WHS – Testimony

Appendix A

Recommendation No. 1

Review unit startup procedures for all its major units (Merrimack, Schiller, and Newington) to determine if changes need to be made to start-up procedures when coming on line after longer than normal downtimes.

Response:
PSNH has taken action and is continuing to assess start-up procedures at Merrimack and Schiller stations to ensure implementation of new procedures takes place to maximize unit start-up readiness. Although adjustments to the start-up procedures were made, the primary focus of this assessment is a more proactive approach designed to confirm that critical equipment is in a ready state and functional when a unit is called for dispatch. This is being implemented so there would be minimal if any adjustments to the existing ISO start-up time required.

Merrimack and Schiller station management discussed this issue with Newington management to better understand where enhancements to start-up procedures or proactive solutions can be implemented. Newington was considered a good internal resource because it is an intermediate and peaking unit and is dispatched as a peaking unit or for transmission system stability. Additionally, other resources were contacted including Siemens and Generation Maintenance's rotating equipment specialist / turbine engineer to understand the optimum ways to layup critical equipment to ensure readiness. While this is an ongoing effort, PSNH is providing a summary of the changes that were implemented based on the information gathered to this point. To support this assessment moving forward, the PSNH's engineering group has been assigned to continue to explore this effort to seek positive, cost effective value.

Merrimack Station:
Turbine: Keep the rotor on turning gear, keep turbine oil system in service, install temporary heating source to the exciter, cycle turbine throttle valves. Merrimack's start-up procedure was modified to ensure the temporary exciter heating system is removed prior to start-up.

Bulk material handling systems: Routinely run system belts (units & FGD) and clean coal, limestone and gypsum feed systems to avoid hardening or agglomeration. Prepare bunkers for extended layup by managing level of coal.

Scrubber: Rotate ball mills, ensure motor heaters are in service, routinely operate mill pumps and manage the limestone silo level.

Boiler: Currently, the practice at Merrimack is to lay-up the boiler and boiler system using what is known as a "dry" method. This method entails draining the boiler and boiler system and adding nitrogen gas which creates a blanket of inert gas to inhibit

corrosion. There are other methods to lay-up the boiler system including a "wet" method which is when the boiler is left full and chemicals are added to inhibit corrosion. Both methods have pros and cons; Merrimack is currently exploring the benefits of both as they pertain to extended lay-up of the units.

Schiller:

Turbine: Keep turbine oil system in service, install heating source to the exciter, cycle turbine throttle valves.

Bulk Material Fuel Handling: Routinely operate fuel system belts; prepare bunkers for extended layup by managing level of coal and clean coal feed system to prevent hardening or agglomeration.

Boiler: The boiler layup at Schiller is different than the one at Merrimack and Newington. Schiller must keep auxiliary steam capacity for the tank farm, so the boiler and boiler systems are left full with auxiliary steam pressure on the drum and deaerator.

Recommendation No. 2

PSNH management should be notified by any contractor or company personnel, when they suspect that gasket installations are problematic, to allow management to evaluate the need for rework at that time within the confines of the existing outage schedule rather than potentially impede the maintenance schedule at the conclusion of the outage. This recommendation should be implemented at all plants.

Response:
Recognizing the importance of quality workmanship during outages, PSNH management identifies liaisons for each contractor and begins preparing for planned maintenance outages several months in advance. This preparation includes ordering materials, preparing scope documents, identifying all work and meeting with the various service contractors that will be on site throughout the outage performing work. During the pre-outage planning process, PSNH expresses the importance of quality work.

Each job, regardless of whether it is during a planned or unplanned outage, is assigned a PSNH liaison. The purpose of the liaison is to oversee the work and to facilitate communication between contractor and station management on safety, quality and productivity.

In an effort to reinforce the importance of quality workmanship and proper communication, PSNH has instituted a specific action with contractors, during pre-outage planning and ongoing during the work, to discuss these issues during the daily outage meetings at each station once the outage has started. This has become a practice at all plants.

Recommendation No. 3 & 4

Recommendation 3:
A vegetation inspection of the 355 and 355x main line 4.5kV circuits be performed, and that the results be filed with the 2012, reconciliation filing; and that a final determination of recoupment of replacement power costs associated with these outages be deferred to the ES/SCRC 2012 filing. (Canaan Outages 1- C,1-D,1-E,1-F,1-G,1-K and1- M)

Recommendation 4:
A vegetation inspection of the 335/332 main line 34.5 kV circuit (including the Hooksett tap to Hooksett Hydro) be performed, and that the results be filed with ES/SCRC 2012 reconciliation filing; and that a final determination of recoupment of replacement power costs associated with these outages be deferred to the ES/SCRC 2012 filing. (Garvin's Falls Outages M-A and Hooksett Outages 1-A, 1B, 1C)

Response:
PSNH Vegetation Management has a comprehensive program in place to maintain vegetation growth and tree clearances, as well as respond to tree related outages. PSNH utilizes a number of different tree trimming techniques to manage tree growth surrounding PSNH's circuits. These include scheduled tree trimming, enhanced tree trimming, maintenance enhanced tree trimming, mid-cycle tree trimming and hazard tree removal. In addition, PSNH implemented a multi-phase Reliability Enhancement Program (REP) on July 1, 2007. The REP is a multiphase program aimed to increase system reliability a component of this program focuses on tree trimming practices and reclaiming full width of the right-of-way.

Below is a summary of how these techniques were utilized and how Vegetation Management responded to tree related outages at the Canaan, Hooksett and Garvin's Falls hydro stations.

Canaan Hydro

355 ROW – Canaan outages C, D, E resulted from tree events on the 355 line.

Note that Canaan outage F was not specifically identified as a tree related outage. This outage may have resulted from a momentary disturbance caused by a tree, but this was never confirmed.

For the other outages, PSNH responded to each of these events on 2/26/10 (C and D), and 5/6/10 (E) respectively. In response to these outages, PSNH and PSNH's tree service contractor performed the following activities:

- Damage assessment
- Localized inspection
- Necessary tree work
- Restoration

Also of note is the Reliability Enhancement Program (REP) of which there is a PSNH Vegetation Management component. REP is a multi-phase program that focuses on improving reliability. One of the objectives of phase I was to reduce the standard tree trimming cycle to no longer than 5 years and increase hazard tree removal. REP phase II is focused on regaining the full width of ROWs. The research and patrolling activities associated with phase II started in 2010. In February 2010, Vegetation Management identified the 355 line as a focus area for the REP phase II effort. As part of this program the entire ROW (approximately 33 miles) was inspected by PSNH Vegetation Management interns from UNH's Thompson School of Forestry. During the inspection, the existing tree line was mapped using GPS. This information was then used to determine if the full width of the ROW was cleared. This was done to assess the work and cost associated with reclaiming the full width of the ROW. During the inspection, 36 hazard trees were identified and marked using GPS; these trees either have been removed or are scheduled to be removed. Most of the offending trees causing the outages were outside of the tree trimming zone. Regaining the full width of the right of way under REP II was not commenced until after the normal tree trimming cycle had treated the 355 line.

355X10 Distribution Circuit – Canaan outages G, K, and M resulted from tree events on the 355X10 line. PSNH responded to each of these events on 5/7/10 (G), 8/23/10 (K), and 12/1/10 (M), respectively. In response to these outages, PSNH and PSNH's tree removal contractor performed the following activities:

- Damage assessment
- Full Line patrol
- Necessary tree work and
- Restoration

Because distribution circuits are more accessible, a full patrol of the line is done prior to energizing the circuit for each tree related outage. The patrol is completed to identify any issues or potential hazard trees. During this patrol, not only are trees that pose an imminent threat identified, but also trees that could develop into a problem are also identified regardless if they are inside or outside the trimming area. Once the circuit is restored, PSNH directs the tree service company to the trees identified during the patrol. This circuit is scheduled for maintenance trimming in 2012. Most of the offending trees causing the outages were outside of the tree trimming zone. Regaining the full width of the right of way under REP II was not commenced until after the normal tree trimming cycle had treated the 355X10 line.

Hooksett/Garvin's Hydro

335/332 Garvin's/Hooksett ROW –Hooksett outages A, B, C and Garvins M-A resulted from tree events on the 335/332 line. PSNH responded to each of these events on 2/26/10 (Hooksett A and Garvins M-A), 4/29/10 (Hooksett B), and 7/26/10 (Hooksett C),

respectively. In response to these outages, PSNH and PSNH's tree service contractor performed the following activities:

- Damage assessment
- Localized inspection
- Necessary tree work and
- Restoration

This line was scheduled for trimming in 2010. This entails mowing under and adjacent to the line and then performing side trimming with an off road skidder bucket or with tree climbers. This is done to allow easier access for equipment working in the ROW. Mowing on this line was completed on 4/24/10; after the mowing was completed the side trimming commenced. On 4/29/10, Hooksett tripped offline. This outage did not occur in the vicinity of the active trimming area. In fact, the tree trimming contractor needed to mobilize a crew from the active side trimming area to address the tree damage which caused the Hooksett outage. During the damage assessment, it was noted the tree that caused the outage was outside the trim zone and was growing in a direction away from the line and broke in an unusual manner. On 7/26/10, Hooksett tripped again for a tree related event. In response to this event, Vegetation Management patrolled the 335/332 line with focus on other hazard trees; any trees that were identified were marked and removed. The outage on 7/26/10 occurred after the trimming was completed. The tree that caused the outage was not identified by the vegetation management crew, because it did not appear to be a threat based on the fact the tree was outside the trim zone and it was leaning/growing away from the line.

PSNH initiated a patrol of the circuit on 11/28/11 and completed it on 12/30/2011; hazard trees or other potential threats to the line were removed or have been scheduled to be removed.

Additionally, the 335/332 line is currently scheduled for REP phase II research and patrol in 2012. Similar to the Canaan 355 line, the entire line will be walked by PSNH and PSNH's tree service contractor. GPS mapping will be used to map the current width of the ROW. The information gathered during this effort will be used to develop a cost estimate and scope of work detail to reclaim the full width of the ROW. Additionally, during the patrol, hazard trees will be identified and marked using GPS, and these trees will then be scheduled for removal.

Recommendation No. 5

Pertaining to outages at small hydro units- PSNH should obtain the in-house ability to perform transient stability analysis to aid in the resolution of inadvertent generator over trips caused by faults on the distribution system, and to aid in the determination of proper time delays of under voltage relays to maintain stability for properly cleared faults.

Response:
PSNH has undertaken the steps necessary to develop this in-house capability. Company engineers have recently completed, through Worcester Polytechnic Institute (WPI), the courses Transients in Power Systems and Fundamentals of Power Transmission. In addition, a PSNH engineer will be attending the course PSS/E – Dynamic Simulation at Siemens Power Academy TD in Schenectady, NY in June 2012. Descriptions of the courses follow.

Transients in Power Systems covered fundamentals of the electrical transient problems in power systems. The course was focused on modeling and building tools for analyzing the effects of electrical transients in power systems.

Fundamentals of Power Transmission covered basic aspects of power system transmission characteristics, in particular those that affect system stability and voltage control. The course focused on modeling, analyzing and mitigating power system voltage and stability problems.

PSS/E – Dynamic Simulation will cover how to use dynamic simulation to analyze how the power system transitions from one status state to another. The course will cover data development and input for dynamics, initial system setup and checkout, running dynamic simulations, and plotting results.

In early 2012, PSNH's Transmission group began working on an upgrade to the Webster Substation (115kV). Localized IPP's and PSNH Hydro Generation were identified by PSNH's Transmission group as stakeholders and requested GSU and generator data. The information request was to support a transient system study. Ultimately, PSNH's Transmission group made a determination that the modification would not impact generation on the 34.5 kV.

Recommendation No. 6

Planning for emergent issues at small hydro stations- PSNH should focus its non-destructive examinations (NDE) on major hydro components (runners, draft tubes, etc) and develop a comprehensive plan to address the results of NDE examinations, and to specifically address items such as exciters, runners, set-up transformers, rotors, stators and draft tubes.

Response:

Since 2010, hydro has performed several NDE analyses, with many focused on the components identified in the recommendation. PSNH hydro has created a Project Plan, in response to this recommendation, to evaluate the NDE effort specific to hydro and equipment identified. This plan will focus on evaluating industry standards, collection of existing data and reviewing annual inspection reports. The intent of the plan is to assess all aspects of implementing a comprehensive NDE plan.

The scope of this assessment may vary but at a minimum include the following:

- Review Hydro Industry Standards
- Review Existing NDE practices
- Review Hydro annual inspection reports
- Review of existing NDE data
- Discuss NDE with Hydro personal familiar with equipment
- Review historical hydro outages or extended outages that resulted from the equipment identified above.
-

Discuss NDE practices with other sources including PSNH steam plant personal

Recommendation No. 7 (Follow-up from DE 09-091 and DE 10-121)

Address and complete the open time of litigation over $1,000,000 insurance deductible associated with Merrimack 2 Turbine problems.

Response:
PSNH has joined a lawsuit against The Babcock and Wilcox Company. This lawsuit was initiated by NU/PSNH's insurance carriers claiming that The Babcock and Wilcox Company supplied boiler tubing during the 2008 Merrimack Unit 2 overhaul that contained foreign material left in the boiler tubes. They further claimed that the foreign material left in the boiler tubes caused the damage to the newly installed high pressure/intermediate pressure (HP/IP) turbine. PSNH has joined the law suit to seek reimbursement of the $1 million deductible for our customers. The litigation is currently in the discovery phase and a conclusion date is currently undetermined.

Recommendation No. 8 (Follow-up from DE 09-091 and DE 10-121)

Address and complete the open item of the interconnection of PSNH Generating Units to PSNH Distribution System.

Response:
Throughout 2011, PSNH performed a study focusing on the adequacy of the overspeed protection scheme for hydro units. The report was finalized on February 15, 2012. In summary, the findings were that the hydro settings are adequate based on the following:

- Settings are consistent with industry standards (i.e. IEEE, NPCC guidance).
- Settings are set similar to other utilities

During the study PSNH found that the two PSNH high head hydro stations, Jackman and Canaan, have reported more overspeed trips than other hydro units. PSNH concluded that it is likely the majority, if not all, of the overspeed trips at these stations was the result of a system or generator fault (i.e. resulting in over frequency trip, or out-of-step).

In an effort to understand these events better, PSNH has installed additional monitoring equipment at Jackman and will be installing similar equipment at Canaan during the annual inspection in.

In addition to further evaluating overspeed trips at Jackman and Canaan, PSNH will be completing a coordination study of Smith, Gorham, Canaan and Lost Nation in 2012. The intent of this study is to ensure that the generator protection systems properly sync with the distribution/transmission system. The scope of the study will include a review of overcurrent relays, voltage relays, frequency relays and other protection systems that overlap the distribution/transmission and generating units.

ATTACHMENT WHS-1

LIST OF UNIT OUTAGES
AND
SCHEDULED OUTAGE PERIODS

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
MERRIMACK 1 - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2011

OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
1/4	1655	1/7	1255	2.8	Furnace Wall Tube Leak
1/24	0750	1/24	0955	0.1	No Load Steam Flow
4/12	1523	5/15	0905	32.7	Scheduled Maintenance Overhaul
5/17	0925	5/17	1252	0.1	Turbine Hydraulic Oil Pressure Control
5/29	2129	5/30	1410	0.7	Turbine Steam Pressure Sensing Line
6/10	1537	6/11	1053	0.8	1A Condensate Pump
6/14	1738	6/15	0100	0.3	Floor tube leaks
6/16	0250	6/16	2125	0.8	Floor tube leaks
7/13	2300	7/15	1530	1.7	Turbine Throttle Valve
9/6	1431	9/25	1518	19.0	FGD Tie in Outage
9/30	2248	10/1	1630	0.7	FGD Pressure Relay Trip
10/4	0820	10/4	1300	0.2	FGD Absorber Inspection
10/31	0500	11/13	1608	13.5	FGD Bypass and Duct work
TOTAL FORCED OUTAGE DOWN TIME				8.3	

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
MERRIMACK 2 - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2011

OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
1/25	1353	1/29	1209	3.9	Front Wall Tube Leak
3/5	0737	3/7	2342	2.7	2A Condensate Pump
3/8	0038	3/8	0253	0.1	Wet Coal
4/21	0043	4/29	0027	8.0	Transmission Outage
5/13	1913	5/16	0055	2.2	Turbine Drain Leak
6/22	2244	6/23	0040	0.1	Cyclone Furnace
8/15	1700	8/17	1420	1.9	Furnace Leaks
8/20	1556	8/22	0855	1.7	Generator Hydrogen Leak
10/12	1200	11/14	0955	32.9	Scheduled Maintenance/Tie-in Overhaul
12/7	0335	12/12	1610	5.5	Flue Gas Recirculating Fan

TOTAL FORCED OUTAGE DOWN TIME 18.1

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
MERRIMACK CT1 - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2011

OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
4/14	0519	4/21	2030	7.6	Scheduled Maintenance Overhaul
7/22	1325	7/26	2101	4.3	Turbine Fuel System Problems
8/3	1353	8/3	1536	0.1	Engine Fuel Leak
9/6	1328	9/6	1415	0.0	Fire Protection System
9/8	0505	9/22	1740	14.5	Switchyard Circuit Breakers
10/3	0527	10/7	2100	4.6	Switchyard Circuit Breakers
10/19	0930	10/19	1600	0.3	Circuit Breakers
12/20	0950	12/20	1045	0.0	Fuel Piping and Valves
TOTAL FORCED OUTAGE DOWN TIME				23.9	

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
MERRIMACK CT2 - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2011

OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
3/30	1250	3/30	1346	0.0	Jet Engine Inlet Air Filters
4/14	0740	4/22	1245	8.2	Scheduled Maintenance Overhaul
5/5	0737	5/5	1252	0.2	Planned Jet Engine Inlet Air Filter Replacement
7/22	1433	7/27	1540	5.0	Generator Voltage Control
9/8	0505	9/22	1740	14.5	Planned MT3 Breaker Installation
10/3	0527	10/7	2100	4.6	Planned MT3 Breaker Installation
10/19	0830	10/19	1600	0.3	Switchyard Circuit Breakers
12/20	0950	12/20	1548	0.2	Fuel Piping and Valves
TOTAL FORCED OUTAGE DOWN TIME				5.9	

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
NEWINGTON - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2011

OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
1/14	0843	1/15	0347	0.8	Furnace Wall Tube Leak
3/9	0945	3/9	1345	0.2	Low Furnace Pressure Trip
3/26	0000	4/10	1124	15.5	Scheduled Maintenance Overhaul
7/23	1611	7/23	1839	0.1	Low Drum Level Trip
9/21	0700	9/23	1200	2.2	Planned Maintenance Outage
9/24	1215	9/24	1545	0.1	Main Steam Leak
9/25	1519	9/25	1656	0.1	Delayed Phase
10/13	0750	10/13	0850	0.0	Delayed Phase
TOTAL FORCED OUTAGE DOWN TIME				3.5	

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
SCHILLER 4 - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2011

OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
5/17	0025	5/17	1500	0.6	Main Steam Stop Packing Valve
6/1	2055	6/4	0107	2.2	Superheater Tube Leak
6/8	1406	6/8	1510	0.0	Drum Level Trip
6/8	1518	6/8	1839	0.1	Drum Level Trip
7/6	0900	7/6	1010	0.0	Motoring Relay
7/18	0800	7/18	0855	0.0	Motoring Relay
10/1	0001	11/5	0843	35.4	Scheduled Maintenance Overhaul
11/5	0930	11/5	1027	0.0	Logic Update and Adjustment
11/9	0000	11/9	2300	1.0	Hydrogen Cooler Leaks
TOTAL FORCED OUTAGE DOWN TIME				4.1	

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
SCHILLER 5 - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2011

OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
2/28	1710	3/3	0530	2.5	Process Building Fire
3/3	0925	3/3	1011	0.0	Forced Draft Fan
3/6	1007	3/6	1722	0.3	Forced Draft Fan Motor RTD
3/17	0701	3/17	0838	0.1	Cyclone Furnace Slagging
4/1	2355	5/18	1927	46.8	Scheduled Maintenance Overhaul
5/21	1704	5/21	1830	0.1	Forced Draft Fan
5/30	1331	5/30	1450	0.1	High Furnace Pressure Trip
6/20	1107	6/21	0235	0.6	High Furnace Pressure Trip
6/26	0227	6/28	0828	2.3	Low Furnace Pressure Trip
7/23	0745	7/23	0855	0.0	High Furnace Pressure Trip
11/12	2108	11/19	1000	6.5	Plugged Cyclones
11/19	1238	11/20	0046	0.5	Drum Level
11/20	0225	11/20	0334	0.0	Drum Level
11/20	0400	11/20	0558	0.1	Drum Level
11/25	1515	11/25	1801	0.1	Wood Feeder Plug
11/27	0618	11/27	1935	0.6	Furnace Pressure Trip
12/2	1626	12/2	1900	0.1	Furnace Pressure Trip
12/2	1921	12/2	2200	0.1	Furnace Pressure Trip
12/2	2234	12/3	0058	0.1	Furnace Pressure Trip
TOTAL FORCED OUTAGE DOWN TIME				14.1	

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
SCHILLER 6 - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2011

OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
3/4	2152	3/25	1526	20.7	Scheduled Maintenance Overhaul
3/26	0205	3/27	0310	1.0	Primary Air Valves
5/5	2157	5/5	2254	0.0	Turbine Trip
5/8	1130	5/8	1235	0.0	Drum Level Trip
5/13	1010	5/14	1247	1.1	Tube Leak
7/5	1301	7/5	1348	0.0	Low Drum Level Trip
7/6	1633	7/9	2225	3.2	Tube Leak
7/11	0500	7/11	0600	0.0	Delayed Phase
8/8	0200	8/8	2200	0.8	Hydrogen Leak
9/26	0730	9/26	0808	0.0	Low turbine steam flow trip
10/1	0700	10/1	1500	0.3	Planned Switchgear Replacement
10/17	2117	10/17	2200	0.0	Loss of Fuel
10/19	1300	10/19	1625	0.1	Induced Draft Fan
TOTAL FORCED OUTAGE DOWN TIME				6.9	

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
SCHILLER CT1 - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2011

OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
1/20	1039	1/21	0931	1.0	Fuel System Problem
5/16	0445	5/20	1125	4.3	Scheduled Maintenance Outage
12/8	0700	12/8	0841	0.1	Miscellaneous External Problems
TOTAL FORCED OUTAGE DOWN TIME				1.0	

WYMAN IV - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2011

OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
1/22	0600	1/22	0700	0.0	4A Gas Recirculation Fan Breaker
5/13	0001	5/27	2029	14.9	Transmission line OOS
7/16	0806	7/17	1520	1.3	Transmission line OOS
7/21	1224	7/21	1318	0.0	Generator coolant
9/9	1727	9/9	1934	0.1	Lost power from local utility
TOTAL FORCED OUTAGE DOWN TIME				16.3	

PSNH Hydro Outage Record - January - December 2011

	Site	Unit Number	Date & Time OFF line	Date & Time ON line	Outage Duration - Hours	Outage Duration - Days	Lost Generation (Y or N)	Outage Type	Cause of Outage
A	Amoskeag	S	7/14/11 7:46	7/14/11 9:07	**1.35**	**0.06**	**Y**	**BS**	Black Start Test
B	Amoskeag	S	9/8/11 9:52	9/8/11 11:23	**1.52**	**0.06**	**Y**	**Trip**	Emergency Generator
A	Amoskeag	1	1/10/11 7:04	1/18/11 13:50	**198.77**	**8.28**	**N**	**AI**	Annual Inspection
B	Amoskeag	1	6/7/11 14:53	6/7/11 17:48	**2.92**	**0.12**	**N**	**Trip**	Unit failed to start
C	Amoskeag	1	12/24/11 17:04	12/24/11 21:57	**4.88**	**0.20**	**Y**	**Trip**	Coil failure
A	Amoskeag	2	2/14/11 7:19	2/18/11 14:02	**102.72**	**4.28**	**N**	**AI**	Annual Inspection
B	Amoskeag	2	2/23/11 8:00	2/23/11 10:39	**2.65**	**0.11**	**Y**	**EMO**	Testing brake system
C	Amoskeag	2	6/23/11 7:20	6/23/11 14:45	**7.42**	**0.31**	**N**	**EMO**	Oil leak on gate lock piston
D	Amoskeag	2	7/7/11 7:37	7/7/11 14:27	**6.83**	**0.28**	**N**	**EMO**	Trouble shooting gate lock problem.
E	Amoskeag	2	7/8/11 7:20	7/8/11 11:30	**4.17**	**0.17**	**N**	**EMO**	Replaced hydraulic valve on gate lock.
A	Amoskeag	3	1/5/11 10:48	1/5/11 12:20	**1.53**	**0.06**	**Y**	**EMO**	Cleaned exciter
B	Amoskeag	3	2/22/11 7:21	3/1/11 8:20	**168.98**	**7.04**	**N**	**AI**	Annual Inspection
C	Amoskeag	3	8/15/11 9:18	8/15/11 11:25	**2.12**	**0.09**	**N**	**EMO**	Oil in lower guide bearing
D	Amoskeag	3	9/13/11 12:24	9/13/11 14:56	**2.53**	**0.11**	**Y**	**EMO**	Replace flashboards
E	Amoskeag	3	9/25/11 2:45	9/25/11 9:14	**6.48**	**0.27**	**Y**	**Trip**	Bladder Transducer out of adjustment
F	Amoskeag	3	10/30/11 7:19	10/31/11 8:15	**24.93**	**1.04**	**Y**	**Trip**	Loss of power to the baldder compressor

PSNH Hydro Outage Record - January - December 2011

	Site	Unit Number	Date & Time OFF line	Date & Time ON line	Outage Duration - Hours	Outage Duration - Days	Lost Generation (Y or N)	Outage Type	Cause of Outage
A	Ayers Island	S	6/2/11 14:58	6/2/11 16:55	**1.95**	**0.08**	**Y**	**T or D**	Line Fault
B	Ayers Island	S	8/19/11 17:01	8/19/11 17:30	**0.48**	**0.02**	**Y**	**T or D**	Line Fault
C	Ayers Island	S	8/28/11 0:19	8/28/11 17:24	**17.08**	**0.71**	**Y**	**T or D**	Line Fault
D	Ayers Island	S	11/23/11 11:01	11/23/11 11:23	**0.37**	**0.02**	**Y**	**T or D**	Line Fault
A	Ayers Island	1	1/17/11 7:56	1/21/11 18:17	**106.35**	**4.43**	**N**	**AI**	Annual Inspection
B	Ayers Island	1	2/3/11 10:13	2/3/11 10:23	**0.17**	**0.01**	**Y**	**Trip**	High lower guide bearing oil
C	Ayers Island	1	11/17/11 14:31	11/17/11 14:38	**0.12**	**0.00**	**Y**	**Trip**	Testing RTU raise/lower circuit.
D	Ayers Island	1	11/18/11 12:52	11/18/11 12:56	**0.07**	**0.00**	**Y**	**Trip**	Testing RTU raise/lower circuit.
A	Ayers Island	2	1/31/11 8:20	2/11/11 18:05	**273.75**	**11.41**	**N**	**AI**	Annual Inspection
B	Ayers Island	2	2/14/11 12:33	2/14/11 13:03	**0.50**	**0.02**	**N**	**EMO**	Wiring Modification
C	Ayers Island	2	2/14/11 14:12	2/14/11 18:32	**4.33**	**0.18**	**N**	**EMO**	Overspeed Alarm
D	Ayers Island	2	6/21/11 10:38	6/21/11 13:45	**3.12**	**0.13**	**N**	**Trip**	Loss of flow through flow switch
A	Ayers Island	3	1/21/11 1:29	1/21/11 3:55	**2.43**	**0.10**	**Y**	**Trip**	Loss of DC Service
B	Ayers Island	3	2/15/11 9:56	2/15/11 10:40	**0.73**	**0.03**	**N**	**EMO**	Wiring modifications
C	Ayers Island	3	2/16/11 8:37	2/16/11 14:00	**5.38**	**0.22**	**Y**	**Trip**	Unit trip
D	Ayers Island	3	8/21/11 17:27	8/21/11 18:30	**1.05**	**0.04**	**N**	**Trip**	Power Card
E	Ayers Island	3	8/23/11 3:23	8/23/11 15:00	**11.62**	**0.48**	**Y**	**Trip**	Power Card
F	Ayers Island	3	9/29/11 7:34	9/30/11 13:43	**30.15**	**1.26**	**Y**	**EMO**	Took unit offline to inspect draft tube.

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	Site	Unit Number	Date & Time OFF line	Date & Time ON line	Outage Duration - Hours	Outage Duration - Days	Lost Generation (Y or N)	Outage Type	Cause of Outage
A	Canaan	1	2/22/11 9:00	2/22/11 17:11	**8.18**	**0.34**	**Y**	**EMO**	Auto phasing testing
B	Canaan	1	3/18/11 11:54	3/18/11 13:54	**2.00**	**0.08**	**Y**	**T or D**	Line Fault
C	Canaan	1	4/21/11 11:25	4/21/11 15:03	**3.63**	**0.15**	**Y**	**T or D**	Line Fault
D	Canaan	1	5/26/11 20:32	5/26/11 22:09	**1.62**	**0.07**	**Y**	**T or D**	Line Fault
E	Canaan	1	5/27/11 20:04	5/27/11 20:11	**0.12**	**0.00**	**Y**	**T or D**	Line Fault
F	Canaan	1	6/1/11 14:36	6/1/11 16:39	**2.05**	**0.09**	**Y**	**T or D**	Line Fault
G	Canaan	1	6/3/11 10:09	6/3/11 10:14	**0.08**	**0.00**	**Y**	**T or D**	Line Fault
H	Canaan	1	8/1/11 8:58	8/11/11 18:35	**249.62**	**10.40**	**Y**	**AI**	Annual Inspection
I	Canaan	1	12/8/11 5:18	12/8/11 8:25	**3.12**	**0.13**	**Y**	**T or D**	Line Fault

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	Site	Unit Number	Date & Time OFF line	Date & Time ON line	Outage Duration - Hours	Outage Duration - Days	Lost Generation (Y or N)	Outage Type	Cause of Outage
A	Eastman	1	11/28/11 8:32	12/2/11 16:53	**104.35**	**4.35**	**Y**	**AI**	Annual Inspection
B	Eastman	1	12/19/11 5:57	12/19/11 12:20	**6.38**	**0.27**	**Y**	**Trip**	Governor problem
A	Eastman	2	6/6/11 8:27	7/19/11 15:29	**1039.03**	**43.29**	**Y**	**AI**	Annual Inspection
B	Eastman	2	8/18/11 0:38	8/18/11 1:56	**1.30**	**0.05**	**Y**	**EMO**	Bestobell Seal
C	Eastman	2	8/26/11 0:49	8/26/11 2:36	**1.78**	**0.07**	**Y**	**EMO**	Bestobell Seal
D	Eastman	2	9/3/11 6:37	9/3/11 8:29	**1.87**	**0.08**	**Y**	**EMO**	Bestobell Seal
E	Eastman	2	9/4/11 9:23	9/4/11 9:53	**0.50**	**0.02**	**Y**	**EMO**	Bestobell Seal
F	Eastman	2	9/10/11 22:00	9/10/11 22:32	**0.53**	**0.02**	**Y**	**EMO**	Bestobell Seal
G	Eastman	2	10/30/11 2:55	10/30/11 9:45	**6.83**	**0.28**	**Y**	**T or D**	Unit trip
H	Eastman	2	10/31/11 11:18	10/31/11 12:09	**0.85**	**0.04**	**Y**	**EMO**	Bestobell Seal
I	Eastman	2	11/15/11 22:36	11/15/11 23:03	**0.45**	**0.02**	**Y**	**EMO**	Bestobell Seal
J	Eastman	2	11/19/11 6:24	11/19/11 7:47	**1.38**	**0.06**	**Y**	**EMO**	Bestobell Seal
K	Eastman	2	11/23/11 6:21	11/23/11 10:05	**3.73**	**0.16**	**Y**	**T or D**	Line Fault/Power Surge
L	Eastman	2	11/27/11 18:33	11/27/11 18:56	**0.38**	**0.02**	**Y**	**EMO**	Bestobell Seal
M	Eastman	2	11/28/11 9:37	11/28/11 9:52	**0.25**	**0.01**	**Y**	**Trip**	Unit trip
N	Eastman	2	12/1/11 6:20	12/1/11 8:17	**1.95**	**0.08**	**Y**	**EMO**	Water Intake
O	Eastman	2	12/12/11 9:45	12/12/11 10:38	**0.88**	**0.04**	**Y**	**EMO**	Bestobell Seal

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	Site	Unit Number	Date & Time OFF line	Date & Time ON line	Outage Duration - Hours	Outage Duration - Days	Lost Generation (Y or N)	Outage Type	Cause of Outage
A	Garvins	S	1/12/11 18:45	1/12/11 18:52	**0.12**	**0.00**	**Y**	**TRIP**	Pond Control
B	Garvins	S	5/4/11 8:52	5/4/11 9:44	**0.87**	**0.04**	**Y**	**EMO**	Fish louver line
C	Garvins	S	6/3/11 9:41	6/3/11 12:14	**2.55**	**0.11**	**Y**	**EMO**	Fish louver line
D	Garvins	S	7/18/11 7:44	8/9/11 13:56	**534.20**	**22.26**	**Y**	**AI**	Annual Inspection
E	Garvins	S	9/5/11 18:58	9/5/11 22:34	**3.60**	**0.15**	**Y**	**T or D**	Line Fault
F	Garvins	S	10/13/11 8:24	10/13/11 9:17	**0.88**	**0.04**	**Y**	**EMO**	Fish louver line
G	Garvins	S	10/13/11 10:41	10/13/11 11:40	**0.98**	**0.04**	**Y**	**EMO**	Fish louver line
H	Garvins	S	10/13/11 15:11	10/13/11 16:44	**1.55**	**0.06**	**Y**	**EMO**	Fish louver line
I	Garvins	S	10/21/11 8:34	10/21/11 9:30	**0.93**	**0.04**	**Y**	**OU**	Fish louver line
J	Garvins	S	10/28/11 8:18	10/28/11 9:09	**0.85**	**0.04**	**Y**	**OU**	Fish louver line
K	Garvins	S	12/11/11 23:43	12/12/11 1:20	**1.62**	**0.07**	**Y**	**OU**	Rack Alarm
L	Garvins	S	12/21/11 11:13	12/21/11 11:53	**0.67**	**0.03**	**Y**	**EMO**	Equipment removal
M	Garvins	S	12/21/11 13:58	12/21/11 15:31	**1.55**	**0.06**	**Y**	**EMO**	Fish louver line equipment
N	Garvins	S	12/22/11 8:00	12/22/11 9:14	**1.23**	**0.05**	**Y**	**BS**	Black start test
A	Garvins	1	1/12/11 22:13	1/12/11 23:20	**1.12**	**0.05**	**N**	**TRIP**	Unit failed to start
B	Garvins	1	1/13/11 4:30	1/13/11 5:30	**1.00**	**0.04**	**N**	**TRIP**	Unit failed to start
C	Garvins	1	2/15/11 8:00	2/15/11 12:00	**4.00**	**0.17**	**N**	**EMO**	Planned Outage
D	Garvins	1	8/28/11 13:04	8/28/11 13:12	**0.13**	**0.01**	**Y**	**TRIP**	Unit trip
A	Garvins	2	6/1/11 8:57	6/1/11 9:35	**0.63**	**0.03**	**Y**	**EMO**	Switching
B	Garvins	2	8/9/11 8:00	8/24/11 13:11	**365.18**	**15.22**	**Y**	**EMO**	Failed bearings
C	Garvins	2	8/28/11 6:10	8/28/11 9:57	**3.78**	**0.16**	**Y**	**TRIP**	Unit trip

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	Site	Unit Number	Date & Time OFF line	Date & Time ON line	Outage Duration - Hours	Outage Duration - Days	Lost Generation (Y or N)	Outage Type	Cause of Outage
A	Garvins	3	3/30/11 3:08	3/30/11 4:37	**1.48**	**0.06**	**Y**	**Trip**	Unit Trip
B	Garvins	3	4/10/11 17:30	4/10/11 19:25	**1.92**	**0.08**	**Y**	**Trip**	Unit Trip
C	Garvins	3	4/14/11 3:36	4/14/11 6:38	**3.03**	**0.13**	**Y**	**Trip**	Unit Trip
D	Garvins	3	7/5/11 22:51	7/6/11 0:34	**1.72**	**0.07**	**N**	**Trip**	Failed Start
E	Garvins	3	8/28/11 13:04	8/28/11 15:21	**2.28**	**0.10**	**Y**	**Trip**	Unit Trip
A	Garvins	4	1/1/11 0:01	2/2/11 13:30	**781.48**	**32.56**	**Y**	**AI**	Continuation of g4 bearing
B	Garvins	4	5/26/11 17:26	5/26/11 18:30	**1.07**	**0.04**	**Y**	**Trip**	Unit trip
C	Garvins	4	5/27/11 14:59	5/27/11 15:28	**0.48**	**0.02**	**Y**	**Trip**	Automatic Shutdown
D	Garvins	4	5/27/11 19:24	5/27/11 19:59	**0.58**	**0.02**	**Y**	**Trip**	Automatic Shutdown
E	Garvins	4	5/27/11 23:05	5/28/11 0:35	**1.50**	**0.06**	**Y**	**Trip**	Automatic Shutdown
F	Garvins	4	5/29/11 16:49	5/29/11 17:22	**0.55**	**0.02**	**Y**	**Trip**	Automatic Shutdown
G	Garvins	4	5/30/11 13:00	5/30/11 13:37	**0.62**	**0.03**	**Y**	**Trip**	Automatic Shutdown
H	Garvins	4	5/30/11 16:36	5/30/11 17:12	**0.60**	**0.03**	**Y**	**Trip**	Automatic Shutdown
I	Garvins	4	7/3/11 3:12	7/3/11 4:30	**1.30**	**0.05**	**N**	**Trip**	Unit trip
J	Garvins	4	8/18/11 16:20	8/18/11 16:37	**0.28**	**0.01**	**Y**	**Trip**	Unit trip
K	Garvins	4	9/15/11 16:29	9/15/11 18:16	**1.78**	**0.07**	**Y**	**EMO**	Board work

PSNH Hydro Outage Record - January - December 2011

	Site	Unit Number	Date & Time OFF line	Date & Time ON line	Outage Duration - Hours	Outage Duration - Days	Lost Generation (Y or N)	Outage Type	Cause of Outage
A	Gorham	S	8/8/11 7:48	9/7/11 11:56	**724.13**	**30.17**	**Y**	**AI**	Annual Inspection
B	Gorham	S	9/12/11 2:04	9/12/11 3:07	**1.05**	**0.04**	**Y**	**T or D**	Line Fault

PSNH Hydro Outage Record - January - December 2011

	Site	Unit Number	Date & Time OFF line	Date & Time ON line	Outage Duration - Hours	Outage Duration - Days	Lost Generation (Y or N)	Outage Type	Cause of Outage
A	Hooksett	1	2/18/11 19:56	2/18/11 20:55	**0.98**	**0.04**	**Y**	**Tor D**	Line Fault
B	Hooksett	1	2/22/11 9:06	2/22/11 12:26	**3.33**	**0.14**	**Y**	**Tor D**	Line Fault
C	Hooksett	1	9/3/11 22:57	9/4/11 0:51	**1.90**	**0.08**	**Y**	**Trip**	Unit Trip
D	Hooksett	1	11/1/11 16:27	11/1/11 17:50	**1.38**	**0.06**	**Y**	**T or D**	Line Fault
E	Hooksett	1	12/5/11 8:11	12/9/11 10:00	**97.82**	**4.08**	**Y**	**AI**	Annual Inspection
F	Hooksett	1	12/13/11 10:33	12/13/11 13:29	**2.93**	**0.12**	**Y**	**EMO**	Faulty operation of governor

PSNH Hydro Outage Record - January - December 2011

	Site	Unit Number	Date & Time OFF line	Date & Time ON line	Outage Duration - Hours	Outage Duration - Days	Lost Generation (Y or N)	Outage Type	Cause of Outage
A	Jackman	1	7/6/11 8:37	7/6/11 13:18	**4.68**	**0.20**	**N**	**EMO**	EMO
B	Jackman	1	9/29/11 23:57	9/30/11 0:01	**0.07**	**0.00**	**N**	**T or D**	Line Fault
C	Jackman	1	11/15/11 8:27	11/21/11 14:09	**149.70**	**6.24**	**N**	**AI**	Annual Inspection
D	Jackman	1	12/8/11 4:54	12/8/11 9:48	**4.90**	**0.20**	**Y**	**T or D**	Line Fault

PSNH Hydro Outage Record - January - December 2011

	Site	Unit Number	Date & Time OFF line	Date & Time ON line	Outage Duration - Hours	Outage Duration - Days	Lost Generation (Y or N)	Outage Type	Cause of Outage
A	Lost Nation	1	4/26/11 7:00	5/13/11 14:01	**415.02**	**17.29**	**N**	**AI**	Annual Inspection
B	Lost Nation	1	5/20/11 9:18	5/20/11 14:20	**5.03**	**0.21**	**N**	**BS**	Black Start

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	Site	Unit Number	Date & Time OFF line	Date & Time ON line	Outage Duration - Hours	Outage Duration - Days	Lost Generation (Y or N)	Outage Type	Cause of Outage
A	Smith	1	5/26/11 22:07	5/26/11 23:04	**0.95**	**0.04**	**Y**	**Trip**	Unit Trip
B	Smith	1	7/15/11 13:03	7/15/11 16:22	**3.32**	**0.14**	**Y**	**T or D**	Line Fault
C	Smith	1	9/1/11 9:49	12/30/11 10:15	**2880.43**	**120.02**	**Y**	**Trip**	Breaker Failure

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	Site	Unit Number	Date & Time OFF line	Date & Time ON line	Outage Duration - Hours	Outage Duration - Days	Lost Generation (Y or N)	Outage Type	Cause of Outage
A	White Lake	1	2/6/11 5:23	2/6/11 13:17	**7.90**	**0.33**	**N**	**Trip**	Annunicator Alarm
B	White Lake	1	3/6/11 11:29	3/6/11 11:42	**0.22**	**0.01**	**N**	**Trip**	Fire system
C	White Lake	1	4/4/11 8:00	4/21/11 14:02	**414.03**	**17.25**	**N**	**AI**	Annual Inspection
D	White Lake	1	4/27/11 14:14	4/27/11 14:45	**0.52**	**0.02**	**N**	**Trip**	Dispatcher could not lower unit.
E	White Lake	1	5/2/11 4:00	5/2/11 5:27	**1.45**	**0.06**	**N**	**EMO**	Troubleshooting themocouples
F	White Lake	1	5/5/11 12:59	5/5/11 13:39	**0.67**	**0.03**	**N**	**EMO**	Air Pack
G	White Lake	1	5/21/11 6:00	5/21/11 16:47	**10.78**	**0.45**	**N**	**EMO**	Replaced fuel manifold

ATTACHMENT WHS-2

PUC OUTAGE REPORTS

PSNH

FOSSIL STATION OUTAGE REPORT

Outage Report No.: OR-2011-01 (MK1-01)

Station/Unit: Merrimack Station Unit No. 1

Dates: January 4 – January 7, 2011

Duration: 2.8 days

Immediate Cause: Furnace Wall Tube Leak

Discussion / Remedy: Unit 1 was removed from service due to excessive water usage. A boiler inspection was performed and identified leaks in the lower furnace. The failed tubes were numbers 5&6 from the front wall, (counting from west to east) on the south firebox wall (right hand sidewall). The failed wall tubes were a result of porosity in the original weld on tube five which in turn cut into tube six. The tube failure was at elevation 258' which is at "B" cyclone level. Due to the location of the leaks, staging needed to be installed to access the area, in this case staging inside and outside the fire box were necessary. A leak in a weld of tube five (counting from the front wall) caused the leak in tube number six. These 3" tangent tubes are without membrane and are some of the most time consuming weld repairs to perform. After the staging was erected removal of lagging, insulation, casing and refractory was completed. The wall tubes are tack welded to horizontal channels on the outside of the boiler. The tack welds needed to be cut free from the channels, refractory and studs removed on the inside, and the tubes needed to be pulled out of alignment with com-a-longs and wedges. Once the work area was accessible from the side, the tubes could be pad welded. After the weld repairs were performed, a successful pressure check and black light procedure was performed. The tubes were restored to the correct position and tack welded back to the channels. Studs and refractory were reinstalled on the firebox side. Refractory, casing, insulation and lagging were reinstalled on the outside, and finally the staging was removed.

While the repairs were being performed, an air heater wash was done along with an inspection of the circumferential and radial seals. No seal replacements needed. Critical path was the water wall repair, with the backlog of jobs being performed by the maintenance department and vendors.

Additional routine work was completed during the outage.
Other work performed during the outage included jobs that were in the priority outage backlog, jobs that were found during the inspection of the boiler at the beginning of the outage, and other corrective and preventative work in an effort to avoid future forced outages and support an extended unit run.

PSNH

FOSSIL STATION OUTAGE REPORT

Outage Report No.: OR-2011-02 (MK2-01)

Station/Unit: Merrimack Station Unit No. 2

Dates: January 25 – January 29, 2011

Duration: 3.9 days

Immediate Cause:
The unit was taken off line due to a front wall tube leak in the gas recirculation duct.

Discussion/Remedy:
Unit 2 was removed from service on January 25, 2011 for front wall tube leaks in the gas recirculation duct. The tubes that failed were the second and third from the south recirculation view port, located at the floor level of the duct. The tube failures also caused damage to the gas recirculation duct floor, refractory and metal expansion joint. After the unit cooled down a boiler inspection was completed. During the inspection a tube leak was found in "F" cyclone, measuring down 18" from the elbows (by the secondary air damper) and 18" from the neck. Both cyclone and front wall tube leaks were caused by erosion. The tubes were repaired and a pressure check performed. During the pressure check two additional tube leaks were discovered. One was in the wind box at the 3 o'clock position, on the south side of "G" cyclone. In this area the tubes are boxed in a 2" by 12" seal welded casing. The boxed area was cut open and barrel tube #9 (counting from the re-entrant throat side), was found to be the source of the leak. A thorough inspection of the area found that tubes 6, 7, and 8 also needed to be pad welded back to original wall thickness. An additional leak was identified and was on a cracked weld of a furnace supply tube. This tube was the third tube down on the west part of the horizontal furnace supply tube bundle, elevation 223', located directly across from the cyclone drain valves. The insulation, lagging and metal frame had to be removed to access the leak. One of the hangers that support the tubes together was cut to allow the tubes to be separated for repair.

Once all the tube leaks were repaired, a final waterside pressure test was performed and no other tube leaks were found.

Additional work completed during the outage.
Other work performed during the outage included jobs that were in the priority outage backlog, jobs that were found during the inspection of the boiler at the beginning of the outage, and other corrective and preventative work in an effort to avoid future forced outages and support an extended unit run.

PSNH

FOSSIL STATION OUTAGE REPORT

Outage Report No.: OR-2011-03 (MK2-02)

Station/Unit: Merrimack Station Unit No. 2

Dates: March 5 – March 7, 2011

Duration: 2.7 days

Immediate Cause:
The unit was removed from service due the 2A condensate pump.

Discussion/Remedy:
MK2 was taken off line on 3/5/11 at 07:37 due to failed bushing on the 2A Condensate Pump. The upper guide bushing had become worn which caused excessive vibration and ultimately the unit needed to be removed from service. In this case the pump and motor were replaced with spares from the station inventory. The failed pump and motor were sent out for re-build to restock the inventory for future use.

The Unit was declared available to ISO at 23:42 on 3/7/11.

Additional work completed during the outage.
Other work performed during the outage included jobs that were in the priority outage backlog, jobs that were found during the inspection of the boiler at the beginning of the outage, and other corrective and preventative work in an effort to avoid future forced outages and support an extended unit run.

PSNH

FOSSIL STATION OUTAGE REPORT

Outage Report No.: OR-2011-04 (MK2-03)

Station/Unit: Merrimack Station Unit No. 2

Dates: May 13 – May 16, 2011

Duration: 2.2 days

Immediate Cause:
Steam leak in the HP/IP turbine governor valve loop-pipe drain line.

Discussion/Remedy:
Operators conducting equipment rounds in the turbine area noticed a steam leak coming from the underside of the turbine. Access to the area was restricted to ensure safety. The leak was monitored and ultimately the determination was made to remove the unit from service to make the necessary repair. With the unit off line, the steam leak was traced to the HP/IP turbine governor valve loop-pipe drain line.

The steam was leaking from a crack in an old weld. The leak was caused by a failed weld that was attributed to low cycle fatigue. The entire drain line was removed and replaced. The new welds were stress relieved and non-destructive examination was completed per the power piping code.

Additional work completed during the outage.
Other work performed during the outage included jobs that were in the priority outage backlog, jobs that were found during the inspection of the boiler at the beginning of the outage, and other corrective and preventative work in an effort to avoid future forced outages and support an extended unit run.

PSNH

FOSSIL STATION OUTAGE REPORT

Outage Report No.: OR-2011-05 (NT1-01)

Station/Unit: Newington Unit No. 1

Dates: September 21 – September 23, 2011

Duration: 2.2 days

Immediate Cause: Preventative Maintenance Outage

Discussion / Remedy:
The unit was scheduled out of service beginning September 21, 2011 @ 07:00 for a Planned Maintenance Outage. The outage was scheduled to allow for a number of backlog maintenance activities to be completed prior to the winter season. The critical job of the outage was the replacement of the rebuilt Main Boiler Feed Pump/Turbine 1B Lube Oil Pump. The pump had been inspected during the 2011, Scheduled Annual Overhaul, during the inspection a crack in the pump's outlet flange was identified. The original pump manufacturer no longer manufactured or provided parts for the pump. A new pump casing was fabricated by PSNH's Generation Maintenance group prior to the Planned Outage. Generation Maintenance reversed engineered the housing and installed the original rotating element in the new casing prior to the Planned Outage. A technical representative from the original pump manufacturer was called and mobilized to the site to perform a full inspection of the rebuilt pump. The manufacturer's representative determined the pump as within the original specifications and concluded that it suitable for continued operation.

Additional work completed during the outage.
Other work performed during the outage included jobs that were in the priority outage backlog, jobs that were found during the inspection of the boiler at the beginning of the outage, and other corrective and preventative work in an effort to avoid future forced outages and support an extended unit run.

PSNH

FOSSIL STATION OUTAGE REPORT

Outage Report No.: OR-2011-06 (SR5-01)

Station/Unit: Schiller Station No. 5

Dates: November 12 – November 19, 2011

Duration: 6.5 days

Immediate Cause:
Schiller Unit No. 5 was removed from service due to plugged cyclones.

Discussion/Remedy:
Unit 5 was taken offline due to plugged cyclones. PSNH notified the vacuum contractor and the boilermakers to mobilize to the site for outage support and established day and night shifts.

The Unit was vented and cooled to prepare for the outage. PSNH completed a boiler and ash system inspection. The cyclones were found plugged and cleaned. The perforated plate distribution baffles in all eight bag house modules were inspected and repaired as necessary. The dip legs also showed significant pluggage and the material was noted as hard. The pluggage was cleaned from the dip legs.

In addition to the cyclone and bag house work the condenser water-boxes were opened and cleaned. The protective coating and zincs were inspected and determined to be in good condition. The moly guard coolers were also opened, inspected, and cleaned of debris.

During the start-up, heavy leaf loading caused the inlet tunnel of the condenser to become plugged. The condenser was opened and leaves cleaned from the tube sheet. In addition divers were mobilized to the site to remove leaves from the trash racks.

During start-up the drum trip level control setting was adjusted after the boiler tripped. Once the adjustment was completed, start-up commenced and progressed successfully.

Additional work completed during the outage.
Other work performed during the outage included jobs that were in the priority outage backlog, jobs that were found during the inspection of the boiler at the beginning of the outage, and other corrective and preventative work in an effort to avoid future forced outages and support an extended unit run.

PSNH

FOSSIL STATION OUTAGE REPORT

Outage Report No.: OR-2011-7 (MK2-04)

Station/Unit: Merrimack Station Unit No. 2

Dates: December 7 – December 12, 2011

Duration: 5.5 days

Immediate Cause:
Merrimack Station Unit No. 2 was removed from service due to problems with the gas recirculation fans.

Discussion/Remedy:
MK2 was taken off line on December 7th, to address problems with the Gas Recirculation Fans. The 2A Fan was experiencing high vibration and the 2B outboard fan bearing temperature was running high. A contractor was utilized to mill and hone the 2B rotors on both ends of the fan. The bearings were sent out to be re-babbitted and bored to the design dimensions. In addition, the drive couplings were replaced, the motors were cleaned, and the seals and internals were inspected.

The Unit was declared available to ISO at 16:10 on 12/12/11.

Additional work completed during the outage.
Other work performed during the outage included jobs that were in the priority outage backlog, jobs that were found during the inspection of the boiler at the beginning of the outage, and other corrective and preventative work in an effort to avoid future forced outages and support an extended unit run.

ATTACHMENT WHS – 3

PSNH FOSSIL STEAM UNIT AVAILABILITY

PSNH FOSSIL STEAM UNIT AVAILABILITY

January 2011through December 2011

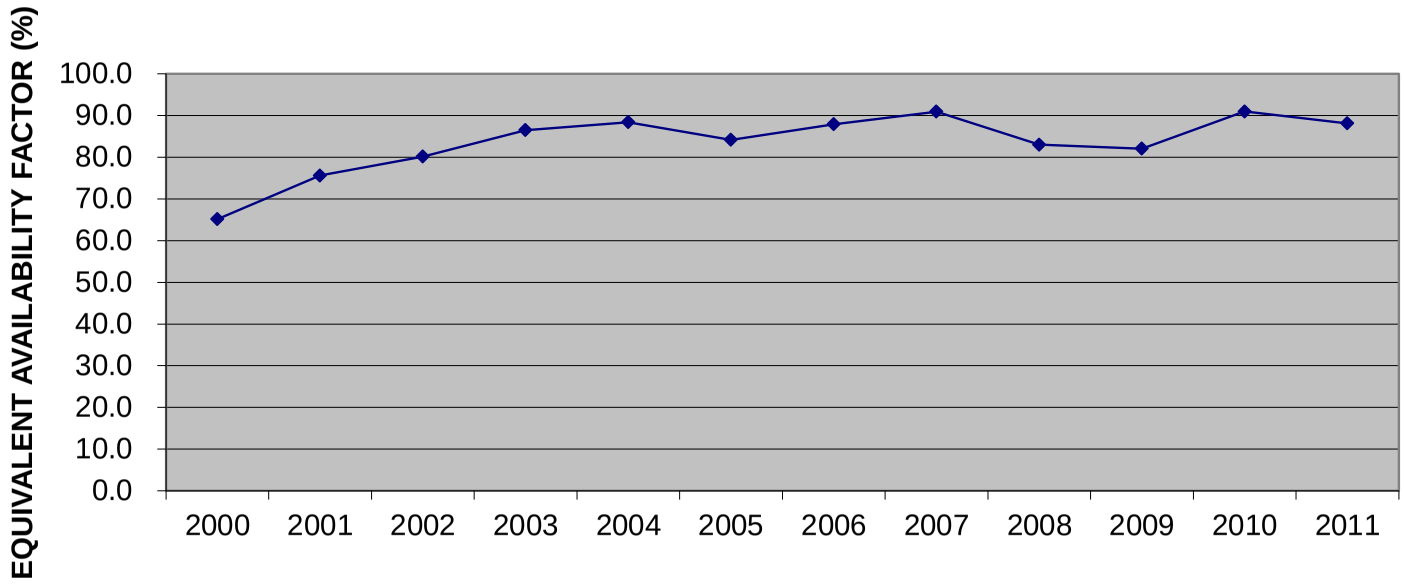
	Merrimack Unit 1	Merrimack Unit 2	Newington Unit 1	Schiller Unit 4	Schiller Unit 5	Schiller Unit 6
January	99.7%	87.3%	97.4%	100.0%	100.0%	100.0%
February	100.0%	100.0%	100.0%	100.0%	99.0%	100.0%
March	100.0%	91.1%	80.1%	100.0%	91.4%	29.8%
April	38.8%	100.0%	68.4%	100.0%	3.3%	100.0%
May	50.9%	92.8%	100.0%	98.0%	44.9%	96.0%
June	93.7%	99.7%	100.0%	92.1%	97.0%	100.0%
July	94.6%	100.0%	99.7%	99.7%	99.8%	89.3%
August	100.0%	88.4%	100.0%	100.0%	100.0%	97.3%
September	36.4%	100.0%	91.9%	100.0%	100.0%	100.0%
October	94.6%	37.1%	99.9%	0.0%	100.0%	98.7%
November	57.7%	55.2%	100.0%	82.2%	73.3%	100.0%
December	100.0%	82.2%	100.0%	100.0%	99.0%	100.0%

Scheduled Maintenance Outages

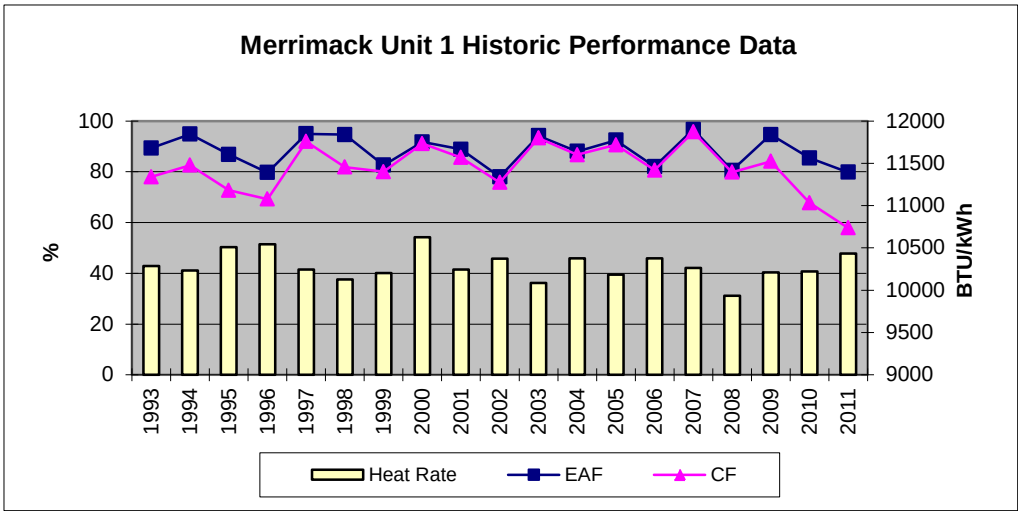
January 2011 through December 2011

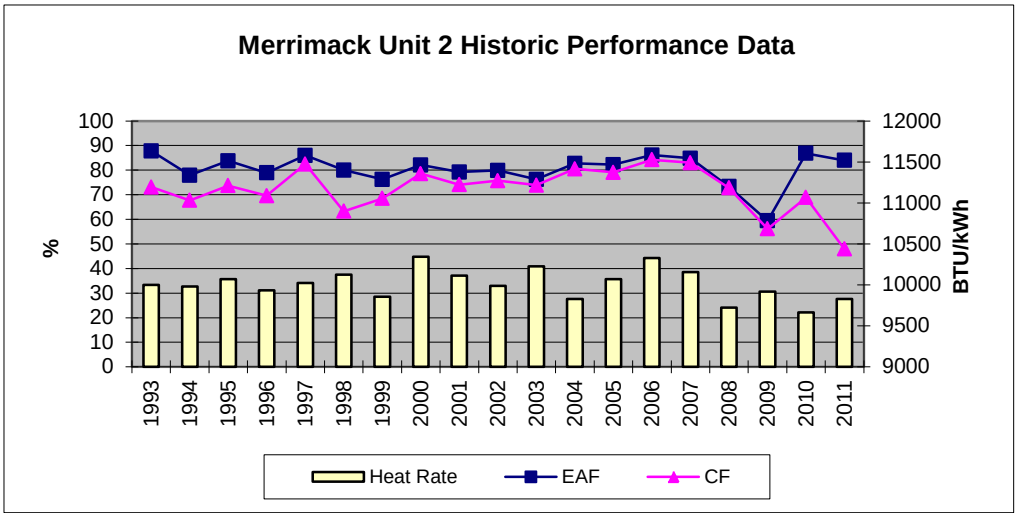
Unit	Month(s)
Merrimack 1	Apr-May
Merrimack 2	Oct-Nov
Newington	Mar-Apr
Schiller 4	Oct-Nov
Schiller 5	Apr-May
Schiller 6	Mar

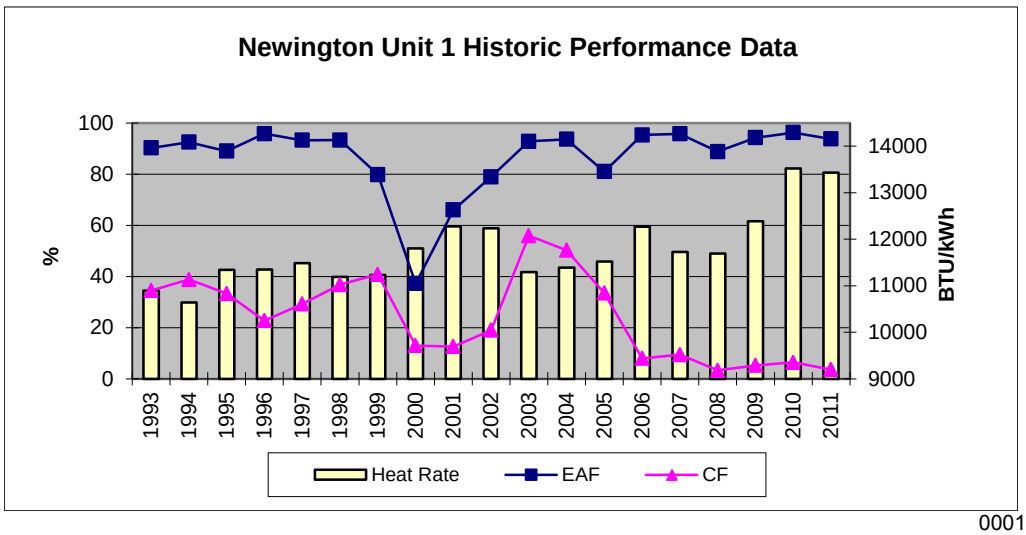
PSNH FOSSIL SYSTEM WEIGHTED EAF
2011



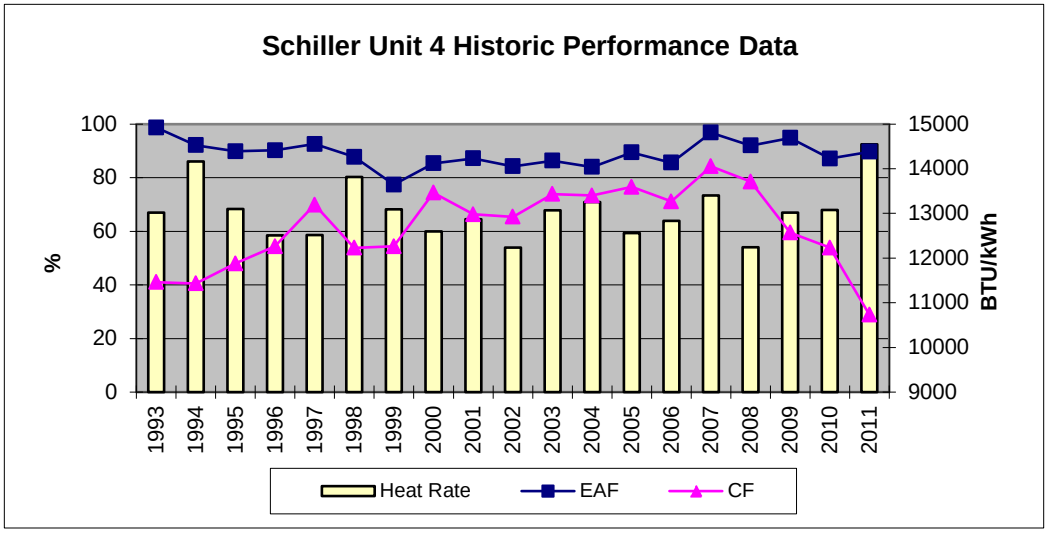
Fossil Plant Graphs – Planned Outages Included

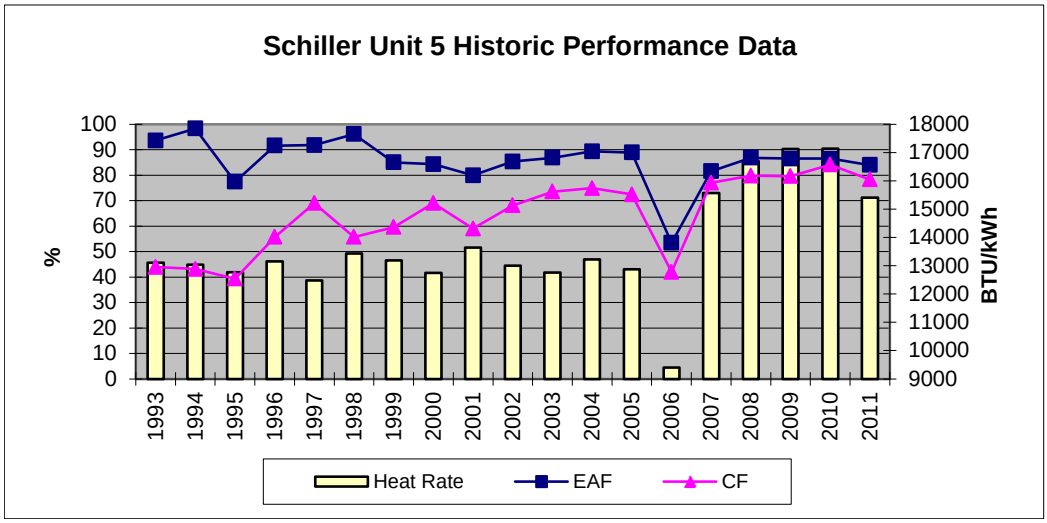


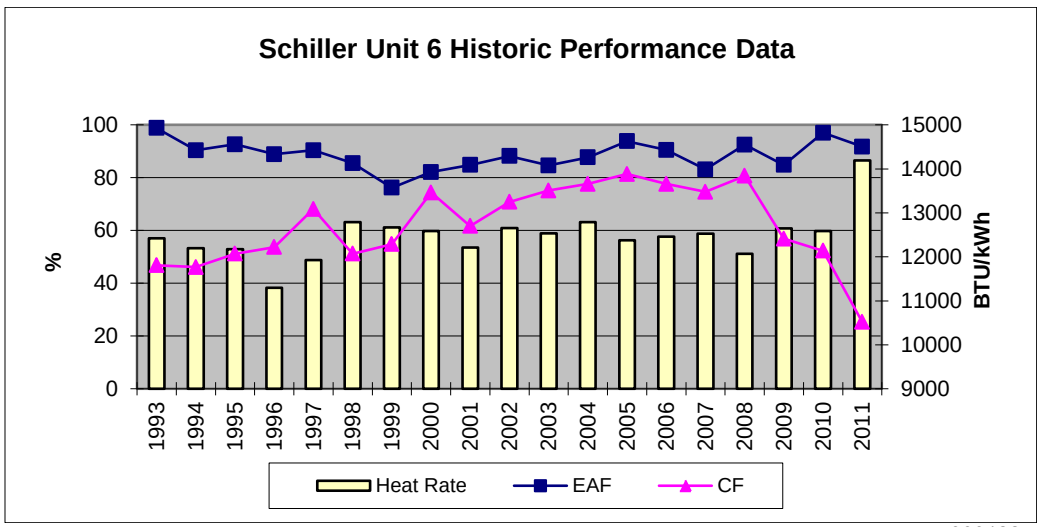




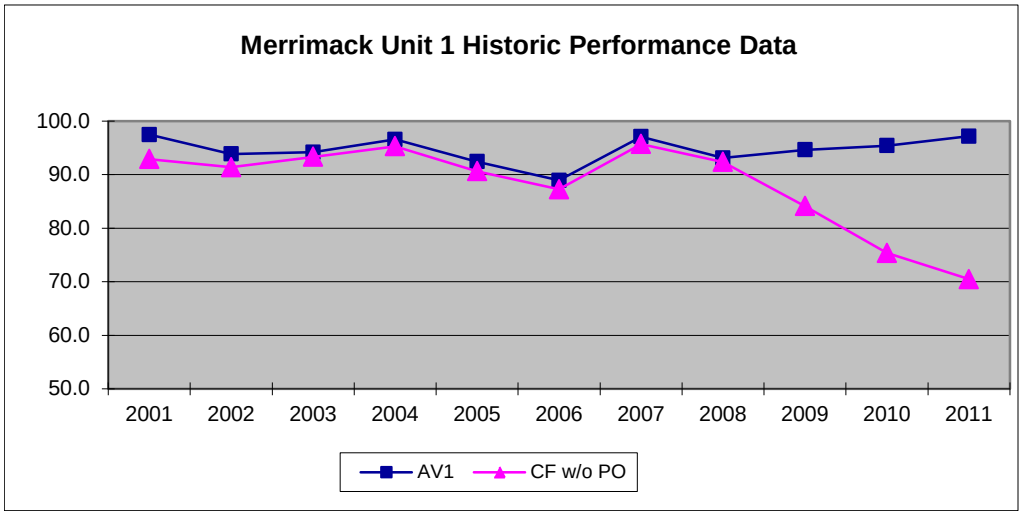
Fossil Plant Graphs – Planned Outages Included

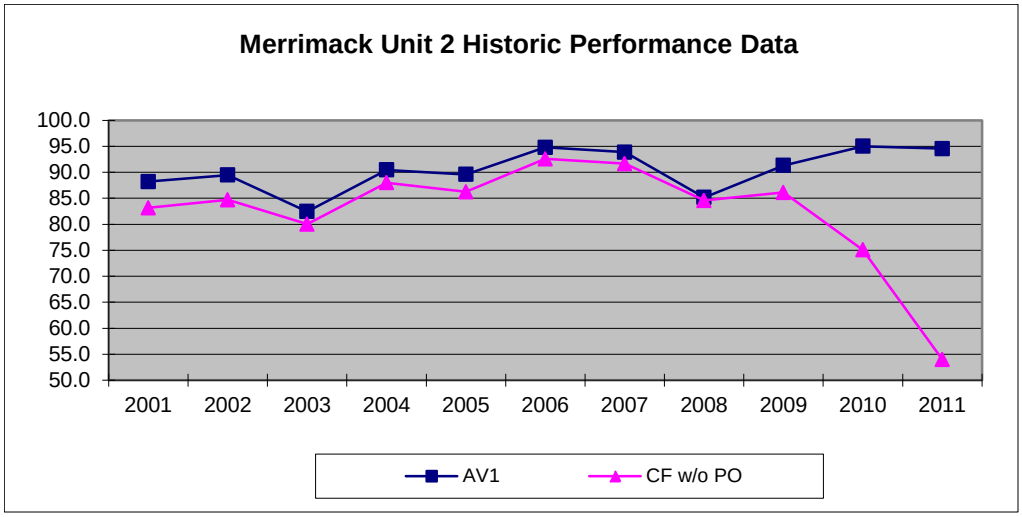


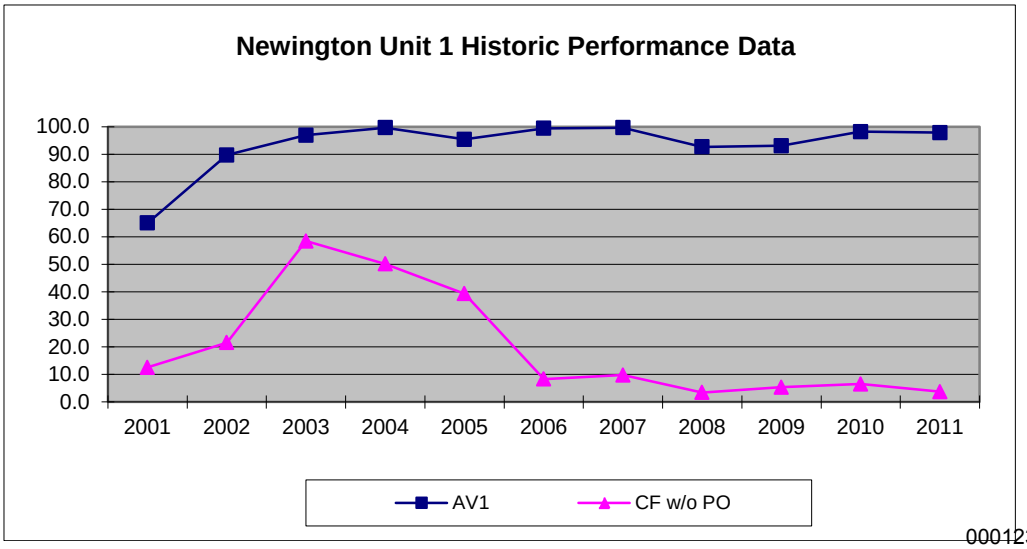




Fossil Plant Graphs – Planned Outages Omitted







Fossil Plant Graphs – Planned Outages Omitted