

**STATE OF NEW HAMPSHIRE
PUBLIC UTILITIES COMMISSION**

Docket No. DE 11-094

In The Matter of

**PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
2010 ENERGY SERVICE AND STRANDED COST RECOVERY CHARGE
RECONCILIATION**

DIRECT TESTIMONY

of

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ACCION GROUP, INC.**

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1 **I. Introduction and Qualifications**

2
3 **Q. Mr. Cannata, please state your full name.**

4 A. My name is Michael D. Cannata, Jr.

5

6 **Q. Please state your employer and your business address.**

7 A. For this engagement, I am contracted by .Accion Group, Inc. (“Accion”) to address
8 the issues raised in this proceeding. My business address is 244 North Main Street,
9 Concord, New Hampshire 03301.

10

11 **Q. In what capacity are you employed?**

12 A. I am generally responsible for the review of energy utility engineering and operations
13 management, practices, and procedures.

14

15 **Q. Please describe your educational background, work experience, and major**
16 **accomplishments of your professional career?**

17 A. My educational background, work experience, and major career accomplishments are
18 presented in Exhibit MDC-1.

19

20 **Q. To what professional organizations or industry groups do you belong or have**
21 **you belonged?**

22 A. I am a member of the Institute of Electrical and Electronic Engineers and its Power
23 Engineering Society, and am a Registered Professional Engineer in the State of New
24 Hampshire (#5618). I served as a member of virtually all of the former New England
25 Power Pool (NEPOOL) Task Forces and Committees, except for their executive

1 Committee, where my role was supportive to an Executive Committee member. I
2 also served as a member of the New England/Hydro Quebec DC Interconnection
3 Task Force and the Hydro Quebec Phase Two Advisory Committee. These two
4 groups designed the Hydro Quebec Phase One and Phase Two 450kV DC
5 interconnections with New England. The various committees and groups I have
6 served on addressed the functions now being performed by the Independent System
7 Operator – New England (ISO-NE).

8 On national issues, I represented Public Service Company of New Hampshire
9 (PSNH) at the Northeast Power Coordinating Council as its Joint Coordinating
10 Committee member, at the Edison Electric Institute as its System Planning
11 Committee member, and at the Electric Power Research Institute as a member of the
12 Power Systems Planning and Operations Task Force.

13 While employed by the of the State of New Hampshire, I managed a professional
14 staff engaged in investigations regarding safety, operations, reliability, emergency
15 planning, and the implementation of public policy in the electric, gas,
16 telecommunications, and water industries. I also sat as a full member of the New
17 Hampshire Site Evaluation Committee responsible for siting major energy facilities
18 (Generating stations, gas transmission lines, electric transmission lines, and gas
19 storage facilities). At the request of the New Hampshire Public Utilities
20 Commission's (NHPUC or Commission) Chairman, I sat on the State Emergency
21 Response Commission as a designated member. Additionally, I was a member of the
22 former Staff Subcommittee on Engineering of the National Association of Regulatory
23 Utility Commissioners.

1

2 **Q. Have you testified before regulatory bodies before?**

3 A. I have testified before the NHPUC in rate case, condemnation, least cost planning,
4 fuel adjustment, electric industry restructuring, and unit outage reviews. I have
5 testified before the Kentucky Public Service Commission and the Maine Public
6 Utilities Commission in transmission siting proceedings; the Maryland Public Service
7 Commission regarding system reliability; and I have submitted testimony at
8 proceedings at the Federal Energy Regulatory Commission (FERC). I have also
9 testified at the request of the Commission before Committees of the New Hampshire
10 Legislature on a variety of matters concerning regulated utilities.

11 **II. Summary of Testimony**

12

13 **Q. Please describe the areas that your testimony addresses today.**

14 A. My testimony addresses three main areas and other lesser issues. It was requested that
15 Accion review 1.) the market-based capacity and energy transactions performed by
16 PSNH that augmented its own generation to supply 2010 Default Energy Service with
17 recommendations concerning PSNH's future procurement of energy and capacity; 2.)
18 the outages that occurred at all PSNH generating units during 2010 with
19 recommended disallowances and operational changes; and 3.) the review of PSNH's
20 efforts to address the recommendations remaining in the settlement agreement in
21 Docket No. DE 09-091, and the recommendations contained in the settlement
22 agreement in Docket No. DE 10-121. I also present Accion's views regarding the
23 unit availabilities and capacity factors, heat rates of PSNH generating units for 2010,
24 and the adequacy of future capital and O&M expenditures for reliable and efficient

1 plant operations. In addition, I opine on the significant reductions made by PSNH in
2 the Newington capital and O&M budgets due to changed market operating conditions
3 for the unit¹.

4 This testimony addresses the review areas either through the questions and answers
5 presented below, or through a series of individual reports, which are attached as
6 exhibits to my testimony and are organized as follows:

7 **Capacity/Energy Transactions:**

8 Exhibit MDC-2, 2010 Capacity/Energy Transactions

9 **Generating Unit Outages:**

10 Exhibit MDC-3, Merrimack Outages for 2010

11 Exhibit MDC-4, Newington Outages For 2010

12 Exhibit MDC-5, Schiller Unit Outages For 2010

13 Exhibit MDC-6, Hydroelectric Unit Outages For 2010

14 Exhibit MDC-7, Combustion Turbine Outages For 2010

15 Exhibit MDC-8, W. F. Wyman Outages for 2010

16 Exhibit MDC-9, Stipulation Items from the 2008 and 2009 Energy
17 Service/Stranded Cost Recovery Charge reconciliation proceedings, Dockets
18 No. DE 09-091 and DE 10-121, respectively.
19

20 **Q. Please summarize your capacity and energy transaction testimony.**

21 A. With regard to capacity and energy transactions, Accion concluded that PSNH's
22 filing is an accurate representation of the capacity and energy purchasing process that
23 took place in 2010. Additionally, Accion concluded that PSNH made sound and
24 prudent management decisions with regard to its capacity and energy purchases in its

¹ PSNH began this effort in 2009. As stated in Accion's testimony in Docket No. DE 10-121, comments could not be made at that time until the PSNH effort was completed. PSNH completed its effort in 2010.

1 market environment consistent with its 2010 Least Cost Plan. PSNH made progress
2 in making short-term sales of excess energy and capacity once energy or capacity was
3 purchased. PSNH developed additional procedures to govern all aspects of
4 supplemental energy purchases and sales which limit exposure to market forces.
5 PSNH's efforts in focusing more on the short-term, as recommended in Docket No.
6 DE 10-121, significantly reduced customer costs. The net cost of supplemental
7 energy service decreased from \$217.0 million in 2009 to \$81.8 million in 2010.

8 Accion reviewed the capacity and energy testimony filed by PSNH, conducted an on-
9 site interview with knowledgeable personnel responsible for the capacity and energy
10 transaction function at PSNH, requested follow-up information, and reviewed
11 detailed, backup information of the summary results supplied by PSNH. Accion also
12 concluded that the capacity factor projections for PSNH units used for 2010 market
13 purchases were reasonable, and included ongoing discussions with generating plant
14 personnel. Accion is satisfied with the manner in which PSNH is modeling short
15 reliability outages in 2010 and the impact of economic reserve status on its units
16 beginning in 2011. In addition, Accion concluded that even though the volume of
17 customer migration in 2010 was reasonably constant throughout the year, it still
18 introduced uncertainty into the supplemental energy procurement process because of
19 the inability to adjust purchases in a timely manner for unknown customer decisions.

1 **Q. Do you have recommendations regarding capacity and energy transaction**
2 **issues?**

3 A. Yes. Accion Group recommends that PSNH continue to focus on the short-term
4 market in the near future as market prices remain depressed due to low economic
5 activity, growth, and fuel prices resulting in lower market energy prices. The
6 currently low market energy prices are expected to remain low in the near-term
7 future, due to depressed economic activity and fuel prices absent major world events.

8 **III. Outages**

9 **Q. Please state the results of your review of the PSNH unit outages that occurred**
10 **during 2010.**

11 A. With regard to planned and forced unit outages, Accion Group found that the base
12 load units on the PSNH system ran well in 2010. In fact, PSNH units generally
13 performed as well or better than forecasted from an availability perspective with very
14 high availability on the highest priced energy days during 2010. From a capacity
15 factor basis, PSNH units performed at a lower level than expected. PSNH had
16 forecast no economic reserve shutdowns² to its base load units when preparing the
17 2010 ES rate and its update. In actuality, economic reserve shutdowns significantly
18 reduced expected capacity factors in 2010 and this phenomenon is expected to
19 continue in 2011.

20 Accion reviewed outage information, conducted on-site interviews, and submitted
21 follow-up requests for information as necessary. In each instance, except those noted
22 below, Accion found the outages to be reasonable and not unexpected for the

² An economic reserve shutdown is an operating event where a unit is available and ready to run, but does not run because its operating costs are higher than other available units in the dispatch region.

1 particular unit, its vintage, or that the outage was necessary for proper operation of
2 the unit. Accion also concluded that PSNH conducted proper planning and
3 management oversight regarding these planned and forced unit outages.
4 Additionally, from its review of unit outages, Accion has recommendations it
5 believes will support and elevate PSNH's efforts in achieving additional improvement
6 in unit operation.

7
8 **Q. Which outages do you recommend that replacement power costs not recover?**

9 A. Accion found some PSNH unit outages should not have their replacement power
10 costs (RPC) recovered and they are noted below. Accion also lists outages below
11 where circumstances presented an opportunity for PSNH to improve its processes.
12 Accion will first present its findings with regard to outages where it recommends
13 RPC should not be recovered.

14 The first outage is associated with Schiller 4-C on August 29, 2010, as identified in
15 Exhibit MDC-5. PSNH missed the scheduled start-up time because the boiler feed
16 pump was not up to required temperature. Standard operating procedure calls for
17 opening the warm-up line to the boiler feed pump when the unit is shut down. The
18 operator failed to open the warm-up line the night before when the unit was taken off
19 line. This item was discussed with the operator in question.

20 Startup and shutdown activities follow formal procedures which normally are written
21 with sequenced checklists. PSNH procedures follow this format. In addition, startups
22 and shutdowns are routinely performed, especially on units that often cycle. To miss a

1 step on a formal procedure checklist suggests either gross inattention, filling in the
2 checklist after rounds are made, or not using the checklist at all. All of these
3 possibilities are unacceptable.

4 Accion recommends that the replacement power cost associated with this outage not
5 be recovered from customers.

6 The next outages relate to Ayers Island. These outages relate to polymer insulator
7 failures on the double circuited 337 34.5kV and J-125 115kV line, identified as Ayers
8 Island Outage 1-D and 2-C in Exhibit MDC-6. These outages occurred on November
9 3, 2010. With regard to the original fault on the 337 34.5kV line, PSNH conducted a
10 review because of the occurrence of multiple polymer insulator failures on these
11 facilities. PSNH determined that the insulators require replacement and will do so
12 with higher rated insulators in 2011. The PSNH review also found that some of the
13 34.5kV insulators were mistakenly mounted on the wrong side of the pole, placing
14 the center phase of the 34.5kV under the lower 115kV rather than the center 115kV
15 phase wire, which reduced the insulation between the two circuits. Additionally,
16 PSNH used the polymer insulators designed for the wood pole 34.5kV system
17 (200kV BIL). The poles for this double circuited line are steel, which requires a
18 higher rated insulator.

19 In the design of the line, inadequate insulation was specified for the 34.5kV circuit.
20 Some insulators were mounted on the wrong side of the pole, further reducing the
21 flashover level between the two circuits and resulting in 34.5kV faults enveloping the
22 115kV circuit. Neither the design or installation deficiencies were detected by PSNH

1 during design, construction, or final line inspection phases of the project. The 34.5kV
2 polymer suspension insulators turned out to be defective; they required replacement,
3 and the quality control of the insulators was out of PSNH's control. The failures,
4 however, were a result of the design and construction deficiencies.

5 Accion recommends that replacement power costs for these two outages be
6 disallowed. Accion Group also recommends that the costs of the capital replacements
7 to correct insulation deficiencies be collected through the rate making process, as they
8 would be the same if constructed correctly during the original project.

9 The last outage Accion was associated with the operation of W. F. Wyman 4 that
10 occurred on July 24, 2010 and is identified as Outage 4-N in Exhibit MDC-8. When
11 called to run, the unit tripped on lockout during startup. Investigation found that the
12 lockouts were not reset at the end of the previous shutdown as required by procedure.

13 Startup and shutdown activities follow formal procedures which are generally written
14 with sequenced checklists. In addition, startups and shutdowns are routinely
15 performed, especially on units that often cycle. To miss a step on a formal procedure
16 checklist suggests either gross inattention, filling in the checklist after rounds are
17 made, or not using the checklist at all; none of which is acceptable.

18 Accion recommends that the replacement power cost associated with this outage not
19 be recovered from customers.

20

21

1 **Q. Is that the extent of the outages that you recommend RPC not be recovered?**

2 A. Yes, it is.

3

4 **Q. How should the replacement power costs of these outages be quantified?**

5 A. PSNH has consistently used a method to quantify replacement power costs in recent
6 Energy Service/Stranded Cost Recovery Charge reviews. Accion recommends they
7 continue to use that methodology for these outages and provide such quantification
8 for review prior to the hearing in this proceeding.

9 **IV. Unit Operations Recommendations**

10

11 **Q. In addition to your recommendations regarding the recovery of outage costs, you**
12 **mentioned that you have recommendations that you believe will support and**
13 **elevate PSNH's efforts in achieving additional improvement in unit operation.**
14 **Please present those recommendations.**

15 A. Certainly. First, let me clarify that while Accion found all the following referenced
16 outages reasonable and recommends the recovery of all costs related to these outages,
17 they do present circumstances from which PSNH may apply "lessons learned" in the
18 future, thereby enabling PSNH to improve operating proficiency and, thus, lower
19 costs to customers. The first recommendation relates to the outage identified as
20 Outage MK 1-G occurring on November 8, 2010. When returning to service from
21 Outage 1-F, the unit did not start because it went into economic reserve. When
22 starting the unit, only one of the three cyclones (B) is used. As load is picked up, fuel
23 is switched to cyclones A and C. When requested to start on this date, the starting
24 cyclone lost fuel and tripped the unit due to coal thin out. Coal thin out occurs when

1 coal does not freely flow in the feed pipe and therefore starves the cyclone burner of
2 fuel. PSNH suspects that the coal bridged in the feed pipe due to sitting for a month
3 while the unit was in economic reserve shutdown and caused this outage. The unit
4 was restarted without incident.

5 This outage occurred after the unit returned from its annual overhaul and went into a
6 lengthy period of economic reserve shutdown due to low market energy prices.
7 Historically, economic reserve shutdowns have not been encountered by this unit.
8 Although the instant issue was related to coal blockage from staying idle for a long
9 period of time, Accion recommends that PSNH review unit startup procedures for all
10 its major units (Merrimack, Schiller, and Newington) to determine if changes need to
11 be made to start-up procedures when coming on line after longer than normal
12 downtimes.

13 The next outage that suggests performance can be improved involved the outage
14 identified as Schiller Outage 4-A in Exhibit MDC-5, and occurred from February 26,
15 2010 through April 1, 2010. The unit was returning from its annual maintenance
16 overhaul and was in start-up mode when a leak developed in an air injection gasket.
17 Start-up was halted until this leak was repaired and eleven hours of critical path were
18 lost.

19 Accion recommends that when any contractor or company personnel suspects that
20 gasket installations are problematic, PSNH management should be notified to
21 evaluate the need for rework at that time within the confines of the existing outage

1 schedule rather than potentially impede schedule at the conclusion of the outage. This
2 recommendation should be implemented at all plants.

3 The next set of outages relate to the Canann hydro unit. At Canaan, Outages 1-C, 1-
4 D, 1-E, 1-F, 1-G, 1-K, and 1-M were tree-related with most of the offending trees
5 located outside of the trim zone causing most of the outages. The 355 circuit was
6 trimmed in 2008 and the 355X10 circuit was trimmed in 2007. The significant
7 deterioration of reliability within two to three years after trimming suggests that either
8 danger trees were not identified and removed or that deadwood above the conductors
9 was not removed. Such abnormalities should be identified during the circuits' quality
10 control inspection.

11 Accion recommends that a vegetation inspection of the 355 and 355X10 main line
12 34.5kV circuits be performed, and that the results be filed with the 2012
13 reconciliation filing. Accion also recommends that a final determination of
14 recoupment of replacement power costs associated with these outages be deferred to
15 the ES/SCRC 2012 filing.

16 Trees located outside of the right-of-way caused Garvins Falls Outage M-A and
17 Hooksett Outages 1-A, 1-B, 1-C. The trimming of the 335/332 34.5kV line was
18 completed on April 24, 2010, prior to most, if not all of the incidents. For reliability
19 to significantly deteriorate soon after trimming was performed suggests that "danger
20 trees" were not identified and removed. Such abnormalities should be identified
21 during the circuits' quality control inspection. Accion recommends that a vegetation
22 inspection of the 335/332 main line 34.5kV circuits (including the tap to Hooksett

1 Hydro) be performed, and that the results be filed with the ES/SCRC 2012
2 reconciliation filing.

3 Accion recommends that a final determination of recoupment of replacement power
4 costs associated with these outages be deferred to the ES/SCRC 2012 filing.

5 The next item that suggests performance can be improved is generally related to
6 outages of the small hydro units. Accion suspects that many of the outages at PSNH's
7 smaller hydro units are related to instability caused by long coordination times as
8 protective equipment is layered onto the electric distribution system. In addition, as
9 PSNH pushes for efficiency in its distribution operations, the system operates more
10 closely to its stability limits. PSNH states that it has the ability to contract stability
11 analysis capability from outside resources, and has done so for interconnection
12 analysis of independent power producers. To Accion's knowledge, no such analysis
13 has been done for the PSNH units.

14 Accion recommends that PSNH obtain the in-house ability to perform transient
15 stability analysis to aid in the resolution of inadvertent generator overtrips caused by
16 faults on the distribution system, and to aid in the determination of proper time delays
17 of undervoltage relays to maintain stability for properly cleared faults (Also, see
18 discussion in Exhibit MDC-9).

19 The last item to improve unit operation relates to emergent issues that are occurring
20 during planned maintenance outages of the small hydro units. There has been an
21 increase in the number of routine maintenance outages where emergent issues turned

1 out to dramatically extend what were expected to be relatively short outages. The
2 resultant lengthy outages usually resulted in increased costs to customers.

3 Although PSNH does generally budget for maintenance repairs of major components
4 in its long-term budget, Accion finds that the process requires redirection in order to
5 provide more benefit to customers. While PSNH's budget process generally manages
6 major station repair issues among its stations, Accion believes that PSNH could
7 improve its processes and add benefits to customers through a more formalized major
8 component maintenance process. PSNH's repair process is typical for power systems
9 that maintain a fleet of hydro generators up to one hundred years old. In fact, PSNH
10 believes it is better than most. However, there is one area where improvement can and
11 should be made. The area of improvement Accion Group identified is that of timely
12 recognizing emerging major repair issues to fleet operations before they present a
13 problem found in the outage management processes. There is no doubt that PSNH
14 made appropriate management decisions to address the emergent issues at hand, once
15 they were discovered, however, Accion's focus here is on process improvements.

16 Accion therefore recommends that PSNH focus its non-destructive examinations
17 (NDE) on major hydro components (runners, draft tubes, etc.), and develop a
18 comprehensive plan to address the results of the NDE examinations. To be more
19 specific, Accion expects that items such as exciters, runners, step-up transformers,
20 rotors, stators, and draft tubes be explicitly addressed.

21

22

1 **Q. Commission Staff also requested that you review PSNH's efforts with regard to**
2 **the remaining stipulation items agreed to in Docket No. DE 09-091 and the**
3 **twelve stipulation items in Docket No. DE 10-121. Please present the results of**
4 **your review.**

5 **A.** Certainly. The details of my review are contained in Exhibit MDC-9. Exhibit
6 MDC-9 describes the issue in each stipulated item, PSNH's actions, Accion Group's
7 view regarding whether the PSNH effort was appropriate and complete, and Accion
8 Group's recommendation as to the disposition of the item. A summary of Exhibit
9 MDC-9 appears directly below.

10 **V. Open Items From Prior ES/SCRC Dockets**

11

12 **Stipulation Items related to the 2009 ES/SCRC Review in Docket No. DE 09-091**

13 **2009-1 - Mitigation of Customer Costs regarding certain 2008 generation unit**
14 **outages**

15 PSNH has collected all monies from its insurance carrier except the last payment of
16 \$5,812,161 for recovery of replacement power costs, which is expected to be received
17 before the end of 2011. The insurance carrier has not contested this amount but is
18 carefully auditing its validity.

19 PSNH also stated that its insurance carrier performed an independent analysis
20 regarding the root cause of the foreign material that damaged the MK-2 HP turbine.

21 The insurance carrier believes it has sufficient documentation to show that Babcock
22 & Wilcox (B&W) was the source of the foreign material and has initiated legal action
23 against B&W to try to recoup its loss. PSNH further stated that it has joined in that
24 suit. If recovery is made, PSNH would receive the first \$1,000,000 of recovery

1 representing its insurance deductible. Any recovery made by PSNH would be
2 credited to customers.

3 Accion believes that the original insurance issue is resolved but that a new issue has
4 arisen with respect to the potential recovery of the property damage insurance
5 deductible. Accion recommends that the Commission:

- 6 • Close Outage MK-2E when PSNH files a complete accounting of
7 proceeds and credits with the Commission. (Issue resolved)
- 8 • Open a new stipulated item to track PSNH's success in the recovery of its
9 \$1,000,000 insurance deductible.

10

11 **2009-2 – Schiller Warranty Items**

12 The remaining issues in this stipulation item were the inadequate soft start capabilities
13 of the forced draft and induced draft fans. PSNH filed its first report with the
14 Commission on February 1, 2010 and its second report on May 1, 2011.

15 PSNH reports that both these issues were successfully resolved with Alstom by
16 reaching settlement for a payment of \$1,500,000 to PSNH. PSNH received \$750,000
17 in January 2011 and \$750,000 in June 2011. Of the funds received, \$1,000,000 was
18 credited to capital accounts and \$500,000 was credited to O&M accounts.

19

20 Accion recommends that the Commission:

- 21 • Close both the Forced Draft and Induced Draft Fan Capabilities under Soft
22 Start Conditions Issue and the Inlet Duct Design Issue when PSNH files a
23 complete accounting of proceeds and credits with the Commission. Issue
24 resolved.

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2009-5 - Interconnection of PSNH Generating Units to the PSNH Distribution System

PSNH filed its first report with the Commission on May 7, 2010 and its second report on May 1, 2011.

PSNH’s investigations and reviews have found issues related to protection coordination in the areas near the hydro units, the tightness of the overspeed relay settings, and the timer settings of its undervoltage relays. PSNH is investigating alternative methods that could increase undervoltage relay time delay to 2.0 seconds, but that solution may not be applied to all stations, as it will be based on need and cost.

As noted above, transient stability of the hydro units appears to be part of the issue of inadvertent trips of the hydro units. Accion now includes a recommendation that PSNH develop the in-house ability to investigate transient stability issues surrounding the small hydro units and perform analysis on their own facilities. The transient stability analysis tool will also be beneficial to PSNH in its analysis of requirements to connect additional small generators to its system.

Accion believes good progress is being made by PSNH in both understanding and addressing the many interrelated issues causing poor distribution coordination.

Accion recommends that the Commission:

- Leave this item open – Analysis and implementation is incomplete and transient stability analysis needs to be performed.

2009-8 - Hold Manufacturers Responsible for Unreasonable Delays of Shipments of Major Components and Have Shipment Plans in Place

PSNH agreed to ensure that contractual arrangements with the manufacturer will hold the manufacturers responsible for unreasonable shipping delay of major components, and that the manufacturer has plans in place for shipping major components.

PSNH holds the manufacturer and the trucking company responsible to “carry safely” and “arrive timely”. The vast majority of cases where shipping may be an issue occur with the major generator and turbine components. All PSNH units are supported by Siemens. PSNH discussed shipping issues with Siemens during 2010 and developed a “living” transportation schedule that would be adjusted for changes in ship dates throughout the outage. Updates of the transportation schedules are done in conjunction with the trucking company with the goal to minimize transportation delays considering potential contingencies. No contractual agreements were included in this review, except the usual guaranteed ship date with the manufacturer. PSNH stated that the new transportation understanding was implemented during the Merrimack 2 HP/IP turbine outage repair.

Accion believes that the process worked well and that both PSNH and Siemens were well in tune with what the other was doing. However, further review was recommended because of the critical nature and financial consequences to customers from transportation mishaps.

1 In its 2011 review, Accion found that PSNH met with Siemens to determine if
2 improvements to the shipping process could be made. Siemens indicated that it was in
3 virtual constant contact with the drivers via cell phone. Siemens also indicated that it
4 uses professional heavy haul drivers, and that the equipment is fully inspected by
5 PSNH upon receipt. PSNH stated that even if PSNH accepts shipment, that
6 acceptance does not void warranties.

7 PSNH stated that Siemens has been very responsive to its schedule requests. Siemens
8 has added additional personnel to improve schedule at PSNH's request and PSNH
9 regularly participates in discussion with Siemens regarding Siemens' schedule. For
10 the above reasons, PSNH believes that GPS or recorders are not warranted at this
11 time.

12

13 Accion recommends that the Commission:

- 14
 - Close this item – Commitment satisfied.

15

16 **Stipulation Items related to the 2009 ES/SCRC Review in Docket No. DE 10-121**
17 **2010-1 – Siemens' Workmanship Issues (MK-2 Annual maintenance Overhaul –**
18 **Outage 2-H)**

19 PSNH agreed to submit a report describing the efforts taken and results achieved in
20 addressing Siemens' workmanship issues regarding the assembly of the boiler feed
21 pump.

1 In its filing, PSNH stated that it reviewed Siemens' last five-year supplier
2 evaluations. Those evaluations scored from 97 to 100 (out of 100) indicating that
3 Siemens consistently performs and delivers high quality work.

4 PSNH also performed a follow-up with Siemens on this issue and found that Siemens
5 addressed the workmanship issue on its own and took action on its own. After
6 analysis of the incident, Siemens removed the field engineer from field work
7 assignments. Siemens also performed the necessary rework at no cost to PSNH. For
8 these reasons, and the fact that subsequent work has been performed by Siemens
9 without incident, PSNH believes that the issue has been addressed.

10

11 Accion recommends that the Commission:

- 12 • Close this item – Commitment satisfied.

13

14 **2010-2 – Policies and Practices Review of Overtime Expenditures versus Reserve**
15 **Shutdown**

16 PSNH agreed to review its policy and practices regarding overtime expenditures and
17 reserve shutdown, on a unit-by-unit basis and between units at all its major stations,
18 to ensure that units are in an operational state that maximizes customer benefits.

19 PSNH considers safety, successful completion of the outage work list, the energy
20 market, different overtime scenarios, fuel inventory levels and deliveries, multi-unit
21 station operating needs, and expected market conditions including weather and
22 regional availability of generation when managing unit outages. To manage these

1 factors, PSNH has initiated conference calls for all its major units modeled after the
2 routine calls instituted for Newington Station with the plant operation staff,
3 administrative staff, fuels, and wholesale marketing at a minimum of three times a
4 week. Topics discussed included expected loads, energy prices, status of each unit,
5 potential outages, unit operating constraints and fuel issues.

6

7 Accion recommends that the Commission:

- 8
 - Close this item – Commitment satisfied.

9

10 **2010-3 – Policies and Practices Regarding Early Start of Planned Outages**

11 PSNH agreed to review its policies and practices concerning its ability to start
12 planned outages early on a unit-by-unit basis to ensure that it maximizes the ability to
13 take an outage early while minimizing potential increases in outage duration.

14 Unit planned outages typically occur in the spring and fall, in parallel with other unit
15 outages in the region. The fact that maintenance work is concentrated in two general
16 time periods limits the flexibility to reschedule labor resources, specialized technical
17 services and repair facility shop space.

18 PSNH stated that on major budgeted projects, orders are placed well in advance of
19 outage planning to ensure materials are received on-site in advance to the outage start
20 date. All other materials are requested to be received on-site prior to the outage start
21 date. Vendor services are scheduled based on the outage start date. As the outage start
22 date approaches, discussions take place to discuss starting the outage earlier if a

1 forced outage were to occur. The type of forced outage, its duration, time remaining
2 to the planned outage, status of scheduled contractors including constraints on an
3 early response, in-house work force availability, and market conditions play a key
4 role in these discussions. As a result, there is risk that if a forced outage occurs more
5 than a few days prior to the planned outage, contractors and shop facilities may not be
6 available due to commitments at other unit locations. PSNH concluded that further
7 expansion of starting outages early would be cost prohibitive.

8

9 Accion recommends that the Commission:

- 10 • Close this item – Commitment satisfied.

11

12 **2010-4 – Coordination Studies in the Area of the Merrimack Combustion**
13 **Turbines**

14 PSNH agreed to perform fuse coordination analysis, protection device placement, and
15 lightning protection analysis in this area of the system to ensure that optimum
16 equipment protection is in place.

17 As a result of PSNH analysis, all lightning arrestors and capacitors associated with
18 the combustion turbines have been changed out. In addition, the lightning arrestors on
19 the main power transformer will be changed out in fall 2011. PSNH stated that it is
20 also in discussions with the Transmission group regarding the installation of a high
21 side breaker on the main power transformer in order to create operational flexibility
22 and simplify protection for the two combustion turbines. PSNH also performed a fuse
23 and relay coordination study as recommended. No mis-coordination was found.

Accion recommends that the Commission:

- Close this item – Commitment satisfied.

2010-5 – Valve Position Irregularity

PSNH agreed to establish a procedure that expands its review process of valve position irregularity to include non-safety incidents at all PSNH generating facilities.

PSNH has established an enhanced and formal practice to review and or investigate valving incidents. Valving events are reviewed by the Operations Manager to determine if the event warrants an investigation. If an investigation is warranted, the Operations Manager is responsible to author written communications to Shift Supervisors and others, as necessary, in order to prevent a recurrence of the event.

Accion recommends that the Commission:

- Close this item – Commitment satisfied.

2010-6 – GenIS Outage Data Base Refinements

GenIS is an outage data base system from which outage data can be grouped in a number of ways. Its capability is limited, can be cumbersome, and is not friendly in tracking data that is market based. PSNH agreed to review its GenIS system capabilities so that the outage data system is useful in performing market based equipment evaluations in the variety of plants that it operates. Such review would include a review of the entire GenIS system along with appropriate changes that might include a different information system such as the GADS system.

1 Upon the review of the GenIS unit outage tracking system, PSNH determined that the
2 GADS NxI system would provide an improved tool to report GADS data to the ISO-
3 NE, NERC, and the Commission. PSNH stated that the new system will also assist
4 with internal monitoring and management. The GenIS tracking system was replaced
5 with the GADS NxI system as of March 1, 2011.

6

7 Accion recommends that the Commission:

- 8 • Close this item – Commitment satisfied.

9

10 **2010-7 – Focus Purchases on the Shorter Term in Non-Peak Quarters**

11 PSNH agreed to focus more of its supplemental energy purchases on shorter term
12 arrangements and spot market prices during the two non-peak quarters, due to the low
13 market energy prices that are expected to continue in the short-term.

14 In 2010, PSNH's purchase strategy envisioned a high migration level and low energy
15 prices. When coupled with PSNH's unit availability, PSNH's supplemental energy
16 needs were met with shorter term bilateral arrangements and ISO-NE administered
17 energy markets. In 2010, PSNH did not enter into any additional long-term (one year
18 or longer) energy arrangements as it already had the three annual 2010 energy
19 purchases contracted for in 2008, and the Bethlehem and Tamworth unit contingent
20 contracts.

1 Accion recommends that the Commission:

- 2 • Close this item – Commitment satisfied.
- 3

4 **2010-8 – Establish Percentage of Supplemental Energy Purchased in Two Peak**
5 **Quarters**

6 PSNH agreed to establish a percentage of its on-peak monthly needs that will be
7 procured from supplemental sources in the two peak quarters using an established
8 point of reference, such as an approved load forecast.

9 In response to Accion’s recommendations, PSNH established its “Wholesale
10 Marketing Policy – PSNH Load Asset Management” and attained executive approval
11 for its use. That policy established a directive that no more than a fixed small
12 percentage (confidential) of the positive difference between the adjusted load forecast
13 and the available generation resources, by volume per day during peak hours, shall be
14 purchased through the ISO-NE spot energy markets. In addition to the two peak
15 quarters, PSNH applies this policy during all months of the year.

16

17 Accion recommends that the Commission:

- 18 • Close this item – Commitment satisfied.
- 19

20 **2010-9 – Establish Formal Basis for Non-Hedge Short-Term Purchases and Sales**

21 PSNH agreed to establish a formal basis from which it would make purchases and
22 sales of supplemental energy that fall outside of projected needs.

1 By establishing the percentage of energy that can be obtained from spot markets for
2 peak hours of all days of the year as noted above in section 2010-8, PSNH also
3 established the basis from which additional purchases or sales were required from the
4 amounts originally contracted. Under this policy in 2010, PSNH made four longer
5 term (much less than a year) energy purchases and one longer term energy sale, each
6 of which was much less than a year in duration.

7
8 Accion recommends that the Commission:

- 9
 - Close this item – Commitment satisfied.
- 10

11 **2010-10 – Quarterly Review of Supplemental Energy Needs**

12 PSNH agreed to establish a quarterly review of its supplemental energy purchase
13 requirements due to the lagging nature of econometric inputs into its load forecasting
14 methodology.

15 PSNH did not perform any quarterly reviews of its supplemental energy purchases
16 during 2010, due to the timing of the settlement approval and filing dates for 2010 ES
17 rates and update. PSNH did establish its quarterly review process in 2011 and will use
18 that process in the establishment of 2012 ES rates. In the establishment of quarterly
19 supplemental energy purchases or sales, PSNH has set a minimum percentage
20 (confidential) of supplemental needs that must be met for both the peak and non-peak
21 quarters. PSNH also set MW values above which sales must be made, set MW values
22 below which limited exposure is acceptable, and established the exception that PSNH
23 will not sell forward from the expected output of owned generation.

Accion recommends that the Commission:

- Close this item – Commitment satisfied.

2010-11 – Formally Factor Economic Reserve Shutdowns into Supplemental Energy Purchase Process

PSNH agreed to formally and explicitly model economic reserve shutdown of its units in the initial determination of supplemental energy needs. Modeling could be done in a manner similar to the modeling done for the short planned unit reliability outages.

PSNH stated that it always factored economic reserve shutdown of its units into the determination of supplemental energy needs. PSNH also stated that through 2010, and with the data available at the time supplemental energy needs were determined, only Newington was identified as in economic reserve shutdown. In 2011, PSNH will explicitly factor economic reserve shutdowns into its hourly dispatch for initial supplemental energy determinations.

Accion recommends that the Commission:

- Close this item – Commitment satisfied.

2010-12 – Establish Formal Criteria for the Sale of Supplemental Energy Purchases that Become Surplus

PSNH agreed to establish formal criteria for the sale of purchased surplus supplemental energy into the spot market and to analyze its purchases and formulate sales of surplus energy and capacity into markets other than the spot market.

1 By establishing the percentage of energy that can be obtained from spot markets for
2 peak hours of all days of the year, as noted above in section 2010-8, PSNH can also
3 establish the basis from which sales of surplus purchased energy and capacity can be
4 made into other than the spot market.

5

6 Accion recommends that the Commission:

- 7 • Close this item – Commitment satisfied.

8

9 **Q. Are there any other operational issues related to performance improvement that**
10 **you wish to discuss?**

11 A. No, there are not.

12 **VI. Unit Availability**

13

14 **Q. What was the result of your review of the unit availability factors, capacity**
15 **factors, and heat rates of the PSNH units?**

16 A. As stated above, PSNH units generally performed as well or better than forecasted
17 from an availability perspective, with very high availability on the highest priced
18 energy days during 2010 when needed to insulate customers from high cost. From a
19 capacity factor basis, PSNH's units performed at a lower level than expected. PSNH
20 had forecast no economic reserve shutdowns to its base load units when preparing the
21 2010 ES rate filing and its update. In actuality, economic reserve shutdowns
22 significantly reduced expected capacity factors in 2010, and this phenomenon is
23 expected to continue in 2011.

1 Accion made the following observations regarding 2010 availability factors, capacity
2 factors (with planned outages removed from the calculations, so that the different
3 maintenance schedules do not skew the data) and heat rates for the major PSNH units.

4 Schiller 4 and Schiller 6 availabilities have historically been about 95 percent with
5 capacity factors of over 80 percent. In 2010, availabilities remained at approximately
6 95 percent, but economic reserve shutdowns required by the ISO-NE due to
7 depressed energy prices reduced the capacity factors of these units to approximately
8 55 to 60 percent. Without reserve shutdowns, the units' capacity factors would have
9 been much closer to historic values.

10 Unit 5 at Schiller had its boiler replaced in late 2006 with a wood-fired fluidized bed
11 boiler. This unit has different operating characteristics than the old coal-fired boiler,
12 so Accion makes comparisons from 2007 forward. Accion does note that in 2007, the
13 first full year of commercial operation, the unit had numerous startup and warranty
14 issues which impacted the availability and capacity factors of the unit. In spite of
15 new unit difficulties, Schiller 5 had an approximate 85 percent availability and an
16 approximate 80 percent capacity factor for 2007. Since that time and as warranty and
17 start-up issues have been resolved, both availability and capacity factors have
18 increased each year. In 2010, Unit 5 availability approached 95 percent and its
19 capacity factor increased to 90 percent. Accion believes that the improvement in unit
20 operation is not only due to the resolution of start-up problems, but also the increased
21 proficiency of PSNH personnel as they learn how to operate the high technology
22 wood-fired boiler.

1 Newington maintained an availability of near 100 percent in 2010. Its capacity factor
2 has fallen from 60 percent in 2003 to 40 percent in 2005; to 10 percent in 2006 and
3 2007; 3 percent in 2008; and about 7 percent in 2009. In 2010, the unit capacity
4 factor was 3 percent. Accion notes that the unit operated at times other than what
5 would be expected from an economic viewpoint, and at a reduced load as shown by
6 its increased heat rate data. Accion attributes the cost of the unit in relation to the
7 market price for the recent reduced capacity factor. What Accion cannot definitively
8 explain is the increased requirement by ISO-NE for Newington to operate at market
9 price levels where one would not expect it to do so. Based on the times of
10 Newington's operation, Accion believes that there are changes developing in the ISO-
11 NE market where the ISO-NE places value on the fast response capability and
12 operational flexibility of the unit resulting in Newington operating at unexpected
13 times.

14 Historically, capacity and availability factors for Merrimack-1 have been
15 approximately 90 to 95 percent since it went to its two-year major maintenance
16 schedule in 2002. In 2010, the availability factor for this unit was about 95 percent.
17 In 2010, there was an overhaul on this unit and its capacity factor dropped to about 75
18 percent. In outage years, unit capacity factors have dropped to approximately 85
19 percent. Accion attributes the additional drop in capacity factor due to reduced unit
20 operation during shoulder load periods.

21 The availability factor for Merrinack-2 has historically been approximately 90 to 95
22 percent, except during 2008 as a result of the HP turbine failure. In 2010, the unit
23 availability factor was approximately 95 percent. The historical capacity factor for the

1 unit has been about 85 to 90 percent. In 2010, the capacity factor dropped to
2 approximately 75 percent. Accion attributes the additional drop in capacity factor due
3 to reduced unit operation during shoulder load periods.
4

5 **Q. Are there other observations you made with regard to the availabilities and**
6 **capacity factors of PSNH generating units?**

7 A. No, there are not.
8

9 **Q. What are your observations regarding the heat rates of the PSNH major**
10 **generating units?**

11 A. The full load heat rates of the PSNH units have remained relatively constant over the
12 last six years, another indication in addition to availability and capacity factors, that
13 capital and maintenance expenditures are adequate. With unit reductions required by
14 ISO-NE dispatch requirements, PSNH has maintained as low a heat rate as can be
15 maintained for its fossil units in the market environment in which it operates, except
16 for Newington. The increase in the Newington heat rate is due solely to the
17 significant increase in the number of starts and stops required by ISO-NE.

18 **VII. Projected Capital Spending**

19
20 **Q. What did you form as a conclusion when you reviewed the projected spending**
21 **for capital projects and O&M at PSNH generating stations?**

22 A. Accion reviewed the five-year capital and O&M budgets (business plans) for
23 Merrimack Station, Newington Station, and Schiller Station. Accion also reviewed
24 the five-year business plan for the Hydro group as well as its ten-year conceptual

1 budget plan. Accion Group made the following general observations, and drew the
2 following conclusions. Newington is addressed separately below because of the
3 significant revisions that have recently taken place regarding its budgets. The
4 Newington budgets have been completely re-evaluated due to reduced unit operation.

6 **Capital**

7 PSNH capital expenditures remain relatively constant at present levels into the future
8 when adjusted for major unit overhauls and other large planned capital expenditures.
9 PSNH has included FERC licensing requirements, dam repairs, and general capital
10 project replacements in its budget projections at all stations. Past and future
11 maintenance issues at the major PSNH units appear below.

13 **Merrimack-1**

14 PSNH has addressed the superheater maintenance issue.
15 No major maintenance issues are within the five-year budget horizon.

17 **Merrimack-2**

18 PSNH has addressed maintenance issues concerning the boiler floor, superheater,
19 generator rotor, and air heater tubes.
20 Maintenance issues involving the cyclones, primary heater, primary superheater, and
21 the generator stator are within the five-year budget horizon.

1 **Schiller-4**

2 PSNH has addressed generator tubes, economizer and superheater maintenance
3 issues.

4 No major maintenance issues are within the five-year budget horizon.

6 **Schiller-5**

7 PSNH has addressed the maintenance issue related to the forced draft and induced
8 draft fans, air heater design, and cyclones.

9 No major maintenance issues are within the five-year budget horizon.

10

11 **Schiller-6**

12 PSNH has addressed generator tubes, economizer and superheater maintenance
13 issues. No major maintenance issues are within the five-year budget horizon.

14

15 Accion observes that PSNH's five-year business plan calls for adequate continued
16 minor and major equipment replacement as required, in order to maintain its units in a
17 reliable and efficient manner for unit operations.

18

19 **O&M**

20 PSNH's O&M expenditures remain relatively constant at present levels into the
21 future, when adjusted for major unit overhauls and other large planned capital
22 expenditures. PSNH has included FERC licensing requirements, dam repairs, and

1 general capital project replacements in their budget projections at all stations as
2 required.

3 Accion observes that the PSNH five-year business plan calls for continued
4 maintenance of equipment as required for reliable and efficient unit operations.

5 Accion concluded that PSNH is currently spending and plans to spend sufficient
6 funds for capital replacement and or improvement maintenance projects, and
7 sufficient money for adequate maintenance to assure continued operation of its units
8 consistent with good utility practice, and with recognition of unit age and operational
9 duty cycle as required. Such expenditures should result in future reliable and efficient
10 unit operation.

11

12 **Newington**

13 As stated in Accion Group's testimony in the 2009 ES/SCRC review (Docket No. DE
14 10-121), PSNH was in the process of revaluating its capital and O&M budgets in
15 light of the recent sharp reduction in unit operations. Accion describes the process
16 and evaluates the results below.

17

18 **Newington Capital**

19 PSNH reviewed historic budgets and subtracted large capital maintenance projects
20 required by the historically high operational duty. The net result was a list of capital
21 and contingency projects that averaged less than \$500,000 over the historic period.
22 PSNH rounded the forward-looking capital project budget up to \$500,000.

Newington has addressed the following maintenance items in the recent past when they were required either due to operational duty or age.

2002 – Economizer, boiler overfire air system, condenser tubes and tubesheets, and turbine control system upgrade

2004 – Feedwater heater and closed cooling water heat exchangers

2005 – Plant control computer, Plant data logger computer, and ash collection system

2006-2007 – Circulating pump motor, spare forced draft fan motor, and spare induced draft fan motor

2008 – Main exciter and major overhauls of the LP turbine, HP/IP turbine, and generator

2010 – 4.16kV and 480V load centers

Newington O&M

With reduced operation, PSNH was able to eliminate a few employee positions. PSNH also reduced historic maintenance overtime; lubes and chemicals of which amounts used are related to unit capacity factor; reduced the scope of maintenance outages and associated overtime; and operational maintenance that is dependent on operation time. PSNH stated that it did not reduce these items in direct proportion to the reduction in operation of the unit, and these maintenance values would be reviewed and adjusted when actual O&M data under the new operating regime was available. The resultant O&M budget was one that was approximately \$5 to \$6 million per year.

1 Accion concluded that PSNH approached its revaluation of the Newington budgets in
2 a conservative manner, as PSNH left room in its estimates for actual budget values to
3 be above estimated values determined from historic values. Accion also concluded
4 that PSNH plans to spend sufficient funds for capital replacement and or
5 improvement maintenance projects, and sufficient money for adequate maintenance
6 in order to assure continued operation of its units consistent with good utility practice,
7 and with recognition of unit age and operational duty cycle as required. Such
8 expenditures should result in future reliable and efficient unit operation.

9

10 **Q. Are there any other items you wish to discuss?**

11 A. I only wish to list the data responses relied upon by Accion in preparation of its
12 testimony, so they may be officially admitted into the record. Those data responses
13 are:

14 **Staff Set 01**

15 Data Responses 1 through 27, 29 through 31, and 37 through 51.

16 **TECH Set 01**

17 Data Responses 1 through 5.

18

19 **Q. Does that conclude your testimony?**

20 A. Yes, it does.