE ACTUATOR MOUNT BROKE / B.EDWARDS & J.WEST NOTIFIED													
		DOGGED OFF H2-B FD FAN SHUT OFF DAMPER WHILE MAINT REPAIRS MOUNTING BRACKET													
	1:04PM	H2 FIRES IN BOILER													
	1:40PM	ACES NOTIFIED													
	1:45PM	CALLING J.REYNOLDS-L/M,R.DENTON-L/M,J.BAKER-L/M,J.HIGGINS-L/M,J.GOODMAN-L/M,G.EDWARDS-L/M,G.CALHOUN-L/M													
	NOTE	R1 OPACITY GETTING HIGH PULLED R1 PRECIPS MANUALLY & BEAT DOWN ADJUSTED BURNERS STILL TRENDING UP													
	NOTE	H2 A1,A2,A3,A4 B2 OILGUNS IN													
	NOTE	BLOWING H2 ELECTROMATIC AS MUCH AS POSSIBLE TO TURN S.H. TEMP													
	NOTE	H2 SEALING TURBINE & PULLING VACUM													
	3:28PM	H2 SEALING TURBINE & PULLING VACUM													
	4:00PM	R1 STARTING HOTWELL CHECK													
	4:01PM	ROLLING H2 TURBINE													
	4:17pm	H2 TURBINE TV-GV TRANSFER													
	4:28pm	H2 GENERATOR TIED ON LINE													
	4:35PM	H2-B FD FAN SHUT-OFF DAMPER HOOKED BACK IN													
	4:35PM	H2-B FD FAN SHUT-OFF DAMPER HOOKED BACK IN													
	4:50pm	FOUND H2 B4 BURNER WEST INSPECTION PORT CRACKED NEW PORT JUST INSTALLED PUT AIR ON IT / J.FRANCIS,R.PARKER,G.BUNCH NOTIFIED													
		SAID TO KEEP EYE ON IT.													
	5:19PM	J.WADLINGTON CALLED IN SICK FOR TONITE 8P-8A													
	NOTE	R1 HOTWELL CHECK LOST 3" 1 HOUR													
	NOTE	CALLING ~J.BAKER-L/M,J.HIGGINS-L/M,J.GOODMAN-L/M,G.EDWARDS-L/M,G.CALHOUN-L/M													
	6:13PM	H2 SILICA .206 GOOD FOR MAX DOING SAME													
	6:24PM	H2 SCRUBBERS IN SERVICE													
	6:25PM	H2 SCR WARMING													
	NOTE	R1 HAD 61 EXCESS EMISSIONS OUT (03) BETWEEN 9:24AM-6:06PM													
	NOTE	R1 HAD 4 3HOUR EXCEEDENCES OUT													
	6:44PM	H2 FUEL OIL OUT OF BOILER													
	7:30PM	CALLED THRU LIST AGAIN - LEFT MESSAGES													
7/17/2014	8:00PM	CLARK, BREEDEN, YOUNG, BLANKS													
		WADLINGTON S/L, CUTSHAW VACATION, BOWLEY STAYING OVER & ONAN HERE													
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	42	48	42	4.5	9.9	0.453	9.1				3.74	CTL 17.5'	
		H1	158	165	153	0.142	10.4	0.065	17.9	97%	4.72	230	3.7		
		H2	155	165	152	0.179	10.9	0.056	18.6	96%	10.25	234	3.7	CTL 15.3'	
		CT..	ON STANDBY		59										
		ALARMS:													
		R1													
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL/A & B PA FAN MOTOR/B BFP AUX OIL												
		H2	EH RES LEVEL HI, GEN. MAIN STEPUP												
		SOOT BLOWERS TAGGED													
		R1						GAUGE GLASSES		PWTL 27'		DRYING AGENT			
								OK				R1-0%			
		H1 31,33,43										H1 0%			
		H2 37,39,41										H2-0%			
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH						SILO LVL	BOOTHE SYSTEM		
		LEVELS	7' 2 3/8"	13' 10 1/2"	14' 11 5/8"	6 1/2"						12'	IN		



# Forced Outage Report

**To:** Jim Garrett

**From:** Billy Boarman

**Date:** 8-Jul-2014

**Plant:** Reid Station

**Unit:** 1

**GADS Class:** UO1

## Duration

Trip Time: 7-Jul-2014 03:44

Tie Time: 7-Jul-2014 20:34

Time Offline: 16:50

## Outage Description

Reid Station Unit 1 was removed from service on Monday, 7-Jul-2014 at 03:44 due to possible blockage in 'A1' coal pipe.

## Root Cause

"A" Mill classifier was packed with coal not allowing proper flow to the burners.

## Failure History

On 30-Jun-2014 R-1 unit was removed from service due to plugging in B-1 coal pipe.

# Forced Outage Report

## Corrective Action

Inspected "A" Mill, classifier, reject chute and riffle box. Found that "A" classifier was plugged with coal and cleaned it out. Removed "A1" burner and found the spinner and inlet vanes were burned up. Also pulled the other three burners and found them in good condition. Installed new inlet vanes and spinner on "A1" burner and repaired the refractory on end of burner.

## Other Work Completed While Unit Was Offline

- Repaired coal leak on 'B' Mill
- Inspected 'B' Mill, classifier, reject chute and riffle box
- Inspected all burners

## Operators Event Log

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# Forced Outage Report

7/7/2014	8:00PM	CONN, BREEDEN, HIGGINS, CUTSHAW, BLANKS, YOUNG										B SHIFT		PENDLEY	
		CLARK VACATION - JOHNSON HERE - FELTY & CALHOUN HERE FOR R-1 START UP													
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	START UP - ROLLING TURBINE												CTL 18'
		H1	142	165	153	.096	9.1	0.074	14.7	98%	8.84	178	2.7		
		H2	145	165	152	0.34	10.7	0.069	15.3	93%	11.98	189	3.7	CTL 15.5'	
		CT..	ON STANDBY		57										
		ALARMS:													
		R1	VOLTAGE REG												
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL/A &B PA FAN MOTOR/B BFP AUX OIL												
		H2	EH RES LEVEL HI, GEN. MAIN STEPUP												
		SOOT BLOWERS TAGGED						GAUGE GLASSES		PWTL	27'	DRYING AGENT			
		R1	22L,22R					OK		R1-0%					
		H1	30,31,33,44							H1 0%					
		H2	37,39,41,42							H2-0%					
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH			SILO LVL	BOOTHE SYSTEM					
		LEVELS	9'8"	13' 11"	17' 1 1/2"	6 1/2"			4'	IN					
7/7/2014	8:00PM	SAFETY BRIEFING													
	8:05PM	ROLLING R-1 TURBINE TO 3600 RPM													
	8:34PM	R-1 GENERATOR TIED ONLINE													
	8:36PM	R-1 PRECIPS IN													
	NOTE	R-1 'A' MILL HAD A LOT OF WATER IN IT													
	9:00PM	TOOK BOOTHE SYSTEM OUT - SILO 4'													
	NOTE	GOT 2 PIECES OF METAL OUT OF H-1 WEST SIDE SLAG GRINDER													
	10:55PM	H-2 OUT OF ADS - BOILER UPSET 'B' MILL BLEW OUT													
	NOTE	RUNNING 10% DRYING AGENT TO HMPL UNITS - 'A' SIDE AUGER KEEPS TRIPPING BREAKER													
	11:38PM	H-2 BACK IN ADS													
	11:45PM	H-1 'B' MILL DIFFERENTIALS OUT TOP - INST BLEW BACK DIFFERENTIALS - STILL OUT TOP - GOT OK FROM ACES TO PEAK 'B' MILL													
	NOTE	WHILE PEAKING H-1 'B' MILL - MILL H-1 'A' MILL LOADED UP													
7/8/2014	12:10AM	CALLED J. ARNOLD L/M, T. WEST L/M & J. GLASSCO - COMING IN													
	12:04AM	OIL FIRE OUT OF R-1 BOILER													
	12:40AM	J. GLASSCO HERE													
	1:00AM	R-1 SILICA 1.238 - GOOD FOR 1100 LBS DRUM													
	2:01AM	J. GLASSCO REPORTED 'A' SIDE DRYING AGENT HAS A BAD DRIVE - NONE IN STOCK - HE IS LEAVING													
	4:02AM	R-1 SILICA 1.153 - GOOD FOR MAX													
	4:00AM	D. FELTY LEAVING													
	7:15AM	FIGHTING BOTH MILLS ON H1													
	7:30AM	COMING OUT OF ADS ON BOTH HMPL UNITS PER ACES													
7/8/2014	8:00AM	EDMONDS, GRIFFIN, BOWLEY, HOGAN, ALEXANDER, WADLINGTON, KURZ										C SHIFT		PAYNE	
		JACKSON, ONAN, GOODMAN, VAC													
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	47	48	42	4.57	10.3	0.386	10.2					CTL 176"	
		H1	85	85	75	0.08	6.6	0.356	14	98.3	6.75	OUT	2.2	PWTL / 27'	
								OUT				C			
		H2	155	155	152	0.323	10.7	0.39	23.4	93.7	10.71	OUT	3.8	CTL 14.9'	
								OUT				C			
		CT..	ON STANDBY		59										
		ALARMS:													
		R1	VOLTAGE REG												
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL/A &B PA FAN MOTOR/B BFP AUX OIL												
		H2	EH RES LEVEL HI												
		SOOT BLOWERS TAGGED						GAUGE GLASSES		DRYING AGENT					
		R1	22L,22R					OK		R1-0%					
		H1	30,31,33,44							H1 0%					
		H2	37,39,41,42							H2-0%					
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH			SILO LVL	BOOTHE SYSTEM					
		LEVELS		13' 11"	17' 1 1/2"	6 1/2"									

# Forced Outage Report

## Estimated Outage Cost

- Titan – coal leak repairs and inspections

Labor           \$4,760

Material       \$241.17

Total           \$5001.17

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>Reid 1 - R1-14-11</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	7/7/14 3:43			<b>MW</b>
<b>Date &amp; Time On Line</b>	7/7/14 20:33			<b>\$/MW</b>
<b>Outage Duration</b>	16 hr. 50 min.			20
<b>Outage Code</b>	UO2			35
<b>Outage Reason</b>	Unit removed from service to inspect A mill - unplug A-1 coal pipe			45
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
7/7/14 (HE 4-24)	\$ 40.08	\$ 50.47	\$ (18,386)	\$ -
7/8/14 (HE 1-5)	\$ 25.19	\$ 23.14	\$ (269)	\$ -
<b>Total</b>			<b>\$ (18,655)</b>	<b>\$ -</b>
<b>Start Up Fuel Cost</b>				<b>Total Forced Outage Cost</b>
S/U Fuel Consumed	6,352			DART P&L
S/U Fuel Price	\$ 3.17			Lost Opportunity
<b>S/U Fuel Cost</b>	<b>\$ (20,152)</b>			S/U Fuel Cost
				<b>Total</b>
				<b>\$ (38,807)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Jim Garrett

**From:** Billy Boarman

**Date:** 7-Jul-2014

**Plant:** Reid Station

**Unit:** 1

**GADS Class:** UO3/UO0

## Duration

Trip Time: 30-Jun-2014 15:37

Placed on 12-Hour Standby: 2-Jul-2014 23:00

Offline UO3: 26:06

Offline UO0: 28:57

Total Time Offline: 55:03

## Outage Description

Reid Station Unit 1 was removed from service on Monday, 30-Jun-2014 at 15:37 due to a possible fire in 'B1' Coal Pipe. The coal pipe was cleared and a fire was established for start-up on Tuesday, 1-Jul-2014 at 10:03. The outage classification was changed to a starting failure (UO0) at 18:03 when the unit did not return to service within the allotted timeframe due to trouble with the turning gear. The unit was placed on 12-hr reserve stand-by on Wednesday, 2-Jul-2014 at 23:00.

## Root Cause

"B" Mill became unstable and had to be removed from service. When it was placed back into service apparently hot coal got stuck in the horizontal run on 'B1' coal pipe allowing the pipe to get excessively hot.

# Forced Outage Report

## Failure History

On 28-Jul-2012 R1 "B" mill was tripped due to a fire in the outlet. The unit then tripped due to loss of flame.

## Corrective Action

Removed both "B" Mill burner spinners for inspection and both were badly burned up. Maintenance replaced both "B" burner spinners. Maintenance opened the doors on "B" Mill, PA duct, classifier, reject chute door, riffle box access doors under the coal valves, mill inlet and outlet doors, and the access door to the hot and cold air dampers for inspection. Found the hot air damper was only closing about 40% due to binding on the drive side. Disassembled the damper and cleaned out the bushing assembly, lubricated the shaft and bushings, re-connected and test stroked the damper. The damper is now opening and closing 100%. Cycled it two times and it worked the same both times. Cut a window in the "B1" coal pipe on second floor and found burning coal in the bottom of the pipe. Operations washed out the coal pipe from the burner end and got the pipe clean. Found some very hot coal in the outlet end of the mill. Operations cleaned out and washed the classifier and the outlet of end the mill. All smoking embers and hot coal was removed.

## Other Work Completed While Unit Was Offline

- Replaced "A1" burner spinner
- Replaced "B" Coal feeder belt
- Performed boiler hydro, no leaks were discovered
- Replaced Superheat Spray Regulator control valve
- Calibrated Feed water control valve

## Forced Outage Report

- Found the turbine turning gear drive was malfunctioning and not engaging properly. The turning gear assembly was removed from the front standard and transported to the Central Machine Shop for disassembly and inspection. The inner flange had eight 1/4"-20 bolts broken off and the pieces were jamming up in the bottom of the unit. All burrs were removed and the bolts were replaced. The unit was reassembled with new fasteners and thread-lock. The unit was transported back to the plant, re-installed, and tested. Test run was successful.

## Operators Event Log

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# Forced Outage Report

7/1/2014	8:00AM	FELTY, CECIL, EMBRY, HILLYARD, DUVALL, JAMES, LEE, JONES VAC ONAN GOODMAN										A SHIFT		TOW	
		BREEDEN													
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1		48	42									CTL 18'	
		H1	159	165	153	0.577	10.7	0.055	30.7	89.1	7.97	250 C	3.6		
		H2	161	165	152	1.009	11	0.078	22.5	81	10.15	216 C	4	CTL 15.5'	
		CT..	ON STANDBY		56										
		ALARMS:													
		R1	VOLTAGE REG												
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL/A & B PA FAN MOTOR/B BFP AUX OIL												
		H2	EH RES LEVEL HI, GEN. MAIN STEPUP												
		SOOT BLOWERS TAGGED													
		R1	22L						GAUGE GLASSES		PWTL / 27'		DRYING AGENT		
		H1	30,31,33						OK				R1-0%		
		H2	37,39,41,42										H1 0%		
													H2-0%		
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH					SILO LVL		BOOTHE SYSTEM		
		LEVELS	5'11 1/2"	9' 11 3/4	15'6 7/8"	6 1/2"					16.6'		BSO		
	8:00AM	SAFETY BRIEFING													
	8:00AM	DEBUSCK SETTING UP TO VACUUM MIDDLE BURNER DECK AREA													
	8:20AM	THOMPSON WORKING ON R-1 WET BOTTOM													
	8:25AM	RELEASING TAGGS R-1 PULLING SETTING UP SAME													
	9:00AM	R-1 WET BOTTOM FINISHED													
	9:10AM	H-2 SOOT BLOWING SYSTEM BACK IN													
	9:18AM	R-1 FD FANS ON													
	9:33AM	PURGE COMPLETE													
	9:50AM	REPURGE DID NOT OIL FIRE IN BOILER													
	10:03AM	FIRES IN R-1 BOILER													
	10:14AM	LOST FIRE IN R-1 BOILER													
	10:20AM	FIRES IN R-1 BOILER													
	11:30AM	OIL OUT OF R-1 BOILER													
	11:40AM	R-1 FD FANS OFF													
	12:00PM	LOST BOTH AIR COMP ON HMPL RENTAL AUTO STARTED LOST WATER TO SLUICE PUMPS STRAINER LEFT CLOSED													
		C ASH SLUICE PUMP SEALS LEAKING H-2 B AUX AIR COMP WATER PUMP SEAL LEAKING													
	NOTE	WHEN A AIR COMP TRIPPED OFF B WOULD NOT AUTO START (MAIN DRIVE MOTOR TURBINE FAULT TRIP) ELECT CHECKING SAME													
		HAD RUN OUT OF STARTS WILL HAVE TO WAIT TO CHECK OUT													
	12:45PM	DEBUSK GOING HOME													
	NOTE	STOP BUTTON ON RENTAL AIR COMP LEAVE IN THE POSITION IT IS NOW AND IT WILL SHUT DOWN AUTO													
	1:35PM	C ASH SLUICE PUMP TAGGED													
	1:47PM	BACKWASHING 1 3 SIDE R-1 COND													
	NOTE	GREEN PUTIN A LOAD OF SBS SHOULD HELP WITH SCRUBBING BUT TOMORROW PUTTING IN A LOAD OF SULFUR WHICH IN THE BEGINNING WILL HURT SCRUBBING													
	3:45PM	SETTING R-1 BOILER FOR HYDRO													
	NOTE	B AIR COMP WILL RUN NOW AND IN AUTO (BAD BKR)													
	4:25PM	R-1 FD FANS ON TO COOL BOILER													
	5:15PM	C.H. CALLED BARGE UNLOADER NOT REPAIRED CALLED BAYLOR MAN COMING IN													
	5:45PM	RAN LIST FOR ELECT C ASH SLUICE PUMP SHUTTER BRACKET BROKE OFF NO LUCK R. PARKER OKED RUNNING A ASH SLUICE PUMP IN AN EMERGENCY													
	6:20PM	J GLASSCO CALLED BACK WILL BE IN													
	NOTE	NOTE CANT RUN A ASH SLUICE PART MISSING ON THE BKR													
	7:40PM	T.WEST HERE FOR GLASCO													
	8:00PM	MORRIS, DENTON VAC, REYNOLDS, GATTON, BAKER-, EDWARDS, TATE, CALHOUN,										D SHIFT	PAYNE, STERLING		
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	OFF												
		H1	160	165	153	0.378	10.8	0.055	24.8	92.8	7.9	235	3.8		
		H2	160	165	152	0.8	11.3	0.063	18.9	82.8	15.38	236	3.3		
		CT..			ON STANDBY										
		ALARMS:													
		R1													
		H1													
		H2	EH RES LEVEL HI B PA FAN MTR.HIGH TEMP												
		SOOT BLOWERS TAGGED													
		R1	22L						GAUGE GLASSES				DRYING AGENT		
		H1	27						OK				R1-0%		
		H2	41,46/37										H1-0%		
													H2-0%		
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH					SILO LVL		BOOTHE SYSTEM		
		LEVELS	11'2 1/2"	10'	14'9 5/8"	6 1/2"					18'		IN		

# Forced Outage Report

7/1/2014	8:00PM	SAFETY BRIEFING													
	8:05PM	WEEKLY SAFETY MEETING													
	9:30PM	HAVE DRYING AGENT STAGED AND FILLING HOPPER IF NEEDED.													
	11:00PM	SWAPPED OVER TO B AMMONIA TANK. A TANK OUT OF SERVICE.													
7/2/2014	1:15AM	ELECT HAS BREAKER CHANGED OUT IN C ASH SLUICE PUMP PUMP IS RUNNING.													
	2:00AM	R1 IS SET TO HYDRO													
	6:00AM	R-1 CONDENSER BACK TO NORMAL													
	7:18AM	R-1 F.D. FANS OFF													
7/2/2014	8:00AM	CONN, CLARK, BREEDEN, HIGGINS, CUTSHAW, BLANKS, YOUNG										B SHIFT		PENDLEY	
		GOODMAN HERE - PAYNE VACATION													
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	OFF										CTL 17'		
		H1	160	165	153	0.436	10.7	0.057	24.6	96%	9.27	223	3.4		
		H2	160	165	152	1.048	10.8	0.079	13.2	81%	15.4	192	3.5		
		CT..	ON STANDBY		56								CTL 14.7'		
		ALARMS:													
		R1	VOLTAGE REG												
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL/A & B PA FAN MOTOR/B BFP AUX OIL												
		H2	EH RES LEVEL HI, GEN. MAIN STEPUP												
		SOOT BLOWERS TAGGED							GAUGE GLASSES		PWTL / 26'		DRYING AGENT		
		R1	22L, 22R					OK					R1-0%		
		H1	27, 30, 31, 33, 43, 44										H1 0%		
		H2	37, 41, 42										H2-0%		
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH					SILO LVL	BOOTHE SYSTEM			
		LEVELS	11' 1/2"	9' 9 1/4"	15' 11 1/2"	6 3/4"					12FT	IN			
7/2/2014	8:00AM	SAFETY BRIEFING													
	8:00AM	R-1'B' BFP ON TO SQUEEZE BOILER													
	8:00AM	R-1 WETBOTTOM TAGGED OUT													
	8:03AM	R-1 BFP OFF - 1050 LBS													
	8:45AM	DRAINING R-1 BOILER TO FIRING LEVEL													
	9:30AM	R-1 BOILER SET TO FIRE													
	9:37AM	H-2 'A' GLAND EXHAUSTER TRIPPED - WILL NOT RESTART - PUT 'B' ON - ISSUED W/O													
	9:15AM	R-1 TURBINE OFF GEAR - TAGGED TURNING GEAR													
	9:45AM	LUBE OIL OFF OF R-1 TURBINE - TURNED 3 WAY VALVE 1/4 TURN COUNTER CLOCKWISE - HANDLE TO THE 3 O'CLOCK POSITION													
	10:11AM	R-1 F.D. FANS OFF													
	NOTE	DRYING AGENT AUGER IS WORKING - OVERLOADS WERE TRIPPED													
	2:30PM	MAINT RELEASED R-1 WETBOTTOM													
	3:00PM	PUT 'A' AIR DRYER IN SERVICE - DEW POINT UP TO 57 DEGREES ON 'B'													
	NOTE	MAINT INSTALLED A NEW SUPERHEAT REGULATOR ON R-1													
	4:00PM	L. BREEDEN LEAVING - 4 HRS VACATION													
	5:45PM	LUBE OIL BACK ON R-1 TURBINE - D.C. LUBE OIL PUMP WILL NOT SHUT OFF - INSTRUMENT CHECKING													
	6:00PM	R-1 TURBINE ON GEAR -													
7/2/2014	8:00PM	EDMONDS, JACKSON, GRIFFIN, BOWLEY, HOGAN, ALEXANDER, WADLINGTON, KURZ										C SHIFT		CARTER	
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1	OFF	50	42	12 HR STANDBY							CTL/17.8'		
		H1	162	165	153	0.639	11	0.065	20.1	87.1	8.84	245/c	3.1		
		H2	160	165	152	1.713	10.6	0.07	23.3	68.8	11.84	244/c	3.5		
		CT..		65	56	ON STANDBY							CTL 15.4'		
		ALARMS:													
		R1	DECS COMMOM 300												
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT												
		H2	EH RES LEVEL HI												
		SOOT BLOWERS TAGGED							GAUGE GLASSES		PWTL 26.0'		DRYING AGENT		
		R1	16,,19,28,29,30,31/22L					OK					R1-0%		
		H1	1- 24 ,,44 / 31,33,39,44										H1-0%		
		H2	41,42/37,39										H2-0%		
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH					SILO LVL	BOOTHE SYSTEM			
		LEVELS	11' 1/2"	9' 9 1/4"	15' 11 1/2"	6 3/4"					13'	IN			
	8:00PM	SAFETY BRIEFING													
	NOTE	INST DEPT WORKING ON R1 DC L.O. PUMP/ 32PSI @ TANK & 24.5@ TURBINE FRONT STANDARD													
	10:30PM	R1 TURBINE OFF GEAR													
	10:40PM	TOOK L.O. OFF R1 TURBINE WITH 3-WAY VALVE THEN VALVED BACK IN / TEST RUN D.C. OIL PUMP TEST OFF GEAR & ON GEAR DID FINE & PUT IN STANDBY													
	11:00PM	R1 TURBINE ON GEAR													
	11:00PM	R1 ON 12HR STANDBY /R.PARKER EMAIL & ACES NOTIFIED													
	11:07PM	CALLED N.STIFF COME IN AT NORMAL TIME													
	11:15PM	M.PEYTON GOING HOME													

# Forced Outage Report

7/6/2014 1:00AM WEEKLY SAFETY MEETING  
3:45AM RAN MONTHLY H-2 FRONT STANDARD TEST ALL PASS OVERSPEED AT 38

8:00AM	MORRIS, DENTON , REYNOLDS, GATTON, BAKER-, EDWARDS, TATE, CALHOUN,										D SHIFT STERLING	
	UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE
	R1		48	42		12 HR	STANDBY					
	H1	143	165	153	0.138	11	0.06	13	97.8	4.62	188	2.5
	H2	143	165	152	0.372	10	0.09	9	93	11.18	209	3
	CT..	STANDBY										
	ALARMS:											
	R1											
	H1											
	H2	EH RES LEVEL HI B PA FAN MTR.HIGH TEMP										
	SOOT BLOWERS TAGGED											
	R1	22L										
	H1	30,31,33										
	H2	41,42, 39, 37										
	GAUGE GLASSES											
	OK											
	DRYING AGENT											
	R1-0%											
	H1-0%											
	H2-0%											
	SILO LVL											
	17"											
	BOOTHE SYSTEM											
	IN											
	FUEL OIL	C.H.	HMPL	NORTH	SOUTH							
	LEVELS	11'2 1/2"	10'	14'9 5/8"	6 1/2"							

9:30AM SCRUBBER STACK ELEVATOR IS NOT WORKING. CALLED AMERICAN SERVICE GROUP THEY ARE ON THERE WAY.  
10:30AM H1 A2 MILL FEEDER CLEANOUT HAS SHEARED PIN. REDTAGGING FOR MAINT. TO REPAIR.  
11:30AM H1 A2 CLEANOUT KEY IS WOLLERED OUT MAINT WELDING SHAFT WILL HAVE TO REPLACE NEXT OUTAGE. ANDY HOLT HERE FOR STARTUP  
1:00PM AMERICAN SERVICE GROUP HAS SCRUBBER ELEVATOR RUNNING.  
2:00PM H2 WETBOTTOM WEST SIDE SLIDE GATE HAS GAS BLOWING OUT AROUND ROLLER BRG  
4:00PM JAY HIGGINS HERE FOR STARTUP SUPPORT.  
4:10PM FIRE IN R1 BOILER  
5:00PM CLOSED DRUM VENTS  
7:40PM PULLING VACUUM ON R-1

7/6/2014	8:00PM	FELTY, CECIL, EMBRY, HILLYARD, DUVALL, JAMES, LEE, JONES VAC										HOGAN, HIGGINS, BREI		A SHIFT	TOW	
		BOWLEY														
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE			
		R1	FIRING	48	42									CTL 18'		
		H1	165	165	153	0.137	10.9	0.065	24.4	97.2	5.98	262 C	2.9			
		H2	160	165	152	0.387	11	0.043	28.7	92.1	12.59	240 C	3.3	CTL 15.5'		
		CT..	ON STANDBY		59											
		ALARMS:														
		R1	VOLTAGE REG													
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E. H. START REQUIRED/DRUM TRANS/ C.T. LEVEL/A & B PA FAN MOTOR/B BFP AUX OIL													
		H2	EH RES LEVEL HI													
		SOOT BLOWERS TAGGED														
		R1	22L						GAUGE GLASSES		PWTL / 28'		DRYING AGENT			
		H1	30,31,33						OK				R1-0%			
		H2	37,39,41,42										H1 0%			
													H2-0%			
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH									SILO LVL	BOOTHE SYSTEM
		LEVELS	11'2 1/2"	10'	14'9 5/8"	6 1/2"									11.3'	BSI

8:00PM SAFETY BRIEFING  
8:00PM PULLING VACUUM ON R-1 2 OIL GUNS IN D.P.900 ST. TEMP. 645 SUPERHEAT 115  
8:05PM TESTED BEARING OIL PUMPS ON R-1  
9:00PM J GOODMAN CALLED FOR VAC. DAY 8A-4P 7-7-14 OKED  
9:00PM A HOGAN GOING HOME  
9:16PM ROLLING R-1 TURBINE  
9:53PM R-1 TIED ON LINE  
10:00PM R-1 PRECIPS IN SERVICE  
10:17PM R-1 A MILL TRIPPED LOST OF FLAME DETECTION  
10:22PM R-1 B MILL ON TO DRY OUT HAD TROUBLE WITH BKR  
10:27PM R-1 A MILL ON  
10:36PM TRIPPED R-1 TURBINE HAD VALVED IN SH SPRAYS REG WAS SHOWING CLOSED BUT STILL SPRAYING SUPER HEAT GOT DOWN TO 5 DEGREES FROM SATURATION TEMP  
10:45PM R-1 PRECIPS OUT  
10:53PM FIRES BACK IN R-1 BOILER  
NOTE DID NOT BREAK VACUUM ON R-1 TURBINE NEVER LOST SUPERHEAT COMPLETELY WAITING ON 100 DEGREES SUPERHEAT TO ROLL AGAIN

7/7/2014 12:52AM	R-1 TIED ONLINE
1:00AM	R-1 PRECIPS IN SERVICE
1:30AM	CANT GET ANY COAL OUT OF A-1 COAL PIPE HOLDING UNIT ON WITH JUST A-2 COAL PIPE TILL B MILL DRIES OUT
NOTE	SHOT COAL PIPE ALL THE WAY FROM 2ND FLOOR TO BURNER HEAD HIGHEST TEMP 130 DEGREES BELOW FLANGE AT BURNER HEAD BURNER HEAD 400 DEGREES
3:44AM	R-1 TURBINE OFF LINE MILL INSPECTION
3:46AM	R-1 PRECIPS OUT OF SERVICE
4:15AM	R-1 FD FANS OFF

# Forced Outage Report

## Estimated Outage Cost

Wash wet bottom and Boiler De-Slag

Cleaning Total	\$1,929.97
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Titan – boiler hydro and Mill/coal pipe/burner inspections

Labor	\$3,120
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<u>Material</u>	<u>\$1,828.11</u>
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Total	\$4,948.11
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Turning Gear Repairs

Total	\$3,600
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Grand Total	\$10,478.08
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# Forced Outage Report

## Lost Sales Opportunity Report

FORCED OUTAGE COST ANALYSIS					
MISO DART Revenue and LOST OPPORTUNITY					
Unit	Reid 1 - R1-14-09			Production Cost	
Date & Time Off Line	6/30/14 15:57			MW	\$/MW
Date & Time On Line	7/2/14 23:00			25	\$ 30.78
Outage Duration	55 hr. 3 min.			40	\$ 29.69
Outage Code	UO3 (26 hr. 6 min.), SF (28 hr. 57 min.)			50	\$ 29.27
Outage Reason	Unit removed from service due to B-1 coal pipe plugged and getting hot. Starting failure due to turbine turning gear problems. Turning gear repaired and unit placed in reserve standby at 2300 on 7/2/14.				
Date	DA LMP Average	RT LMP Average	DART P&L	Lost Opportunity	
6/30/14 (HE 16-24)	\$ 57.86	\$ 37.24	\$ (2,550)	\$ -	
7/1/14 (HE 1-24)	\$ 50.57	\$ 30.30	\$ (1,446)	\$ (8,869)	
7/2/14 (HE 1-23)	\$ 34.21	\$ 30.84	\$ -	\$ (4,371)	
Total			\$ (3,996)	\$ (13,239)	
Start Up Fuel Cost			Total Forced Outage Cost		
S/U Fuel Consumed	0	Unit placed in reserve standby		DART P&L	\$ (3,996)
S/U Fuel Price	\$ -			Lost Opportunity	\$ (13,239)
S/U Fuel Cost	\$ -			S/U Fuel Cost	\$ -
				Total	\$ (17,235)
NOTES:					
All negative values are money out of pocket.					
DART Revenue is calculated from differences between the DA award and RT events					
Lost Opportunity is the lost margins if the unit had stayed running					

# Forced Outage Report

**To:** Jim Garrett

**From:** Billy Boarman

**Date:** 29-Aug-2014

**Plant:** HMP&L Station Two

**Unit:** 2

**GADS Class:** UO3

## Duration

Trip Time: 12-Aug-2014 01:01

Tie Time: 14-Aug-14 04:12

Time Offline: 51:11

## Outage Description

HMP&L Station Two Unit 2 was removed from service on Tuesday, 12-Aug-2014 at 01:01 due to a suspected tube leak in the boiler penthouse area.

## Root Cause

Tube leaks were in the 2<sup>nd</sup> Reheat Outlet Element from the east on the 5<sup>th</sup> and 6<sup>th</sup> tubes off of the Reheat Outlet Header, at elevation 585' -2" in the penthouse. The most likely cause of the leaks is stress cracking.



# Forced Outage Report

## Failure History

No failures of this nature have been reported on this unit in the last three years.

## Corrective Action

Upon further UT and visual investigations, stress cracks were also located where the tube meets the outlet header on the 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> tubes on the 2<sup>nd</sup> element. A washed out spot was also located near the tube-header connection on the 1<sup>st</sup> Reheat Outlet element from the east, the 4<sup>th</sup> tube. These areas along with the tube leaks on the 2<sup>nd</sup> Reheat Outlet Element from the east on the 5<sup>th</sup> and 6<sup>th</sup> tubes, at elevation 585' -2" were cleaned and base metal repairs were applied. Visual inspection of the first three elements on the west side of the outlet header revealed no issues. Also found a leak on the east lower water wall header in the wet bottom area, the 11<sup>th</sup> tube from the north at elevation 438' - 8". This leak was a crack about 1" - 2" long, running parallel with the header. This leak created a shallow wash on the east header; this wash and the crack were repaired via base metal repair. Dye checked tube 31 from the north off of the east lower water wall header at elevation 438' - 8" and found it also required a BMR.

# Forced Outage Report

## SOE Print Out

Triggered on: 12-Aug-2014 01:00:35:210

12-Aug-2014 01:01:05:080	OK		A	H222HTR2LVLHI	LP HEATER 2-3 LEVEL HIGH
12-Aug-2014 01:01:04:962	HIGH		A	H222HTR2LVLHI	LP HEATER 2-3 LEVEL HIGH
12-Aug-2014 01:01:00:901	LOW		A	H225DRMLVLLOW	BOILER DRUM LEVEL LOW
12-Aug-2014 01:00:50:716	OK		A	H240STPVLVTRP	TURB STOP VLV CLSD TRIP
12-Aug-2014 01:00:48:465	OK		A	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
12-Aug-2014 01:00:47:848	TRIP		A	H250OCB186CSTR	OCB 0186 GEN H2 CS TRIP
12-Aug-2014 01:00:46:407	OK		A	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
12-Aug-2014 01:00:45:984	TRIP		A	H250OCB182CSTR	OCB 0182 GEN H2 CS TRIP
12-Aug-2014 01:00:39:384	TRBLE		A	H246XFERTOMAN	VOLTAGE REG TROUBLE
12-Aug-2014 01:00:39:348	LOW		A	H222HTR2LVLLO	LP HEATER 2-3 LEVEL LOW
12-Aug-2014 01:00:39:322	OPEN		A	H250FLDBKRSTS	GEN H2 FIELD BKR STATUS
12-Aug-2014 01:00:39:313	OPEN		A	H250OCB186STS	OCB 0186 GEN H2 STATUS
12-Aug-2014 01:00:39:300	OPEN		A	H250OCB182STS	OCB 0182 GEN H2 STATUS
12-Aug-2014 01:00:39:211	OK		A	H250OCB186GETR	OCB 0186 GEN H2 TRIP
12-Aug-2014 01:00:39:210	OK		A	H250OCB182GETR	OCB 0182 GEN H2 TRIP
12-Aug-2014 01:00:39:186	LKOUT		A	H240STPVLO86TV	TURB STOP VLV LOCKOUT (86TV3)
12-Aug-2014 01:00:39:180	TRIP		A	H250OCB182GETR	OCB 0182 GEN H2 TRIP
12-Aug-2014 01:00:39:180	TRIP		A	H250OCB186GETR	OCB 0186 GEN H2 TRIP
12-Aug-2014 01:00:38:954	OK		A	H233LMISTRP	LAST MILL IN SERVICE TRIP
12-Aug-2014 01:00:35:709	TRIP		A	H240STPVLVTRP	TURB STOP VLV CLSD TRIP
<b>12-Aug-2014 01:00:35:210</b>	<b>TRIP</b>		<b>A</b>	<b>H233EMERBLRTRP</b>	<b>EMERGENCY BLR TRIP</b>
12-Aug-2014 01:00:34:960	TRIP		A	H233LMISTRP	LAST MILL IN SERVICE TRIP
12-Aug-2014 01:00:19:869	OK		A	H225DRMLVLLOW	BOILER DRUM LEVEL LOW

# Forced Outage Report

## Other Work Completed While Unit Was Offline

- Repaired gas leaks in the boiler penthouse and also the economizer hopper area
- Clean 480V transformer
- Checked battery charger connections
- Cleaned air flow back taps
- Adjusted 'B' SCR Diverter Damper limits
- Repaired SCR Seal Air Fan ducting
- Cleaned Wet bottom Seal Trough
- Repaired 'A' PA Fan rating damper
- Inspected and cleaned 'A' PA Fan
- Replaced 'B' Mill pinion gear and bearing
- Replaced 'B' Seal Air Fan discharge valve
- Repaired packing leak on SH spray regulator
- Changed the EH filters and fluid
- Replaced SW-1, NW-4, and NW-2 Steam coils
- Inspected Scrubber duct work and expansion joints
- Inspected Booster Fan inlet guide vanes
- Precipitator inspection
- Boiler Back-pass inspection
- Repaired coal leaks on "A" Mill
- Repaired coal leaks on "B" Mill
- Cleaned seal air fan filters
- Repaired the two south doors on top of Air Heaters

# Forced Outage Report

## Operators Event Log

8/12/2014	12:35AM	H-2 SCR OUT										GLOBAL HERE					
	1:00AM	OIL OUT OF H-2 BOILER															
	1:01AM	H-2 OFF LINE SCRUBBERS OUT															
	1:05AM	H-2 PRECIPS OUT															
	1:15AM	FANS BLOWING IN H-2 PENTHOUSE															
	1:50PM	DRAINING H-2 BOILER															
	4:00AM	SETTING H-2 FOR HYDRO															
	4:15AM	BYPASSING H-2 SCR TOP TEMP 288 BOTTOM 184															
	5:15AM	H-2 B BFP ON FOR HYDRO															
	6:00AM	H-2 BFP OFF BOILER FULL VENTS CLOSED															
	NOTE	WASHED FD FAN PADS															
	NOTE	ALL PRECIPS AND ECON HOPPERS PULLED DOWN ON H-2															
	6:30AM	BOOTHE SYSTEM IS OUT															
	7:06AM	H2 B BOILER FEED PUMP ON FOR BOILER HYDRO															
	7:07AM	H2 A AND B VAC PUMPS ON FOR VAC CHECK															
	7:10AM	H2 A 480V LOAD CENTER TAGGED OUT															
	7:11AM	H2 B BOILER FEED PUMP OFF FOR HYDRO. NOTIFY B. CHEATHAM															
	7:15AM	H2 A 480 V MCC OUT FOR ELECTRICIANS															
	7:52AM	H2 A BFP ON FOR HYDRO AGAIN. MAINT HAVING TROUBLE LOCATING LEAK															
	7:55AM	H2 A 4160V LOAD CENTER OUT FOR ELECTRICIANS. SWAPPING OUT 4160BRK ON TIE															
8:00AM	DENTON , REYNOLDS, HIGGINS, BAKER- EDWARDS VAC, GOODMAN , CALHOUN,												D SHIFT		STERLING/PAYNE		
	UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE					
	R1	12 HOUR STANDBY															
	H1	160	165	153	0.331	10.5	0.071	28	93	6.6	255	3					
	H2		165	UNIT OUTAGE													
	CT..	STANDBY															
	ALARMS:																
	R1																
	H1	B PA FAN MTR HIGH TEMP BOILER DRUM LEVEL TRANS MAINT. B BOILER FEEDPUMP AUX OIL PUMP															
	H2	EH RES LEVEL HI															
	SOOT BLOWERS TAGGED													GAUGE GLASSES		DRYING AGENT	
	R1												OK		R1-0%		
	H1	30,31,33,46													H1-0%		
	H2	9,4',37,42													H2-0%		
											SILO LVL		BOOTHE SYSTEM				
											11FT		OUT				
	FUEL OIL													C.H.	HMPL	NORTH	SOUTH
	LEVELS													4' 9 3/4"	11'1 3/4"	13'	6 1/2"
	8/12/2014	8:00AM	SAFETY BRIEFING														
		8:00AM	H2 A BFP OFF FOR HYDRO														
8:01AM		H1 PARTICULATE TESTING STARTED.															
8:01AM		H2 A 4160V TIE BREAKER BACK IN SERVICE															
NOTE:		C CIRC WATER PUMP OFF															
9:30AM		FOUND LEAK IN H2 PENTHOUSE , AND SMALL WEAVER ON RING HEADER AT WET BOTTOM															
NOTE:		INSULATORS WORKING ON PULLING OF LAGGING AND INSULATION. EXPRO ON STANDBY WAITING FOR THEM															
10:15AM		H1 IN MANUAL. TRYING TO KEEP BOILER FROM SWINGING SO BAD AT 165 MW															
10:35AM		INSULATORS COMPLETED ON BOILER. EXPRO MAKING 15MIN ANNOUNCEMENT BEFORE BLASTING															
10:55AM		BLASTING IN H2 BOILER															
11:07AM		H1 BACK IN AUTOMATIC AND ADS CONTROL															
11:25AM		H2 B RECYCLE PUMP WILL NOT RACK OUT. NUT IS STRIPPED. ELEC WORKING ON SAME															
1:15PM		H1 PARTICULATE TEST COMPLETE															
1:20PM		H1 A RECYCLE PUMP BACK ON															
2:30PM		H2 BOILER DESLAGGED, PULLING WETBOTTOM ON H2															
4:30PM	WET BOTTOM TAGGED FOR ENTRY																
8/12/2014	8:00PM	CECIL, EMBRY, HILLYARD, TATE, JOHNSON, JAMES, JONES												A SHIFT TOW			
	UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE					
	R1		48	ON 12 HOUR STANDBY											CTL 18"		
	H1	162	165	153	0.102	10.7	0.072	28.1	97.8	5.78	270	2.8	PWTL 27'				
	H2	PIT STOP	162	149											CTL 15.3'		
	CT..		65	59	ON STANDBY												
	ALARMS:																
	R1																
	H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT/A & B PA FAN MOTORS/ B BF															
	H2	EH RES LEVEL HI															
	SOOT BLOWERS TAGGED													GAUGE GLASSES		DRYING AGENT	
	R1												OK		R1-0%		
	H1	30,31,33,46													H1-0%		
	H2	37,41,42													H2-0%		
											SILO LVL		BOOTHE SYSTEM				
											12.3'		OUT				
	FUEL OIL													C.H.	HMPL	NORTH	SOUTH
	LEVELS													4' 9 3/4"	11'1 3/4"	13'	6 1/2"

[illegible]

8/13/2014		8:00PM										B SHIFT				PENDLEY	
FELTY, CLARK, BREEDEN, CUTSHAW, YOUNG, BLANKS, WADLINGTON																	
JOHNSON & JONES HERE																	
UNIT		LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE					
R1			48										CTL 18'				
		ON 12 HR STANDBY															
H1		143	165	152	0.099	10.7	0.064	30.4	98	4.31	198	2.9					
H2		OFF	165								C		CTL 15.5'				
CT..		ON STANDBY		58											C		
ALARMS:																	
R1																	
H1		BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. START REQUIRED/DRUM TRANS/ C.T. LEVEL/A & B PA FAN MOTOR/B BFP AUX OIL															
H2		EH RES LEVEL HI															
SOOT BLOWERS TAGGED																	
R1									GAUGE GLASSES		PWTL		DRYING AGENT				
									OK		26'		R1-0%				
H1		30,31,33,46											H1 0%				
H2		37.41											H2-0%				
FUEL OIL																	
C.H.		HMPL		NORTH		SOUTH				SILO LVL		BOOTHE SYSTEM					
LEVELS		10' 5"	11' 1 1/2"	12' 4 1/2"	6 1/2"					15'		OUT					
8/13/2014		8:00PM SAFETY BRIEFING															
		8:20PM MAINT RELEASED FOR AIR TEST															
		8:28PM A AND B FD FANS ON FOR AIR TEST															
		8:45PM MAINT FOUND TWO PORTS LEAKING BADLY. FANS OFF															
		9:33PM H2 AIR TEST GOOD															
		9:48PM FIRE IN H2 BOILER															
		10:35PM LOST FIRE IN H-2 - DRUM SWELL - DROPPED DOWN TO 1 OIL GUN AND LOST SCANNER ON IT															
		10:45PM FIRE BACK IN H-2 BOILER															
		11:16PM H-2 VENTS CLOSED - 50 LBS															
8/14/2014		12:18AM PRI & SEC INLET DRAINS CLOSED															
		2:15AM SEALING & PULLING VACUUM - H-2															
		2:43AM H-2 TURBINE ROLLED OFF GEAR - 890 LBS & 99 DEGREE SUPERHEAT															
		2:51AM RESET H-2 TURBINE - ROLLING															
		3:50AM H-2 VALVE TRANSFER															
		4:12AM H-2 TIED ONLINE - PRECIPS IN EXCEPT 'B' OUTLET - WILL NOT GO IN															
		5:29AM H-2 SCRUBBER IN SERVICE															
		5:38AM TRANSFERRED H-2 AUXILIARIES															
		6:40AM R-1 TURBINE CAME OFF GEAR - WILL NOT GO BACK ON GEAR - INST CHECKING															
		6:50AM WARMING H-2 SCR															
8/14/2014		8:00am JACKSON ,GRIFFIN,BOWLEY, HOGAN,GATTON ,ALEXANDER,PAYNE															
C SHIFT CARTER/PAYNE																	
UNIT		LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE					
R1			48	12HR STANDBY									CTL/18.0'				
H1		164	165	153	0.154	9.8	0.071	35.5	96.4	5.56	272/C	3.1					
H2			162										CTL 15.5'				
CT..		65	56	ON STANDBY													
ALARMS:																	
R1																	
H1		BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT/A & B PA FAN MOTORS/ B BFP AUX OIL F															
H2		EH RES LEVEL HI															
SOOT BLOWERS TAGGED																	
R1		16,,19,28,29,30,31/24R							GAUGE GLASSES		PWTL 26.0'		DRYING AGENT				
									OK				R1-0%				
H1		1- 24 , / 30,31,33,46											H1-0%				
H2		9,,41/37											H2-0%				
FUEL OIL																	
C.H.		HMPL		NORTH		SOUTH				SILO LVL		BOOTHE SYSTEM					
LEVELS		10' 5"	11' 1 1/2"	12' 4 1/2"	6 1/2"					14'		OUT					

# Forced Outage Report

## Boiler Tube Leak Record

Plant: HMP&L Station Two

Unit: 2

### Type of Leak:

Pin Hole ☒ Thick Lip Failure \_\_\_\_\_ Thin Lip Failure \_\_\_\_\_

Tube Wall Thinning \_\_\_\_\_

Orientation of Rupture: Longitudinal ☒ Circumferential \_\_\_\_\_

### Probable Cause:

Stress ☒ Overheat \_\_\_\_\_ Erosion \_\_\_\_\_ Internal Corrosion \_\_\_\_\_

External Corrosion \_\_\_\_\_ Weld Failure \_\_\_\_\_ (Shop \_\_\_\_\_ Field \_\_\_\_\_)

Internal Obstruction to Flow \_\_\_\_\_ Soot blower Erosion \_\_\_\_\_

Other \_\_\_\_\_

### Type of Repair:

Dutchman \_\_\_\_\_ Pad Weld ☒ Plug Tube \_\_\_\_\_ Short Circuit \_\_\_\_\_ Other \_\_\_\_\_

### Description of Repair:

Upon further UT and Visual investigations, cracks were also located where the tube meets the outlet header on the 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> tubes on the 2<sup>nd</sup> element. A washed out spot was also located the tube-header connection on the 1<sup>st</sup> Reheat Outlet element from the east, the 4<sup>th</sup> tube. These areas along with the tube leaks on the on the 2<sup>nd</sup> Reheat Outlet Element from the east on the 5<sup>th</sup> and 6<sup>th</sup> tubes, at elevation 585' -2" were cleaned and had BMR's performed. Visually inspected the first three elements on the west side of the outlet header and found no issues. Also found a leak on the east lower water wall header, the 11<sup>th</sup> tube from the north at elevation 438' - 8". This leak was a crack about 1" - 2" long, running parallel with the header. This leak created a shallow wash on the east header; this wash and the crack were repaired via BMR. Dye checked tube 31 from the north off of the east lower water wall header at elevation 438' - 8" and found it required a BMR.

# Forced Outage Report

## Exact Location of Leaks:

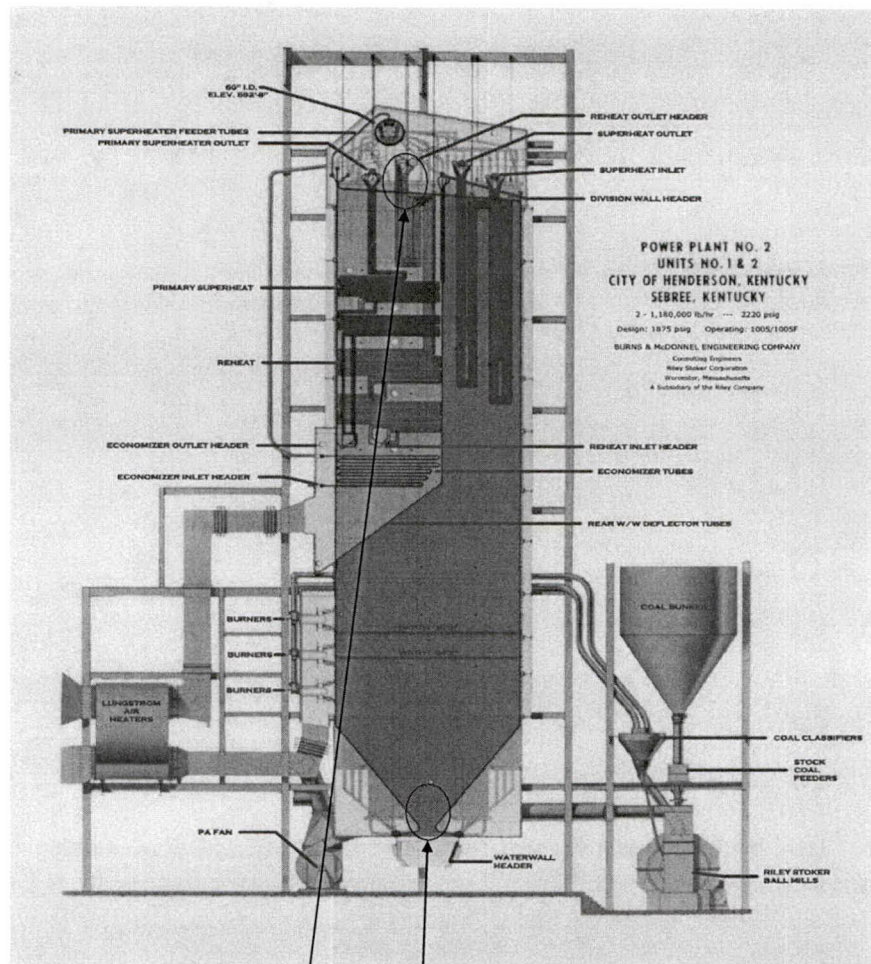
HMPL STATION UNIT 2

2014

(8) TUBES INVOLVED

Date and Time Unit Off 01:01 8-12-14

Date and Time Unit On 04:12 8-14-14



Upon further UT and Visual investigations, cracks were also located where the tube meets the outlet header on the 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> tubes on the 2<sup>nd</sup> element. A washed out spot was also located the tube-header connection on the 1<sup>st</sup> Reheat Outlet element from the east, the 4<sup>th</sup> tube. These areas along with the tube leaks on the on the 2<sup>nd</sup> Reheat Outlet Element from the east on the 5<sup>th</sup> and 6<sup>th</sup> tubes, at elevation 585' -2\" were cleaned and had BMR's performed. Visually inspected the first three elements on the west side of the outlet header and found no issues. Also found a leak on the east lower water wall header, the 11<sup>th</sup> tube from the north at elevation 438' - 8\". This leak was a crack about 1\" - 2\" long, running parallel with the header. This leak created a shallow wash on the east header; this wash and the crack were repaired via BMR. Dye checked tube 31 from the north off of the east lower water wall header at elevation 438' - 8\" and found it required a BMR.

# Forced Outage Report

## Estimated Outage Cost

- Boiler De-Slag

**Total           \$8,815.06**

- Vacuuming Economizer Hoppers, Boiler penthouse and Cleaning the AH's

**Total           \$15,451**

- Titan – tube leak repair and misc. repairs

Labor           \$45,020

Material       \$18,860.70

**Total           \$63,880.70**

**Grand Total       \$88,146.76**

# Forced Outage Report

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>HMP'L 2 - H2-14-08</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	8/12/14 1:01			<b>MW</b>
<b>Date &amp; Time On Line</b>	8/14/14 4:12			<b>\$/MW</b>
<b>Outage Duration</b>	51 hr. 11 min.			61
<b>Outage Code</b>	U03			127
<b>Outage Reason</b>	Repair tube leak located in penthouse.			149
				\$ 33.26
				\$ 29.69
				\$ 29.37
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
8/12/14 (HE 1-24)	\$ 27.72	\$ 28.29	\$ (852)	\$ -
8/13/14 (HE 1-24)	\$ 29.32	\$ 29.26	\$ -	\$ (777)
8/14/14 (HE 1-15)	\$ 26.74	\$ 29.92	\$ (2,456)	\$ -
<b>Total</b>			\$ (3,307)	\$ (777)
<b>Start Up Fuel Cost</b>				<b>Total Forced Outage Cost</b>
S/U Fuel Consumed	7,794			DART P&L
S/U Fuel Price	\$ 3.15			Lost Opportunity
<b>S/U Fuel Cost</b>	<b>\$ (24,536)</b>			S/U Fuel Cost
				<b>Total</b>
				\$ (3,307)
				\$ (777)
				\$ (24,536)
				\$ (28,620)
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Jim Garrett

**From:** Perry Bowley

**Date:** 17-Sep-2014

**Plant:** Green

**Unit:** 1

**GADS Class:** UO3

## Duration

Trip Time: 22-Aug-2014 00:59

Tie Time: 23-Aug-2014 01:40

Time Offline: 24:41 minutes

## Outage Description

Green Unit 1 was removed from service via controlled shutdown on Friday, 22-Aug-2014 at 00:59 due to the main steam outlet safety valve was leaking through.

## Root Cause

Following the two unit trips on the previous day due to the OCB 106 issues, the main steam outlet safety valve lifted and did not fully reseal.

## Failure History

An outage attributed to the main steam outlet safety valve leaking through occurred on 01-Aug-2012 for duration of 19:06.

## Corrective Action

Industrial Valve came in and reseated the valve using Big Rivers' inventory parts.

# Forced Outage Report

## SOE

Not Available

## Other Work Completed While Unit Was Offline

Miscellaneous Valves Were Repacked

Instrumentation Calibrated Some Controls

# Forced Outage Report

## Operators Event Log

8/22/2014 12MN UNDERFLOW RUN TIMES

1A	9HRS.
1B	13HRS.
2A	10HRS.
2B	17HRS.

I.U. RUN TIME 15HRS.

12:59AM G-1 OFF LINE TO FIX SAFETY. ALL OIL OUT AND PRECIPS OUT

	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
1:00AM	1A	OFF			0	6'9"
	1B	ON	210	35.2	10	6'9"
	2A	OFF			0	6' 10"
	2B	ON	213	33.2	5	6'9"

3:15AM RED TAGGED 0100-9 GENERATOR DISCONNECT HOLD #555

4:00AM	PH'S	1A	1B	2A	2B
				6.14	6.35

8/22/2014 8:00 D. BARRON, GEER, TURNER, DENTON, MAHAN, BOLDS, RITTMAYER  
DALE G. THOMAS (VAC) , TOWNSEND , HOBGOOD ,STRICKLAND, RIGDON  
C SHIFT

# Forced Outage Report

	<u>UNITS</u>	<u>LOAD</u>	<u>CAP.</u>	<u>SO2</u>	<u>NOX</u>	<u>OPACITY</u>	<u>MILLS</u>	<u>PR</u>
	G-1	OFF						
	G-2	237	229	0.112	0.25	7.9	2C S/B	
8:00	<u>SLAKERS</u>	<u>IN/OUT</u>	<u># ON</u>	<u>TANK LEVELS</u>	<u>SILO</u>			
	G-1	OUT		22.7/23				
	G-2	IN	2	23.4/23.5	3			
	PREP	OUT		78.2%				
	<u>FEED RATES:</u>	<u>1C1</u>	<u>1C2</u>	<u>1C3</u>	<u>1C4</u>	<u>2C1</u>	<u>2C2</u>	
							50	
8:00	<u>I.U.</u>	<u>CONV.</u>	<u>DRUMS</u>	<u>F/A SILO</u>	<u>F/A TONS</u>	<u>SMOOT</u>	<u>SMT. RATE</u>	<u>T/</u>
	IN	A	B&C	2	19	1	26%	
8:00	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>		
	1A	OFF			0	6'10"		
	1B	ON	218	33.9	5	6'10"		
	2A	OFF			0	6'10"		
	2B	OFF			8	6'9"		

# Forced Outage Report

## STACK DRAINS

G-1

G-2 OPEN

8:00	<u>F/A SILOS</u>	<u>LEVEL</u>	<u>EAST</u>	<u>WEST</u>	<u>SILO</u>	<u>SAFETY</u>
	#1 F/A SILO	34'	1.5	1	0	0
	#2 F/A SILO	24'	1.5	0	0	0

10:30 AM MAINTENANCE RELEASED HMPL SLAKERS PUTTING BUILDING IN SERVICE

12 NOON	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
	1A	ON	57	30.9	0	6'10"
	1B	OFF			5	6'10"
	2A	ON	81	31.8	0	6'10"
	2B	OFF			5	6'9"

3:15 PM SETTING G-1 BOILER FOR HYDRO

4:00 PM G-1 "C" BOILER FEED PUMP ON

4:00 PM	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
	1A	ON	48	32	0	6'10"
	1B	OFF			5	6'10"
	2A	ON	79	32.5	0	6'10"
	2B	ON	207	33.2	10	6'9"

# Forced Outage Report

5:15 PM VALVING OUT G-1 #2 HEATER POSSIBLE TUBE LEAK.

8/22/2014 20:00 DONITHAN, FARLEY, BACHMAN, MILLER, WHITLEDGE, HOOVER, LOVAN, TAPP, T. PARKEI

C.

JOHNSON K. WEST, HUST, BARRON, & SMITH HERE FOR UNIT START-UP

B SHIFT

<u>UNITS</u>	<u>LOAD</u>	<u>CAP.</u>	<u>SO2</u>	<u>NOX</u>	<u>OPACITY</u>	<u>MILLS</u>	<u>PR</u>
G-1	SETTING	TO	FIRE				

G-2	239	237	0.16	0.25	8.8%	2C ON S/B
-----	-----	-----	------	------	------	--------------

<u>SLAKERS</u>	<u>IN/OUT</u>	<u># ON</u>	<u>TANK LEVELS</u>	<u>SILO</u>
G-1	IN	2	23/23	
G-2	IN	2	23/23	3
PREP	OUT	0	89.0%	4

	<u>I.U.</u>	<u>CONV.</u>	<u>DRUMS</u>	<u>F/A SILO</u>	<u>F/A TONS</u>	<u>SMOOT</u>	<u>SMT. RATE</u>	<u>S</u>
20:00	IN	A	B & C	1	24	1	26%	T/

	<u>F/A SILOS</u>	<u>LEVEL</u>	<u>EAST</u>	<u>WEST</u>	<u>SILO</u>	<u>SAFETY</u>
20:00						

# Forced Outage Report

#1 F/A SILO	28'	1.5	0.5	0	0
#2 F/A SILO	31'	1.5	0.5	0	0

<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
1A	ON	58	32.4	0	6' 10"
1B	OFF	248	28.2	2	6' 10"
2A	ON	73	33.8	0	6' 11"
2B	ON	231	32.4	8	6' 9"

NOTE: STACK DRAINS

G-1

G-2 OPEN

22:34 OIL FIRES ESTABLISHED IN G-1 BOILER HOTLINE NOTIFIED

<u>8/23/2014</u>	<u>0:00</u>	<u>I.U.</u>	<u>CONV.</u>	<u>DRUMS</u>	<u>F/A SILO</u>	<u>F/A TONS</u>	<u>SMT. SMOOT</u>	<u>RATE</u>	<u>S TA</u>
		IN	A	B & C	1	23	1	26%	

0:00 UNDERFLOW RUN TIMES

1A	16.5 HRS
1B	8.5 HRS
2A	11.5 HRS

# Forced Outage Report

16.5  
2B HRS  
  
20.5  
I.U. RUN TIME HRS.

	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
0:00	1A	OFF	70		0	6' 10"
	1B	ON	220	34	2	6' 10"
	2A	OFF	80	32.6	0	6' 11"
	2B	ON	230	32.4	6	6' 9"

	<u>SLAKERS</u>	<u>IN/OUT</u>	<u># ON</u>	<u>TANK LEVELS</u>	<u>SILO</u>
0:00	G-1	OUT		24.9 / 23.7	
	G-2	IN	3	25.1 / 25.1	
	PREP	IN	2	73.4%	

1:40 G-1 TIED ON LINE, HOTLINE NOTIFIEDED, UNIT STATUS E-MAIL SENT

1:42 G-1 PRECIPS IN SERVICE, HOTLINE NOTIFIED

4:00 1600 PSIG DRUM ON G-1, CHECKING BOILER SAFETIES FOR LEAKS, NONE LEAKING AT THIS

	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
4:30	1A	ON	57		0	6' 10"

## Forced Outage Report

1B	ON	219	34.4	2	6' 10"
2A	ON	67	34.6	0	6' 11"
2B	ON	233	31.8	4	6' 9"

NOTE: STACK DRAINS

G-1 OPEN

G-2 OPEN

6:00 L. SMITH DEPARTS, OPTIONED OUT AS THAT UNIT WAS STABLE

# Forced Outage Report

## Estimated Outage Cost

Outside Labor	\$2,667
Materials	<u>\$44,034</u>
Total	\$46,700

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>Green 1 - G1-14-15</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	8/22/14 0:59			<b>MW</b>
<b>Date &amp; Time On Line</b>	8/23/14 13:40			<b>\$/MW</b>
<b>Outage Duration</b>	24 hr. 41 min.			163
<b>Outage Code</b>	UO3			199
<b>Outage Reason</b>	Repair leaking superheater outlet safety.			235
				\$ 27.60
				\$ 26.80
				\$ 26.58
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
8/22/14 (HE 1-24)	\$ 34.67	\$ 32.67	\$ (228)	\$ (45,054)
8/23/14 (HE 1-12)	\$ 26.30	\$ 29.27	\$ 63	\$ -
<b>Total</b>			<b>\$ (165)</b>	<b>\$ (45,054)</b>
<b>Start Up Fuel Cost</b>				<b>Total Forced Outage Cost</b>
S/U Fuel Consumed	13,238			DART P&L
S/U Fuel Price	\$ 3.14			\$ (165)
<b>S/U Fuel Cost</b>	<b>\$ (41,619)</b>			Lost Opportunity
				\$ (45,054)
				S/U Fuel Cost
				\$ (41,619)
				<b>Total</b>
				<b>\$ (86,838)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Jim Garrett

**From:** Billy Boarman

**Date:** 28-Aug-2014

**Plant:** Reid Station

**Unit:** 1

**GADS Class:** UO1

## Duration

Trip Time: 14-Aug-2014 06:40      Placed on 12-Hour Standby: 14-Aug-2014 19:55

Time Offline: 13:15

## Outage Description

Reid Station Unit 1 was removed from service on Thursday, 14-Aug-2014 at 06:40 due trouble with the turbine turning gear. The turbine "rolled" off turning gear and the turning gear could not be re-engaged. The unit was placed on 12-hr reserve stand-by on Thursday, 14-Aug-2014 at 19:55.

## Root Cause

The turning gear was disassembled and a few bolts had backed out preventing the gear from engaging. The bolts were tightened and the turning gear was reassembled and reinstalled.

# Forced Outage Report

## Failure History

On 30-Jun-2014 the turning gear failed to engage. The turning gear was removed and the problem was determined to be broken bolts on a sprocket. The bolts were replaced and the unit was placed on 12-hr reserve stand-by.

## Corrective Action

Disassembled the turning gear and found some bolts had backed out preventing the gear from engaging. The bolts were tightened and the turning gear was reassembled and installed.

## Other Work Completed While Unit Was Offline

None

# Forced Outage Report

## Operators Event Log

8/14/2014	6:40AM	R-1 TURBINE CAME OFF GEAR - WILL NOT GO BACK ON GEAR - INST CHECKING													
	6:50AM	WARMING H-2 SCR													
	8:00am	JACKSON ,GRIFFIN,BOWLEY, HOGAN,GATTON ,ALEXANDER,PAYNE										C SHIFT CARTER			
		onan													
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE		
		R1		48	12HR	STANDBY									
		H1	164	165	153	0.105	11	0.068	34.7	97.9	4.89	254/C	3.7		
		H2	65	162	65	0.457	7.7	0.457	10.2	98.3	5.68		CTL/18.0'		
					1550 DRUM										
		CT..	65	56	ON STANDBY									CTL 15.3'	
		ALARMS:													
		R1													
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT/A & B PA FAN MOTORS/ B BFP AUX OIL PUMP, HYDROGEN PURITY COMMON												
		H2	EH RES LEVEL HI												
		SOOT BLOWERS TAGGED													
		R1	16,,19,28,29,30,31/24R						GAUGE GLASSES		PWT/L 27.0'		DRYING AGENT		
		H1	1- 24 , / 30,31,33,46						OK				R1-0%		
		H2	9,,41/37										H1-0%		
													H2-0%		
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH								SILO LVL	BOOTHE SYSTEM
		LEVELS	10' 3"	8' 9 1/2"	12' 4 1/2"	6 1/2"								17'	in
	8:00AM	SAFETY BRIEFING													
	8:48AM	R1 TURBINE OFF GEAR AND R/T WORKING ON TURNING GEAR/ LUBE OIL 3-WAY VALVE IN 6 OCLOCK POSITION BEARING OIL OFF SEAL OIL STILL ON GENERATOR LUBE													
		DC L.O. LOCK OUT IN OFF POSITION													
	8:41AM	H2 SILICA .545													
	9:06AM	BOOTHE SYTEM IN 17'													
	9:08AM	H2-B MILL RELEASED													
	9:39AM	H2 FUEL OIL IN BOILER													
	10:12AM	H2 SILICA .627 GOOD FOR 1800 DRUM													
	11:17AM	H2 SILICA GOOD FOR MAX DOING SAME													
	12:41PM	H2- B MILL ON													
	1:07PM	H2-B INLET PRECIP IN SERVICE / NOTE BEING FEED FROM H2-B MCC LOCAL DISCONNECT BAD													
	1:18PM	H2 SCR FLOWING AMMONIA													
	1:20PM	R1 OFF STANDBY DUE TO TURNING GEAR ISSUES													
	1:45PM	H2 FUEL OIL OUT OF BOILER													
	1:15PM	H2 IN ADS GOOD FOR 152NET													
	NOTE	TRANSFERRED FUEL OIL TO HMPL													
	3:50PM	H2 OUT OF ADS BURERS LOOK GOOD MANUALLY PULLED PRECIPS INST DEPT CLEANED OPACITY LENS, CHECKED PRECIPS & RAPPERS													
	NOTE	H2 STEAM COILS SW-1,NW-4 BACK IN SERVICE / NW-2 OUT PIPING STILL LEAKING													
	NOTE	H2 STEAM COILS SW-1,NW-4 BACK IN SERVICE / NW-2 OUT PIPING STILL LEAKING													
	NOTE	ADDED 1 BARREL LUBE OIL TO GAS TURBINE RESIVOIR													
	4:47PM	H2 BACK IN ADS													
	NOTE	R.PARKER NOTIFIED ABOUT H2 OPACITY PROBLEMS													
	7:55PM	R-1 TURBINE BACK ON TURNING GEAR													

# Forced Outage Report

## Estimated Outage Cost

Turning Gear Repairs

Total	\$3,600
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# Forced Outage Report

## Lost Sales Opportunity Report

None

# Forced Outage Report

**To:** Jim Garrett

**From:** Eric Anderson

**Date:** 18-Sep-2014

**Plant:** Wilson

**Unit:** 1

**GADS Class:** UO2

## Duration

Trip Time: 17-Sep-2014 13:07

Tie Time: 17-Sep-2014 19:14

Time Offline: 06:07

## Outage Description

Wilson Station was removed from service on Wednesday, 17-Sep-2014 at 13:07 to repair motor operated disconnect switch 2079 in the switchyard. The Unit was returned to service immediately after the switch was repaired.

## Root Cause

Motor Operated Disconnect switch 2079 experienced a component failure that prevented the blade from fully entering the contact jaws and locking the switch into place. The failure was in the rotating arm molded bracket, which sheared, allowing the live parts of the switch to float out of the contact jaws. This abnormal situation could have eventually caused a catastrophic failure if left in this condition.

## Failure History

No failures of this nature have been recorded for this unit in the last three years.

## Corrective Action

Big Rivers ET&S technicians were on site to repair disconnect switch 2079.

## Other Work Completed While Unit Was Offline

None

# Forced Outage Report

## Operators Event Log

9/17/2014 12:00am

Working on flyash high levels row 5 east and west  
Daily report

Red tagged #3 mill for M/M for 3000 hr inspection

6:00am SO3 system in service

7:00AM Cooper in Owens out

MW 450 KPPH 362 SO2 5.30/5.16 NOX .054 OPAC 6.9 REMOV 91.4 CO2  
10.5/10.3 4 MILLS 4 MODULES 16 CIRC PUMPS

VARs 90 SLURRY FEED TANKS 12.4/13.1 CO 247/38 Sludge tanks 2.9/3.6  
VOLTAGE 23.8 BED LEVEL 96"

8:00AM McElwain , Stewart , Payne , Poore , Emberton , Jones, Calhoun,  
Safety/job briefing  
Flushing wet seal

10:30AM Morning Meeting

12:27PM Out of ADS bring unit off

12:28PM Oil in all igniter

1:07PM Unit off line for repairs. Notified H/L

1:15PM SCR out of service

2:30PM DeWright Stewart out taking wife to hosp

3:00PM Caldwell called back coming in

3:46PM Fire in Boiler

5:00PM Rolling turbine

6:07PM Daugherty call he maybe late

7:00pm Owens in Cooper out

7:12pm Precipe in Service. H/L notified

7:14pm Unit tied on line. H/L notified

12/1/2013

12:00am WO# 6115263 AL17W hole in hopper behind top gate

WO# 6115264 AL20W hole in bottom of air lock

WO# 6115265 AL22W hole below maint gate

1:00am Weekly Testing

1:58am Out of ADS for valve test

Valve Test complete.

3:48am Back in ADS

7:00am Crowe in Todd out

7:50am Duct #2 C02 failed cal. Running Inst call in list, no answers, notified M. Campbell.

8:00am McCarty, McElwain, S. Roby, Wilson, Worley in. Piper on S/L

Safety Briefing

8:15am Cliff Crain called back and coming in to repair C02 monitor

Boiler inspection

Flushed Wet Seal

9:07am Cliff Crain in

# Forced Outage Report

11:00AM Scrubber nozzle checklist  
Drum level trip test complete  
Monthly Halon system checklist  
Replacing 6.9 breaker bulbs

12:45pm Cliff Crain out  
Daily cleaning  
Working on sprinkler flow system checks

Note: Inlet pipe to sewage plant broke, porta-pottys coming back  
Hydrogen reading  
Picking up trash around plant site

5:00pm Quarterly Primary air heater data

5:30pm Isolated fire water valves 148, 149 & 152 to trouble shoot a under ground leak. Notified Facto

6:20pm #1 Ignition oil pump tripped, motor hot, issued work order, 6115326

7:00pm Todd in, Crowe out  
Current-448 Gross MW 417 Net MW Cap @ 8:00pm  
SCR in, SO3 out, 1,2,3,4 modules, CSI 9', Ball mill- #2-49 amps  
1,2,4,5 Mills Boiler O2-3.1% Windbox- 2.78 Total Coal-353 Total Air- 94.52% Control Air Dw  
So2 Removal- 91.9 Nox-.061 Opacity- 3.0%, Ammonia tank levels- 50/37 S02 inlets- 5.1/5.3  
H2 Pressure- 58 H2 Purity- 98% Gen. Gas Density- 41% INWC Fan Diff.- 75 Seal Oil Diff.- 1!  
Back Press.- 2.99 avg. Stator Gas Temp. diff.- 7.01 Gen. Voltage- 23.81 Gen. Megavars- 87  
J. Stewart, Hall, Stovall, Drake, Barrett in

8:00pm Safety Briefing

8:15pm Opened CBD to 2 turns open

8:30pm Boiler Walkdown

9:00pm Flushed Wet Seal

9:30pm Baricading all sewer inlet points

10:00pm Misc Equip Check

11:00pm Stroked Modulating Dampers

12/2/2013 12:00am AH sootblowing Check

1:00am Hydrogen reading

2:00am Water Run

3:00am Control Room Trash

4:00am Cleaned Feeder Deck

5:00am Unit Status Update  
Scheduled Inland in to clean up ballmill bldg

5:30am RT #1 Ballmill

5:40am RT mill washout svc water root vlv

7:00AM Cooper,in Todd out  
MW 450 KPPH 356 SO2 4.88/5.43 NOX.063 OPAC 3.8 REMOV 91.8 CO2 10.8/10.4 4 MILL!  
MVARs 97 SLURRY FEED TANKS 15.3/14.9 CO 124/677 Sludge tanks 5.0/7.1 VOLTAGE 2

8:00AM Roby,Stewart S/L,Baker,Poore,Jones,Calhoun  
Safety briefing

9:00AM Smoke run

9:11AM Flushing wet seal

10:30AM Morning Meeting

## Forced Outage Report

12:00PM Debusk out  
Working on annual halon system

1:15PM Fred McCarty in Sam Baker out

5:00PM Checking SO3 nozzels 4,5 and 7 west plugged

5:30pm CSI back in service  
WO# 6115420 IR 27 hung in boiler  
WO# 6115419 fire panel in control room showing ground faulted  
WO# 6115415 service air line that feeds both underflow tunnels has a split in line at bottom of  
WO# 6115422 SO# nozzels 4.5, and 7 west plugged

7:00pm Mattingly in Cooper out  
MW 450 KPPH 365 SO2 4.99/4.93 NOX .064 OPAC 3.8 REMOV 91.3 CO2 10.1/10.3 4 MILI

# Forced Outage Report

## Estimated Outage Cost

Contract Labor Cost = \$0.00

Material Cost = \$0.00

Total Non-Labor Cost = \$0.00

Due to the short length of this outage, no contractor work was completed during this time. Big Rivers ET&S technicians repaired the disconnect switch in the switchyard.

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>Wilson - W1-14-08</b>		<b>Production Cost</b>	
<b>Date &amp; Time Off Line</b>	9/17/14 13:07		<b>MW</b>	<b>\$/MW</b>
<b>Date &amp; Time On Line</b>	9/17/14 19:14		300	\$ 25.75
<b>Outage Duration</b>	6 hr. 7 min.		360	\$ 25.02
<b>Outage Code</b>	UO2		420	\$ 24.60
<b>Outage Reason</b>	Unit removed from service to repair broken disconnect switch on MOD-2079			
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
9/17/14 (HE 13-24)	\$ 33.90	\$ 32.78	\$ (37,899)	\$ -
9/18/14 (HE 1)	\$ 22.16	\$ 22.02	\$ 59	\$ -
<b>Total</b>			<b>\$ (37,839)</b>	<b>\$ -</b>
<b>Start Up Fuel Cost</b>			<b>Total Forced Outage Cost</b>	
S/U Fuel Consumed	19,062		DART P&L	\$ (37,839)
S/U Fuel Price	\$ 2.94		Lost Opportunity	\$ -
<b>S/U Fuel Cost</b>	<b>\$ (56,016)</b>		S/U Fuel Cost	\$ (56,016)
			<b>Total</b>	<b>\$ (93,855)</b>

### NOTES:

All negative values are money out of pocket.

DART Revenue is calculated from differences between the DA award and RT events

Lost Opportunity is the lost margins if the unit had stayed running

# Forced Outage Report

**To:** Jim Garrett

**From:** Perry Bowley

**Date:** 5-Nov-2014

**Plant:** Green

**Unit:** 1

**GADS Class:** UO1

## Duration

Trip Time: 7-Oct-2014 14:09

Tie Time: 10-Oct- 2014

Time Offline: 37:32

## Outage Description

Green Unit 1 was removed from service by controlled shutdown due to a tube leak in the reheater section of the boiler.

## Root Cause

The Green Unit 1 intermediate reheater outlet bank, first tube from the south in the seventeenth element from east, failed due to coal ash corrosion and wall thinning. This caused a tube in the eighteenth element from the east in the reheat outlet bank to fail. The outlet tube failures caused the first tube from south in the eighteenth element of the intermediate bank to fail.

# Forced Outage Report

## Failure History

There have been five Intermediate Reheater tube leaks in the last four years:

15-Mar-2014	Offline 29:56
10-Jul-2013	Offline 36:56
15-Oct-2012	Offline 59:20
04-Feb-2011	Offline 38:50
25-May-2010	Offline 26:25

## Corrective Action

Reheater Outlet tube 18<sup>th</sup> element 24" dutchman

Intermediate Reheater 17<sup>th</sup> element from East 1<sup>st</sup> tube 24" dutchman

Intermediate Reheater 18<sup>th</sup> element from East 1<sup>st</sup> tube 24" dutchman

Intermediate Reheater 18<sup>th</sup> element from East 2<sup>nd</sup> tube 24" dutchman

## SOE

Not Available

## Other Work Completed While Unit Was Offline

None

# Forced Outage Report

## Operators Event Log

.0/7/2014 8:00AM BEAVEN, REED, RITTMAYER, LAWRENCE, HOPKINS, BERRY, BELL, RIGDON, GORRELL, DUVALL  
TIM W. OUTAGE: POILES, BOLDS  
D SHIFT SCRUBBERS: SHOULDERS, FORKER, JOHNS, GORRELL, ON VAC

	<u>UNITS</u>	<u>LOAD</u>	<u>CAP.</u>	<u>SO2</u>	<u>NOX</u>	<u>OPACITY</u>	<u>MILLS</u>	<u>PRECIPS</u> <u>OUT</u>	<u>A.D.S.</u>
	G-1	248	250	0.57	0.17	8.90%	1C=S/B	3	IN

G-2 OUTAGE IN PROGRESS

	<u>SLAKERS</u>	<u>IN/OUT</u>	<u># ON</u>	<u>TANK</u> <u>LEVELS</u>	<u>SILO</u>
8:00	G-1	IN	2	23.3/22.1	2
	G-2	OUTAGE			
	PREP	IN	1	83.6%	4

	<u>FEED RATES:</u>	<u>1C1</u>	<u>1C2</u>	<u>1C3</u>	<u>1C4</u>	<u>2C1</u>	<u>2C2</u>	<u>2C3</u>	<u>2C4</u>
8:00			87%	34.0%					

	<u>I.U.</u>	<u>CONV.</u>	<u>DRUMS</u>	<u>F/A</u> <u>SILO</u>	<u>F/A</u> <u>TONS</u>	<u>SMOOT</u>	<u>SMT.</u> <u>RATE</u>	<u>SLG.</u> <u>TANKS</u>
8:00	OUT							9' / 9.5'

	<u>F/A SILOS</u>	<u>LEVEL</u>	<u>EAST</u>	<u>WEST</u>	<u>SILO</u>	<u>SAFETY</u>
8:00	#1 F/A SILO	25'	1	1	0	0
	#2 F/A SILO	18'	R/T	R/T	R/T	R/T

	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED</u> <u>LEVEL</u>
8:30	1A	ON	48	36.9	28	6'7"
	1B	OFF			2	6'9"
	2A	OUT	FOR	CLEANING		
	2B	ON	242	W/O	30	6'9"

NOTE: STACK DRAINS

G-1	OPEN
G-2	N/A

# Forced Outage Report

	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
12:00	1A	ON		34.5	14	6'9"
	1B	ON	208	33	0	6'9"
	2A	OUT	FOR	CLEANING		
	2B	OFF		W/O	24	6'8"

	<u>I.U.</u>	<u>CONV.</u>	<u>DRUMS</u>	<u>F/A SILO</u>	<u>F/A TONS</u>	<u>SMOOT</u>	<u>SMT. RATE</u>	<u>SLG. TANKS</u>
13:00	IN	A	B	1	11	1	15%	23' / 23'

13:15 RUNNING HOTWELL CHECK ON G-1, SUSPECT TUBE LEAK  
 13:30 ABORTED G1 HOTWELL LOSS CHECK, LOST 5" IN 15 MINUTES ON DCS  
 13:35 TAKING G1 OFF FOR TUBE LEAK, ACES NOTIFIED  
 14:09 G1 OFF LINE FOR REHEAT TUBE LEAK - HOTLINE NOTIFIED.  
 14:25 LOAD OF SBS HERE D. BELL GOING TO UNLOAD IT. PUT IN G-1 TRT  
 3:44PM RECYCLE PUMPS OFF SCRUBBERS OUT OF SERVICE  
 4:58PM DRAINING G-1 BOILER

	<u>UNDERFLOWS</u>	<u>ON/OFF</u>	<u>GPM</u>	<u>SOLIDS</u>	<u>TORQUE</u>	<u>BED LEVEL</u>
5:00PM	1A	ON	51	33.9	2	6'9"
	1B	ON	190	33.6	5	6'9"
	2A	OUT	FOR	CLEANING		
	2B	ON	231	W/O	25	6'8"

5:20PM G-1 ISOLATING #5 HEATER --- TUBE LEAK  
 5:30PM UNDERFLOW PUMPS ARE SHUT OFF

# Forced Outage Report

## Boiler Tube Leak Record

Unit Green 1

### Type of Leak: (Check One)

Pin Hole \_\_\_\_\_ Thick Lip Failure \_\_\_\_\_ Crack X Thin Lip Failure \_\_\_\_\_

Tube Wall Thinning X Other \_\_\_\_\_

### Orientation of Rupture: (Check One)

Longitudinal X Circumferential \_\_\_\_\_

### Probable Cause: (Check One)

Stress \_\_\_\_\_ Overheat \_\_\_\_\_ Erosion \_\_\_\_\_ Internal Corrosion \_\_\_\_\_

External Corrosion X Weld Failure \_\_\_\_\_ (Shop \_\_\_\_\_ Field \_\_\_\_\_)

Internal Obstruction to Flow \_\_\_\_\_ Sootblower Erosion \_\_\_\_\_

Other Coal Ash Corrosion

### Type of Repair: (Check One)

Dutchman X (Length of Dutchman see below Pad Weld \_\_\_\_\_)

Plug Tube \_\_\_\_\_ Short Circuit \_\_\_\_\_ Other \_\_\_\_\_

# Forced Outage Report

## Description of Repair:

Tube Size OD 2 ½" & 2 ¼" Wall Thickness .148

Tube Material SA213T11

Welding procedure GS-P1-1L for tube welds

Welded By: Titan

## Exact Location of Leak: Be Specific:

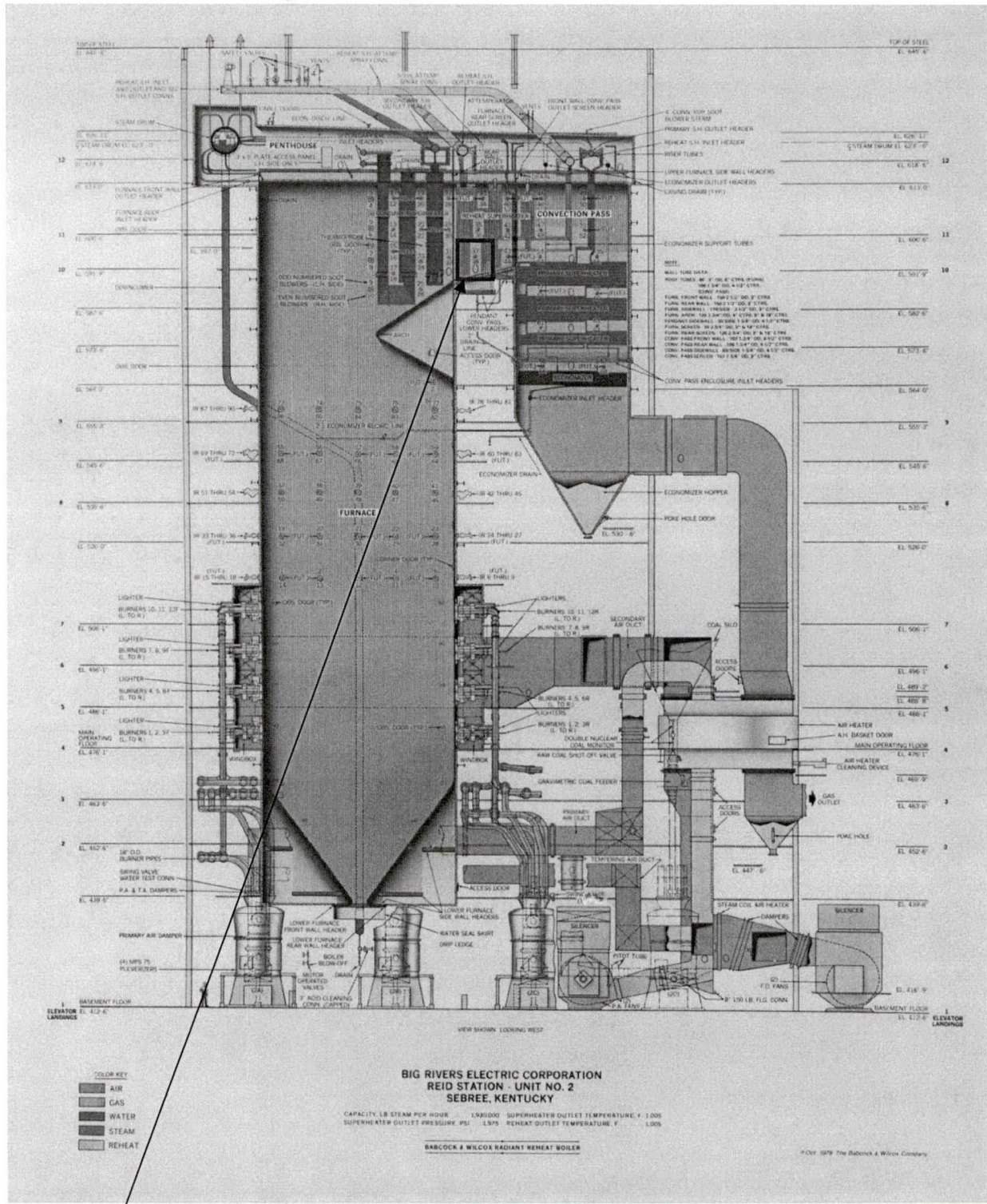
Reheater Outlet tube 18th element 24" dutchman 2 ¼" OD

Intermediate Reheater 17th element from East 1st tube 24" dutchman 2 ½" OD

Intermediate Reheater 18th element from East 1st tube 24" dutchman 2 ½" OD

Intermediate Reheater 18th element from East 2nd tube 24" dutchman 2 ½" OD

## Forced Outage Report



Tube Leaks Here

# Forced Outage Report

## Estimated Outage Costs

Labor \$20,593

Material \$ 216

Total \$20,809

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>Green 1 - G1-14-16</b>		<b>Production Cost</b>	
<b>Date &amp; Time Off Line</b>	10/7/14 14:09		<b>MW</b>	<b>\$/MW</b>
<b>Date &amp; Time On Line</b>	10/9/14 3:41		163	\$ 26.79
<b>Outage Duration</b>	24 hr. 41 min.		181	\$ 26.33
<b>Outage Code</b>	UO2		235	\$ 25.80
<b>Outage Reason</b>	Repair reheater tube leak.			
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
10/7/14 (HE 14-24)	\$ 34.21	\$ 31.71	\$ (14,929)	\$ -
10/8/14 (HE 1-24)	\$ 31.28	\$ 30.10	\$ (23,896)	\$ -
10/9/14 (HE 1-24)	\$ 32.57	\$ 39.18	\$ 20,173	\$ (7,662)
<b>Total</b>			\$ (18,653)	\$ (7,662)
<b>Start Up Fuel Cost</b>			<b>Total Forced Outage Cost</b>	
S/U Fuel Consumed	11,879		DART P&L	\$ (18,653)
S/U Fuel Price	\$ 3.09		Lost Opportunity	\$ (7,662)
<b>S/U Fuel Cost</b>	<b>\$ (36,740)</b>		S/U Fuel Cost	\$ (36,740)
			<b>Total</b>	<b>\$ (63,054)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Jim Garrett

**From:** Billy Boarman

**Date:** 7-Nov-2014

**Plant:** HMP&L Station Two

**Unit:** 1

**GADS Class:** UO1

## Duration

Trip Time: 30-Oct-2014 05:20

Tie Time: 30-Oct-2014 11:24

Time Offline: 6:04

## Outage Description

HMP&L Station Two Unit 1 tripped on Thursday, 30-Oct-2014 at 05:20 on a turbine low vacuum trip due to losing the power feed to the C and D circulating water pumps.

## Root Cause

H-2 tripped offline due to an inverter transformer failure, and both H-2 "A" and "B" 4160 volt main breakers were lost. As a result, we lost all start-up power to H2, which caused C and D circulating water pumps to trip. The HMP&L units have a common circulating water system, and with the loss of two circulating water pumps H-1 began experiencing backpressure problems, which resulted in the H-1 unit trip.

## Failure History

HMP&L Station Two Unit 1 tripped on Saturday, 17-Aug-2013 at 01:55 on turbine low vacuum due to losing the power feed to the C and D circulating water pumps. The total outage duration was 33:43.

## Corrective Action

Both main breakers and the circulating water pumps were placed back in service and the unit was returned back to service.

# Forced Outage Report

## SOE Print Out

STANDARD SOE REPORT      Triggered on: 30-Oct-2014 05:19:52:294

Event Time	State	Tag Name	Tag Description
30-Oct-2014 05:19:55:982	OK	H132SAF2ATP	SEAL AIR FAN 2A TRIP
30-Oct-2014 05:19:55:972	TRIP	H124AXCWP2ATP	AUX CIRC WTR PMP 2A TRIP
30-Oct-2014 05:19:55:952	TRIP	H140HYDOP2ATP	HYD OIL PUMP 2A TRIP
30-Oct-2014 05:19:55:952	OK	H132SAF2BTP	SEAL AIR FAN 2B TRIP
30-Oct-2014 05:19:55:943	TRIP	H141BGOPP2ATP	BRG OIL PUMP 2A TRIP
30-Oct-2014 05:19:55:943	OK	H124AXCWP2BTP	AUX CIRC WTR PMP 2B TRIP
30-Oct-2014 05:19:55:941	OK	H124AXCWP2ATP	AUX CIRC WTR PMP 2A TRIP
30-Oct-2014 05:19:55:937	OPEN	H132AHDR2AST	AIR HTR DRIVE 2A STATUS
30-Oct-2014 05:19:55:933	TRIP	H132AHDR2ATP	AIR HTR DRIVE 2A TRIP
30-Oct-2014 05:19:55:932	OK	H141BGOPP2BTP	BRG OIL PUMP 2B TRIP
30-Oct-2014 05:19:55:920	TRIP	H141BGOPP2BTP	BRG OIL PUMP 2B TRIP
30-Oct-2014 05:19:55:919	TRIP	H124AXCWP2ATP	AUX CIRC WTR PMP 2A TRIP
30-Oct-2014 05:19:55:893	TRIP	H132BRCAF2TP	BNR CLG AIR FAN 2 TRIP
30-Oct-2014 05:19:55:717	OPEN	H150OCB166ST	OCB 0166 GEN H1 STATUS
30-Oct-2014 05:19:55:659	OK	H150FLDBKRTP	GEN H1 FIELD BKR TRIP
30-Oct-2014 05:19:55:653	OPEN	H150FLDBKRST	GEN H1 FIELD BKR STATUS
30-Oct-2014 05:19:55:636	OK	H103BUSAMAINTP	4160 BKR BUS A MAIN TRIP
30-Oct-2014 05:19:55:611	OPEN	H103BUSBMAINST	4160 BKR BUS B MAIN STATUS
30-Oct-2014 05:19:55:597	OK	H150OCB166GETP	OCB 0166 GEN H1 TRIP
30-Oct-2014 05:19:55:595	OK	H150OCB162GETP	OCB 0162 GEN H1 TRIP
30-Oct-2014 05:19:55:578	TRIP	H103BUSBMAINTP	4160 BKR BUS B MAIN TRIP
30-Oct-2014 05:19:55:572	LKOUT	H140SPVLO86TV2	TURB STOP VLV LOCKOUT (86TV2)
30-Oct-2014 05:19:55:571	TRIP	H103BUSAMAINTP	4160 BKR BUS A MAIN TRIP
30-Oct-2014 05:19:55:571	TRIP	H150FLDBKRTP	GEN H1 FIELD BKR TRIP
30-Oct-2014 05:19:55:567	TRIP	H150OCB166GETP	OCB 0166 GEN H1 TRIP
30-Oct-2014 05:19:55:566	TRIP	H150OCB162GETP	OCB 0162 GEN H1 TRIP
30-Oct-2014 05:19:52:989	OK	H140LOVACTP	TURB LOW VACUUM TRIP
30-Oct-2014 05:19:52:795	TRIP	H133LMISTP	LAST MILL IN SERVICE TRIP
30-Oct-2014 05:19:52:746	TRIP	H140STPVLVTP	TURB STOP VLV CLSD TRIP
30-Oct-2014 05:19:52:378	OK	H103M2ATP	4160 BKR MILL 2A TRIP
30-Oct-2014 05:19:52:365	TRIP	H103M2ATP	4160 BKR MILL 2A TRIP
30-Oct-2014 05:19:52:356	OPEN	H103M2AST	4160 BKR MILL 2A STATUS
30-Oct-2014 05:19:52:349	OPEN	H103PAF2AST	4160 BKR PA FAN 2A STATUS
30-Oct-2014 05:19:52:348	OPEN	H103PAF2BST	4160 BKR PA FAN 2B STATUS
30-Oct-2014 05:19:52:345	OPEN	H103M2BST	4160 BKR MILL 2B STATUS
30-Oct-2014 05:19:52:316	TRIP	H103M2BTRIP	4160 BKR MILL 2B TRIP
<b>30-Oct-2014 05:19:52:294</b>	<b>TRIP</b>	<b>H133EMERBLRTP</b>	<b>EMERGENCY BLR TRIP</b>
30-Oct-2014 05:19:52:117	LOW	H143HYDOILPRLO	TURB HYD OIL PRESS LOW
30-Oct-2014 05:19:51:496	TRIP	H140LOVACTP	TURB LOW VACUUM TRIP
30-Oct-2014 05:18:55:398	HIGH	H140EXHOODTEHI	TURB EXH HOOD HIGH TEMP
30-Oct-2014 05:17:25:351	OK	H103AIRCMPATP	4160 BKR AIR COMP A TRIP
30-Oct-2014 05:17:20:401	OK	H132FLUGASLOO2	FLUE GAS LOW OXYGEN
30-Oct-2014 05:17:20:374	OPEN	H103AIRCMPAST	4160 BKR AIR COMP A STATUS
30-Oct-2014 05:17:20:341	TRIP	H103AIRCMPATP	4160 BKR AIR COMP A TRIP

## Operators Event Log

3

# Forced Outage Report

## Estimated Outage Cost

No outage work was completed.

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>HMP'L 1 - H1-14-12</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	10/30/14 5:20			<b>MW</b>
<b>Date &amp; Time On Line</b>	10/30/14 11:24			<b>\$/MW</b>
<b>Outage Duration</b>	6 hr. 4 min.			56
<b>Outage Code</b>	U01			133
<b>Outage Reason</b>	Unit tripped on low vacuum due to one circulating water pump in service after H2 tripped earlier			155
				\$ 32.00
				\$ 27.45
				\$ 27.30
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
10/30/14 (HE 6-22)	\$ 35.59	\$ 33.20	\$ (16,626)	\$ -
<b>Total</b>			\$ (16,626)	\$ -
<b>Start Up Fuel Cost</b>			<b>Total Forced Outage Cost</b>	
S/U Fuel Consumed	6,270		DART P&L	\$ (16,626)
S/U Fuel Price	\$ 3.09		Lost Opportunity	\$ -
<b>S/U Fuel Cost</b>	<b>\$ (19,358)</b>		S/U Fuel Cost	\$ (19,358)
			<b>Total</b>	<b>\$ (35,984)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Jim Garrett

**From:** Billy Boarman

**Date:** 16-Oct-2014

**Plant:** HMP&L Station Two

**Unit:** 1

**GADS Class:** UO1/UO0

## Duration

Trip Time: 2-Oct-2014 17:19

Starting Failure: 3-Oct-2014 02:47

Tie Time: 3-Oct-2014 07:34

UO1: 09:28

UO0: 04:47

Total Time Offline: 14:15

## Outage Description

HMP&L Station Two Unit 1 tripped on Thursday, 2-Oct-2014 at 17:19 due to loss of 'B' Mill. A starting failure was declared on 3-Oct-2014 at 02:47 when the unit did not return to service in the allotted time for a hot start, due to the right side reheat intercept valve would not open.

## Root Cause

The Control Room Operator was having trouble with the Mill being too heavy with coal so the operator stopped the coal flow to "B" mill by shutting off the feeders. The Mill tripped due to zero coal flow for 15 minutes. This is a trip in the BMS logic.

## Failure History

No failures of this nature have been reported in the last three years.

## Corrective Action

Worked with controls engineers on reason why this trip was installed into the logic and discovered this is a NFPA boiler code trip. Talked with all supervisors about this trip to make sure everyone is aware.

# Forced Outage Report

## Other Work Complete While Offline

Replaced Burner Cooling Air Fan Motor

Replaced Turbine Right Intercept Valve Servo

## SOE Print Out

### STANDARD SOE REPORT

Triggered on: 2-Oct-2014 17:19:59:313

2-Oct-2014 17:19:59:670	ENG D	H140TGRSTPENG	TURNING GEAR STOPPED/ENGAGED
2-Oct-2014 17:19:59:666	OK	H132SAF2ATP	SEAL AIR FAN 2A TRIP
2-Oct-2014 17:19:59:662	TRIP	H140HYDOP2ATP	HYD OIL PUMP 2A TRIP
2-Oct-2014 17:19:59:649	TRIP	H148MNSOPTP	MAIN SEAL OIL PUMP TRIP
2-Oct-2014 17:19:59:642	OPEN	H132AHDR2AST	AIR HTR DRIVE 2A STATUS
2-Oct-2014 17:19:59:641	TRIP	H140HYDOP2BTP	HYD OIL PUMP 2B TRIP
2-Oct-2014 17:19:59:637	TRIP	H141BGOPP2ATP	BRG OIL PUMP 2A TRIP
2-Oct-2014 17:19:59:635	TRIP	H132AHDR2ATP	AIR HTR DRIVE 2A TRIP
2-Oct-2014 17:19:59:631	OK	H132SAF2BTP	SEAL AIR FAN 2B TRIP
2-Oct-2014 17:19:59:628	TRIP	H124AXCWP2ATP	AUX CIRC WTR PMP 2A TRIP
2-Oct-2014 17:19:59:622	TRIP	H132BRCAF2TP	BNR CLG AIR FAN 2 TRIP
2-Oct-2014 17:19:59:428	OPEN	H150OCB166ST	OCB 0166 GEN H1 STATUS
2-Oct-2014 17:19:59:391	OK	H150FLDBKRTP	GEN H1 FIELD BKR TRIP
2-Oct-2014 17:19:59:387	OPEN	H150FLDBKRST	GEN H1 FIELD BKR STATUS
2-Oct-2014 17:19:59:374	OK	H103BUSAMAINTP	4160 BKR BUS A MAIN TRIP
2-Oct-2014 17:19:59:351	OPEN	H103BUSBMAINST	4160 BKR BUS B MAIN STATUS
2-Oct-2014 17:19:59:318	TRIP	H103BUSBMAINTP	4160 BKR BUS B MAIN TRIP
2-Oct-2014 17:19:59:314	OK	H150OCB162GETP	OCB 0162 GEN H1 TRIP
<b>2-Oct-2014 17:19:59:313</b>	<b>TRIP</b>	<b>H103BUSAMAINTP</b>	<b>4160 BKR BUS A MAIN TRIP</b>
2-Oct-2014 17:19:59:313	OK	H150OCB166GETP	OCB 0166 GEN H1 TRIP
2-Oct-2014 17:19:59:309	TRIP	H150FLDBKRTP	GEN H1 FIELD BKR TRIP
2-Oct-2014 17:19:59:306	LKOUT	H150GENLO86G2	GEN DIFFERENTIAL LO (86G2)

# Forced Outage Report

## Operators Event Log

10/2/2014	8:00AM	SAFETY BRIEFING												
	8:10AM	H2 A RECYCLE PUMP TRIPPED. (OVERLOAD TRIP)												
	8:11AM	H2 BOOSTER FAN OFF												
	8:12AM	H2 OUT OF ADS CONTROL												
	8:15AM	H2 B RECYCLE PUMP ON												
	8:19AM	H2 BOOSTER FAN ON												
	8:25AM	H2 BYPASS DAMPER CLOSED. SCRUBBERS IN SERVICE												
	8:26AM	H2 BACK IN ADS CONTROL												
	11:20AM	BAYLOR HERE TO LOOK AT CONTROL ROOM AIR CONDITIONER												
	12:05PM	FILLING B AMMONIA TANK												
	12:13PM	H1 PURGE STARTED ON BOILER												
	NOTE:	H1 B BFP DISCHARGE VALVE WILL NOT OPEN. ELEC WORKING ON SAME												
	12:23PM	FIRE IN H2 BOILER NOTIFY H/L												
	1:10PM	H1 MAIN STEAM STOP VALVE OPEN												
	1:11PM	B AMMONIA TANK FILLING COMPLETED												
	2:30PM	90 DEGREES SUPERHEAT, SEALING AND PULLING VACUUM ON TURBINE												
	2:50PM	H1 B FD FAN OFF. VIBRATING.												
	NOTE:	CLEANING H1 B FD FAN AND FLUSING OIL THROUGH BEARING												
	3:50PM	H1 B MILL ON												
	3:52PM	H1 TIED ON LINE												
	4:15PM	LOST B1,B3 COAL PIPE, B1 COOLING AIR VALVE WONT CLOSE												
	4:35PM	H2 B1 COAL PIPE TRIPPED												
	4:37PM	H1 B1 CC												
	4:45PM	H1 B FD FAN BACK ON												
	4:57PM	TRANSFER AUX ON H1												
	5:16PM	H1 A MILL ON												
	5:18PM	B MILL TRIPPED OFF. (FEEDERS OFF FOR MORE THAN 15MIN NO OIL GUNS.) BUT OIL GUNS WERE IN												
	5:19PM	H1 TRIPPED OFF LINE												
	NOTE:	H1 A SIDE 4160 BREAKERS DID NOT AUTO TRANSFER. LOST EVERYTHING ON A SIDE WHEN UNIT TRIPPED												
	5:20PM	H1 PRECIPS OUT OF SERVICE												
	5:42PM	H1 BOILER PURGE												
	5:46PM	H1 A CWP BACK ON												
	5:47PM	FIRES ESTABLISHED IN H1 BOILER												
	6:10PM	J.HIGGINS CALLED IN SICK FOR TONIGHT												
	6:15PM	BIG RIVERS DISPATCH CALLED. SCRUBBER TRANSFORMER HAS ALARM IN AFTER TRIP.												
	6:20PM	C.TUCKER CALLED. SAID ALARM CAN BE RESET ON SCRUBBER TRANSFORMER												
	8:00PM	DENTON, REYNOLDS, GOODMAN, HIGGINS SL, CALHOUN, SNELLING, EDWARDS												
		BAKER,												
		UNIT	LOAD	UNIT CAP	NET CAP.	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE	
		R1	12HR STANDBY	42										
		H1	OFF TO REPAIR TURBINE CROSSOVER											
		H2	165	165	153	0.484	10.8	0.098	30	85	7	235	2.7	
		CT..	OUTAGE											
		ALARMS:												
		R1												
		H1	BURNER MANAGEMENT/STEAM SEAL LOW PRESSURE/E.H. PRESSURE LO START REQUIRED/ DRUMXMTR MAINT. B PA FAN MTR											
		H2	EH RES LEVEL HI B MILL GEAR OIL PRESSURE LOW											
		SOOT BLOWERS TAGGED						GAUGE GLASSES			DRYING AGENT			
		R1							OK			R1-0%		
		H1	31,32,30,33,46									H1-0%		
		H2	41, 34									H2-0%		
		FUEL OIL	C.H.	HMPL	NORTH	SOUTH	SILO LVL			BOOTHE SYSTEM				
		LEVELS	6' 8 1/2"	9' 10 3/4"	16'	6 3/4"	12FT			OUT				

[illegible]

# Forced Outage Report

## Estimated Outage Cost

Replaced Burner Cooling Air Fan Motor

Sub Total: \$2,990

Replaced Right Intercept Valve Servo

Sub Total: \$4,252.59

**Total: \$7,242.59**

# Forced Outage Report

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>HMP'L 1 - H1-14-11</b>			<b>Production Cost</b>
<b>Date &amp; Time Off Line</b>	10/2/14 17:19			<b>MW</b>
<b>Date &amp; Time On Line</b>	10/3/14 7:34			<b>\$/MW</b>
<b>Outage Duration</b>	14 hr. 15 min.			67
<b>Outage Code</b>	UO1			122
<b>Outage Reason</b>	Unit tripped due to boiler upset from loss of B mill.			155
				\$ 30.96
				\$ 27.71
				\$ 27.30
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
10/2/14 (HE 18-24)	\$ 32.74	\$ 29.43	\$ (1,383)	\$ (1,400)
10/3/14 (HE 1-22)	\$ 29.11	\$ 28.12	\$ 1,599	\$ -
<b>Total</b>			<b>\$ 216</b>	<b>\$ (1,400)</b>
<b>Start Up Fuel Cost</b>			<b>Total Forced Outage Cost</b>	
S/U Fuel Consumed	10,555		DART P&L	\$ 216
S/U Fuel Price	\$ 3.09		Lost Opportunity	\$ (1,400)
S/U Fuel Cost	\$ (32,587)		S/U Fuel Cost	\$ (32,587)
			<b>Total</b>	<b>\$ (33,771)</b>
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				

# Forced Outage Report

**To:** Jim Garrett

**From:** Billy Boarman

**Date:** 7-Nov-2014

**Plant:** HMP&L Station Two

**Unit:** 2

**GADS Class:** UO1

## Duration

Trip Time: 30-Oct-2014 05:16

Tie Time: 30-Oct-14 14:24

Time Offline: 9:08

## Outage Description

HMP&L Station Two Unit 2 tripped from service on Thursday, 30-Oct-2014 at 05:16 due to Master Fuel Trip.

## Root Cause

H-2 inverter caught on fire due to a problem with the inverter transformer. When this happened the inverter malfunctioned causing the loss of essential power to the Unit. With the loss of essential power, the contact from the Main MFT relay located in the BMS cabinet that sends the MFT signal to the DCS lost power because it is fed from the essential power panel. This in turn caused the signal to the DCS to drop out, initiating a boiler and turbine trip from the DCS system, along with all the other equipment fed from essential power panel to fail.

## Failure History

No failures of this nature have been reported on this unit in the last three years.

## Corrective Action

Bypassed the Inverter due to the transformer located inside the inverter catching on fire.

# Forced Outage Report

## SOE Print Out

Triggered on: 30-Oct-2014 05:16:08

Event Log: Event Historian Log

Date: 09:24:01 10/30/2014

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16 Area 9	05:12:07	10/30/2014	H009B-AD-COMM	Alarm	ADB COMM STATUS
16 Area 9	05:12:08	10/30/2014	H009A-AC-COMM	Alarm	ACA COMM STATUS
16 Area 9	05:12:08	10/30/2014	H009A-AC-COMM	Alarm	ACA COMM STATUS
16 Area 9	05:12:16	10/30/2014	H009B-AC-COMM	Alarm	ACB COMM STATUS
16 Area 9	05:12:16	10/30/2014	H009B-AC-COMM	Alarm	ACB COMM STATUS
10 FGD	05:12:27	10/30/2014	H256PDAHH-71	Alarm	ABS TWR MIST ELIM DP
10 FGD	05:12:27	10/30/2014	H256PDAHH-71	Bad Input	ABS TWR MIST ELIM DP
10 FGD	05:12:27	10/30/2014	H256PDAHH-71	Alarm	ABS TWR MIST ELIM DP
16 Area 9	05:13:38	10/30/2014	H009B-AD-COMM	Alarm	ADB COMM STATUS
16 Area 9	05:13:38	10/30/2014	H009A-AC-COMM	Alarm	ACA COMM STATUS
16 Area 9	05:13:38	10/30/2014	H009B-AC-COMM	Alarm	ACB COMM STATUS
16 Area 9	05:13:38	10/30/2014	H009B-AD-COMM	Alarm	ADB COMM STATUS
16 Area 9	05:13:39	10/30/2014	H009A-AC-COMM	Alarm	ACA COMM STATUS
16 Area 9	05:13:39	10/30/2014	H009B-AC-COMM	Alarm	ACB COMM STATUS
16 Area 9	05:14:11	10/30/2014	H009B-AD-COMM	Alarm	ADB COMM STATUS
16 Area 9	05:14:11	10/30/2014	H009B-AD-COMM	Alarm	ADB COMM STATUS
16 Area 9	05:14:12	10/30/2014	H009B-AC-COMM	Alarm	ACB COMM STATUS
16 Area 9	05:14:12	10/30/2014	H009B-AC-COMM	Alarm	ACB COMM STATUS
10 FGD	05:14:30	10/30/2014	H256LIC-105	Hi Alarm	REACTN TK LEVEL CTL
10 FGD	05:14:30	10/30/2014	H256LIC-105	Hi Alarm	REACTN TK LEVEL CTL
10 FGD	05:14:58	10/30/2014	H256LIC-105	Bad Input	REACTN TK LEVEL CTL
	05:15:22	10/30/2014	CON29 Node CON27	down	
	05:15:22	10/30/2014	CON29 Node CON26	down	
	05:15:22	10/30/2014	CON29 Node CON21	down	
	05:15:22	10/30/2014	CON29 Client switchover from Con21 to Con22		
	05:15:24	10/30/2014	CON29 Node CON25	down	
	05:15:24	10/30/2014	CON29 Node CON23	down	
	05:15:56	10/30/2014	CON29 Node CON28	down	
01 Area 32	05:16:08	10/30/2014	H232FDFH2ASOFL	Bad Input	FD FAN H2A SO DMPR FAILED
01 Area 32	05:16:08	10/30/2014	H232FDFH2BSOFL	Bad Input	FD FAN H2B SO DMPR FAILED
02 Area 12	05:16:08	10/30/2014	H212SWMWDVFL	Bad Input	SW WTR WALL DRN VLV FAILED
01 Area 22	05:16:08	10/30/2014	H222HTR3DVSFVL	Bad Input	LP HTR 3-3 EMERG DV FAILED
01 Area 22	05:16:08	10/30/2014	H222HTR5DVSFVL	Bad Input	HP HTR 5-3 EMERG DV FAILED
01 Area 22	05:16:08	10/30/2014	H222HTR6DVSFVL	Bad Input	HP HTR 6-3 EMERG DV FAILED
01 Area 32	05:16:08	10/30/2014	H232SCABIASVFL	Bad Input	SCA BLWR H2A SV FAIL TRP
01 Area 33	05:16:08	10/30/2014	H233MFTPRGREQ	Alarm	PURGE REQUIRED (MFT)
03 Area 33	05:16:08	10/30/2014	H233K2002051OK	Alarm	K200205 SLAVE FUSE E1 OK
16 Area 255	05:16:08	10/30/2014	H233IAIRPSL1	Alarm	IGN ATOM AIR PRESS NOT LOW 1
16 Area 255	05:16:08	10/30/2014	H233IHDRPSL1	Alarm	IGN OIL PRESS NOT LOW 1
03 Area 33	05:16:08	10/30/2014	H233K2002052OK	Alarm	K200205 SLAVE FUSE E2 OK
03 Area 33	05:16:08	10/30/2014	H233K2002061OK	Alarm	K200206 SLAVE FUSE E1 OK
03 Area 33	05:16:08	10/30/2014	H233K2002062OK	Alarm	K200206 SLAVE FUSE E2 OK
03 Area 33	05:16:08	10/30/2014	H233K2002071OK	Alarm	K200207 SLAVE FUSE E1 OK
03 Area 33	05:16:08	10/30/2014	H233K2002072OK	Alarm	K200207 SLAVE FUSE E2 OK
03 Area 33	05:16:08	10/30/2014	H233K2002081OK	Alarm	K200208 SLAVE FUSE E1 OK
03 Area 33	05:16:08	10/30/2014	H233K2002082OK	Alarm	K200208 SLAVE FUSE E2 OK
02 Area 33	05:16:08	10/30/2014	H233CLGPRSL0	Alarm	COOLING AIR PRESS LOW
01 Area 33	05:16:08	10/30/2014	H233K2002125OK	Alarm	K2002 125 VDC MFT POWER OK
03 Area 33	05:16:08	10/30/2014	H233K2002091OK	Alarm	K200209 SLAVE FUSE E1 OK
03 Area 33	05:16:08	10/30/2014	H233K2002092OK	Alarm	K200209 SLAVE FUSE E2 OK
01 Area 3	05:16:08	10/30/2014	H203BFP3ATRP	Alarm	4160 BKR BFP H2A TRIP

# Forced Outage Report

Event Log Event Historian Log  
Date 09 24 01 10/30/2014  
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01 Area 3	05 16 08	10/30/2014	H203BFP3BTRP	Alarm	4160 BRR BFP H2B TRIP
03 Area 33	05 16 08	10/30/2014	H233K2002101OK	Alarm	K200210 SLAVE FUSE E1 OK
03 Area 33	05 16 08	10/30/2014	H233K2002111OK	Alarm	K200211 SLAVE FUSE E1 OK
03 Area 33	05 16 08	10/30/2014	H233K2002121OK	Alarm	K200212 SLAVE FUSE E1 OK
03 Area 33	05 16 08	10/30/2014	H233K2002131OK	Alarm	K200213 SLAVE FUSE E1 OK
03 Area 33	05 16 08	10/30/2014	H233K2002161OK	Alarm	K200216 SLAVE FUSE E1 OK
03 Area 33	05 16 08	10/30/2014	H233K2002171OK	Alarm	K200217 SLAVE FUSE E1 OK
03 Area 33	05 16 08	10/30/2014	H233K2002181OK	Alarm	K200218 SLAVE FUSE E1 OK
03 Area 33	05 16 08	10/30/2014	H233K2002191OK	Alarm	K200219 SLAVE FUSE E1 OK
01 Area 33	05 16 08	10/30/2014	H233IGNH0RTRIP	Alarm	IGN HEADER TRIPPED
01 Area 22	05 16 08	10/30/2014	H222HTR3DVSFVL	Alarm	LP HTR 3-3 EMERG DV FAILED
01 Area 22	05 16 08	10/30/2014	H222HTR5DVSFVL	Alarm	HP HTR 5-3 EMERG DV FAILED
01 Area 22	05 16 08	10/30/2014	H222HTR6DVSFVL	Alarm	HP HTR 6-3 EMERG DV FAILED
01 Area 32	05 16 08	10/30/2014	H232SCAB1ASVFL	Alarm	SCA BLWR H2A SV FAIL TRP
01 Area 33	05 16 08	10/30/2014	H233IGNA1TRPPD	Alarm	IGN A1 TRIPPED
01 Area 33	05 16 08	10/30/2014	H233IGNB3TRPPD	Alarm	IGN B3 TRIPPED
01 Area 33	05 16 08	10/30/2014	H233IGNA2TRPPD	Alarm	IGN A2 TRIPPED
01 Area 33	05 16 08	10/30/2014	H233IGNB3TRPPD	Alarm	IGN B3 TRIPPED
01 Area 33	05 16 08	10/30/2014	H233IGNA3TRPPD	Alarm	IGN A3 TRIPPED
01 Area 32	05 16 08	10/30/2014	H232FDFH2ASOFL	Alarm	FD FAN H2A SO DMPR FAILD
01 Area 33	05 16 08	10/30/2014	H233IGNB2TRPPD	Alarm	IGN B2 TRIPPED
01 Area 32	05 16 08	10/30/2014	H232FDFH2BSOFL	Alarm	FD FAN H2B SO DMPR FAILD
02 Area 12	05 16 08	10/30/2014	H2125WWDVFL	Alarm	SW WTR WALL DRN VLV FAILD
01 Area 33	05 16 08	10/30/2014	H233IGNB2TRPPD	Alarm	IGN B2 TRIPPED
12 Area 255	05 16 08	10/30/2014	H240MM1	Bad Input	MEGAWATT 1
01 Area 33	05 16 08	10/30/2014	H233IGNB2TRPPD	Alarm	IGN B2 TRIPPED
16 Area 255	05 16 08	10/30/2014	H233MFT02	Alarm	LOSS OF BOTH FD PANS
16 Area 255	05 16 08	10/30/2014	H233MFT14	Alarm	MFT PUSHBUTTON HARDWIRED
16 Area 255	05 16 08	10/30/2014	H233H0RVLVFO01	Alarm	IGN HEADER FTC TRIP
16 Area 255	05 16 08	10/30/2014	H233IGNA1FO01	Alarm	IGN A1 FUEL VLV FAILED TO CLOSE
16 Area 255	05 16 08	10/30/2014	H233IGNA1FO12	Alarm	IGN A1 GUN FAILD TO RETRACT
01 Area 33	05 16 08	10/30/2014	H233IGNB1TRPPD	Alarm	IGN B1 TRIPPED
16 Area 255	05 16 08	10/30/2014	H233IGNA2FO01	Alarm	IGN A2 FUEL VLV FAILED TO CLOSE
01 Area 33	05 16 08	10/30/2014	H233IGNB1TRPPD	Alarm	IGN B1 TRIPPED
16 Area 255	05 16 08	10/30/2014	H233IGNA2FO12	Alarm	IGN A2 GUN FAILD TO RETRACT
16 Area 255	05 16 08	10/30/2014	H233IGNA3FO01	Alarm	IGN A3 FUEL VLV FAILED TO CLOSE
01 Area 33	05 16 08	10/30/2014	H233IGNA4TRPPD	Alarm	IGN A4 TRIPPED
16 Area 255	05 16 08	10/30/2014	H233IGNA3FO12	Alarm	IGN A3 GUN FAILD TO RETRACT
16 Area 255	05 16 08	10/30/2014	H233IGNA4FO01	Alarm	IGN A4 FUEL VLV FAILED TO CLOSE
16 Area 255	05 16 08	10/30/2014	H233IGNA4FO12	Alarm	IGN A4 GUN FAILD TO RETRACT
16 Area 255	05 16 08	10/30/2014	H233IGNB1FO01	Alarm	IGN B1 FUEL VLV FAILED TO CLOSE
16 Area 255	05 16 08	10/30/2014	H233IGNB1FO12	Alarm	IGN B1 GUN FAILD TO RETRACT
16 Area 255	05 16 08	10/30/2014	H233IGNB2FO01	Alarm	IGN B2 FUEL VLV FAILED TO CLOSE
16 Area 255	05 16 08	10/30/2014	H233IGNB2FO12	Alarm	IGN B2 GUN FAILD TO RETRACT
16 Area 255	05 16 08	10/30/2014	H233IGNB3FO01	Alarm	IGN B3 FUEL VLV FAILED TO CLOSE
16 Area 255	05 16 08	10/30/2014	H233IGNB3FO12	Alarm	IGN B3 GUN FAILD TO RETRACT
16 Area 255	05 16 08	10/30/2014	H233IGNB4FO01	Alarm	IGN B4 FUEL VLV FAILED TO CLOSE
01 Area 33	05 16 08	10/30/2014	H233MFTPRGREQ	Alarm	PURGE REQUIRED (MFT)
16 Area 255	05 16 08	10/30/2014	H233IGNB4FO12	Alarm	IGN B4 GUN FAILD TO RETRACT
01 Area 33	05 16 08	10/30/2014	H233MFTPRGREQ	Alarm	PURGE REQUIRED (MFT)
01 Area 33	05 16 08	10/30/2014	H233IGNA4TRPPD	Alarm	IGN A4 TRIPPED

## Other Work Completed While Unit Was Offline

- Inspected the H-2 Inverter transformer Due to the fire damage we are currently looking at replacing the inverter

## Operators Event Log

10/30/2014	1:00AM	H1 #3 HEATER INLET VALVE HAS PACKING LEAK. W.O.# 6141556												
	1:00AM	H1 B BEARING COOLING WATER PUMP PUMP SEAL IS LEAKING. W.O.# 6141558												
	1:30AM	H2 ELECTROMATIC FLANGE LEAKING ABOVE MANUAL VALVE. W.O.# 6141559												
	2:00AM	LOST 4" ON H1 HOTWELL CHECK												
	3:00AM	LOST 3 1/2" ON H2 HOTWELL CHECK												
	5:00AM	H1 #3 SOOTBLOWER SEAL AIR HOSE IS LEAKING. W.O.# 6141561												
		NOTE H-2 POWER INVERTER ON FIRE												
	5:16AM	H-1 & H-2 TRIPPED												
	7:05AM	PURGING H-1 BOILER												
	7:16AM	FIRE IN H-1 BOILER												
	7:42AM	LOST FIRE IN H-1 BOILER - FIRE RE-ESTABLISHED												
10/30/2014	8:00AM	UNIT R1	LOAD 12HR STANDBY	UNIT CAP 42	NET CAP. 42	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE CTL 17"	
		H1	OFF		FIRING BOILER									
		H2	OFF		FIRING BOILER								CTL 15.4'	
		CT..	OUTAGE											
		ALARMS:												
		R1												
		H1	BURNER MANAGEMENT/STEAM SEAL PRESSURE/A & B PA FAN MOTORS/HY PURITY											
		H2	EH RES LEVEL HI, B MILL OIL PRESSURE											
		SOOT BLOWERS TAGGED					GAUGE GLASSES			PWTL 27'		DRYING AGENT		
		R1						OK					R1-0%	
		H1											H1-0%	
		H2	41										H2-0%	
		FUEL OIL LEVELS		C.H. 10'	HMPL 13'6 3/4"	NORTH 19' 1"	SOUTH 6 3/4"				SILO LVL 11.5'	BOOTHE SYSTEM out		
	8:00AM	SAFETY BRIEFING												
	8:05AM	FIRE IN H-2 BOILER												
	8:00AM	BREEDEN & HOGAN HERE												
	8:30AM	JOHNSON HERE												
	9:00AM	YOUNG HERE												
	10:42AM	RESET H-1 TURBINE - TURBINE ROLLED TO 2200 RPM												
	11:24AM	TIED H-1 GENERATOR - PRECIPS IN - NOTIFIED H/L												
	11:45M	H-1 BOOSTER FAN ON												
	12:05PM	TRANSFERRED H-1 AUXILIARIES												
	12:28PM	H-1 SCRUBBER IN SERVICE												
	1:15PM	SEALING H-2 TURBINE & PULLING VACUUM												
	1:25PM	R-1 AUXILIARY WATER STRAINER BACK IN SERVICE - SLUICE WATER TIE CLOSED - AND AUXILIARY WATER PUMP BACK ON												
	1:38PM	H2 SEALING TURBINE & PULLING VACUM												
	2:10PM	H2 GENERATOR FIELD ON												
	2:24PM	H2 GENERATOR TIED ON LINE												
	2:26PM	H2 PRECIPS IN SERVICE												
	3:00PM	BREEDEN & HOGAN LEAVING												
	3:10PM	H-1 SCR IN SERVICE												
	3:11PM	H-2 SCRUBBER IN SERVICE												
	3:18PM	TRANSFERRED H-2 AUXILIARIES												
	4:00PM	JACKSON & JOHNSON LEAVING												
	NOTE	BETWEEN 2:12PM & 3:18PM H-2 HAD 6 EXCEEDANCES OVER 60%												
	NOTE	BAD LEAK ON CBD LINE ON DRAIN MANIFOLD												
10/30/2014	8:00PM	DENTON, REYNOLDS, GOODMAN P.D., BAKER, EDWARDS, SNELLING, CALHOUN, HIGGINS ,										D SHIFT STERLING		
		UNIT R1	LOAD 12HR STANDBY	UNIT CAP 46	NET CAP. 46	SO2	CO2	NOX	OPACITY	REMOVAL	DUST	AMM. FLOW	BACK PRESSURE CTL	
		H1	146	165	153	0.673	10	0.102	25	80	18	195	2.6	
		H2	130	130	118	0.692	10	0.177	50	84	9	153	2.3 CTL	
		CT..	OUTAGE											
		ALARMS:												
		R1												
		H1	BURNER MANAGEMENT/STEAM SEAL PRESSURE/E H. PRESSURE LO START REQUIRED/ DRUM/XMTR MAINT/A & B PA FAN MOTORS											
		H2	EH RES LEVEL HI, B MILL OIL PRESSURE											
		SOOT BLOWERS TAGGED					GAUGE GLASSES			PWTL 26.2'		DRYING AGENT		
		R1						OK					R1-0%	
		H1											H1-0%	
		H2	41										H2-0%	
		FUEL OIL LEVELS		C.H. 10'	HMPL 13'6 3/4"	NORTH 19'	SOUTH 6 3/4"				SILO LVL 19'	BOOTHE SYSTEM IN		
	8:30PM	FLOWING AMMONIA CALLED HOTLINE												
	8:45PM	H1 BOILER HAS BEEN RELEASED TO FULL PRESSURE. CALLED ACES.												
	9:52PM	H2 RELEASED FOR FULL PRESSURE CALLED ACES.												
	10:30PM	ELECT. HAS H2 RAPPERS IN OUTAGE MODE												
	11:30PM	H2 RAPPERS ARE BACK IN NORMAL. ELECT LEAVING.												

# Forced Outage Report

## Estimated Outage Cost

Work Order 6141667      \$2,396.15

## Lost Sales Opportunity Report

<b>FORCED OUTAGE COST ANALYSIS</b>				
<b>MISO DART Revenue and LOST OPPORTUNITY</b>				
<b>Unit</b>	<b>HMP'L 2 - H2-14-10</b>		<b>Production Cost</b>	
<b>Date &amp; Time Off Line</b>	10/30/14 5:16		<b>MW</b>	<b>\$/MW</b>
<b>Date &amp; Time On Line</b>	10/30/14 14:24		61	\$ 32.66
<b>Outage Duration</b>	9 hr. 8 min.		127	\$ 29.15
<b>Outage Code</b>	UO1		149	\$ 28.84
<b>Outage Reason</b>	Unit tripped on MFT after losing control power			
<b>Date</b>	<b>DA LMP Average</b>	<b>RT LMP Average</b>	<b>DART P&amp;L</b>	<b>Lost Opportunity</b>
10/30/14 (HE 6-23)	\$ 35.03	\$ 32.57	\$ (13,393)	\$ -
<b>Total</b>			\$ (13,393)	\$ -
<b>Start Up Fuel Cost</b>		<b>Total Forced Outage Cost</b>		
S/U Fuel Consumed	4,543	<b>DART P&amp;L</b>	\$	(13,393)
S/U Fuel Price	\$ 3.09	<b>Lost Opportunity</b>	\$	-
<b>S/U Fuel Cost</b>	<b>\$ (14,026)</b>	<b>S/U Fuel Cost</b>	\$	(14,026)
		<b>Total</b>	\$	(27,418)
<b>NOTES:</b>				
All negative values are money out of pocket.				
DART Revenue is calculated from differences between the DA award and RT events				
Lost Opportunity is the lost margins if the unit had stayed running				