WHS - APPENDIX A

Recommendation No. 2012-1:

Accion stated that due to the installation of the Scrubber, situations may arise that could result in failures in both Merrimack units. Accion recommended that, if it has not already done so, PSNH review the interaction of the Scrubber with both units to identify possible failure conditions and determine the need for spare parts or additional redundancy to maximize operational efficiency. PSNH agreed to continue its review of the new scrubber installation and assess potential failure modes to determine the necessity for spare parts or additional redundancy.

Response:

One of PSNH's top priorities is to maintain a high level of reliability and continually seek cost effective opportunities to increase reliability. Similar to other projects that PSNH has undertaken over the years, the Clean Air Project (CAP) incorporated elements throughout all phases of the project to ensure reliability. Some of the efforts that were completed to confirm Flue Gas Desulfurization (FGD) reliability include a thorough equipment redundancy summary and an adequate spare parts inventory.

During the design phase PSNH worked with an engineering firm to develop an equipment redundancy summary. The intent of this effort was to analyze potential failure points, and review the FGD system in its entirety to evaluate the need for system redundancy. Specifically, this evaluation included a review of the absorber, various pumps, tanks, gypsum handling, and air compressor system and ball mills. This analysis was further refined as the FGD design progressed. Ultimately the final design included redundant systems for all critical FGD equipment.

Spare parts are also critical to reliability. Throughout the construction phase of the project PSNH worked closely with the program manager URS Corporation (URS) in developing an adequate spare parts inventory. URS tasked each one of the contractors with providing the recommended spare parts list for each system. URS then reviewed the recommended inventory list and completed a comprehensive review to ensure completeness. The final FGD spare parts inventory consists of slightly more than 500 items and is consistent with industry standards for this type of system.

Recommendation No. 2012-2:
Accion observed that PSNH has to make certain assumptions to develop an outage schedule, but during a planned outage at Merrimack, certain assumptions required refinement. Accion recommended and PSNH agreed to review planned outage schedules to detect assumptions that need to be verified.

Response:

PSNH does perform periodic reviews of the base case schedule to ensure the appropriate logic is assigned to the various activities and seeks opportunities to refine the outage scheduling process.

Furthermore, PSNH recognizes the importance of quality outage planning and a quality outage schedule. When developing a planned outage schedule PSNH uses a base case schedule. The base case schedule incorporates the assumptions and information that have been developed from years of experience in outage planning. PSNH refines these assumptions during the outage planning process and throughout the outage period. For example PSNH management works with stakeholders often several months in advance and reviews the schedule on an activity by activity basis to better understand the scope of work, required resources and the duration for each activity. This process has proven successful over the years.

In some cases, despite thorough advance planning, situations arise during the outage that result in changes to the original schedule. PSNH attempts to proactively address potential changes by conducting daily outage meetings which are attended by PSNH employees and, as necessary, contractors performing critical activities. This meeting provides an opportunity to discuss all outage activities, track progress, reallocate resources and, if needed, update the schedule. This proactive approach allows PSNH to be aware of situations that could result in loss or gain at the earliest possible moment.

Recommendation No. 2012-3:
Accion stated its belief that PSNH will increasingly install used or refurbished equipment as its unit fleet ages. Accion and PSNH agreed to add the testing performed on used or refurbished parts to the part's history documentation. This will be implemented at each station including the hydro units and testing expectations will be made clear to vendors.

Response:

Typically PSNH does not install used equipment, however, under certain circumstances used equipment may be installed. These types of circumstances include components that are no longer available from the original equipment manufacturer or equipment that may have a long manufacturing lead time. When it is determined that used equipment is to be installed PSNH requires testing prior to installation to ensure the component is serviceable. PSNH has a good understanding of what testing is available and appropriate for used or refurbished equipment. Prior to placing used or refurbished equipment in service, PSNH reviews the test results with service contractors. Once the equipment is determined to be serviceable the component is cleared for installation. The testing records associated with the specific device are stored in the station records.

Recommendation No. 2012-4:
Accion recommended and PSNH agreed to make clear to the ISO-NE that all requested unit starts that are shorter than committed start-up times are made on a best efforts basis only and that PSNH is not responsible if the start-up time requested is less than the committed start-up time.

Response:

PSNH provides a number of unit dispatch parameters to ISO – NE, including hot and cold notification start times. Notification start time is the time required from when an order is received from ISO to come online to the time when the generator synchronizes to the system. These parameters will vary depending on the unit type and design.

Occasionally, ISO – NE will request a unit to phase as soon as possible. In an effort to be flexible, PSNH will proceed to start the unit faster than the specified notification time as long as the accelerated startup can be completed safely and in accordance with equipment startup procedures. PSNH has reviewed the notification times to ensure accuracy and has communicated this information with ISO-NE. PSNH has also met with the operations crews to ensure PSNH does not commit to accelerated start times. PSNH will continue to maintain flexibility and start the unit as soon as possible when requested but will not commit to an accelerated start time.

Recommendation No. 2012-5:
Accion recommended and PSNH agreed to review its generation tie-in configurations, assess the risk of similar failures, and, as appropriate and economical, address the risks found.

Response:

In 2011, Smith Hydro experienced a generator circuit breaker failure; the relay protection system at Smith and at Berlin substation appropriately sensed and sectionalized the fault. Subsequent to this event but not because of this event, PSNH installed a circuit breaker in Berlin substation on the 115,000 volt side of the generator step up transformer. The benefit of the high side breaker is that it provides faster fault clearing times and is able to sectionalize a fault closer to the generator, reducing the effect of any generator issues on the adjacent transmission system and to PSNH customers. PSNH also completed a review of each generator's tie-in configurations on both the high and low voltage systems. The result of this review determined that the interconnections are consistent with good utility practice for the type and vintage of these generating units. It should be noted that the high voltage systems (115kV and above) are part of the bulk electric system and are required to meet site specific ISO- NE interconnection agreements along with NERC and/or NPCC requirements.

In recent years, PSNH has made improvements at several points of interconnection to increase reliability and system protection. These improvements include, but are not limited to the installation of high side circuit breakers at Jackman and Smith Hydro Stations. In addition to these installations PSNH has also replaced the low side circuit breaker at Ayers Island, and is currently in the process of replacing the step-up transformer at Ayers Island and replaced one of the generator step-up transformers at Garvins Falls.

This review also noted that Gorham and Hooksett do not have high side breakers installed, but do have fused protection devices, and Canaan is interconnected directly to the distribution system. These types of tie-in configurations are consistent with good utility practice for the type and vintage of these units.

Recommendation No. 2012-6:
Accion recommended and PSNH agreed to develop a time bounded program approach for replacement of Mercoid switches at its hydro stations and other generating facilities with identified opportunities and will submit the switch replacement schedule with its May 2013 ES/SCRC reconciliation filing.

Response:

Many of the level control switches installed throughout the PSNH hydro fleet are Mercoid switches; these switches contain a small amount of mercury. In 2008, The State of New Hampshire prohibited the purchase of new control switches that contain mercury. Currently, PSNH maintains an adequate supply of spare parts to maintain these switches, but recognizes that changing out these switches is needed.

PSNH Hydro Generation has developed a replacement program and reconfigured the level control switch system at targeted locations with electronic type switches (Reed switches). A small scale test has proven successful and PSNH is committed to replacing the Mercoid system with an updated electronic switch system. PSNH intends to complete the system upgrade at all hydro facilities by December 31, 2018.

The fossil stations also utilize Mercoid or mercury control switches, these devices are being changed out with non-mercury containing switches on an as needed basis. The fossil stations have greater flexibility because the replacement of these devices does not require reconfiguring the original design of the system; essentially these are an in kind replacement. PSNH does not have a predetermined schedule to replace the mercury containing switches at the fossil stations.

Recommendation No. 2012-7:
Accion recommended and PSNH agreed to review the time of year it changes temperature settings to address early or late season temperature changes.

Response:

PSNH hydro units have experienced outages that were caused by high bearing temperatures. The bearing cooling system for the hydro units are air cooled and dependent upon the ambient temperature and building ventilation. PSNH has made significant progress in updating the ventilation systems at the hydro facilities to minimize these types of outages and has seen a decrease in these types of outages as a result. However, as Accion noted, during the spring, particularly when the building ventilation system is not configured for summer time operation, unit outages have occurred.

To address this PSNH has created a preventative maintenance practice which includes an alarm that provides an annual notification on April 15th which will trigger an ongoing discussion between hydro personnel. If the weather forecast indicates that high temperatures are likely, then the building ventilation system will be set up for summer time operation. In addition, PSNH is evaluating the possibility of upgrading the existing ventilation with barometric dampers. These types of dampers will automatically increase ventilation and further reduce the chance of high bearing temperature conditions.

Recommendation No. 2012-8:
Accion recommended and PSNH agreed to reinforce with employees (e.g., engineers, operators, and mechanics) the importance of understanding and confirming the appropriateness of a replacement that is not in-kind.

Response:

PSNH completed a training session with all these employees and described the appropriate work practices when completing not in-kind equipment replacements. PSNH further emphasized the need to verify that replacement parts are consistent with system design.

Recommendation No. 2012-9:
Accion recommended and PSNH agreed to review changes in the compatibility of materials used in interface connections and to strengthen its training of proper installation of the various interface sealing mechanisms at all of its stations.

Response:

PSNH believes PSNH employees and its contractors perform quality workmanship. PSNH expresses the importance of quality workmanship for each job, regardless of whether it is during a planned outage, forced outage or maintenance activity. PSNH believes that contractors and PSNH employees performing work understand this philosophy and are properly trained.

In an effort to reinforce the importance of quality workmanship for all work, not only when working with material used at the in interface connections, PSNH now makes a point to discuss workmanship during the daily outage meetings at each station.

Recommendation No. 2012-10 (From recommendation 2009-5):
PSNH agreed to report on this issue as part of its filing for the 2011 ES/SCRC review in May 2012 (DE 11-094 Stipulation Section IV.E). PSNH filed that progress report with the Commission on May 2, 2012 as part of its 2011 ES/SCRC review. PSNH has completed under-voltage and over-speed studies at each of its hydro units. Recommendations from these studies have been completed.

***(From recommendation 2011-6):** - PSNH agreed to acquire the capability to perform in house transient stability analyses. PSNH responded to this item in its filing on May 2, 2012. PSNH is in the process of training in-house personnel. Currently, PSNH is gathering data to construct models to analyze the Canaan and Jackman hydro areas. PSNH will identify the most cost-effective next steps. To the extent that systemic issues are identified as associated with over-trip outages, PSNH will determine prudent action using good engineering judgment.*

Response:

PSNH continues to review and seek opportunities to better coordinate the generator relay protection system with the distribution and transmission system. Since the 2012 update, PSNH has completed a relay coordination study in accordance with this recommendation at Smith Hydro.

The Smith Hydro coordination study included an analysis of the coordination margins of the Smith Hydro protection system with the Berlin substation and nearby transmission protection systems installed as of 2012. This analysis was performed utilizing Aspen One-liner software/ "2012 NEPOOL Short Circuit Model" and information provided in relay setting files, elementary diagrams and setting basis documents. This analysis concluded that Smith hydro generator is protected by overlapping differential zones of protection. High speed fault clearing will occur for all phase faults within the facility and there are no coordination issues with the transmission protection systems that look into Smith Hydro. The results recommended changes to settings and tripping logic. These setting adjustments are scheduled to be completed during the 2013 annual inspection.

In addition to completing the Smith Hydro coordination study, PSNH has developed in house expertise to complete transient stability studies. In 2012, PSNH has undertaken the steps necessary to develop this in-house capability to perform transient stability studies. PSNH engineers have completed, through Worcester Polytechnic Institute (WPI), the courses Transients in Power Systems and Fundamentals of Power Transmission. In addition, a PSNH engineer attended PSS/E – Dynamic Simulation at Siemens Power Academy TD in Schenectady, NY in June 2012.

PSNH also identified Canaan Hydro as a unit that experiences generator trips with overspeed indication. Generator overspeed trips can occur for a variety of reasons, but could be an indicator of a potential stability issue. Therefore, PSNH initiated an in-house transient stability study for Canaan. The specific unit stability data required to complete this type of analysis was not available, so typical generator data was obtained from an electrical engineering firm familiar with completing these types of studies. Several fault simulations were completed using the PSS/E simulation software. The results from the analysis indicate that Canaan remained stable for all fault simulations except for two locations.

PSNH conducted further analysis for the fault simulations that indicated instability, and determined these events apply only to three-phase to ground faults located very close in

proximity to Lost Nation bus or the Canaan bus. PSNH concluded that no changes to the existing system were necessary.

PSNH has collected the data needed to conduct a similar stability analysis for Jackman Hydro. PSNH anticipates this analysis to be completed in 2013.

Recommendation No. 2012-11:
PSNH agreed to conduct a vegetation inspection of the 355 and 355X10 34.5 kV circuits connected to the Canaan Hydro Station and, from recommendation 2011-4, PSNH agreed to conduct a vegetation inspection of the 335/332 34.5 kV circuits that are connected to the Hooksett and Garvins Falls Hydro Stations.

Accion recommends and PSNH Transmission agrees to implement the recently developed plan to remove trees from outside the right-of-way when they pose a risk to the line and the easement allows for removal of such trees. Completion of this plan is contingent upon funding and available easements. PSNH will notify the Commission of the final budgeted amount, the portion of the budgeted amount that is allocated to New Hampshire facilities, and the schedule of completion versus the New Hampshire 5-year transmission vegetation maintenance schedule when the 2013 budget is finalized.

PSNH Distribution agrees to complete the circuit by circuit analysis and identify the rights-of-way that contain easements that allow PSNH to address risk trees outside the right-of-way.

PSNH agrees to continue its right-of-way full-width clearing program for the duration of the existing Reliability Enhancement Program. PSNH agrees to remove risk trees outside the easement area when they are identified and the easement allows for removal of such trees. If the easement does not allow removal, a reasonable attempt will be made to contact the property owner for permission to remove the tree.

PSNH agrees to remove risk trees along roadways when they are identified and the easement language allows for removal of such trees. If the easement language does not allow removal or there is no easement, a reasonable attempt will be made to contact the property owner for permission to remove the tree.

Additionally, PSNH agrees to perform risk tree removal on the 355 line during the fourth quarter of 2012, to assure the line remains reliable until the scheduled full right-of-way maintenance is performed in 2013. An update on this status will be provided in PSNH's May 2013 reconciliation filing.

Response:

From recommendation 2011-3, PSNH agreed to conduct a vegetation inspection of the 355 and 355X10 34.5 kV circuits connected to the Canaan Hydro Station. The 355x10 was inspected in 2011 and all hazard trees were removed. The ROW portion of this circuit is scheduled for mowing in 2013. The 355 line was patrolled in 2011 and findings were addressed in 2012. From recommendation 2012-11, PSNH completed risk tree removal on the 355 line during the fourth quarter of 2012 to assure the line remains reliable until the scheduled full right-of-way maintenance is performed. Full right-of-way maintenance is scheduled to be completed in 2013.

From recommendation 2011-4, PSNH agreed to conduct a vegetation inspection of the 335/332 34.5 kV circuits that are connected to the Hooksett and Garvins Falls Hydro Stations. These lines were patrolled in 2010 and findings were completed in 2011.

PSNH Distribution agreed to continue its right-of-way full-width clearing program for the duration of the existing Reliability Enhancement Program. Removing risk trees outside ROW easement area and along roadways, as described in the DE 12-116 Settlement Agreement, has been integrated into the Scheduled (SMT) and Enhanced Tree Trimming Maintenance (METT) Programs. Risk trees will be removed when the right-of-way easement allows for removal or, if not allowed, when permission is obtained from the property owner. PSNH Distribution completed a circuit by circuit analysis and identified the rights-of-way that contain easements that allow PSNH to address risk trees outside the right-of-way. PSNH has confirmed that most easements do provide removal rights outside the right-of-way.

PSNH Transmission agreed to implement a recently developed plan to remove trees from outside the right-of-way when they pose a risk to the line and the easement allows for removal of such trees. Completion of the plan is contingent upon funding and available easements. Approximately $2.5 million was allocated to hazard tree removals within the Transmission Vegetation Management budget for 2013. There is $600,000 allocated to New Hampshire for hazard tree removals in 2013 - the first year of a proposed 4 year schedule. The budgeted amount may need to be adjusted for future years based on actual experience for costs and numbers of trees addressed this year.

Recommendation No. 2012-12 (From recommendation 2010-1):

Accion recommended and PSNH agreed to update the status of the ongoing litigation regarding the Merrimack Unit 2 Turbine Outage.

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 insurance policy deductible for our customers. The litigation activities, including depositions, are currently ongoing and no further updates are available at this time.

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 2012

OUTAGE ID	OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
A	1/2	0001	1/2	0244	0.1	Condensor Water Box Cleaning
B	1/23	1206	1/27	1600	4.2	Prevenative Maintenance Outage - Air Heater
C	1/30	0700	1/31	1400	1.3	Inspect Air Heater
D	2/16	1031	2/16	2115	0.4	1B Air Heater Clutch Failure
E	4/2	0700	4/13	1815	11.5	FGD Seal Damper Modifications
F	6/18	0300	6/19	1142	1.4	Bottom Fill/Drain Valve Replaced
G	8/4	0155	8/9	1347	5.5	Prevenative Maintenance Outage - Air Heater
H	8/9	1612	8/10	1552	1.0	1A Forced Draft Fan Bearing Temp. High
I	8/11	2236	8/14	1503	2.7	PSMT-1 Transformer Lead Failure
J	9/24	0700	10/12	0850	18.1	Planned Maintenance Outage
K	11/18	1130	11/18	1404	0.1	Furnace Pressure Swing
TOTAL FORCED & MAINTENANCE OUTAGE DOWN TIME					28.1	

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
MERRIMACK 2 - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2012

OUTAGE ID	OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
A	2/16	1755	2/22	0300	5.4	Condenser Tube Cleaning
B	4/2	0700	5/24	0730	52.0	FGD Seal Damper Modifications and Coal Silo Repair
C	6/25	0001	6/29	2125	4.9	Scrubber Tray Replacement
D	8/11	2236	8/14	2253	3.0	PSMT-Transformer Lead Failure
E	9/5	0700	9/6	1159	1.2	Back Pass Water Wall Tube Leak
F	10/22	0700	11/9	1515	18.3	Planned Maintenance Outage
G	11/26	0214	11/26	0619	0.2	Furnace Pressure Swings
H	12/17	1705	12/21	1318	3.8	Booster Fan Control Problem
TOTAL FORCED & MAINTEANCE OUTAGE DOWN TIME					70.5	

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
MERRIMACK CT1 - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2012

OUTAGE ID	OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
A	4/24	0922	4/24	1316	0.2	Repair for corresponding CT2 outage required CT1 to be Out of Service
B	5/21	0715	5/24	1503	3.3	Planned Annual Inspection
C	9/6	0835	9/6	1404	0.2	Fire Suppression System Maintenance
TOTAL FORCED & MAINTENANCE OUTAGE DOWN TIME					0.4	

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
MERRIMACK CT2 - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2012

ID	DATE	TIME	DATE	TIME	DAYS	REASON
A	4/24	0922	4/24	1316	0.2	High Voltage PT, Fuse Blown
B	5/23	0400	5/25	1601	2.5	Planned Annual Inspection
C	6/5	0945	6/5	1325	0.2	Inspecting for Oil Seal Leak
D	9/11	1429	9/12	1109	0.9	Voltage Control Issues
E	12/7	0000	12/8	1347	1.6	Replaced Voltage Regulator

TOTAL FORCED & MAINTENANCE OUTAGE DOWN TIME 2.8

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
NEWINGTON - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2012

OUTAGE ID	OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
A	1/5	0735	1/6	1005	1.1	Waterwall Leak
B	1/13	1320	1/13	2340	0.4	Water Wall Leak
C	4/16	0001	4/27	1400	11.6	Planned Outage
D	6/20	0848	6/20	1313	0.2	Startup Failure
E	6/22	0730	6/22	1210	0.2	Fan Pair 1B Trip
F	11/26	0600	11/29	1601	3.4	Maintenance Outage
TOTAL FORCED & MAINTENANCE OUTAGE DOWN TIME					5.3	

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
SCHILLER 4 - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2012

OUTAGE ID	OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
A	5/2	1053	6/28	2300	57.5	Turbine Repair
B	7/25	0833	7/25	0911	0.0	High Drum Level
C	8/14	1400	8/15	1440	1.0	Outlet Header Safety Flange Repair
D	8/17	1955	8/19	0040	1.2	Packing Leak Main Steam Stop
E	8/20	0147	8/20	0258	0.0	Low Drum Level
F	10/16	1600	10/16	1703	0.0	Loss of Condeser Vaccuum
G	12/7	1331	12/7	1355	0.0	Station Service Breaker (480v)
H	12/7	1407	12/7	1450	0.0	High Drum Level
TOTAL FORCED & MAINTENANCE OUTAGE DOWN TIME					59.9	

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
SCHILLER 5 - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2012

OUTAGE ID	OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
A	3/12	0212	3/12	0308	0.0	Wood Feeder Plug
B	3/24	0737	4/13	0925	20.1	Planned Annual Outage
C	4/25	1042	4/25	1245	0.1	Wood Feeder Plug
D	7/15	1650	7/21	1045	5.7	Inbed tube leak
E	7/24	1955	7/25	1715	0.9	Hydrogen cooler leak
F	7/27	2044	7/30	0831	2.5	Economizer tube leak
G	12/31	2038	1/1	2005	1.0	Wood Feeder Plug
TOTAL FORCED & MAINTENANCE OUTAGE DOWN TIME					10.2	

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
SCHILLER 6 - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2012

OUTAGE ID	OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
A	1/15	1800	1/15	2155	0.2	Voltage Regulator
B	2/13	1026	3/16	1500	32.2	Generator Tube leak
C	6/20	0554	6/20	0612	0.0	Flame Scanner Failure
D	6/20	1041	6/20	1120	0.0	Low Drum Level
E	8/14	2349	8/15	0044	0.0	VAR Testing - Loss of Excitation
TOTAL FORCED & MAINTENANCE OUTAGE DOWN TIME					32.4	

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
SCHILLER CT1 - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2012

OUTAGE ID	OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
A	2/2	0500	2/2	0745	0.1	Electrical testing
B	5/14	0700	5/18	1020	4.1	Planned Annual Outage
C	9/11	0000	9/16	2015	5.8	Gas Pipeline Outage
TOTAL FORCED & MAINTENANCE OUTAGE DOWN TIME					6.0	

WYMAN IV - UNIT OUTAGE LIST
JANUARY TO DECEMBER 2012

OUTAGE ID	OUTAGE DATE	START TIME	OUTAGE DATE	STOP TIME	DAYS	REASON
A	3/18	0001	3/23	2359	6.0	Maintenance Outage - Repair lube oil leak
B	10/6	0001	11/4	1555	29.7	Planned Outage
C	11/8	0800	11/8	1001	0.1	Solenoid Failure
D	12/30	0600	12/30	1637	0.4	Voltage Regulator failure
TOTAL FORCED & MAINTENANCE OUTAGE DOWN TIME					6.5	

	AMOSKEAG HYDRO							
Station	**Unit ID**	**Date & Time OFF line**	**Date & Time ON line**	**Outage Duration - Hours**	**Outage Duration - Days**	**Lost Generation (Y/N)**	**Outage Type**	**Cause of Outage**
Amoskeag	Units - 1,2,3	1/19/12 8:19	1/19/12 11:34	3.25	0.14	Y	TRIP	D - Line Fault
Amoskeag	Units - 1,3	2/27/12 10:58	2/27/12 11:42	0.73	0.03	Y	EMO	Emergency Generator Testing
Amoskeag	Units - 1,3	3/5/12 9:44	3/5/12 12:04	2.33	0.10	Y	EMO	Scheduled Highyard Maintenance
Amoskeag	Units - 1,2,3	3/16/12 23:24	3/17/12 0:39	1.25	0.05	Y	TRIP	D - Line Fault
Amoskeag	Units - 1,2,3	3/29/12 8:36	3/29/12 10:46	2.17	0.09	Y	EMO	Scheduled Highyard Maintenance
Amoskeag	Units - 2,3	4/19/12 14:36	4/19/12 14:59	0.38	0.02	Y	EMO	Emergency Generator Testing
Amoskeag	Units - 1,2,3	10/29/12 14:45	10/29/12 15:47	1.03	0.04	Y	TRIP	D - Line Fault
Amoskeag	Units - 1,2	10/29/12 18:19	10/29/12 18:52	0.55	0.02	Y	TRIP	D - Line Fault
Amoskeag	Units - 1,2,3	11/28/12 7:43	11/28/12 8:48	1.08	0.05	Y	EMO	Station Testing
Amoskeag	1	1/5/12 7:49	1/5/12 8:51	1.03	0.04	Y	EMO	Exciter Maintenance
Amoskeag	1	3/12/12 6:19	3/15/12 14:49	80.50	3.35	Y	AI	Annual Inspection
Amoskeag	1	5/30/12 12:41	5/30/12 13:21	0.67	0.03	N	EMO	Routine Maintenance
Amoskeag	2	1/5/12 9:37	1/5/12 10:34	0.95	0.04	Y	EMO	Exciter Maintenance
Amoskeag	2	2/27/12 7:16	3/2/12 13:12	101.93	4.25	N	AI	Annual Inspection
Amoskeag	2	9/5/12 7:39	9/5/12 14:03	6.40	0.27	N	FMO	Governor Coil Fail
Amoskeag	2	9/27/12 10:00	10/26/12 18:02	704.03	29.33	N	FMO	Bearing Replacement
Amoskeag	2	11/13/12 18:41	11/14/12 10:48	16.12	0.67	Y	TRIP	Low Guide Bearing Oil Level
Amoskeag	3	1/5/12 10:48	1/5/12 12:20	1.53	0.06	Y	EMO	Exciter Maintenance
Amoskeag	3	2/16/12 7:38	2/16/12 8:35	0.95	0.04	N	EMO	Routine Maintenance
Amoskeag	3	3/20/12 17:56	3/20/12 23:52	5.93	0.25	Y	TRIP	Low Guide Bearing Oil Level
Amoskeag	3	4/9/12 7:33	4/13/12 11:34	100.02	4.17	N	AI	Annual Inspection

	AYERS ISLAND HYDRO							
Station	**Unit ID**	**Date & Time OFF line**	**Date & Time ON line**	**Outage Duration - Hours**	**Outage Duration - Days**	**Lost Generation (Y/N)**	**Outage Type**	**Cause of Outage**
Ayers Island	Units - 2,3	2/18/12 3:53	2/18/12 4:11	0.30	0.01	Y	TRIP	D - Line Fault
Ayers Island	Units - 1,2,3	6/3/12 16:31	6/4/12 0:55	8.40	0.35	Y	TRIP	PK Test Device Failure
Ayers Island	Units - 1,2,3	6/13/12 11:13	6/13/12 12:15	1.03	0.04	Y	TRIP	PK Test Device Failure
Ayers Island	Units - 1,2,3	7/3/12 7:38	7/3/12 13:42	6.07	0.25	Y	EMO	Diver Safety
Ayers Island	Units - 1,2,3	7/20/12 7:34	7/20/12 15:29	7.92	0.33	Y	EMO	Diver Safety
Ayers Island	Units - 1,2,3	8/12/12 18:13	8/12/12 19:19	1.10	0.05	Y	TRIP	D - Line Fault
Ayers Island	1	2/16/12 14:27	2/24/12 15:00	192.55	8.02	N	AI	Annual Inspection
Ayers Island	1	5/24/12 9:55	5/24/12 11:19	1.40	0.06	N	EMO	Routine Maintenance
Ayers Island	2	2/7/12 14:33	2/16/12 14:20	215.78	8.99	N	AI	Annual Inspection
Ayers Island	2	6/19/12 10:04	6/19/12 15:36	5.53	0.23	Y	EMO	Worker Safety
Ayers Island	2	7/19/12 7:12	7/19/12 15:49	8.62	0.36	N	EMO	Diver Safety
Ayers Island	3	1/30/12 7:43	2/7/12 13:50	198.12	8.25	N	AI	Annual Inspection
Ayers Island	3	3/18/12 12:24	3/19/12 14:18	25.90	1.08	Y	TRIP	Directional Power Relay (67M)
Ayers Island	3	3/21/12 7:58	3/21/12 11:59	4.02	0.17	Y	TRIP	Directional Power Relay (67M)
Ayers Island	3	6/19/12 7:27	7/19/12 15:47	728.33	30.35	Y	EMO	Scheduled outage for Draft Tube Replacement

	CANAAN HYDRO							
Station	**Unit ID**	**Date & Time OFF line**	**Date & Time ON line**	**Outage Duration - Hours**	**Outage Duration - Days**	**Lost Generation (Y/N)**	**Outage Type**	**Cause of Outage**
Canaan	1	4/23/12 21:38	4/23/12 23:22	1.73	0.07	Y	TRIP	D - Line Fault
Canaan	1	4/23/12 23:32	4/24/12 0:14	0.70	0.03	Y	TRIP	Lube Oil Flow Relay Failure
Canaan	1	6/26/12 12:36	6/26/12 12:41	0.08	0.00	Y	TRIP	Breaker 357 Operation
Canaan	1	7/4/12 17:07	7/4/12 19:21	2.23	0.09	Y	TRIP	Breaker 357 Operation
Canaan	1	7/16/12 8:30	7/27/12 10:52	266.37	11.10	Y	AI	Annual Inspection
Canaan	1	12/19/12 8:54	12/19/12 19:19	10.42	0.43	Y	TRIP	Lube Oil Flow Switch Failure
Canaan	1	12/20/12 10:14	12/20/12 17:55	7.68	0.32	Y	EMO	Station Testing

	EASTMAN FALLS HYDRO							
Station	**Unit ID**	**Date & Time OFF line**	**Date & Time ON line**	**Outage Duration - Hours**	**Outage Duration - Days**	**Lost Generation (Y/N)**	**Outage Type**	**Cause of Outage**
Eastman	Units - 1,2	5/1/12 13:13	5/1/12 13:33	0.33	0.01	Y	EMO	ESCC - Testing
Eastman	1	3/9/12 10:33	3/9/12 17:13	6.67	0.28	Y	EMO	Governor Adjustment
Eastman	1	5/29/12 23:19	5/29/12 23:57	0.63	0.03	Y	TRIP	Unit Failed to Start
Eastman	1	6/20/12 13:56	6/20/12 14:20	0.40	0.02	Y	TRIP	High Bearing Temp.
Eastman	1	6/21/12 15:00	6/21/12 15:59	0.98	0.04	Y	TRIP	High Bearing Temp.
Eastman	1	7/9/12 8:08	7/13/12 10:53	98.75	4.11	N	AI	Annual Inspection
Eastman	1	7/30/12 8:16	8/10/12 14:42	270.43	11.27	Y	TRIP	Sump Pump System Failure
Eastman	1	9/11/12 14:08	9/11/12 15:26	1.30	0.05	Y	EMO	Routine Maintenance
Eastman	2	1/5/12 8:45	1/5/12 9:53	1.13	0.05	N	EMO	Bestobell Seal
Eastman	2	3/14/12 10:28	3/14/12 11:06	0.63	0.03	Y	EMO	Bestobell Seal
Eastman	2	3/25/12 9:03	3/25/12 12:35	3.53	0.15	Y	TRIP	Bestobell Seal
Eastman	2	4/27/12 11:17	4/27/12 12:04	0.78	0.03	Y	EMO	Bestobell Seal
Eastman	2	5/17/12 7:20	5/17/12 8:02	0.70	0.03	Y	EMO	Bestobell Seal
Eastman	2	6/18/12 7:29	7/5/12 13:16	413.78	17.24	Y	AI	Annual Inspection
Eastman	2	7/10/12 0:59	7/10/12 1:29	0.50	0.02	Y	EMO	Bestobell Seal
Eastman	2	7/11/12 12:32	7/11/12 13:32	1.00	0.04	Y	EMO	Bestobell Seal
Eastman	2	7/13/12 10:46	12/14/12 11:32	3696.77	154.03	Y	FMO	Runner/Seal System Overhaul

	GARVINS FALLS HYDRO							
Station	**Unit ID**	**Date & Time OFF line**	**Date & Time ON line**	**Outage Duration - Hours**	**Outage Duration - Days**	**Lost Generation (Y/N)**	**Outage Type**	**Cause of Outage**
Garvins	1	2/16/12 8:00	2/16/12 10:00	2.00	0.08	N	EMO	Routine Maintenance
Garvins	Units - 1,3	4/16/12 9:38	4/16/12 12:34	2.93	0.12	N	EMO	Fish Louver Installation
Garvins	Units - 1,2,3,4	10/19/12 8:23	10/19/12 9:12	0.82	0.03	N	EMO	Station Testing
Garvins	Units - 3,4	11/29/12 10:55	11/29/12 11:38	0.72	0.03	N	EMO	Fish Louver Removal
Garvins	Units - 3,4	12/5/12 9:39	12/5/12 11:59	2.33	0.10	Y	EMO	Fish Louver Removal
Garvins	1	4/17/12 9:38	4/17/12 10:14	0.60	0.03	N	EMO	Fish Louver Installation
Garvins	1	5/16/12 20:59	5/16/12 22:03	1.07	0.04	Y	TRIP	D - Line Fault
Garvins	1	5/24/12 9:52	5/24/12 10:39	0.78	0.03	N	EMO	Routine Maintenance
Garvins	1	10/22/12 8:18	10/22/12 14:45	6.45	0.27	Y	EMO	Diver Safety
Garvins	1	10/29/12 16:22	10/29/12 17:20	0.97	0.04	Y	TRIP	D - Line Fault
Garvins	2	3/6/12 9:45	3/7/12 9:07	23.37	0.97	N	EMO	Routine Maintenance
Garvins	2	10/22/12 8:14	10/26/12 16:20	104.10	4.34	N	AI	Annual Inspection
Garvins	3	1/11/12 9:07	1/11/12 10:38	1.52	0.06	N	EMO	Routine Maintenance
Garvins	3	1/19/12 16:54	1/19/12 18:55	2.02	0.08	N	TRIP	Unit Failed to Start
Garvins	3	2/7/12 8:18	2/7/12 11:17	2.98	0.12	N	EMO	Governor Maintenance
Garvins	3	2/21/12 10:09	2/21/12 10:24	0.25	0.01	N	EMO	Routine Maintenance
Garvins	3	2/22/12 7:48	2/22/12 9:07	1.32	0.05	N	EMO	Routine Maintenance
Garvins	3	3/27/12 11:26	3/27/12 12:41	1.25	0.05	N	FMO	Replace Breaker Trip Coil
Garvins	3	6/18/12 7:53	6/22/12 14:15	102.37	4.27	N	AI	Annual Inspection
Garvins	3	6/28/12 13:30	7/10/12 12:12	286.70	11.95	N	FMO	Scroll Case Leak
Garvins	3	8/27/12 14:30	8/27/12 15:23	0.88	0.04	N	EMO	Gatehouse Structural Repair
Garvins	4	1/27/12 10:22	1/27/12 10:37	0.25	0.01	Y	TRIP	Lower Guide Oil Level
Garvins	4	2/7/12 11:21	2/7/12 13:51	2.50	0.10	N	EMO	Governor Maintenance
Garvins	4	4/17/12 14:44	4/20/12 9:47	67.05	2.79	N	FMO	Electrical Maintenance
Garvins	4	4/20/12 13:25	4/23/12 19:52	78.45	3.27	N	Trip	Electrical Maintenance
Garvins	4	6/18/12 9:18	6/18/12 9:41	0.38	0.02	N	EMO	Worker Safety
Garvins	4	6/25/12 7:50	6/29/12 11:20	99.50	4.15	N	AI	Annual Inspection
Garvins	4	7/9/12 16:30	7/12/12 10:41	66.18	2.76	N	FMO	Sump Pump System Failure
Garvins	4	11/3/12 1:04	11/3/12 10:30	9.43	0.39	Y	Trip	Failed Electrical Resistor

	GORHAM HYDRO							
Station	**Unit ID**	**Date & Time OFF line**	**Date & Time ON line**	**Outage Duration - Hours**	**Outage Duration - Days**	**Lost Generation (Y/N)**	**Outage Type**	**Cause of Outage**
Gorham	Units - 1,2,3,4	8/29/12 7:47	8/31/12 17:54	58.12	2.42	Y	EMO	Scheduled Electrical Maintenance
Gorham	Units - 3,4	9/28/12 21:52	9/29/12 7:45	9.88	0.41	Y	EMO	RTU Failure
Gorham	Units - 3,4	10/8/12 7:01	10/8/12 9:01	2.00	0.08	Y	TRIP	352 Breaker Operation
Gorham	Units 1,2	4/9/12 8:10	4/19/12 12:36	244.43	10.18	N	AI	Annual Inspection
Gorham	3	4/5/12 12:17	4/5/12 14:19	2.03	0.08	N	TRIP	Low Actuator Oil Pressure
Gorham	3	8/20/12 8:24	8/24/12 9:47	97.38	4.06	N	AI	Annual Inspection
Gorham	3	8/31/12 18:22	8/31/12 18:36	0.23	0.01	N	EMO	Electrical System Troubleshooting
Gorham	4	8/24/12 9:48	8/31/12 17:04	175.27	7.30	N	AI	Annual Inspection
Gorham	4	8/31/12 18:26	8/31/12 20:06	1.67	0.07	N	FMO	Electrical Maintenance

	HOOKSETT HYDRO							
Station	**Unit ID**	**Date & Time OFF line**	**Date & Time ON line**	**Outage Duration - Hours**	**Outage Duration - Days**	**Lost Generation (Y/N)**	**Outage Type**	**Cause of Outage**
Hooksett	1	10/12/12 22:50	10/13/12 0:03	1.22	0.05	Y	TRIP	Overspeed - Unit did not Lockout & Restarted
Hooksett	1	10/13/12 15:59	10/13/12 18:14	2.25	0.09	Y	TRIP	Overspeed Switch Repair

	JACKMAN HYDRO							
Station	**Unit ID**	**Date & Time OFF line**	**Date & Time ON line**	**Outage Duration - Hours**	**Outage Duration - Days**	**Lost Generation (Y/N)**	**Outage Type**	**Cause of Outage**
Jackman	1	1/30/12 10:56	1/30/12 16:11	5.25	0.22	N	TRIP	Unit failed to start
Jackman	1	3/29/12 11:25	3/29/12 11:45	0.33	0.01	N	FMO	Electrical Maintenance
Jackman	1	7/23/12 8:00	8/8/12 11:20	387.33	16.14	N	AI	Annual Inspection
Jackman	1	8/9/12 6:01	9/26/12 10:57	1156.93	48.21	Y	FMO	Penstock Failure
Jackman	1	10/6/12 19:50	10/6/12 23:40	3.83	0.16	N	TRIP	Bearing Protection System Issue
Jackman	1	10/7/12 19:21	10/7/12 21:08	1.78	0.07	N	TRIP	Bearing Protection System Issue
Jackman	1	10/11/12 19:33	10/11/12 19:38	0.08	0.00	N	EMO	Routine Maintenance
Jackman	1	10/29/12 23:58	10/30/12 0:15	0.28	0.01	N	TRIP	D - Line Fault

	LOST NATION COMBUSTION TURBINE							
Station	**Unit ID**	**Date & Time OFF line**	**Date & Time ON line**	**Outage Duration - Hours**	**Outage Duration - Days**	**Lost Generation (Y/N)**	**Outage Type**	**Cause of Outage**
Lost Nation	1	2/13/12 8:42	2/13/12 17:05	8.38	0.35	N/A	TRIP	Station Testing
Lost Nation	1	5/7/12 8:25	5/18/12 14:11	269.77	11.24	N/A	AI	Annual Inspection
Lost Nation	1	8/9/12 8:30	8/16/12 19:21	178.85	7.45	N/A	Trip	Station Testing

	SMITH HYDRO							
Station	**Unit ID**	**Date & Time OFF line**	**Date & Time ON line**	**Outage Duration - Hours**	**Outage Duration - Days**	**Lost Generation (Y/N)**	**Outage Type**	**Cause of Outage**
Smith	1	1/10/12 8:30	1/12/12 16:40	56.17	2.34	Y	EMO	Scheduled Highyard Maintenance
Smith	1	1/15/12 9:45	1/15/12 13:40	3.92	0.16	Y	TRIP	Capacitor Bank Failure
Smith	1	2/1/12 19:45	2/1/12 20:55	1.17	0.05	Y	TRIP	Headwater Float Control Failure
Smith	1	2/22/12 10:05	2/22/12 13:20	3.25	0.14	Y	TRIP	Restricted Earth Fault Setting Issue
Smith	1	3/20/12 11:33	3/20/12 13:18	1.75	0.07	Y	TRIP	Restricted Earth Fault Setting Issue
Smith	1	3/26/12 14:18	3/26/12 18:54	4.60	0.19	Y	TRIP	Relay Setting Adjustment
Smith	1	3/26/12 18:59	3/28/12 11:17	40.30	1.68	Y	TRIP	Relay Setting Adjustment
Smith	1	8/7/12 9:53	8/7/12 10:40	0.78	0.03	Y	EMO	Highyard Maintenance
Smith	1	9/8/12 7:15	9/20/12 12:40	293.42	12.23	Y	AI	Annual Inspection
Smith	1	11/6/12 14:51	12/1/12 0:00	585.15	24.38	Y	FMO	Capacitor Failure

	WHITE LAKE COMBUSTION TURBINE							
Station	**Unit ID**	**Date & Time OFF line**	**Date & Time ON line**	**Outage Duration - Hours**	**Outage Duration - Days**	**Lost Generation (Y/N)**	**Outage Type**	**Cause of Outage**
White Lake	1	4/23/12 9:29	4/27/12 18:26	104.95	4.37	N/A	AI	Annual Inspection
White Lake	1	9/25/12 7:09	9/25/12 9:00	1.85	0.08	N/A	FMO	Fire Protection System

PSNH

FOSSIL STATION OUTAGE REPORT

PUC Outage Report No.: OR-2012-01

Station/Unit: Merrimack Station, Unit No. 1

Dates: January 23 - January 27, 2012

Duration: 4.2 Days

Immediate Cause:
Planned Preventative Maintenance – The unit was removed from service to clean the air heater.

Discussion/Remedy:
Unit 1 was removed from service to clean the air heater and perform preventative maintenance. Prior to performing the air heater, an inspection of the upper and lower air heater seals (circumferential and radial) was performed. All seals were determined to be in good condition. In addition to the air heater inspection, a boiler inspection was also completed. The boiler inspection revealed one tube leak in 1-B Cyclone. The leak was located on the lead tube at the 6 o'clock position and was repaired with a pad weld.

The critical path activity for this outage was the air heater wash. In parallel to the critical path activity, a number of backlog jobs were completed.

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 boiler inspection that was completed at the beginning of the outage and other corrective and preventative work. An abbreviated list of some of these activities is provided below.

Mechanical:

- Replaced the brass isolation valve on the hydrogen station.
- Replaced 1-inch vent valve on the main steam line.
- Repaired 1-A and 1-C downcomer leaks.
- Replaced vent valve next to TRCV-4 1-B SSH attemperator manual valves.
- Replaced vent valve next to TRCV-3 1-A SSH attemperator manual valves.
- Rebuilt north roof SSH vent valves.
- Rebuilt PCV-1 1900# aux steam control valve.
- Replaced root valve on the north side of the steam drum and the one adjacent to it.
- Replaced 1-A cooling water pump motor.

- Replaced #2 sluice line drain valve.
- Removed and reinstalled the blank on the slag sluice line for freeze protection.
- Installed swivel and expansion valves on the fly ash reinjection system.
- Replaced small section of piping below the continuous blow down valve.
- Replaced the lance tube on IK-1 sootblower.
- Replaced the discharge valve and flange to the boiler knife gate on the SCR flyash reinjection piping.

Boiler:

- Performed thorough boiler inspection.
- Pad welded downcomer elbow on 1C cyclone door.
- Pad welded 1-A and 1-B cyclone door elbows.
- Externally inspected 1C water jacket for leaks, none found.
- Water washed both air preheaters.
- Cleaned ammonia reagent probes.
- Vacuumed the SCR inlet, SCR outlet, and breech room and economizer by-pass dampers.

Electrical:

- Inspected all collector ring brushes.
- Disconnected and reconnected 1-A cooling water pump motor.
- Cleaned and tested 2nd point high pressure heater equalizer valve motor operator.
- Inspected precipitator and repaired broken lead in “C” field.

Instrument:

- Replaced boiler drum levalert probe.
- Replaced glass on pressure gauge on the steam line at the air ejector.

Chemical:

- Brush cleaned south side condenser tubes.
- Brush cleaned north side condenser tubes.
- Brush cleaned the cooling water heat exchanger.

PSNH

FOSSIL STATION OUTAGE REPORT

PUC Outage Report No.: OR-2012-02

Station/Unit: Schiller, Unit No. 6

Dates: February 13-March 16, 2012

Duration: 32.19 days

Immediate Cause: Generator Bank Tube Leak

Discussion/Remedy:
On February 13, ISO New England dispatched Unit 6 and the unit phased on schedule. At approximately 1030, a generating bank tube failure occurred causing the unit to become unstable and ultimately trip offline due to high furnace pressure.

Initial inspection found a generating bank tube at the rear wall near the north end of the boiler failed. A significant portion of the rear-wall refractory tile had also been damaged by the leak as well as adjacent generator tubes.

Based on the initial assessment, it was determined that two sections of the rear wall would need to be removed to access this area for closer inspection and to make the necessary repair.

Crews focused on the removal of the boiler casing, insulation, and damaged tile to better access the work area. Once the two sections of the rear wall were removed and the entire affected area was accessible, it became evident there was more damage than initially thought, in particular to the refractory.

Based on the thorough inspection and discussions with a refractory specialist, it was determined that removing the entire wall of casing and tile would be required to make the appropriate repair. The wall would be replaced with a straight tile wall and anchored with pins and square washers for reinforcement.

Once the rear wall was removed, boiler crews could access the area to make the generator tube repairs. The generator tube repairs required the installation of two 15-inch Dutchman, localized pad welding and straightening misaligned tubes. It was also decided to abandon one tube, which involved installing tube plugs at both the steam and mud drum locations.

While refractory work continued an initial hydro was completed on February 28, 2012, the repairs were completed and an initial hydro test was attempted and one leak was

detected. The leak was located in a secondary super-heater tube towards the south wall, near elevation 83 feet. This tube was repaired by installing an 18-foot Dutchman. A second hydro test was completed and five leaks were found at the generating bank tube rolls in the north and south end of the steam drum, each of these leaks were weld repaired.

In parallel to the generator tube roll repairs and hydro boiler tests, the refractory contractor continued to install new tile in the sections of the rear wall.

On March 12, 2012, a final hydro test was completed and no leaks were found. Upon completing a successful hydro test, insulation was installed and a new rear wall boiler casing was installed. The unit was returned to service at 1500 on March 16, 2012.

Additional Work Completed During the Outage:
Other work performed during this outage included jobs that were in the priority backlog, jobs that were found during the boiler inspection that was completed at the beginning of this outage and other corrective and preventative work. An abbreviated list of some of these activities is provided below.

Mechanical:
- Repaired a broken hose on the De-foamer pump.
- Changed oil in both coal feeder gear boxes.
- Reset receiver drip pump.

Boiler:
- Water washes of the air heater and the economizer.
- Repaired Steam Drum Sight Glass Indicator.

Electrical:
- Installation of a new motor on 6A hydrogen dryer tower which replaced a non-working motor.

PSNH

FOSSIL STATION OUTAGE REPORT

PUC Outage Report No.: OR-2012-03

Station/Unit: Merrimack Station, Unit No. 2

Dates: February 16-February 22, 2012

Duration: 5.4 Days

Immediate Cause:
The unit was removed from service for condenser cleaning.

Discussion/Remedy:
Unit 2 had been online for 51 days prior to this outage. On February 16, 2012, the unit was removed from service to clean the condenser. The condenser shell was opened and ventilated. The condenser was then inspected by the Chemical Department and it was determined that all main condenser tubes on the both the east and west sides needed to be clean. All 11,600 tubes needed to be individually brush cleaned. In addition to the main condenser work, a complete boiler inspection was performed. The boiler inspection revealed tube leaks in 2C, 2E and 2F cyclones. The leaks were repaired with pad welds.

The critical path activity for this outage was the condenser cleaning. In parallel to this activity, a number of backlog jobs were completed. The unit was declared available and released to ISO New England at 0300 on February 22.

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 boiler inspection that was completed at the beginning of the outage and other corrective and preventative work. An abbreviated list of some of these activities is provided below.

Mechanical:

- Repaired wear plate on 2B redler.
- Replaced north inlet cone on 2A forced draft fan.
- Performed minor weld repair to south inlet cone of 2A forced draft fan.
- Cleaned and repacked 2B gas recirculating fan turning gear coupling.
- Performed tension adjustment on 2B gravimetric coal feeder.
- Inspected north side bearing of 2D gravimetric coal feeder tail pulley.

- Repaired north intake screen on 2A forced draft fan.
- Performed weld repairs to north view port of slag tank.

Electrical:

- Installed filter board for supplemental precipitator AVC 9000 controller.
- Installed filter board for primary precipitator AVC 9000 controller.

Chemical:

- Cleaned water boxes on inlet and outlet sides of east and west main condenser.
- Brush cleaned east and west main condensers.
- Brush cleaned north and south cooling water heat exchangers.

Boiler:

- Repaired water tube leaks in 2C, 2E and 2F cyclones.
- Repaired metal expansion joint leak above IR-2.
- Repaired casing in the wind box roof near IR-7.
- Repaired casing in #1 shot hopper.
- Repaired two areas of casing in #4 shot hopper.
- Repaired two support beams on the forced draft fan outlet duct pant leg.
- Repaired the perforated plate between the forced draft fan outlet duct and the air heater cold side inlet.
- Vacuumed the gas Recirc duct.
- Vacuumed tempering duct.
- Vacuumed the 3rd economizer hopper.
- Vacuumed the crawl space.
- Vacuumed the shelf next to the SCR inlet damper.

PSNH

FOSSIL STATION OUTAGE REPORT

PUC Outage Report No.: OR-2012-04

Station/Unit: Wyman Station, Unit No. 4

Dates: March 18 March 23, 2012

Duration: 6.0 Days

Immediate Cause:
Maintenance Outage–Unit 4 – to repair lube oil leak

Discussion/Remedy:
Unit 4 was removed from service on March 18 for a maintenance outage. The primary reason for this outage was to make repairs on the oil seal for the Permanent Magnetic Generator (PMG). The PMG is an integral element to the exciter and voltage regulator system and required a unit outage to make the necessary repair. The oil seal located on the Turbine Front Standard had failed allowing lube oil to leak from the front standard onto the base and on the piping located below the turbine. This work was performed by GE and their contract millwrights.

Wyman personnel were able to contain and manage the oil leak until the maintenance outage was approved by ISO New England.

Additional Work Completed During the Outage:
Other work performed during the outage included jobs that were in the priority outage backlog and other corrective and preventative work.

PSNH

FOSSIL STATION OUTAGE REPORT

PUC Outage Report No.: OR-2012-05

Station/Unit: Merrimack Station, Unit No. 1

Dates: April 2-April 13, 2012

Duration: 11.5 days

Immediate Cause: Unit 1 Seal Air Damper Modification

Discussion/Remedy:
Unit 1 was removed from service on April 2. The primary reason for this outage was to modify the seal air dampers which are an integral component of the man-safe isolation damper system. The man-safe damper system is designed to isolate the various flue gas ducts from each other. This type of isolation is beneficial because it allows for safe work conditions during the following boiler operating modes:

- MK1 or MK2 is in an outage.
- MK1 or MK2 is in reserve shutdown.
- MK1 is operating in Scrubber bypass mode.

The removal of the originally installed seal air dampers and installation of a modified seal air dampers was performed to maintain a better seal and eliminate flue gas leakage. The original seal air dampers were designed with a single guillotine and were prone to leak flue gas when the seal air system was not running. The modified guillotine design included compressed seal air between two guillotines to create a better seal system.

Scope of work included:

- Removing original seal air dampers and installing replacement seal air dampers.
- Replaced seal air packing and J-Seals on three (3) man-safe isolation dampers.
- Installed and connected Isolation Air to new guillotine seal air dampers.

The critical path activity for this outage was the installation of the modified seal air damper. In parallel to the critical path activity, a number of back log jobs were completed.

Additional Work Completed During the Outage:
Other work performed during this outage included jobs that were in the priority outage backlog, jobs that were found during the boiler inspection that was completed at the

beginning of the outage and other corrective and preventative work. An abbreviated list of some these activities are provided below.

CAP:

- Replaced SWPH caustic skid.
- Replaced simplex strainer with duplex strainer and modify piping to accommodate change.
- Installed pressure relief valves on sw pump outlet piping and 4-inch relief discharge lines.
- Installed VFDs on each service water pump, three (3) total.
- Replaced static mixer.
- Flushed service water line from pump house to FGD.
- Installed isolation valves on service water AFR Filter.

Maintenance:

- Replaced seals on 1B forced draft fan inboard bearing.
- Replaced gate valves on fly ash piping just north of hopper room.
- Repaired MK1 DA drain valve #1.
- Replaced 1B cooling water pump motor.
- Vacuumed precipitator hoppers.
- Rebuilt continuous blow-down manual valve.
- Replaced 1B air heater drive gearbox.
- Rebuilt LP valve on bottom fill line.
- Repaired Air Ejector.
- Rebuilt SAMM cleaner control valve.

Electrical Department:

- Adjusted switch bracket on SCR inlet damper limit switch.

I&C Department:

- Rebuilt 1A SAMM cleaner steam inlet block valve

PSNH

FOSSIL STATION OUTAGE REPORT

PUC Outage Report No.: OR-2012-06

Station/Unit: Merrimack Station, Unit No. 2

Dates: April 2-May 24, 2012

Duration: 52.02 days

Immediate Cause:
Unit 2 Seal Air Damper Modifications / Coal Silo Repairs

Discussion/Remedy:
Unit 2 was removed from service on April 2. The primary reason for this outage was to modify the FGD seal air damper system (man-safe damper), modify the FGD service water pump system, and to conduct repairs on the 2A and 2B coal silos. Due to low electrical demand and power market prices, the work was completed with minimal overtime to minimize expense, extending the duration of the outage.

The man-safe damper system is designed to isolate the various flue gas ducts from each other. This type of isolation is beneficial because it allows for safe work conditions during the following boiler operating modes:

- MK1 or MK2 is in an outage.
- MK1 or MK2 is in reserve shutdown
- MK1 is operating in Scrubber bypass mode.

The removal of the originally installed seal air dampers and installation of a modified seal air dampers was performed to maintain a better seal and eliminate flue gas leakage. The original seal air dampers were designed with a single guillotine and were prone to leak flue gas when the seal air system was not running. The modified guillotine design included compressed seal air between two guillotines to create a better seal system.

Scope of work included:

- Removal of original seal air dampers and installation of replacement seal air dampers.
- Replaced seal air packing and J-Seals on three (3) man-safe isolation dampers.
- Installed and connected Isolation Air to new guillotine seal air dampers.

The service water pump system supplies water to the FGD system. The system includes 3 pumps, a caustic skid, 2 filters, and associated piping. Water is pulled from the station treatment pond, filtered, treated for pH, and pumped to the FGD process. As part of the continuing effort to optimize the FGD system, the service water pump system was modified. The modifications to this system included upgrades to the caustic skid, replacement of the simplex strainer with a duplex strainer, piping modifications, static caustic mixer modification, and installation of variable frequency drives (VFD) on service water pumps. These changes enhance the effectiveness, reliability and overall efficiency of the FGD process.

In addition to the work completed to optimize the FGD system, repairs were also made to the lower cone area of the 2A and 2B coal silos. The original planned coal silo work involved the repair of cracks in the lower section of 2A and 2B coal silos in the vicinity of the silo vibrators. Prior to conducting the planned work, an internal and external inspection revealed more significant stress corrosion cracking. PSNH consulted with Thielsch Engineering, a vendor that specializes in non-destructive examination (NDE). Thielsch conducted NDE testing and provided guidance throughout the silo repair.

Based on the NDE testing results and consulting with Thielsch, the lower 3 feet of each of the two silo hoppers and some structural steel members were replaced. Material was fabricated locally and installed by the PSNH personnel.

The critical path of this outage was the coal silo repairs. In parallel to the coal silo repairs, FGD work and additional back log jobs were completed.

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 inspections that were completed at the beginning of the outage and other corrective and preventative work. An abbreviated list of some of these activities is provided below.

Mechanical:

- Drained slag sluice sump and inspected inlet screen. Reset pump end suction clearance.
- Opened and dewatered slag pump sump pit, inspected all pump suctions.
- Replaced valve 1st & 2nd point heater vent piping.
- Installed condensate cross-connect between MK1 & MK2.
- Calibrated MK1 TG board MW meter on extraction steam system.
- Replaced DPCV-23 condensate from primary coal Recirc control valve.
- Replaced slag tank nozzle valves.
- Replaced turbine lube oil vapor extractor.
- Installed flanges on 210 valve turbine main steam drain.
- Repaired south heat exchanger tube sheet leak.
- Replaced turbine drain manual valve.
- Replaced turbine inner casing drain valve.

- Replaced cold reheat drain valve.
- Replaced 2A & 2B vacuum breakers on secondary air heater steam coils.
- Repaired packing leak on 2B secondary air preheater fancoil northern bank outlet valve.
- Replaced gaskets on inlet and outlet flanges of 2A Secondary air heater fan coil steam line.
- Replaced check valves on 2B condensate drip return pump.
- Replaced gaskets on inlet and outlet flanges of 2A secondary air preheater fan coil steam line.
- Repaired leak on slag tank loop seal drain line.
- Replaced seal on slag tank gland water pump.
- Repacked knife gate on north economizer hopper.
- Installed new isolation valve on 210 root valve drain line.
- Repaired seal oil air side cooling water outlet flow indicator valve.

Electrical:

- Installed new power capacitor on 2B circ water pump motor.
- Disconnected and reconnected conduits for 2C & 2D coal downcommers.
- Replaced solenoid on firemate feed boiler inlet valve.
- Replaced precipitator avc 8 analog meter.
- Repaired precipitator hopper leads.
- Repaired and cleaned insulators, repaired rapper rod on precipitator control “C” field south
- Disconnected, relocated and reconnected conduits for 2A & 2B coal downcommers.

Boiler:

- Replaced boiler door on 6 2/3 south.
- Replaced boiler door on 2A GRF outlet duct on 5th floor.
- Repaired duct work leak on 5th floor near convection supply downcommer inlet header.

Instrumentation:

- Disconnected coal feeder 2C & 2D, reinstalled pipe and connected wires.
- Replaced SCR catalyst temp thermocouples.

PSNH

FOSSIL STATION OUTAGE REPORT

PUC Outage Report No.: OR-2012-07

Station/Unit: Schiller Station, Unit No. 4

Dates: May 2-June 28, 2012

Duration: 57.51 Days

Immediate Cause:
LP Turbine Shroud Failure

Discussion/Remedy:
On May 2, ISO New England dispatched Unit 4 and the phased on schedule. At approximately, 1400 the turbine experienced abnormal vibration, but vibration did not exceed the turbine trip setting. The abnormal vibration subsided after a few minutes and all vibration alarms returned to normal with the exception of the #3 bearing vibration sensor. The #3 bearing vibration alarm continued to remain in an alarm state but below the turbine vibration trip setting. The unit continued to operate and fulfill the ISO commitment.

After the unusual vibration, the PSNH Turbine Engineer performed system checks and testing. In order to verify the #3 bearing vibration indication was accurate and for troubleshooting purposes, a temporary bearing vibration monitor was installed.

The vibration monitoring equipment readings obtained during the shutdown indicated the #3 bearing was indeed experiencing higher than normal vibration. Based on this information, the unit was declared unavailable, and LP turbine was cooled and opened for closer inspection. The inspection was conducted by Siemens along with PSNH and revealed that a shroud segment on Row 1R Gen had separated from the blades and the base half of the tenons on those blades remained in place. Based on the visual inspection, it appeared the plug welds failed and resulted in the separation of a section of the turbine shroud from the blades. The visual assessment also indicated that Row 2R Gen and Row 3R Gen also sustained damage from the shroud failure and the rotor would need to be repaired at Siemens' shop in Charlotte.

The LP rotor was removed from the casing and prepared for shipment to Siemens' Shop for further blade damage assessment, and repair. The rotor was shipped out on the morning of May 7, 2012. Siemens received the LP rotor on May 8, 2012.

Once the LP Rotor was at Siemens' shop, it was diametrically inspected and a liquid penetrant nondestructive test was completed on the stationary vanes. Based on the inspection and nondestructive examination, Siemens staff determined the schedule and scope of the repair which included removing all upper half LP components and repairing the row 1, 2, and 3 stationary vanes on the generator end of the rotor. The original schedule was for Siemens to repair and deliver the LP Rotor on June 11, 2012.

PSNH accepted delivery of the rotor on June 11, 2012 as scheduled. The rotor was placed in roller stands for a final inspection prior to installation. During the final inspections, it was discovered that the inner steam gland seals on both ends of the rotor were machined to a dimension of 16.000 inches. Drawing requirements indicate the proper dimensions were 15.960 inch diameter. The required tolerance for the inner steam gland seals is 0.020 inches and is to ensure the radial clearance to the inner gland bore.

It was determined the machining error was the result of a Siemens machinist misreading the drawing. Siemens acknowledged the mistake, reviewed the information with their staff, and revised our drawings to better identify the proper clearances.

The LP rotor rework was completed on June 20, 2012 and the rotor was shipped from Charlotte. The rotor was received on June 21, 2012, where Siemens and PSNH crews were standing by to inspect the rotor before offloading. The original 5-10 hour shift plan was implemented with some additional OT worked at critical times during reassembly. The additional overtime helped to expedite the installation and testing of the rotor. The unit was then rolled up and phased on the line on June 28, 2012.

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 boiler inspection that was completed at the beginning of the outage and other corrective and preventative work. An abbreviated list of some of these activities is provided below.

Boiler:
- Do a complete internal boiler inspection.
- Perform a boiler hydrostatic test
- The opportunity was taken to have the boiler inspected by the licensed boiler inspector.

Mechanical:
- The maintenance department replaced #3 hydrogen cooler cooling water inlet valve. (The hydrogen coolers were then lined up for normal service.)
- Steam drum spray header was inspected and nuts were tightened.
- The North drum safety drip pan drain line was replaced.
- Re-shielded Generation tubes on El. 83 from South to North Row 1 tubes 4 & 5.
- Test ports were installed on the air heater and duct work for upcoming testing.

- ID fan dampers were inspected and aligned.
- Repaired a seal leak on the air heater lube oil pump.
- Changed oil in fans, and motors.
- Replaced steam traps on the 10th and 18th stage extractions.
- Condensate pumps A & B; replaced packing sleeves, nuts, and repacked both pumps.

Turbine:

- Repaired the turn handle on the turbine governor lube oil filter.

PSNH

FOSSIL STATION OUTAGE REPORT

PUC Outage Report No.: OR-2012-08

Station/Unit: Merrimack Station, Unit No. 2

Dates: June 25 - June 29, 2012

Duration: 4.9 Days

Immediate Cause:
FGD Optimization and Absorber Tray Modification

Discussion/Remedy:
Unit 2 was removed from service on June 25th; the primary reason for this outage was to modify the FGD absorber trays. The absorber tray system is an integral component to the scrubber system. The tray system is designed to increase the surface area contact between the flue gas and the absorber slurry. The trays system was modified to balance and tune overall absorber performance. This work was completed by Siemens Environmental Systems.

The critical path activity for this outage was FGD absorber tray modification. In parallel to the critical path activity, a number of backlog jobs were completed.

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 boiler inspection that was completed at the beginning of the outage and other corrective and preventative work. An abbreviated list of some of these activities is provided below

Boiler
Boiler inspection was completed.

- Tube shields were removed that were near screen tubes in the furnace.
- 2 F cyclone had 3 leaks under the flat studs on the barrel tubes that were repaired.

Mechanical Department:

- Pad welded leak on HP/IP turbine inner casing drain.
- Replaced condenser sight glass and seals.
- Replaced gaskets on slag tank sluice line.

- Replaced trap on FD Fan secondary steam coil.
- Repaired crack on 2 B Recirculation fan casing.
- Repaired original precipitator rapper.

Electrical Department:

- Adjusted and tested 210 turbine valve main steam drain motor operated valve.
- Corrected emergency system inverter amperage reading.

Instrument Department:

- Adjusted torque settings on deaerator level control valve and tested.
- Inspected and verified 201 secondary superheater bypass control valve position versus feedback signal.
- Inspected, cleaned and tested SCR high and low side draft connections.
- Inspected and verified economizer differential pressure reading.

PSNH

FOSSIL STATION OUTAGE REPORT

PUC Outage Report No.: OR-2012-09

Station/Unit: Schiller Station, Unit No. 5

Dates: July 15-July 21, 2012

Duration: 5.75 days

Immediate Cause: In-bed boiler tube leak.

Discussion/Remedy:
The Unit 5 was operating for 81 consecutive days. Leading up to this outage, the unit was showing signs that a tube leak had developed. These signs included increased water usage and increase forced draft fan amperage. Due to these conditions, PSNH initiated a controlled shutdown of the unit. It was also suspected that the leak was located in the in-bed boiler tube bank. Removing bed material is standard operating procedure when shutting down the unit; however, in this case because an in bed boiler tube failure was suspected, bed bacterial was removed to avoid the potential of plugging the silo or transfer piping. The bed material was removed from the boiler by a vacuum truck.

In parallel to removing the bed material, boiler and equipment inspections were performed to determine the scope of the necessary repair and the cause of the leak.

After completing the inspection and fully understanding the scope of the repair, the repair to the tubes began. This work was completed on two shifts to repair the leaks. In total four dutchmen and eight pad weld repairs were made. In addition to the boiler tube work, significant refractory work was also required on the boiler wall.

The four tubes that were replaced with dutchmen were sent out for analysis. Tube 1 showed signs of OD erosion. Tubes 2, 3, and 4 failed as the result of localized furrowing and sharp cuts consistent with steam impingement erosion cause by the Tube 1 tube failure.

After tube repairs were completed, the unit underwent a successful hydro test. The unit was then turned over to the operations department for startup. The unit phased online on July 21, 2012 at 10:45 ending the outage.

Additional Work Completed During the Outage:

Mechanical:

- Replaced the bed material drain valve.
- Pulsation Drive Damper oil leak repaired.
- Rebuilt Cooling water return pump Changed oil on the ID and FD fans.

Electrical:

- Condensate motor went out for rewind.
- AC seal oil pump was sent out for repair.
- Circulating water motor had feeder cables replaced.

Boiler:

- Repaired a shell leak in the 18th stage feed water heater.

PSNH

FOSSIL STATION OUTAGE REPORT

PUC Outage Report No.: OR-2012-10

Station/Unit: Merrimack Station, Unit No. 1

Dates: August 4-August 9, 2012

Duration: 5.5 Days

Immediate Cause:
Planned Preventative Maintenance – The unit was removed from service to clean the air heater.

Discussion/Remedy:
Unit 1 was removed from service to clean the air heater and perform preventative maintenance. Prior to performing the air heater, an inspection of the upper and lower air heater seals (circumferential and radial) was performed. All seals were determined to be in good condition. In addition to the air heater inspection, a boiler inspection was also completed. The boiler inspection revealed a small waterside barrel tube leak in 1C cyclone. The leak was on the 8th barrel tube elbow from the neck, located by the secondary air damper. The leak was small and repaired with a pad weld. The upper furnace secondary superheater (SSH), vertical reheater (VRH), primary superheater (PSH) and back-pass were in very good condition with no other steam or water tube leaks found.

The critical path activity for this outage was the air heater wash. In parallel to the air heater wash, a number of backlog jobs were completed. The outage was completed and the unit was declared available and release to ISO at 13:47 on August 9, 2012.

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 boiler inspection that was completed at the beginning of the outage and other corrective and preventative work. An abbreviated list of some of these activities is provided below.

Mechanical:
- Repaired G9B-1 and G9B-3 sootblowers.
- Replaced 1-A condensate drip return pump.
- Greased bearings on 1-A and 1-B Economizer bypass dampers.
- Replaced 1-A air heater drive coupling.
- Replaced 1-A forced draft fan inboard fan bearing and both slinger rings.

- Changed oil in 1-B forced draft fan inboard and outboard motor bearings.
- Changed oil in 1-B forced draft fan inboard and outboard bearings.
- Replaced isolation valve for circulating water pump gland water supply and flowrator valves.
- Changed slag tank jetpulsion venturi.
- Changed oil and cleaned the sight glass on the hydrogen seal oil vacuum pump.
- Replaced elbow on the slag tank overflow loop seal piping.

Boiler:
- Performed complete boiler inspection.
- Repaired boiler waterside tube leak as described above.
- Rebuilt and tested PCV-25, fan coil drip return.
- Disassembled and repaired 1-B air heater steam cleaning device.
- Vacuum SCR.

Electrical:
- Disconnected and reconnected 1-A condensate drip return pump.
- Fabricated new limit switch arm for the SCR inlet damper.
- Disconnected and reconnected 1- A air heater drive gearbox motor.
- Repaired broken wires over number three and five hoppers in the original precipitator.

Instrumentation:
- Replaced thermocouple TT-1041 for the inlet to the SCR Reactor.

Chemical:
- Brush cleaned south side condenser tubes.
- Brush cleaned north side condenser tubes.
- Brush cleaned the cooling water heat exchanger.

Turbine:
- Replaced gasket on turbine auxiliary governor controller.

FGD:
- Replaced pressure regulator and gauge on ball mill “A” motor lift oil system.

PSNH

FOSSIL STATION OUTAGE REPORT

PUC Outage Report No.: OR-2012-11

Station/Unit: Merrimack Station, Unit No.1

Dates: August 11-August 13, 2012

Duration: 2.7 days

Immediate Cause: Power spray module Transformer Bus Failure.

Discussion/Remedy:
On August 11, 2012, MK1 was declared unavailable when a power spray module transformer bus failure occurred. The spray modules are located in the MK discharge canal and operate as necessary to maintain canal temperature. Due to the ambient temperature of the Merrimack River at the time of this event, the power spray modules would have been required to be in service to meet thermal discharge limits. Because the power spray modules would have been required for unit operation, MK1 needed to be declared unavailable until the necessary repairs were made.

PSNH electricians were called in to troubleshoot and determined that because of a recent heavy rain storm that rain water infiltrated the bus duct which caused a phase to phase fault. The electrical protection system sensed the fault and tripped the power spray module transformer breaker effectively sectionalizing the fault. The section of bus that was affected was located between the transformer and the power spray module building. This bus section was disassembled, cleaned, repaired, reinsulated, tested, and installed. Once the system was installed, a final electrical test was completed to ensure the integrity of the circuit.

This work was completed by PSNH personnel under the direction of Eaton Corporation. Eaton also verified the relay settings and tested the relays before re-energizing the transformer.

Additional Work Completed During this Outage:
Additional work was not completed on MK1 during this outage because of the recent planned preventative air heater outage and because of the work being completed during the corresponding MK2 outage.

PSNH

FOSSIL STATION OUTAGE REPORT

PUC Outage Report No.: OR-2012-12

Station/Unit: Merrimack Station, Unit No. 2

Dates: August 11- August 14, 2012

Duration: 3.0 days

Immediate Cause: Power spray module Transformer Bus failure.

Discussion/Remedy:
On August 11, 2012, MK2 was declared unavailable when a power spray module transformer bus failure occurred. The spray modules are located in the MK discharge canal and operate as necessary to maintain canal temperature. Due to the ambient temperature of the Merrimack River at the time of this event, the power spray modules would have been required to be in service to meet thermal discharge limits. Because the power spray modules would have been required for unit operation, MK2 needed to be declared unavailable until the necessary repairs were made.

PSNH electricians were called in to troubleshoot and determined that because of a recent heavy rainstorm, that rain water infiltrated the bus duct which caused a phase to phase fault. The electrical protection system sensed the fault and tripped the power spray module transformer breaker effectively sectionalizing the fault. The section of bus that was affected was located between the transformer and the power spray module building. This bus section was disassembled, cleaned, repaired, reinsulated, tested, and installed. Once the system was installed, a final electrical test was completed to ensure the integrity of the circuit.

In addition to the power spray module transformer bus repairs, a boiler inspection was also completed. The boiler inspection revealed tube leaks in 2-F cyclone barrel tube leaks. The leaks were repaired with a pad weld.

This work was completed by PSNH personnel under the direction of Eaton Corporation. Eaton also verified the relay settings and tested the relays before re-energizing the transformer.

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 boiler inspection that was completed at the beginning of the outage and other corrective and preventative work. An abbreviated list of some of these activities is provided below.

Mechanical:

- Cleaned 2A and 2B main condenser vacuum pump heat exchangers.
- Performed inspection on slag tank, checked wheels, gate, etc.
- Replaced pipe and elbows on slag tank overflow line.
- Replaced the water side relief valve on the 2nd point high pressure heater.
- Rebuilt the convection pass supply downcomer drain valve (#21).
- Repacked the steam sootblowing block valve (MOV-300).
- Replaced bottom gasket on PCV-130 turbine gland steam startup supply valve.
- Replaced nitrogen piping at the primary superheater steam side vent.
- Replaced IR'S 4, 5, and 6 with rebuilt units.

Electrical:

- Replaced DC emergency oil pump switch at the unit 2 turbine aux control board.
- Adjusted torque switch, stroked and tested DA level control by-pass valve.
- Inspected electrostatic precipitator, original and supplemental.

Instrumentation:

- Tested condensate recirc valve and valve controller.
- Performed inspections on 200'S, 201'S, 202'S, and 207 valves.
- Inspected all connections on 2-B forced draft fan inboard motor bearing TC'S.
- Rebuilt piston on 2-B forced draft fan outlet damper. Tested and lubricated damper.

Chemical:

- Brush cleaned north and south heat exchangers.
- Brush cleaned main condenser (both sides, east and west).

Boiler:

- Repaired casing on elevation 294' SE corner of the backpass.
- Repaired gas leak on the south metal expansion joint on the gas recirc duct floor.

PSNH

FOSSIL STATION OUTAGE REPORT

PUC Outage Report No.: OR-2012-13

Station/Unit: Newington Station, Unit No. 1

Dates: November 26-November 29, 2012

Duration: 3.4 Days

Immediate Cause:
Planned Maintenance Outage – Replace Station Service Transformer

Discussion/Remedy:
The unit was scheduled out of service beginning November 26 through December 2, this approved by ISO New England. The primary reason for this outage was to replace one of the three original 4160/480 volt load center transformers, 1LC. The original transformers were oil filled with 100% PCB oil. In the mid 1980's, the transformers were retro-filled with System 50 Fluid with reduced the PCB contamination to less than 50 ppm of PCB oil. The ongoing oil analysis program began to indicate problems developing with all three transformers, which included elevated moisture levels in the oil and some deterioration of the windings insulation. As a result, a plan was developed to replace all three transformers.

As these three transformers provide all of the 480 volt and lower voltage service, including all lighting panels within the Station, it was determined to replace one transformer first in 2012 and the other two transformers in the Spring of 2013 during the Annual Outage. By scheduling the work in this fashion, it allowed for the temporary transfer of critical loads onto the in-service Load Center transformer. The replacement of 1LC was determined in large measure due to the relatively easy access of this transformer by the Turbine Hall Gantry Crane. The other two transformers are located together in an area that is inaccessible to the overhead crane.

Additional Work Completed During the Outage:
Other work performed during the outage included jobs that were in the priority backlog, jobs that were found during the boiler inspection that was completed at the beginning of the outage and other corrective and preventative outage work. An abbreviated list of some of these activities is provided below.

Mechanical:

- Replaced #4 Feedwater Heater Level Column.

Boiler:

- Hydro statically tested Main Boiler, no leaks were found.
- Vacuum tested Main Boiler Reheater, no leaks were found.
- Scavenging Steam Valve (1) Replacement.

Electrical:

- 4160 Volt Breaker Cell supplying Load Center Transformer 1LC, cleaned.
- 4160 Volt Breaker supplying 1LC swapped with spare breaker.

PSNH

FOSSIL STATION OUTAGE REPORT

PUC Outage Report No.: OR-2012-14

Station/Unit: Merrimack Station, Unit No. 2

Dates: December 17-December 21, 2012

Duration: 3.8 Days

Immediate Cause:
High Furnace Pressure Trip

Discussion/Remedy:
MK2 tripped off line due to high furnace pressure. The immediate cause of the outage was suspected to be a communication issue between the control system and the booster fan. However, troubleshooting revealed the Enter key on the Unit 2 FGD workstation keyboard was depressed or stuck (i.e. constantly active). The active enter key resulted in a signal to be sent to shut down the booster fan when the control room operator moved the mouse on the screen over the booster fan control panel "off" button.

It is unknown if the enter button was constantly active due to something pressing on the button or a keyboard with a sticking enter button. The keyboard was replaced.

The 2A Booster fan is a critical fan to the operation of the unit and balances the furnace pressure and Scrubber system pressure to ensure proper balance. This system is sensitive and when the booster fan shut down, it caused an instantaneous high furnace pressure condition. Although the root cause of the outage was the stuck Enter key, it was decided to keep the unit offline to repair furnace casing leaks as well as perform other preventative maintenance, in preparation for a long winter run.

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 boiler inspection that was completed at the beginning of the outage and other corrective and preventative work. An abbreviated list of some of these activities is provided below.

Boiler:
- Performed boiler inspection.
- Repaired cyclone tube leaks in 2A, 2B, 2F, and 2G cyclones.
- Repaired casing leak at north metal expansion joint on top of recirc duct on the west side of the 5th floor.
- Repaired casing leak on southeast corner of the DO-1 duct.

- Repaired casing leak at northeast corner of the north DO-1 duct expansion joint.
- Repaired casing leak at the penthouse overhang on the southeast corner of the south wall.
- Repaired windbox casing leak below 2F cyclone.
- Repaired casing leak near 201B valve.
- Repaired casing leak near convection pass downcomer, 8th floor, southeast side.
- Replaces both swipers.
- Replaced boiler draft connection for boiler gas outlet pressure transmitter (Pt. 2155).
- Repaired boiler door between IK34 & IK36.

Mechanical:
- Repaired two compression fitting leaks at 2B ammonia tank.
- Repaired leak at secondary fan coil drip return trap.
- Repaired auxiliary steam backup supply steam trap leak.
- Repaired secondary fan coil steam trap union leaks.
- Repaired flash tank level column leak, east side.
- Inspected coal feeders.
- Inspected Stress-Trols.
- Adjusted/inspected Redlers.
- Inspected screen house pumps.

I&C:
- Replaced and calibrated #2 west O2.
- Adjusted common flyash silo bag house differential pressure alarm from 7.5 inches of water to 4 inches.
- Replaced inlet side control air dryer filter due to high dp.
- Cleaned CEM opacity monitor lenses.
- Cleaned sensor for common flyash silo level indication.
- Changed out 2B booster fan inlet vane positioner.
- Stroked booster fan inlet vanes.

Electrical:
- Set limits for 2D guillotine air damper.

Sootblowers:
- SB-11 & SB13 adjusted packings.
- Inspected sootblowers.

Turbine:
- Replaced hoses for both N_2 cylinders to the dry chem for the #1 turbine bearing fire protection system

ATTACHMENT WHS – 3

PSNH FOSSIL STEAM UNIT AVAILABILITY

PSNH FOSSIL STEAM UNIT AVAILABILITY

January 2012 through December 2012

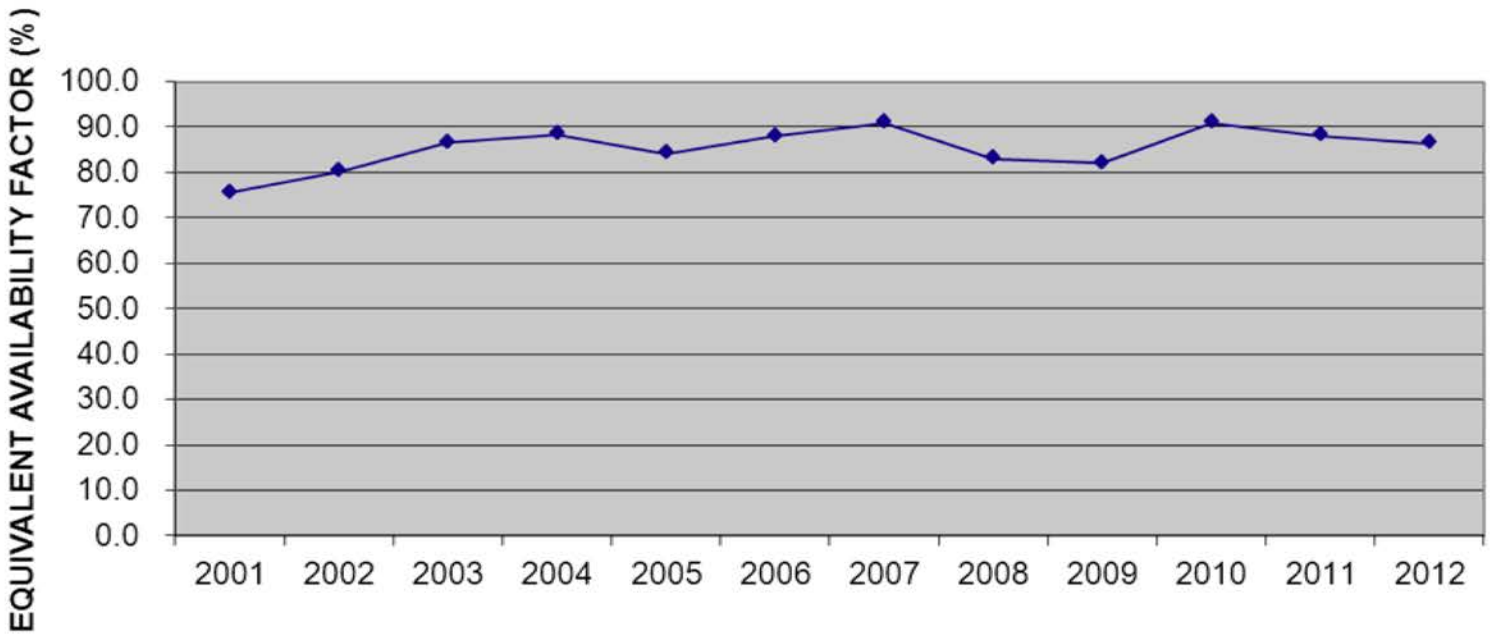
	Merrimack Unit 1	Merrimack Unit 2	Newington Unit 1	Schiller Unit 4	Schiller Unit 5	Schiller Unit 6
January	81.0%	98.0%	95.0%	99.8%	97.3%	98.4%
February	96.8%	80.0%	99.9%	100.0%	100.0%	42.4%
March	98.7%	98.5%	100.0%	100.0%	75.1%	49.2%
April	61.0%	4.2%	61.4%	100.0%	58.2%	99.0%
May	98.7%	24.4%	100.0%	4.7%	100.0%	99.0%
June	94.2%	82.4%	98.6%	6.8%	100.0%	98.8%
July	98.7%	98.4%	100.0%	99.9%	69.6%	99.0%
August	69.5%	88.8%	100.0%	92.7%	100.0%	98.8%
September	76.6%	94.5%	99.5%	100.0%	99.8%	99.0%
October	63.3%	67.6%	100.0%	99.9%	99.7%	99.0%
November	98.3%	69.5%	88.6%	99.8%	99.8%	99.0%
December	98.9%	86.0%	100.0%	99.8%	99.5%	99.0%

Planned Maintenance Outages

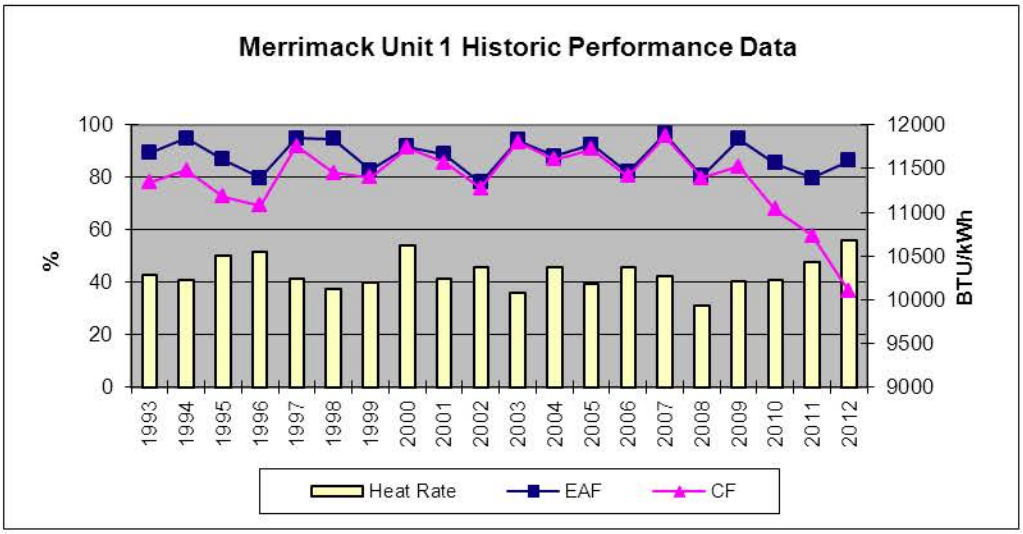
January 2012 through December 2012

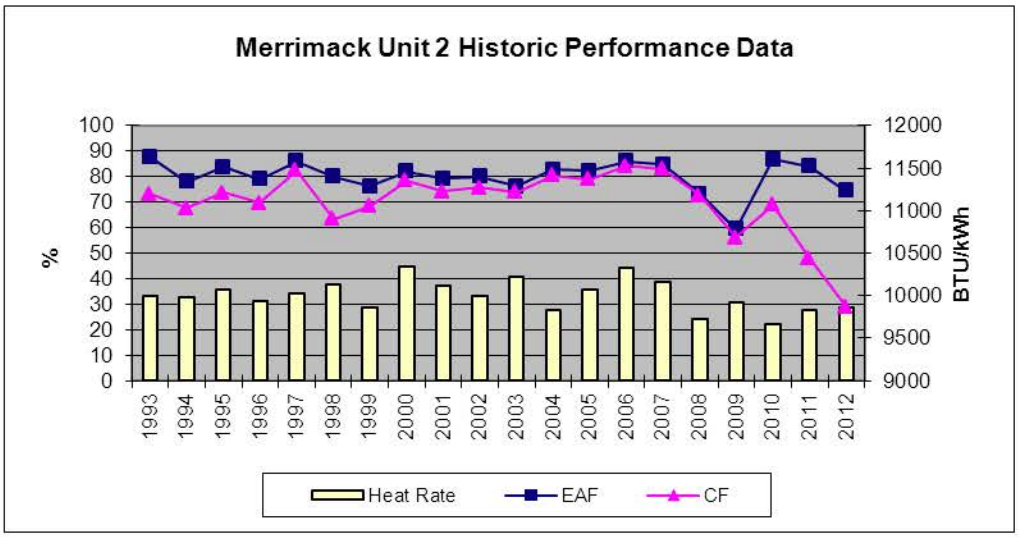
Unit	Month(s)
Merrimack 1	Sept-Oct
Merrimack 2	Oct-Nov
Newington	Apr
Schiller 5	Mar-Apr

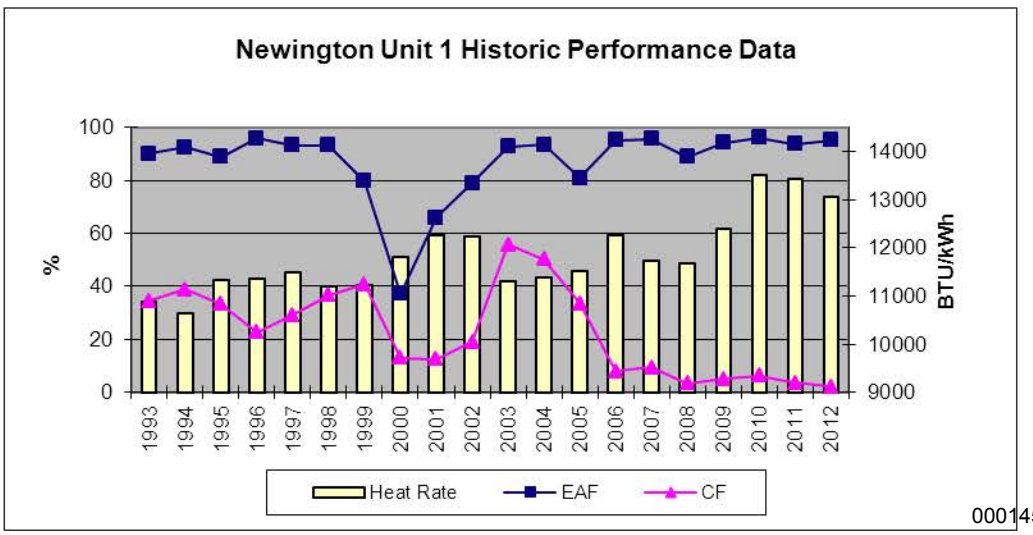
PSNH FOSSIL SYSTEM WEIGHTED EAF
2012



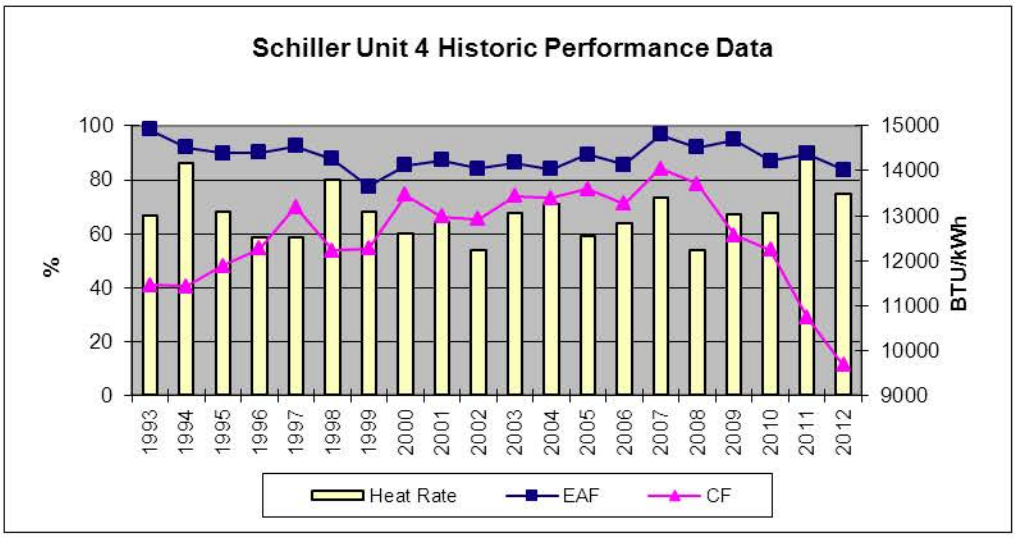
Fossil Plant Graphs – Planned Outages Included

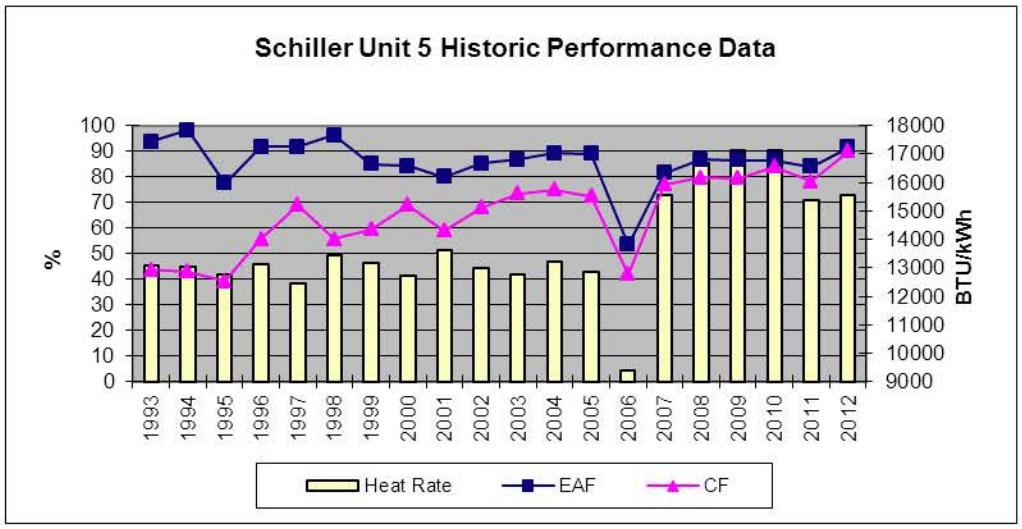


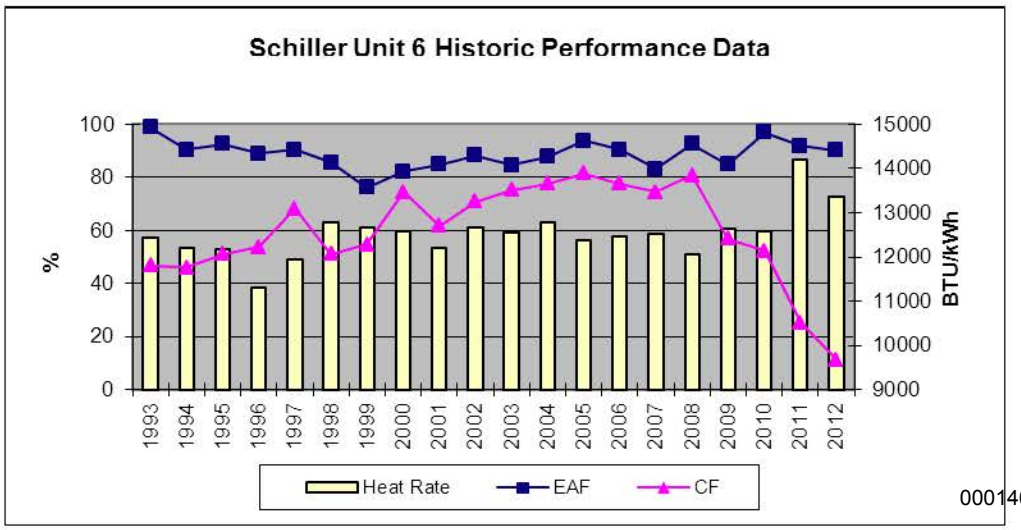




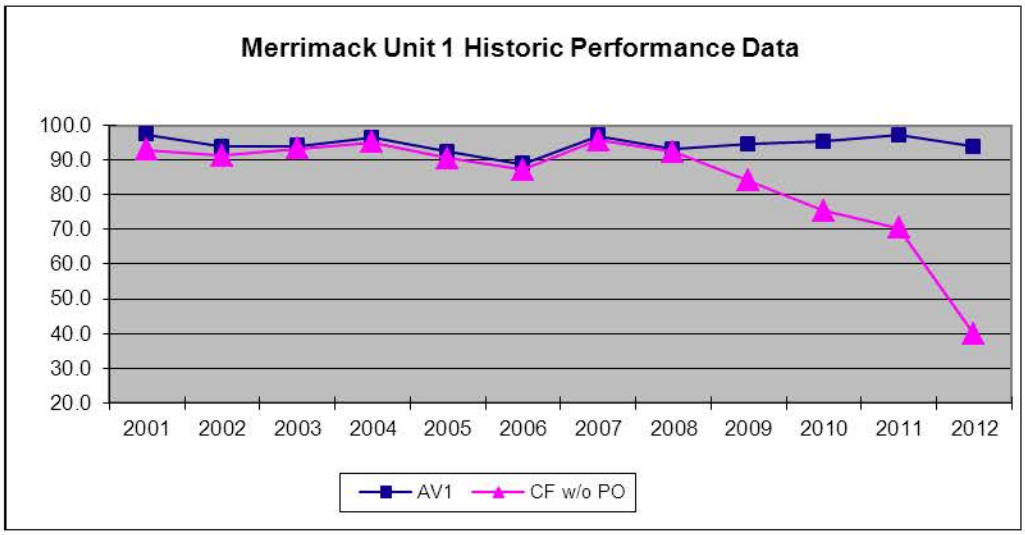
Fossil Plant Graphs – Planned Outages Included

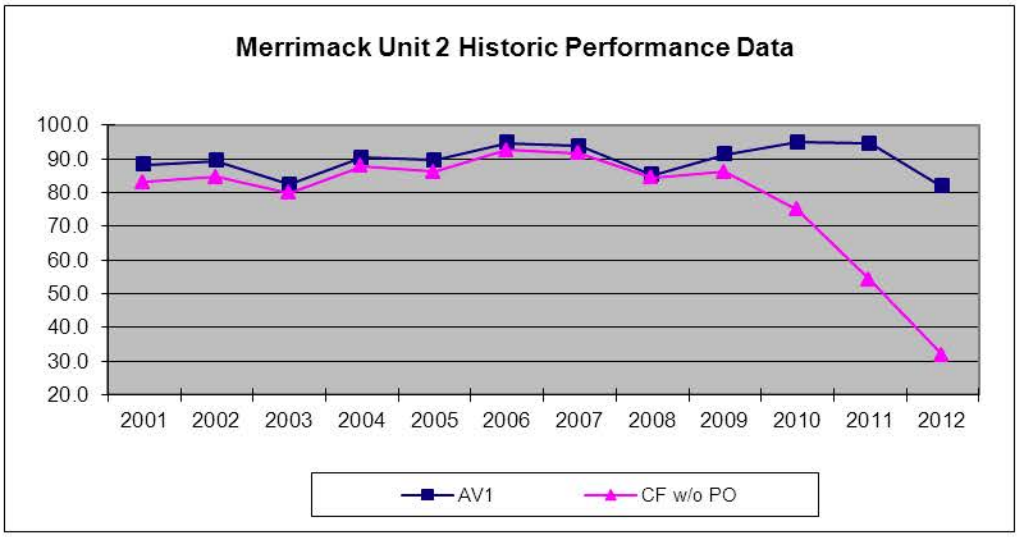


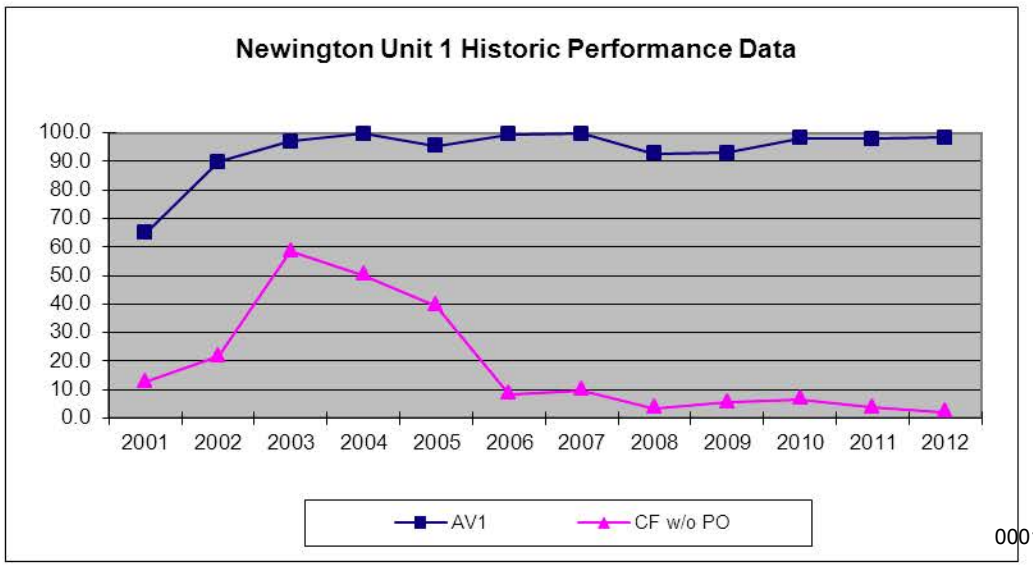




Fossil Plant Graphs – Planned Outages Omitted







Fossil Plant Graphs – Planned Outages Omitted