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| Approval Date: | 02/07/2018 06/01/2018 |
| Effective Date: | 02/07/2018 06/01/2018 |

Thomas Falin, Manager
Resource Adequacy Planning
Revision 13 (XX/XX/2018):

- **Cover to cover periodic review**
- **Added a specific reference in the introduction that this manual augments the RAA Schedule 9**
- **Addition of Capacity Interconnection Rights section**
- **Shortening of the summer test period from June through August to July through August**
- **Simultaneous testing requirements for all Manual 18 defined Capacity Storage and Intermittent Resources (excluding wind and solar)**
- **PJM mandated full plant testing**
- **Appendix B, transition to use of the median capacity factor for wind and solar units**

Revision 12 (1/1/2017):

Cover to Cover Periodic Review

- Added more detail to testing requirements, acceptance testing for newly constructed units and re-wording of Net Capability terms
- Added references to capacity interconnect rights and added testing rules for non-hydro storage
- Removed reference to wind and solar as intermittent units (per Manual 18) include units other than just wind and solar capacity resources
Welcome to the PJM Manual for Rules and Procedures for Determination of Generating Capability. In this Introduction, you will find the following information:

- What you can expect from the PJM Manuals in general (see “About PJM Manuals”).
- What you can expect from this PJM Manual (see “About This Manual”).
- How to use this manual (see “Using This Manual”)

### About PJM Manuals

The PJM Manuals are the instructions, rules, procedures, and guidelines established by the PJM for the operation, planning, and accounting requirements of the PJM and the PJM Energy Market. The manuals are grouped under the following categories:

- Transmission
- PJM Energy Market
- Generation and Transmission Interconnection
- Reserve
- Accounting and Billing
- PJM Administrative Services
- Miscellaneous

For a complete list of all PJM manuals, go to the Library section on PJM.com.

### About This Manual

**Purpose**

The PJM Manual for *Rules and Procedures for Determination of Generating Capability* is one of a series of manuals within the Reserve group of manuals. These rules and procedures for determining the capability of generating units on the systems of PJM have been adopted to provide uniformity for planning, operating, accounting and reporting purposes, and have been designed to meet the following requirement in the coordinated operation of PJM:

- **Net Capability** of generating units installed in, scheduled for installation in or transacted into the PJM Control Area is required for planning and reporting purposes and for use in accounting for deficiencies of a Party to obligations under the Operating and Reliability Assurance Agreements of PJM.

The rules and procedures recognize the difference in types of generating units involved as resources within the PJM Capacity Markets processes and the relative ability of units to maintain output at stated capability over a specified period of time. Factors affecting such ability include fuel availability, stream flow for hydro units, reservoir storage for hydro and pumped storage units, mechanical limitations, system operating policies.

The PJM Manual for *Rules and Procedures for Determination of Generating Capability* consists of the two sections and two attachments. These are listed in the Table of Contents.
This manual is specifically intended to re-inforce and augment Schedule 9 of the Reliability Assurance Agreement.

### Intended Audience

The intended audiences for the PJM Manual for *Rules and Procedures for Determination of Generating Capability* are:

- **PJM Board of Managers** - The PJM Board of Managers is responsible for the administration and approval of the forecast obligation and techniques for its determination.

- **PJM Markets and Reliability Committee (MRC)** - Members are responsible for the review and submittal of the obligations to the PJM Board of Managers.

- **PJM Market Implementation Committee (MIC)** – Members initiate and develop proposals to advance and promote competitive wholesale electricity markets in the PJM region for consideration by the Markets and Reliability Committee.

- **PJM Planning Committee** - Members are responsible for reviewing PJM Capacity Adequacy Planning staff recommendations on reserve requirement matters and the parameters used in their determination.

- **PJM Resource Adequacy Planning Staff** - PJM staff are responsible for the compilation, review and processing of the acceptance and verification tests as well as the continual collection and review of generating unit event and performance records via the Generating Availability Data System (GADS).

- **PJM Market Services** – PJM staff are responsible to assess generation resource rating test failure penalties under the RPM process.

- **Parties to Other PJM Agreements** - The staff of these Parties are responsible for supplying load and generator data in the required format and time period to assist in the calculation and submittal of required quantities.

- **Generator Availability Analyzers** - Industry personnel charged with reviewing and interpreting the impacts of generator unavailability on the reliability and markets of their respective systems.

### References

There are several references to other documents that provide background or additional detail. The PJM Manual for *Rules and Procedures for Determination of Generating Capability* does not replace any information in these reference documents. The following documents are the primary source of specific requirements and implementation details:

- Amended and Restated Operating Agreement of PJM Interconnection, L.L.C.
- PJM Reliability Assurance Agreement
- PJM Open Access Transmission Tariff (OATT)
- PJM Manual for Pre-Scheduling Operations (M-10)
- PJM Manual for Generator Operational Requirements (M-14D)
- PJM Manual for PJM Capacity Market (M-18)
Using This Manual

We believe that explaining concepts is just as important as presenting procedures. This philosophy is reflected in the way we organize the material in this manual. We start each section with an overview. Then we present details, procedures or references to procedures found in other PJM manuals. The following provides an orientation to the manual's structure.

What You Will Find in This Manual

- A Table of Contents that lists two levels of subheadings within each of the sections.
- An approval page that lists the required approvals and a brief outline of the current revision.
- Sections containing the specific guidelines, requirements, or procedures including PJM actions and PJM Member actions.
- A section at the end detailing all previous revisions of this PJM manual.
Section 1: Requirements

[Automatic Title]

1. Capacity Interconnection Rights

Capacity Interconnection Rights (CIRs) are granted as a function of a control area integration, or the execution of an Interconnection Service Agreement (ISA) or Wholesale Market Participant Agreement (WMPA) that grant CIRs in the specifications section after completion of all required work. Rights may be granted on interim bases in the ISA or WMPA.

CIRs are determined by deliverability studies performed by PJMs planning department. These studies determine whether the transmission and/or distribution system can receive power commensurate with the CIR level of a generating unit and if upgrades to the system are needed in order to receive the power therein. CIRs are evaluated under summer peak conditions.

Typically the CIRs are reflective of the net capability of the generating unit at the time of the expected summer peak (this does not include wind and solar units; wind and solar units CIRs are discussed in Appendix B of this document). Net capability is discussed in section 2 of this document and cannot be higher than the CIR level; however, it can be lower. CIRs are typically granted on an individual generating unit basis, but, in some cases, can be issued in aggregate at the Point of Interconnection (POI).

Retaining CIRs

CIRs are retained when a generating unit meets or exceeds its CIR level at least once in the three most recent PJM Summer Capability Verification Tests performed in the summer test period. Out-of-period tests cannot be used for CIR retention calculations; out-of-period tests are described later in this document.

If CIRs are granted fully on an interim bases, in advance of the studied delivery year identified in the System Impact Study, the three year clock to maintain the rights commences upon exercising the right.

Loss of CIRs

CIRs are lost when a generating unit fails to prove the CIRs once in any consecutive three year period in the PJM Summer Capability Verification Test. If CIRs are lost, the quantity lost will be the difference between the current CIR level and highest Net Corrected Test Capability proved in the most recent three years’ PJM Summer Capability Verification Test.

Attaining CIRs

CIRs can only be attained or increased by entering the New Services Queue and executing an ISA or WMPA following the study process. These increases are expected to be for improvements to the generating units such as, but not limited to, more efficient components, improved control systems, and for capital projects that restore generating unit capability such as boiler rebuilds and turbine overhauls. If the studies identify any system upgrades are required to obtain the rights, then those upgrades must be completed before the rights are available for use in the market. The rolling three year clock on the new CIR level commences at the next summer period after the CIRs are declared in-service, regardless if the owner exercised the rights in the market.
CIR Calculations
Retention or loss of CIRs is determined for each generating unit that holds CIRs by performing calculations annually, in the fourth quarter of the year, after the PJM Summer Capability Verification Tests have been submitted to PJM in the third quarter of the year.

Individual Generating Unit CIR Calculation Example

A generating unit is granted 105 MW CIRs as a result of a newly executed ISA and is declared in service on 6/1/2018. The generating unit tests to 105.2 MW, 102.5 MW and 103.5 MW in the next three consecutive years PJM Summer Capability Verification Tests. Since the generating unit met its CIR level in the first test year of the most recent three, the generating unit retains its 105 MW of CIRs until the next evaluation of CIRs occurs (in this case the next evaluation will occur in the 4th quarter of 2021).

Suppose in the next PJM Summer Capability Verification Test (in the fourth test summer), the unit tests to 103.0 MW. In the 4th quarter of 2021, the highest of the most recent three years PJM Summer Capability Verification tests is then 103.5 MW. The generating unit will then lose 1.5 MW of CIRs.

If the new CIR level is below the PJM ICAP value starting 2/1/2022, the generating unit’s owner must CAPMOD the unit down to its CIR level or lower, effective 2/1/2022. This is discussed further in section 1.2 under the heading Capacity Interconnection Right Limitations.

Multiple Generating Unit CIR Calculation Example

A Combined Cycle generating unit (2 combustion turbine generators and one steam turbine generator) is granted 750 MW CIRs as a result of a newly executed ISA and is declared in service on 6/1/2018. If the three component generators are issued unit specific CIRs (this must be delineated in the executed agreement) their evaluation will follow the rules for individual generating unit CIR evaluation. In this example, the individual unit CIRs were not delineated. The combined cycle generating unit tests to 750.0 MW, 745.3 MW and 746.2 MW in the next three consecutive years PJM Summer Capability Verification Tests. Its individual components test as follows:

<table>
<thead>
<tr>
<th>Unit</th>
<th>Summer 2018 Test</th>
<th>Summer 2019 Test</th>
<th>Summer 2020 Test</th>
<th>Summer 2021 Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT1</td>
<td>201.0</td>
<td>200.0</td>
<td>199.0</td>
<td>200.0</td>
</tr>
<tr>
<td>CT2</td>
<td>199.0</td>
<td>199.0</td>
<td>199.0</td>
<td>201.0</td>
</tr>
<tr>
<td>ST</td>
<td>350.0</td>
<td>346.3</td>
<td>348.2</td>
<td>349.0</td>
</tr>
<tr>
<td>Total</td>
<td>750.0</td>
<td>745.3</td>
<td>746.2</td>
<td>750.0</td>
</tr>
</tbody>
</table>

Since the generating unit met or exceeded its CIR level in the first test year of the most recent three, the generating unit retains its 750 MW of CIRs until the next evaluation of CIRs occurs (in this case the next evaluation will occur in the 4th quarter of 2021). In this case, the CIRs for each component have now been established after the third year of testing. CT1 has 201.0 MW of CIRs; CT2 has 199.0 MW of CIRs; ST1 has 350.0 MW CIRs; these CIRs in aggregate total 750.0 MW.
Suppose in the next PJM Summer Capability Verification Test (in the fourth test summer), the unit tests to 750.0 MW. In the 4th quarter of 2021, the highest of the most recent three years PJM Summer Capability Verification Tests is then determined on the individual components of the combined cycle unit rather than the combined components. The CIRs are then evaluated as follows:

The CT1 CIR level was 201.0 MW and its highest test in the most recent three years is 200.0 MW; it loses 1.0 MW of CIRs; its new CIR level is 200.0 MW

The CT2 CIR level was 199.0 MW and its highest test in the most recent three years is 201.0 MW; it loses no CIRs; it retains its existing CIR level of 199.0 MW

The ST CIR level was 350.0 MW and its highest test in the most recent three years is 349.0 MW; it loses 1.0 MW of CIRs; its new CIR level is 349.0 MW

The combined cycle in aggregate now has 748.0 MW of CIRs.

If the new CIR level is below the PJM ICAP value starting 2/1/2022, the generating unit's owner must CAPMOD the unit down to its CIR level or lower on each component, effective 2/1/2022. This is discussed further in section 1.2 under the heading Capacity Interconnection Right Limitations.

1.2.12 Installed Capacity (ICAP)

Installed Capacity (ICAP) of a generation resource is defined as the summer net capability of a generating unit as determined in accordance with PJM manual M-21, Rules and Procedures for Determination of Generation Capability and within the capacity interconnection right limits of the bus to which it is connected. The ICAP for any generating unit is the sum of the summer based capacity modifications (CAPMODs) in the RPM Capacity Markets system for that date. The ICAP is equivalent to the claimed installed capacity in eGADS and the Summer Net Capability defined in section 2.2 of this document.

ICAP is the capability of the generating unit at the expected time of the PJM Summer Peak. This is determined by using generator site conditions coincident with the dates and times of the last 15 years PJM summer peaks. This is a proxy for a generators capability at future PJM summer peaks. Calculation of ICAP must also take into consideration typical station service power use and other load, such as, but not limited to, host process load (both steam, mechanical and electrical), scrubber load, and cooling load, supplemental cooling load and any other load that supports the auxiliaries of generating unit. Additionally, if other load is used only under extreme conditions, and those conditions exist during any of the most recent 15 years PJM summer peaks, that load must be accounted for in the ICAP calculation. For example, if supplemental cooling load has been used during 10 of the 15 most recent PJM summer peaks, then two thirds of that average load should be removed from the generators ICAP to account for the supplemental cooling loads use. Additionally, if there is common load that is split among the generators at a plant, such as, but not limited to, scrubber load, that load must also be accounted for in the determination of ICAP.

Regarding Wind and Solar Capacity Resources, the information regarding the calculation of their capacity value can be found in Appendix B of this manual.
Occasions Requiring Submittal of Acceptance or Verification Test

1. Verification tests for all PJM capacity resources (other than hydro, wind and solar) are to be submitted for both summer (June-July-August) and winter (December-January-February) test periods. Hydroelectric generators need only submit summer verification tests and hydroelectric generating units have only one test period (June-July-August) during the year. The summer test period runs from July 1 @0000 hours local plant time until September 1 @0000 hours local plant time; the winter test period runs from December 1 @ 0000 hours local plant time until March 1 @0000 local plant time.

2. A recent summer verification test is to accompany any CAPMOD increasing the ICAP of a generating unit. This test must meet or exceed the requested ICAP and the ICAP of the generating unit cannot be greater than the generating unit's capacity interconnection rights.

3. A recent summer verification test is to accompany any return of a generating unit from a “mothballed” state. The included test must meet or exceed the requested ICAP and the ICAP of the generating unit cannot be greater than the generating unit’s capacity interconnection rights.

4. A recent summer verification test is to accompany any existing generating unit being included in the PJM capacity markets for the first time or returning to the PJM capacity markets after an absence. The included test must meet or exceed the requested ICAP and the ICAP of the generating unit cannot be greater than the generating unit’s capacity interconnection rights.

5. Acceptance tests for newly constructed generating units must be completed prior to the new generating unit’s initial CAPMOD effective date in the PJM Capacity Markets. These tests must be corrected to summer conditions (pursuant to Section 2 of this document) and must meet or exceed the newly constructed generating units ICAP. In cases where a newly constructed generating unit’s participation in the PJM Capacity Markets increases by a series of CAPMODs, new acceptance test(s) must be conducted no greater than 30 days after any subsequent CAPMOD effective date(s). Once the generating unit is declared fully operational and has entered all of its intended CAPMODs, a final acceptance test must be performed to prove its ICAP. Failure to meet or exceed the ICAP in the final acceptance test will be remedied by a CAPMOD for the shortfall effective as soon as practical. Also, a derating event for the shortfall must be entered into the PJM eGADS system that starts and ends on the respective CAPMOD effective dates. A final acceptance test, conducted within the summer test period, will also be accepted as the summer verification test for that year as long as it is corrected for summer conditions (pursuant to section 2 of this document); likewise, a final acceptance test, performed within the winter test period, will be accepted as the winter verification test for that year as long as it is corrected for winter conditions (pursuant to section 2 of this document).

6. In all of the cases above except 5, the recent summer verification test must have been conducted within the 12 months prior to the CAPMOD effective date.

7. In all of the cases above except 5, if a recent summer verification test is not available, then a new verification test must be performed within 30 days of the CAPMOD effective date. This test needs to be corrected for summer conditions (pursuant to section 2 of this document).
document) and if the Corrected Net Test Capacity does not meet or exceed the ICAP, a CAPMOD in the amount of the difference must be entered into the RPM system effective as soon as practical. Also, a derating event for the difference must be entered into the PJM eGADS system that starts and ends on the respective CAPMOD effective dates.

Capacity Interconnection Right Limitations

1. All increases in capability are subject to limitations of capacity interconnection rights (CIRs) to the bus to which the generating unit is currently or about to be connected as verified by the Interconnection Analysis Resource Adequacy department of PJM. If CIRs for the generating unit(s) were issued on a revenue meter basis, then Net Capability testing must be verified on all generating units behind that respective revenue meter, simultaneously. For the purposes of this document, a project, that is issued CIRs with multiple generating units behind a single revenue meter, will be considered a single generating unit. CIR retention is determined based on the largest Corrected Net Test Capacity of the last three years’ summer verification tests. If the largest Corrected Net Test Capacity of a generating unit’s summer verification test of the prior three years falls short of the existing CIR value for that generating unit, the generating unit will lose the difference in CIRs effective the next February 1. CIR retention will be analyzed based on only those summer verification tests performed within the summer test period. Results of out of period tests cannot be used in CIR retention calculations. Any increase in CIRs can only be attained by initiating an Interconnection Request and executing an ISA (or WMPA) with PJM. *(see section 1.1 of this document for complete details on CIRs)*

PJM Mandated Full Plant Simultaneous Testing

1. PJM, at its discretion, can require all generating units at a plant to simultaneously test in the Summer Test Period. PJM will limit the number of plants to a maximum not to exceed ten per summer and notify each plant prior to the summer test period that it has been chosen for simultaneous testing. PJM will also specify a period of time in which the simultaneous tests must be performed. This period of time will be no less than a contiguous fourteen day period.

Late Data Submittal Charges

1. In accordance with Schedule 6 (Plans to Meet Capacity Obligations), Schedule 12 (Data Submittals) and Schedule 13 (Data Submission Charges) of the Reliability Assurance Agreement, a data submission charge of $500/day can be applied to any data not submitted in accordance with published deadlines. The deadlines for verification test result submittal are September 20 for the summer test period and March 20 for the winter test period.

Impacts of Test Results

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1 These dates are intended to coincide with the PJM eGADS data reporting deadline for those months.
1. **Successful Test Result** – A successful test result is one in which the Corrected Net Test Capacity is equal to or greater than the claimed installed capacity (ICAP) for the applicable test period and conducted within the respective test period.

2. **Failed Test** – A failed test is one in which the Corrected Net Test Capacity is less than the claimed installed capacity (ICAP) for the applicable test period. This case will result in a forced outage or derating in the amount of the difference between the claimed installed capacity (ICAP) and the Corrected Net Test Capacity being applied to the generating unit in question retroactive from the beginning of the respective test period and lasting until either a) a successful out of period test is conducted, b) a reduction in the claimed installed capacity (ICAP) of the generating unit is in effect (if and only if the capability is not to be restored, in accordance with section 2.1.12 of this document), or c) the beginning of the next test period. **Also, a Generation Resource Rating Test Failure Charge**, per PJM Manual 18, **PJM Capacity Market**, will be assessed if a verification test shortfall is not accompanied by a derating in the eGADS system and the event was not submitted by the generating units owner or agent. Examples of **applying the failed test rules** the application using the summer test period are:

   a. **A notice of a Capacity Modification (CAPMOD) is received and approved for reducing the claimed installed capacity of the generating unit to the Corrected Net Test Capacity effective August 31 @ 0000 hours.** A forced outage or derating as described above is entered for the generating unit starting June 1 @ 0000 hours and ending August 31 @ 0000 hours (the outage or derating ends when the CAPMOD begins).

   b. **The beginning of the next test period.** No test outside the test period (June-July-August) or CAPMOD are received. A forced outage or derating as described above is applied to the generating unit starting June 1 @0000 hours and ending December 1 @ 0000 hours (December 1 begins the winter test period).

   c. **An out of period test is conducted.** A successful out of period test is conducted on October 15 commencing at 1700 hours and ending at 1900 hours. A forced outage or derating as described above is applied to the generating unit starting June 1 @ 0000 hours and ending October 15 @ 1900 hours.

3. **Failure to Submit Test** - Failure to submit a verification test (conducted within the respective test period), unless exempted by GADS support personnel, will result in a full forced outage being applied to the generating unit in question retroactively from the beginning of the applicable test period and will remain in effect until either a successful out of period test is conducted or the next test period begins. For example, a generating unit not submitting a verification test for the summer test period will have a full forced outage applied retroactively starting June 1 @ 0000 hours of the year of the test period and ending December 1 @ 0000 hours of that same year (ending December 1, the beginning of the winter test period), unless a test is received prior to December 1. The results of this outage will be applied going forward and no retroactive adjustments to PJM Markets will be made. **Also, a Generation Resource Rating Test Failure Charge**, per PJM manual, M-18, **PJM Capacity Market**, will be assessed if a verification test shortfall is not accompanied by a derating in the eGADS system and the event was not submitted by the generating units owner or agent.
2.1 General

1. Net Capability shall mean the number of megawatts of electric power which can be delivered by an electric generating unit without restriction by the owner under the conditions and criteria specified herein and shall be determined as the gross output of the unit less power used for unit auxiliaries and other station use required for electrical generation and any power required to serve host process load. In the case where auxiliary load, station use and/or process load is apportioned across multiple units at a plant, the apportioned auxiliary load, station use and/or process load during the test must be commensurate with the apportioned auxiliary load, station use and/or process load during summer conditions (summer conditions are delineated in section 2.2, item 2 of this document).

2. Without restriction means that Net Capability values so determined are available for utilization at the request of PJM for supply of operating capacity and energy before any operating procedures are placed in effect anticipatory to a voltage reduction on the PJM system except as such utilization may at times be limited in duration by water or fuel availability. If the Net Capability, at times, is limited by water or fuel availability, the Net Capability should be based on the expected streamflow or expected fuel availability.

3. The determination of the Net Capability of a combined-cycle unit will depend on the structure of the complete unit and its components. The steam turbine and combustion turbines shall adhere to the existing guidelines set forth in this reporting manual. In the case of thermally dependent components, the determination of the Net Capability shall require the operation of both combustion turbine and steam components simultaneously. The output of the components can be netted to determine the combined-cycle unit net capability.

4. The determination of the Net Capability of a steam unit shall recognize the use of any procedures for increasing unit output such as turbine over-pressure, boiler over-rating, cycle modification or any others which are normally utilized in operation.

5. The determination of Net Capability for a combustion turbine unit shall be consistent with the owner's policy with respect to maximum outputs.

6. The determination of Net Capability for a hydro (with storage and/or pooling capability) or pumped storage unit shall recognize the head available giving proper consideration to operating restrictions and the reservoir storage program during a normal cycle at the expected time of the PJM peak.

7. The determination of Net Capability for a storage (non-hydro) unit shall recognize the MWH energy available, giving proper consideration to other market activities for which the storage (non-hydro) unit may be committed during the expected time of the PJM peak.

8. The determination of Net Capability for a hydro unit (without storage and pooling capability) shall be based on the expected head and streamflow at the expected time of the PJM peak.
9. The determination of the Net Capability of a nuclear unit shall recognize its nuclear fuel management program and any restrictions (except as noted in 15 below) imposed by regulatory authority.

10. The Net Capability of a planned steam or combined-cycle unit shall be based on the manufacturer's guarantee or estimate of performance. The Net Capability of a planned combustion turbine or combined-cycle unit shall give recognition to the elevation of the unit location, the type of fuel available for use, and the owner's policy with respect to the maximum output. The Net Capability of a planned hydro unit shall be based on the expected head and/or streamflow in accordance with items 6 or 8 above. The Net Capability of a planned storage (non-hydro) unit shall be based on the MWH energy available, given proper consideration to other market activities in which the unit may be participating at the expected time of the PJM peak.

11. After a unit is in operation, its Net Capability shall be based on current operating performance or test results. Both Summer and Winter Net Capability values shall be confirmed annually. If adequate data is available from normal operation to confirm Net Capability during the summer or winter test period, no test is required to be performed, as long as actual operating data from the respective test period is used. Units for which the foregoing data is not available shall be tested to confirm Summer and Winter Net Capability. Winter Net Capability Tests may utilize the latest Summer Net Capability test data corrected for winter conditions. When a known change occurs in the Net Capability of a unit, or is indicated by operating data or test results, it shall become effective as soon as possible except as noted in items 12 and 15 below.

12. The Net Capability of a unit shall not be reduced to reflect unplanned deratings or temporary capacity restrictions provided it is the intention of the owner to restore the reduced capability. The time of this restoration may depend on availability of parts and scheduling of an outage required for repairs. If the owner does not intend to restore the reduced capability by the end of the next Delivery Year, a reduced Net Capability value may become effective at the request of the owner. The owner shall make the required changes via the Capacity Modifications (CAPMOD) process of the PJM Capacity Market.

13. All or any part of a unit's capability that can be sustained for a number of hours of continuous operation commensurate with PJM load requirements, specified as 10 hours, shall be considered as unlimited energy capability. All or any part of a unit's capability shall be considered as limited energy capability only for those periods in which it does not meet the foregoing criteria for sustained operation. Such limited energy capability will be used to meet the energy requirements of PJM and depending on the extent to which it meets these requirements such capability may be reduced as provided in Schedule 9 of the Reliability Assurance Agreement (RAA).

14. Each generation owner shall be responsible for the determination and reporting of Summer and Winter Net Capability. The first notification is through completion of Attachment N of the Open Access Transmission Tariff (Form of Feasibility Study Agreement) and sending this application to the Interconnection Analysis Department of PJM. The second notification, if approval is received, is via the CAPMOD procedures of the PJM Capacity Market. The Resource Adequacy Planning Department of the PJM
RTO shall be responsible for the establishment of test procedures required to confirm such values including any amount which could be treated as limited energy capability.

15. The Net Capability reported for a generating unit shall in no case exceed an amount determined by the owner in accordance with items 1, 2 and 14 above but for PJM accounting purposes may initially be less than that amount. The extent of any such reduction in reported capability may be determined by the company in such manner as will permit the most effective use of its own resources.

2.1.1 Conventional Generating Units

1. The determination of the Net Capability of a combined-cycle unit will depend on the structure of the complete unit and its components. The steam turbine and combustion turbines shall adhere to the existing guidelines set forth in this reporting manual. In the case of thermally dependent components, the determination of the Net Capability shall require the operation of both combustion turbine and steam components simultaneously. The output of the components can be netted to determine the combined-cycle unit net capability.

2.

3. The determination of the Net Capability of a steam unit shall recognize the use of any procedures for increasing unit output such as turbine over-pressure, boiler overrating, cycle modification or any others which are normally utilized in operation.

4. Insert new information here

5. The determination of the Net Capability of a nuclear unit shall recognize its nuclear fuel management program and any restrictions (except as noted in 15 below) imposed by regulatory authority.

6. The determination of Net Capability for a combustion turbine unit shall be consistent with the owner's policy with respect to maximum outputs.

7. The determination of Net Capability for a reciprocating engine unit shall be consistent with the owner's policy with respect to maximum outputs and on the type(s) of fuel used.

8. The Net Capability of a planned steam or combined-cycle unit shall be based on the manufacturer's guarantee or estimate of performance.

9. The Net Capability of a planned combustion turbine or combined-cycle unit shall give recognition to the elevation of the unit location, the type of fuel available for use, and the owner's policy with respect to the maximum output.

10. The Net Capability of a planned reciprocating engine unit shall be consistent with the owner's policy with respect to maximum outputs and on the type(s) of fuel used.

2.2.2 Capacity Storage Levels

1. The determination of Net Capability for a hydro (with storage and/or pooling capability) or pumped storage unit shall recognize the head available giving proper consideration to operating restrictions and the reservoir storage program during a normal cycle at the expected time of the PJM peak.
Section 2: Net Capability

2. The determination of Net Capability for a storage (non-hydro) unit shall recognize the MWH energy available, giving proper consideration to other market activities for which the storage (non-hydro) unit may be committed during the expected time of the PJM peak.

3. The Net Capability of a planned hydro (with storage and/or pooling capability) or pumped storage unit shall be based on the expected head and/or streamflow in accordance with item 1 above.

4. The Net Capability of a planned storage (non-hydro) unit shall be based on the MWH energy available, given proper consideration to other market activities in which the unit may be participating at the expected time of the PJM peak.

5. The determination of Net Capability of Capacity Storage Units requires that all units at each plant test simultaneously.

2.2.3 Intermittent Units (other than wind and solar)

1. The determination of Net Capability for a hydro unit (without storage and pooling capability) shall be based on the expected head and streamflow at the expected time of the PJM peak.

2. The Net Capability of a generating unit consuming landfill gas shall be based on the availability of landfill gas at the expected time of the PJM peak.

3. The Net Capability of a planned storage (non-hydro) unit shall be based on the MWH energy available, given proper consideration to other market activities in which the unit may be participating at the expected time of the PJM peak.

4. The Net Capability of a planned generating unit consuming landfill gas shall be based on the landfill gas available at the expected time of the PJM peak. Proper consideration should also be given to other market activities in which the unit may be participating at the expected time of the PJM peak.

5. The determination of Net Capability for all Intermittent Units (other than wind and solar) requires that all units at each plant test simultaneously.

2.2 Summer Net Capability

1. The Summer Net Capability of each generating unit shall be based on summer conditions and on the power factor level normally expected for that generating unit at the time of the annual summer PJM peaks.

2. Summer conditions shall reflect the 50% probability of occurrence (approximated by the mean) of ambient site conditions at the time of the last 15 years’ summer PJM peaks. Site conditions shall be based on plant records or local weather bureau records coincident with the dates and times of the last 15 years’ summer PJM peaks, updated no less than every five years. When local weather records are not available, the values shall be estimated from the best data available.

3. The determination of the Summer Net Capability of fossil and nuclear steam units shall be based on, where applicable, the expected condenser intake water temperature under
4. The determination of the Summer Net Capability of combustion turbine units shall be based on, where applicable, the ambient air temperature and humidity under summer conditions.

5. The determination of the Summer Net Capability of hydro (with storage and/or pooling capability) and pumped storage units shall be based on operational data or test results taken once each PJM delivery year during the summer test period under summer conditions.

6. The determination of the Summer Net Capability of storage (non-hydro) units shall be based on the expected inventory of energy given other market activities for which the storage (non-hydro) unit may be committed under summer conditions.

7. The determination of the Summer Net Capability of hydro units (without storage and/or pooling capability) shall be based on operational data or test results taken once each PJM delivery year during the summer test period. The Summer Net Capability shall be based on the expected head and streamflow under summer conditions.

8. The determination of Summer Net Capability of combined-cycle units shall be based on, where applicable, the expected intake water temperature of once-through or open cooling systems under summer conditions and/or the performance of cooling towers and combustion turbines under summer conditions.

2.2.1 Conventional Generators

1. The determination of the Summer Net Capability of fossil and nuclear steam units shall be based on, where applicable, the expected condenser intake water temperature under summer conditions, the expected temperature of once-through or open cooling systems under summer conditions as well as the performance of cooling towers under summer conditions.

2. The determination of the Summer Net Capability of combustion turbine units shall be based on, where applicable, the ambient air temperature and humidity under summer conditions.

3. The determination of Summer Net Capability of combined-cycle units shall be based on, where applicable, the expected intake water temperature of once-through or open cooling systems under summer conditions and/or the performance of cooling towers and combustion turbines under summer conditions.

4. The determination of the Summer Net Capability reciprocating engine units shall be based on operational data or test results taken once each PJM delivery year during the summer test period.

2.2.2 Capacity Storage Levels

1. The determination of the Summer Net Capability of hydro (with storage and/or pooling capability) and pumped storage units shall be based on operational data or test results
taken once each PJM delivery year during the summer test period under summer conditions and head and/or streamflow must be taken into consideration.

2. The determination of the Summer Net Capability of storage (non-hydro) units shall be based on the expected inventory of energy given other market activities for which the storage (non-hydro) unit may be committed under summer conditions.

2.2.3 Intermittent Units (excluding wind and solar)

1. The determination of the Summer Net Capability of hydro units (without storage and/or pooling capability) shall be based on operational data or test results taken once each PJM delivery year during the summer test period. The Summer Net Capability shall be based on the expected head and/or streamflow under summer conditions.

2. The determination of the Summer Net Capability of units consuming landfill gas shall be based on operational data or test results taken once during the summer test period. The Summer Net Capability shall be based on the expected landfill gas production under summer conditions. If the generating unit is a combustion turbine it shall also be based on, where applicable, the ambient air temperature and humidity under summer conditions.

2.3 Winter Net Capability

1. The Winter Net Capability of each generating unit shall be based on winter conditions and on the power factor level normally expected for that generating unit at the time of the annual winter PJM peaks. The winter rating shall be equal to or greater than the summer rating unless documentation is supplied to support the exception.

2. Winter conditions shall reflect the 50% probability of occurrence (approximated by the mean) of ambient site conditions at the time of the last fifteen years’ winter PJM peaks. Site conditions shall be based on plant records or local weather bureau records coincident with the dates and times of the last fifteen years’ winter PJM peaks, updated no less than every 5 years. When local weather records are not available, the values shall be estimated from the best data available.

3. The determination of Winter Net Capability of fossil and nuclear steam units shall be based on, where applicable, the condenser intake water temperature under winter conditions, the temperature of once-through or open cooling systems under winter conditions as well as the performance of cooling towers under winter conditions.

4. The determination of Winter Net Capability of combustion turbine units shall be based on, where applicable, the ambient air temperature and humidity under winter conditions.

5. The determination of the Winter Net Capability shall be waived for all hydro and pumped storage units.

6. The determination of the Winter Net Capability of storage (non-hydro) units shall be based on the expected inventory of energy given other market activities for which the storage (non-hydro) unit may be committed under winter conditions.

7. The determination of Winter Net Capability of combined-cycle units shall be based on, where applicable, the expected intake water temperature of once-through or open...
cooling systems under winter conditions and/or the performance of cooling towers and combustion turbines under winter conditions.

2.3.1 Conventional Generators

1. The determination of the Winter Net Capability of fossil and nuclear steam units shall be based on, where applicable, the expected condenser intake water temperature under winter conditions, the expected temperature of once-through or open cooling systems under summer conditions as well as the performance of cooling towers under summer conditions.

2. The determination of the Winter Net Capability of combustion turbine units shall be based on, where applicable, the ambient air temperature and humidity under winter conditions.

3. The determination of the Winter Net Capability for reciprocating engine units shall be based on operational data or test results taken once each PJM delivery year during the winter test period.

2.3.2 Capacity Storage Levels Units

1. The determination of the Winter Net Capability shall be waived for hydroelectric (with storage and/or pooling capability) and pumped storage units.

2. The determination of the Winter Net Capability of storage (non-hydro) units shall be based on the expected inventory of energy given other market activities for which the storage (non-hydro) unit may be committed under winter conditions.

2.3.3 Intermittent Units (excluding Wind and Solar)

1. The determination of the Winter Net Capability shall be waived for hydroelectric (without storage and/or pooling capability) units.

2. The determination of the Summer Net Capability of units consuming landfill gas shall be based on operational data or test results taken once during the winter test period. The Winter Net Capability shall be based on the expected landfill gas production under winter conditions. If the generating unit is a combustion turbine it shall also be based on, where applicable, the ambient air temperature and humidity under winter conditions.
Appendix A: Net Capability Verification Guidelines

A.1 Purpose

These guidelines are to supplement the requirements set forth in the PJM manual, *M-21, Rules and Procedures for Determination of Generating Capability* by setting forth requirements for Net Capability verification, reporting and review of results to ensure uniform and consistent compliance.

1. Philosophy of Net Capability Verification
   a. Responsibility
      i. Generation owners are responsible to comply with these requirements at their own expense.
      ii. Test data are to be submitted to the Resource Adequacy Planning department (RAP) of PJM via the eGADS system. This requirement applies to both discrete tests and to tests that use actual operating data.
   b. Exceptions and Deviations.
      i. Exceptions to and deviations from these Net Capability verification guidelines shall be by RAP approval. These exceptions shall be requested in writing by the generating entity prior to the end of the respective test period for known occurrences such as, but not limited to, environmental restrictions and fuel limitations.

2. Net Capability Verification
   a. Net Capability verification is to demonstrate the Net Capability of each unit(s) and for CIR retention. If that Net Capability was not demonstrated during the test period, a reduction or derating in eGADS shall be enacted to account for the deficiency. CIR retention is determined based on the largest Corrected Net Test Capacity of the prior three years’ summer verification tests conducted during the summer test period. If the Corrected Net Test Capacity in any of the three prior years meets or exceeds the CIR level, CIRs are retained. Results of out of period tests cannot be used in CIR retention calculations.
   b. Both Summer and Winter Net Capability shall be confirmed annually during the respective test periods:
      i. The summer test period shall be the first day of June through the last day of August.
      ii. The winter test period shall be the first day of December through the last day of February. Alternatively, data used to satisfy the Summer Net Capability test may be used to satisfy the winter test requirements after adjustment to the appropriate winter conditions.
   c. If adequate data is available from normal operation to confirm Net Capability values and to satisfy the reporting requirements during the respective test period, data from normal operation can be used for that period’s verification test. Units for which
the foregoing data is not available shall be required to specifically test to confirm Summer and Winter Net Capability values. A test shall include any unit brought on-line or a unit that is on-line and its mode of operation altered for the specific purpose of capability verification. All verification tests, including those based on actual operating data, shall be corrected for the respective summer or winter conditions. Cooling water and ambient conditions typically do not affect the performance of hydroelectric, pumped storage, non-hydro storage, fuel cell and diesel (including other reciprocating engine type) units; hence these types of units are exempt from the aforementioned correction criteria. However, if streamflow or fuel availability is affected, appropriate corrections for summer and/or winter conditions must be applied. The updated peaks, called the PJM Peak Hour History, are published by the Resource Adequacy Planning department after each respective test period and are posted on this PJM webpage: [http://www.pjm.com/planning/resource-adequacy-planning/resource-reports-info.aspx](http://www.pjm.com/planning/resource-adequacy-planning/resource-reports-info.aspx)

d. The duration of acceptance and verification tests shall be two (2) contiguous hours for nuclear, fossil steam and combined-cycle units, one (1) contiguous hour for hydro, pumped storage, non-hydro storage, simple cycle combustion turbine, fuel cell, and diesel (including other reciprocating engine type) units. If actual operating data is used for any acceptance verification test, the data must be contiguous for the aforementioned unit types and durations.

e. To coincide with five minute settlements and to ensure auditability, all tests must start at five minute intervals. This means that tests must start at 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 or 55 minutes past the hour. This will also facilitate confirmation of test results using telemetry and meter data.

f. If a unit does not meet its stated Summer or Winter Net Capability due to a temporary condition that existed prior to the conduct of the test, the deficiency shall be covered by an appropriate reduction (outage or derating) from the date of the problem. If a capability deficiency is uncovered during this verification, a reduction (outage or derating) covering the deficiency shall be entered into the PJM eGADS system retroactive from June 1 or December 1 for summer and winter test periods, respectively.

g. Net Capability verification is required outside of the test period when a reduction (outage or derating) in eGADS occurred prior to or during the test period which prevented demonstration of maximum Net Capability. The Net Capability shall be demonstrated by either actual operating data or by performing a test outside of the respective test period. Any unit may correct a test shortfall using an out of period test provided that a) the original test was not caused by a lack of fuel availability or other restriction(s) agreed upon in the generating unit’s operating licenses or agreements, or b) the original test was not caused by lack of head, streamflow or other restriction(s) agreed upon in the generating unit’s operating licenses or agreements.

i If an out of period test is to be conducted for the summer test period, the out of period test must be conducted between September 1 @0000 hours and December 1 @0000 hours. Likewise, if actual operating data is used in lieu of a formal test, the actual operating data must be within the aforementioned dates.
ii If an out of period test is to be conducted for the winter test period, the out of period test must be conducted between March 1 @0000 hours and June 1 @ 0000 hours. Likewise, if actual operating data is used in lieu of a formal test, the actual operating data must be within the aforementioned dates.

h. Net Capability of multiple generating units that are connected behind a single revenue meter and have CIRs issued based on that single revenue meter, must be determined by the simultaneous testing of all generating units behind a single revenue meter for the aforementioned durations.

3. Reporting

a. Reporting is accomplished through the PJM eGADS reporting system as described in Appendix B: PJM Net Capability Verification Test User of the PJM eGADS User Guide.
Appendix B: Calculating Capacity Values for Wind and Solar Capacity Resources

B.1 Purpose

This appendix describes the procedure for the calculation of capacity values for all wind and solar capacity resources. This procedure is done in place of verification tests.

B.2 Definitions

1. The Capacity Value for a wind or solar capacity resource represents that amount of generating capacity, expressed in MW that it can reliably contribute during summer peak hours and which can be offered as unforced capacity into the PJM capacity markets.

2. The “Capacity Factor” for a wind or solar capacity resource is a factor based on historical operating data and/or the Class Average Capacity Factor, and is used in the calculation that determines a wind or solar capacity resource’s Capacity Value.

3. The wind or solar capacity resource’s “Net Maximum Capacity” is the manufacturer’s output rating less the Station Load where “Station Load” refers to the amount of energy that is consumed to operate all auxiliary equipment and control systems.

4. Wind or solar capacity resources with three or more years of applicable operational data are referred to as “Mature.” Those with fewer than three years of data are “Immature.”

5. “Class Average Capacity Factor” is a factor that is used only in the calculations for the Capacity Value of an immature wind or solar capacity resource. Class average capacity factors shall be determined and periodically updated by PJM based upon review of operating data for similar units and/or engineering studies for future installations.

6. “Hourly output” is the average of the metered outputs, in MW, integrated over a one-hour period.

7. “Summer Day” is defined as any day from June 1 through August 31, inclusive.

8. “Summer Period” is the period from June 1 through August 31, inclusive.

9. “Peak Hours” are those ending 3, 4, 5, and 6 PM Local Prevailing Time.

10. “Summer Peak Hours” means all “Peak Hours” for all of the “Summer Days”.

11. “Summer Calculation Hours” means all “Summer Peak Hours” for which PJM did not direct the resource to reduce its output.

B.3 Calculation Procedure

1. General Approach - The calculation of a capacity value for a particular wind or solar capacity resource for a particular year is performed by first computing its unique single year capacity factors for each of the prior three summers. Single year capacity factors are based upon operating data for each of those summers, or in the case of an immature wind or solar capacity resource, the single year capacity factor is assigned the value of the Class Average Capacity Factor for each summer where there is no or incomplete data. The mean of single year capacity factors for each of the prior three years results
in a Capacity Factor representative of the three prior years. That Capacity Factor, when multiplied by the current Net Maximum Capacity yields the current capacity value for that wind or solar capacity resource. Commencing with Delivery Year 2018/2019 the median capacity factor will be used to determine the capacity value of wind and solar resources. This will be blended with capacity values from prior Delivery Years until the capacity value is derived solely from median values. This change will also accommodate 5 minute settlement values; so starting with Delivery Year 2018/2019 capacity value will be based on the median of the 5 minute settlement values for generator output. This two-step process accommodates any changes in the Net Maximum capacity that may have occurred during the most recent prior three summers of operation. A detailed outline of this approach (addressing both mature and immature wind or solar capacity resources) is as follows:

2. Prior to Delivery Year 2018/2019
   a. Sum all of the "hourly outputs" for each of the summer calculation hours in the year that is three years prior to the current year.
   b. Then, for each of those same summer calculation hours, sum the Net Maximum Capacity values.
   c. For solar resources, any hour in which the output of the solar resource has been reduced, wholly or in part, due to a constraint on the transmission or distribution system or by order of the PJM system operator, both the hourly output and the Net Maximum Capacity for the constrained hour will be omitted. The resource owner must notify the PJM Resource Adequacy Planning department of those curtailed hours via email to GADSSUPPORT@pjm.com by September 30 each year.
   d. For wind resources, any hour in which the output of the wind resource has been reduced, wholly or in part, due to a constraint on the transmission or distribution system or by order of the PJM system operator, the hourly data for the curtailed hours will be replaced, in part, with 5 minute data from the PJM state estimator for each 5 minute period without constraints and, for the five minute periods with constraints, values will be determined by linear interpolation using the nearest 5 minute data surrounding the constrained period(s).
   e. The quotient of the summed summer calculation hour outputs (a) divided by the summed summer calculation hour Net Maximum Capacities (b) will yield a single year capacity factor for that year.
   f. If there is no or incomplete operating data for one or more of the summers (immature wind or solar capacity resource) then the single year capacity factor for each of those years is assigned the value of the Class Average Capacity Factor.
   g. Repeating steps (a) through (d) above for each Delivery Year prior to Delivery Year 2018/2019 of the two intervening years (current year minus 2, and current year minus 1) will generate two more single year capacity factors, one for each of those years.

3. Delivery Year 2018/2019 and later
a. Divide each 5 minute output by the Net Maximum Capacity for each of the summer peak hours 5 minute periods; this will yield 4,416 individual capacity factor values.

b. For solar resources, any 5 minute period in which the output of the solar resource has been reduced, wholly or in part, due to a constraint on the transmission or distribution system or by order of the PJM system operator, both the 5 minute period output and the Net Maximum Capacity for the constrained 5 minute period will be omitted. The resource owner must notify the PJM Resource Adequacy Planning department of those curtailed 5 minute periods via email to GADSSUPPORT@pjm.com by September 30th each year.

c. For wind resources, any 5 minute period in which the output of the wind resource has been reduced, wholly or in part, due to a constraint on the transmission or distribution system or by order of the PJM system operator, all 5 minute period outputs for curtailed 5 minute periods will be replaced, by linear interpolation using the nearest unconstrained 5 minute periods capacity factors surrounding the constrained 5 minute period(s).

d. The Capacity Factor to be calculated from Delivery Year 2018/2019 data used in the current year is the mean (arithmetic average) of the three single year capacity factors calculated in steps (c) and (d) above, is the median of the 4,416 values rendered from the 368 summer peak hours 5 minute periods for Delivery Year 2018/2019.

e. The Capacity Factor to be calculated for Delivery Year 2019/2020 is the median of the 8,832 values rendered from the 736 summer peak hours 5 minute periods for Delivery Year 2018/2019 and Delivery Year 2019/2020.

f. The Capacity Factor to be calculated for Delivery Year 2020/2021 is the median of the 13,248 values rendered from the 1,104 summer peak hours 5 minute periods for Delivery Year 2018/2019, Delivery Year 2019/2020 and Delivery Year 2020/2021.

g. Capacity factors shall be calculated annually following the summer peak period and be applicable for the delivery year beginning the following June.

h. Currently effective class average capacity factors are posted to the PJM website on this webpage: http://www.pjm.com/planning/resource-adequacy-planning/resource-reports-info.aspx

i. Owners of immature wind and solar units may substitute an alternate class-average capacity factor with suitable documentation and approval by PJM.

j. The current Capacity Value is then calculated by multiplying the applicable Capacity Factor from (g) above by the current Net Maximum Capacity of the wind or solar capacity resource.
Revision History

Revision 12 (1/1/2017):
- **Cover to Cover Periodic Review**
- **Added more detail to testing requirements, acceptance testing for newly constructed units and re-wording of Net Capability terms**
- **Added references to capacity interconnect rights and added testing rules for non-hydro storage**
- **Removed reference to wind and solar as intermittent units (per Manual 18) include units other an just wind and solar capacity resources**

Revision 11 (03/05/2014):
- Added general administrative updates. Added requirement that hydro and pumped storage units must perform ratings test during Summer verification window. Added clarification that all generators, with the exception of hydroelectric, pumped storage and diesel units, must adjust their ratings test for ambient conditions beginning June 1, 2014. Changes were endorsed at the 2/27/14 MRC meeting.

Revision 10 (10/01/2013):
- Added specific instructions for calculating capacity factors for wind resources when hourly output is constrained over summer peak hours.

Revision 09 (05/01/2010):
- Added requirement to document cases where unit winter ratings are less than summer ratings.
- Clarified language regarding correction of observed test data to rated site ambient conditions.
- Changes to Appendix B to specify that, in the calculation of an intermittent resource’s capacity value, any hours during which PJM directed the resource to reduce its output are excluded.

Revision 08 (01/01/2010):
- Revisions approved by stakeholders at November 30, 2009 MRC meeting and awaiting FERC approval by February 1, 2010 (received FERC approval in January, 2010):
  - Removed all references to the Winter Net Capability Test Exemption Program.
  - Revision to Appendix A allowing submission of ambient weather-adjusted data from the summer verification test in place of an actual winter verification test.

Revision 07 (06/01/2008):
- Clarification of capacity verification testing corrections to average ambient conditions described in Section 2.
Clarification of test duration requirements for various unit types in Appendix A.
Revision to Appendix B to add Solar Class Average Capacity Factor of 38%.
Elimination of Appendix B-1 and combination of wind and solar calculation methodology into Appendix B. Update to list of Manuals.

Revision 06 (04/01/2008):
- Revision to Appendix B-1 to indicate change of Wind Class Average Capacity Factor to 13%.
- Clarification of existing practices regarding performance of seasonal verification tests.

Revision 05 (06/01/2007):
- Revisions for the implementation of the Reliability Pricing Model and general clean-up.
- Added Section 1: Requirements
  - Added Definition of Installed Capacity (ICAP)
- Data Submittal: Added Occasions Requiring Submittal of Verification Test
- Data Submittal: Added reference to need to adhere to injection right limitations when increases in Installed Capacity (ICAP) are requested
- Appendix A: Part B-4 Added Duration of Test or Operational Status to Satisfy Test Requirements

Revision 04 (08/15/2005):
- Removed all references to Non-Utility Generators (NUGs)
- Included references and links to Winter Net Capability Test Exemption section of PJM Manual for Pre-scheduling Operations (M-10)
- Removed all data input instructions and sample forms from part C, Reporting of Appendix A: Net Capability Verification Guidelines and inserted link to Appendix B: PJM Net Capability Verification Test User Manual of PJM eGADS User Manual (M-23)

Revision 03 (04/30/2004):
Attached two files:
- The first is Appendix B which addresses Intermittent Capacity Resources in general.
- The second is Appendix B-1. This addresses Capacity calculations for wind generation which is the first intermittent capacity resource under the category of Intermittent Capacity Resources.

Revision 02 (11/21/2003):
- Changed all references from “PJM Interconnection, L.L.C.” to “PJM.”
- Renamed Exhibits I.1 through 10.1 to Exhibit 1 through Exhibit 5.
• Reformatted to new PJM formatting standard.
• Renumbered pages to consecutive numbering.

Revision 01 (08/23/2000):
• Manual updated to reflect use of eCapacity system and to remove Available Capability, Limited Energy Resources and Transmission Limitations sections. These will be addressed in sections of the PJM Manual for *Installed Capacity: Generation Data Systems* dealing with generation availability. Appendices A and B of the 10/14/98 version have also been removed since they dealt with Limited Energy and Transmission Limitation procedures.

Revision 00 (10/14/1998):
• This is the first release of the PJM Manual for Rules and Procedures for Determination of Generating Capability (Green Book) under new format.