



## STAFFING REQUISITION FORM ACKNOWLEDGEMENT

**Title: Sr. Lead Engineer – Performance Compliance Dept.**

**Requisition # 569**

All internal applicants must complete the Staffing Requisition Form (See attached).

Internal applicants must have their completed information into Human Resources by the close of business of the last day of the posting period.

Human Resources will screen internal and external applicant resumes and completed Staffing Requisition forms and will forward only candidates who fully meet the minimum posted requirements to the appropriate hiring manager/interviewing team.

Internal applicants will discuss their interest in the said position with the current manager. Upon recommendation of the employee's current manager, Human Resources may allow employees to be considered for promotion or transfer when it is in the best interest of both PJM and the employee.

If the applicant has less than one year of service or possesses a rating of "2" or less (e.g. Achieves Some Requirements or Unacceptable) on the most recent performance review, the candidate will request a release from the manager to apply for the position.

I have read, understand, and agree to the above statements. Through my signature below I attest that I have spoken with my current manager, (name) \_\_\_\_\_, on (date) \_\_\_\_\_.

If necessary, Human Resources or the hiring manager can contact my current manager. (yes) or (no)  
If no, why not? \_\_\_\_\_

Employee Name:	
Employee Signature:	
Date:	

SMM - 01749

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# haash

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\\server\name

PSCRIPT Page Separator



**STAFFING REQUISITION FORM**  
**Job req. # 568**  
**ANALYST/SR. ANALYST - PERFORMANCE COMPLIANCE DEPARTMENT**  
**HR Fax #: 610.666.4570**

Requisition Number:	568
Title:	ANALYST/SR. ANALYST
Career Band:	III / IV / V
Department/Division:	Performance Compliant Department/ Market Services Division
Date of posting:	March 30, 2007
Date of closing:	April 6, 2007
Date of submission:	
Name of Candidate:	
Address:	
Phone Number:	

**GENERAL POSITION SUMMARY:**

An Analyst in Performance Compliance assures the reliable, economic, and coordinated operation of the PJM Interconnection in accordance with PJM Operating Principles and Standards and applicable Regional and NERC Operating Policies. The Analyst, Performance Compliance supports this mission by assembling and analyzing key power system data and documenting the results. Key activities include the following:

- Compile, prepare and analyze various statistical/analytical data, reports statements, studies or projects.
- Provide analysis of the electric power grid across many areas of RTO operations and recommend changes or enhancements to PJM and NERC policies and procedures.
- Develop performance metrics for ISO performance goals and develop the associated measurement and reporting process.
- Perform technical and mathematical analysis to develop measures of market performance.
- Assist project teams in the development of new market products

SMM - 01751

**DIVISION/DEPARTMENT SUMMARY:**

The Performance Compliance Department develops and evaluates operations, markets and planning related performance indices. It monitors compliance with industry and self-imposed standards, and provides analysis of actual system operations with respect to those standards. The department evaluates organizational processes related to planning and operating procedures and develops and recommends courses of action to improve performance. The department provides routine and special reports concerning system and market operations.

<b>STAFFING REQUISITION FORM</b>	<b>HR USE ONLY</b>	
<b>Required</b>	<b>Meets</b>	<b>Does Not Meet</b>
<b>Requirement #1:</b> Bachelors Degree in Engineering (preferably Electrical), Mathematics or Information Science or equivalent.  <b>How do you meet the qualification?</b>		
<b>Requirement #2:</b> 0-5 years experience (Band III)  <b>How do you meet the qualification?</b>		
<b>Requirement #3:</b> At least 5 years relevant experience (Band IV)  <b>How do you meet the qualification?</b>		
<b>Requirement #4:</b> At least 8 years relevant experience (Band V)  <b>How do you meet the qualification?</b>		
<b>Requirement #5:</b> Demonstrated ability to communicate effectively.  <b>How do you meet the qualification?</b>		
<b>Requirement #6:</b> Demonstrated ability to visualize and solve complex problems.  <b>How do you meet the Qualification?</b>		
<b>Requirement #7:</b> Strong analytical skills.  <b>How do you meet the qualification?</b>		
<b>Requirement #8:</b> Requirement Good written and verbal communications.  <b>How do you meet the qualification?</b>	SMM - 01752	

<b>Requirement #9:</b> Ability to work closely with peers in a teamwork environment.  <b>How do you meet the qualification?</b>		

SMM - 01753

<b>STAFFING REQUISITION FORM</b>  <b>Preferred</b>	<b>Meets</b>	<b>Does Not Meet</b>
<b>Preferred #1:</b> Knowledge of power system engineering concepts, principles, standards and reliability concepts.  <b>How do you meet the qualification?</b>		
<b>Preferred #2:</b> Experience using PSS/e or other power system analysis programs.  <b>How do you meet the qualification?</b>		
<b>Preferred #3:</b> Experience with Oracle PL/SQL.  <b>How do you meet the qualification?</b>  <b>Preferred #3:</b> Experience with Oracle PL/SQL.  <b>How do you meet the qualification?</b>  <b>Preferred #3:</b> Experience with Oracle PL/SQL.  <b>How do you meet the qualification?</b>  <b>Preferred #3:</b> Experience with Oracle PL/SQL.  <b>How do you meet the qualification?</b>		

SMM - 01754



## STAFFING REQUISITION FORM ACKNOWLEDGEMENT

**Title: ANALYST/SR. ANALYST - PERFORMANCE COMPLIANCE DEPARTMENT**  
**Requisition # 568**

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Internal applicants will discuss their interest in the said position with the current manager. Upon recommendation of the employee's current manager, Human Resources may allow employees to be considered for promotion or transfer when it is in the best interest of both PJM and the employee.

If the applicant has less than one year of service or possesses a rating of "2" or less (e.g. Achieves Some Requirements or Unacceptable) on the most recent performance review, the candidate will request a release from the manager to apply for the position.

I have read, understand, and agree to the above statements. Through my signature below I attest that I have spoken with my current manager, (name) \_\_\_\_\_, on (date)\_\_\_\_\_.

If necessary, Human Resources or the hiring manager can contact my current manager. (yes) or (no)  
If no, why not?

Employee Name:	
Employee Signature:	
Date:	

SMM - 01755

Response to Haas email, dated 6/6/07, 10:32 am.

**1.) When Frank Racioppi interviewed for his current position in Operations Compliance?**

Frank Racioppi interviewed with Stan Williams on April 2, 2007 for the Sr Lead Engineer opportunity, Performance Compliance.

**2.) When Frank Racioppi signed the papers agreeing to his transfer to Operation Compliance?**

Frank Racioppi received and signed his offer letter on April 10, 2007.

**3.) When Bridgid Cummings interviewed for her current position in Operation Compliance.**

Bridgid Cummings interviewed for an Analyst position with Performance Compliance on 4/17/2007, 10:30 am.

**4.) When Bridgid Cummings signed the papers agreeing to her transfer to Operation Compliance.**

Bridgid received an offer letter on April 19, 2007. She signed and returned the offer letter on April 23, 2007.

**5.) The number of MMU staff that applied for positions outside of the MMU, the positions in question, the dates of those applications and the dates of the interviews (no names) since March 01, 2007.**

<b>Position Title</b>	<b># of MMU ee applications</b>	<b># of interviews granted</b>	<b>Dates of interviews</b>
<i>Sr Security Analyst</i>	1 (4/6/07)	None	N/A
<i>*Sr Analyst (Performance Compliance)</i>	1 (1/22/07)	1	2/15/07 – 11:00 am
<i>Sr Lead Engineer (Performance Compliance)</i>	1 (4/2/07)	1	4/2/07
<i>Analyst (Performance Compliance)</i>	3 (4/6/07)	3	4/17/07 – 10:30 am 4/17/07 – 11:30 am 4/17/07 – 1:30 pm
<i>Operations Analyst</i>	1(4/12/07)	1	4/12/07 – 2:00 pm

\*Employee did not transfer until March 19, 2007.

**6.) The dates that the MMU presented HR with specific job descriptions for the posting of openings within the MMU since January 2007.**

To my knowledge, MMU has not provided HR with specific job descriptions for the posting of openings in MMU. On multiple occasions, HR presented MMU with information regarding staffing and requested agreement or approval of position descriptions. In many conversations with Joe Bowring, he references needing another person or additional headcount, but did not provide specifics regarding staffing requirements or a position description.

SMM - 01756



A summary of staffing notes:

On 3/1/07 – Dionne Wright sent to Joe Bowring a template for the completion of a Staffing Justification form.

3/14/07 – Joe Bowring sends to Dionne Wright a draft copy of the Staffing Justification form for a replacement position. The replacement is for Tom Zadlo. Joe states in his email that he would send a second form for the replacement position of Yan Lin.

3/20/07 – Joe Bowring sends to Lindsay Johnston a copy of a resume of a potential candidate, no specs.

3/28/07 – Joe Bowring sends an email asking to discuss hiring and retention, no specs.

4/11/07 – Dionne Wright sends to Joe Bowring a position description for review and edits.

Joe Bowring responds with agreement that the position description is correct.

**7.) The dates that HR posted specific MMU job openings since January 2007.**

On 4/24/07, the position of Sr. Engineer/Sr. Analyst, MMU was listed in the PJM Post with a closing date of 5/1/07.

SMM - 01757

**Haas, Howard**

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**From:** Wright, Dionne  
**Sent:** Thursday, June 07, 2007 8:22 AM  
**To:** Haas, Howard  
**Cc:** Duane, Vincent P.  
**Subject:** RE: HR reports/responses prepared with regard to data requests

updated..please check the document.

If additional information is needed, please let me know.

Dionne

-----Original Message-----

**From:** Haas, Howard  
**Sent:** Wednesday, June 06, 2007 4:48 PM  
**To:** Wright, Dionne; Duane, Vincent P.  
**Subject:** RE: HR reports/responses prepared with regard to data requests

Thanks Dionne. Would it be possible to get the dates of the applications in response to question 5?

Thanks,

Howard

-----Original Message-----

**From:** Wright, Dionne  
**Sent:** Wednesday, June 06, 2007 3:22 PM  
**To:** Duane, Vincent P.; Haas, Howard  
**Subject:** RE: HR reports/responses prepared with regard to data requests

You now have rights, sorry for the inconvenience.

Dionne

-----Original Message-----

**From:** Duane, Vincent P.  
**Sent:** Wednesday, June 06, 2007 2:48 PM  
**To:** Haas, Howard  
**Cc:** Wright, Dionne  
**Subject:** RE: HR reports/responses prepared with regard to data requests

Sorry. Dionne, can you do this - I'm not the author.

-----Original Message-----

**From:** Haas, Howard  
**Sent:** Wednesday, June 06, 2007 2:37 PM  
**To:** Duane, Vincent P.  
**Subject:** RE: HR reports/responses prepared with regard to data requests

Vince,

SMM - 01758

6/11/2007

Thanks for the quick turn around. Unfortunately, I apparently do not have read rights to the document. I am unable to pull it up. Would it be possible to arrange a change in the permissions?

Thanks,

Howard

-----Original Message-----

**From:** Duane, Vincent P.

**Sent:** Wednesday, June 06, 2007 2:29 PM

**To:** Haas, Howard

**Subject:** FW: HR reports/responses prepared with regard to data requests

**Importance:** High

Howard, I hope this responds to your request from yesterday afternoon.

-----Original Message-----

**From:** Wright, Dionne

**Sent:** Wednesday, June 06, 2007 1:56 PM

**To:** Duane, Vincent P.

**Cc:** Hugee, Jacquelyn

**Subject:** RE: HR reports/responses prepared with regard to data requests

**Importance:** High

Vince,

Per your request, please review the attached document.

If additional information is needed, please advise.

Dionne

x4618

-----Original Message-----

**From:** Duane, Vincent P.

**Sent:** Wednesday, June 06, 2007 10:32 AM

**To:** Wright, Dionne

**Cc:** Haas, Howard; Mannheimer, Toby

**Subject:** FW: HR reports/responses prepared with regard to data requests

Dionne: can you get the dates (and in the case of Q.4, the numbers) for each of the questions below. Send them along to me and I'll forward them to Howard. Let me know if you have questions or if there is anything that might cause delay. Many thanks.

-----Original Message-----

**From:** Haas, Howard

**Sent:** Tuesday, June 05, 2007 4:24 PM

**To:** Duane, Vincent P.

**Subject:** RE: HR reports/responses prepared with regard to data requests

SMM - 01759

6/11/2007

Duane,

I appreciate your concerns. In the interim, given time constraints, would it be possible to get the following specific objective data that we need to prepare our response to the FERC data request:

- 1.) When Frank Racioppi interviewed for his current position in Operation Compliance.
- 2.) When Frank Racioppi signed the papers agreeing to his transfer to Operation Compliance.
- 3.) When Bridgid Cummings interviewed for her current position in Operation Compliance.
- 4.) When Bridgid Cummings signed the papers agreeing to her transfer to Operation Compliance.
- 5.) The number of MMU staff that applied for positions outside of the MMU, the positions in question, the dates of those applications and the dates of the interviews (no names) since March 01, 2007.
- 6.) The dates that the MMU presented HR with specific job descriptions for the posting of openings within the MMU since January 2007.
- 7.) The dates that HR posted specific MMU job openings since January 2007.

If there are items on this list that can be provided before the proposed meeting, that would be appreciated.

Howard

-----Original Message-----

**From:** Duane, Vincent P.

**Sent:** Tuesday, June 05, 2007 3:02 PM

**To:** Haas, Howard

**Cc:** Barry SPECTOR

**Subject:** RE: HR reports/responses prepared with regard to data requests

Howard, these are PJM documents and I regard PJM as having the obligation to produce these items to the extent they are responsive to the data requests. I did discuss with Joe today the idea of us coming together to have a fact checking discussion ahead of filing to minimize any unintended deviation from, or misunderstanding of, objective facts. I think this would be a good exercise and one that I gather would address Joe's concerns. Check with him, I think he was going to raise this possibility with his counsel.

Barry Spector will be here tomorrow and we'll be trying to get with Joe to answer some questions he had about potentially confidential information. Perhaps at that point we could set a time (Friday?) for a discussion on facts re headcount, etc.

-----Original Message-----

**From:** Haas, Howard

**Sent:** Tuesday, June 05, 2007 2:51 PM

**To:** Duane, Vincent P.

SMM - 01760

6/11/2007

**Subject:** RE: HR reports/responses prepared with regard to data requests

Vince,

Ultimately, I'm looking for MMU related (coming in or going out) transition plans, job posting dates, interview dates, job acceptance dates and memos related to same--dating back to 2004. Whether that would be easiest to pull from the existing prepared information or a new data pull I will leave to you and HR. I would need that data as soon as possible.

Thanks,

Howard

-----Original Message-----

**From:** Duane, Vincent P.

**Sent:** Tuesday, June 05, 2007 11:04 AM

**To:** Haas, Howard

**Subject:** RE: HR reports/responses prepared with regard to data requests

Howard, HR assembled a collection of information for PJM management review prior to the interviews that some executive management had with Duane Morris. We do not intend to produce all this information in the FERC proceeding, only that which is responsive to the data requests.

If there is some specific MMU document that the MMU needs in order to respond to its data requests, please let me know and I'll seek it out. If it is a PJM record responsive to the data requests directed to PJM, PJM will produce that information in the proceeding.

Call me if this is confusing or you think I'm off base in my thinking.

-----Original Message-----

**From:** Haas, Howard

**Sent:** Monday, June 04, 2007 5:04 PM

**To:** Duane, Vincent P.

**Subject:** FW: HR reports/responses prepared with regard to data requests

Vince,

I understand that HR has provided

SMM - 01761

6/11/2007

material to PJM in response to its efforts to answer the FERC data request in *Allegheny Electric Cooperative, Inc., et al.*, 119 FERC ¶ 61,165 (2007) (May 18 Order) Could we arrange to have a copy of that material?

Thanks,

Howard

-----Original Message-----

**From:** Haas, Howard

**Sent:** Friday, May 25, 2007 3:09 PM

**To:** Wright, Dionne

**Cc:** Mannheimer, Toby; Bowring, Joseph

**Subject:** HR reports/responses prepared with regard to data requests

Dionne,

To the extent that HR has produced or provided, or is in the process of producing or providing, information/reports/data in preparation for PJM's response to FERC data request in *Allegheny Electric Cooperative, Inc., et al.*, 119 FERC ¶ 61,165 (2007) (May 18 Order) please provide any and all such responses to the PJM MMU. Please call Joe Bowring or me with any questions.

Thank you.

Howard J. Haas  
Deputy Market Monitor  
PJM Market Monitoring Unit  
(610) 666 8925

SMM - 01762

6/11/2007

Response to Haas email, dated 6/6/07, 10:32 am.

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SMM - 01763

A summary of staffing notes:

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3/14/07 -- Joe Bowring sends to Dionne Wright a draft copy of the Staffing Justification form for a replacement position. The replacement is for Tom Zadlo. Joe states in his email that he would send a second form for the replacement position of Yan Lin.

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On 4/24/07, the position of Sr. Engineer/Sr. Analyst, MMU was listed in the PJM Post with a closing date of 5/1/07.

SMM - 01764



It is not genius, nor glory, nor love that reflects  
the greatness of the human soul; it is kindness.  
—Henri-Dominique Lacordaire

14

Saturday  
April 2007

*this was immediately after  
Andy off walked by and thanked Frank for work on*

Daily Notes

104th Day 261 Left Week 15

on 4/13 I asked Frank why  
he applied for the job (Perfcomp)  
- he said "he had to"  
- he said "it was a transfer"  
- he said "he was sacrificed"

I told him he didn't have  
to and he told me that  
I didn't know half the  
things going on.

I told him he didn't half  
the things that were going  
on.

I told him he didn't have to be  
and Frank  
said "that's  
my new  
boss!"

- Notes written at  
4:23 immediately  
after conversation  
with Frank.

#### Daily Tracker

Track expenses, e-mail, voice mail, or other information.





## INTEROFFICE MEMORANDUM

Date: 3/21/07  
To: Lindsay Johnston  
From: Dionne Wright  
Subject: Cost Development Task Force and Frank Racioppi

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### Background:

On Wednesday, March 21, 2007, 2:00pm, I met with employee Frank Racioppi, MMU. During this meeting, I spoke with Frank regarding a conversation he had with VP, Andy Ott, Market Services.

Frank stated that on Tuesday, March 20, 2007, Andy Ott requested that Frank meet him in his office to discuss career opportunities and work within the Market Services Division. Frank went on to state that Andy discussed transferring the Cost Development Task Force (CDTF) work to the Market Services areas, specifically within the Performance Compliance department, reporting to manager, Stan Williams.

Frank stated that he believes the work should transfer as CDTF was originally performed in the Markets area and really belongs there based upon the analysis and outcomes. Frank currently works closely with the group and would have no concern working with or for Stan.

Frank stated that his concern(s) surround Joe Bowring's reaction to the news of transferring or working for Markets as Frank believes Joe will feel betrayed. Frank comments that he does not want to become a "political pawn" in the battle between MMU and Markets. Frank also states if Andy Ott assures him that there will be no ill feelings or harsh actions taken against him from anyone (particularly Joe) he would transfer with no problem.

I asked Frank what he wanted to do should the CDTF work be transferred to the Markets Division. Frank stated if the position was posted, he would probably post for it because he likes the work and is extremely knowledgeable in this area. Frank further discussed that Analyst, Bridgid Cummings, has been integral in the analysis and information supplied. Frank recommends if the work moves to Markets that Bridgid transfer with the analytics as well. Frank states that currently due to RPM he is allocating anywhere from 30% – 50% of his time to this work. However, he believes once RPM is established this number will decrease dramatically.



I asked Frank about other projects and work tasks in which he was involved. Below is a summary of these tasks:

- Cost Development Task Force (CDTF) Secretary and task force manager (not the Chair as the Chair must be a manager or higher)
- Actual generator net revenue and financial position analysis (includes accumulating and maintaining all specific generator data detail databases from public sources not received from generation owners)
- Generator mark-up analysis
- Generator cost and market offer bid analysis (this occurs in conjunction with analysis – Energy, parameters, ancillary services)
- RPM capacity market analysis (avoided costs and net revenue)
- Generator cost bid development – act as a liaison to generator market participants for cost bid development
- Theoretical generator net revenues (develop perfect and reasonable dispatch scenarios)
- Develop generator financial position based on Forward Energy Market (OTC) contracts
- MMU analysis specific to: peak loads, supply curve development, PJM total net capacity, operating reserves and mark up

Frank states that although he is a 5c, he is not a supervisor, but more of a technical lead responsible for the aforementioned analysis.

**Potential Outcomes/Recommendations:**

The immediate outcome should Racioppi transfer, is a decrease in staff for the MMU. A review of MMU staffing levels would then be conducted.

The Market Services Division will acquire an experienced lead to further assist in analysis and help with the CDTF function which has transferred the Chair to Market Services. Again, this function, due to the nature of the analysis and end result is better aligned with the work performed in the Performance Compliance department.

Regarding skill sets, work tasks and realignment of work, the position in which Frank Racioppi currently performs would be changed slightly to retain his current role with CDTF, but also provide additional technical experience and analytics necessary for Market Services. As a result of the change in scope it is recommended that a description be developed and posted for the "new" position. This is the standard PJM practice and further allows other employees the opportunity to apply and be given consideration for the position.

**Immediate Next steps:**

- Follow up with employee, Frank Racioppi
- Review and create new position description
- Meet with MMU management on process and staffing implications
- Post position, make selection(s) and transfer work to new department

There is a great deal of information to review regarding this position and transfer of work tasks. I would recommend a review of this information with all involved parties prior to execution.

If you should have any additional questions, please feel free to contact me.

cc: T. S. Mannheimer

412198

SMM - 01767

## Haas, Howard

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**Subject:** HR/MMU update  
**Location:** BC1, B1

**Start:** Thu 4/19/2007 1:00 PM  
**End:** Thu 4/19/2007 2:00 PM  
**Show Time As:** Tentative

**Recurrence:** (none)

**Meeting Status:** Not yet responded

**Required Attendees:** Wright, Dionne; Bowring, Joseph; Haas, Howard; Cawley, Susan; Krawiec, Ellen C.; Scheidecker, Paul; Racioppi, Frank; Bazar, Kevin; Cummings, Bridgid M.; Blair, Tom; Million, Mark A.; O'Neill, John; Gockley, Beatrice; Bell, Francis; Engle, Andrew; Niu, Grace

**Optional Attendees:** RS Attendee; Johnston, Lindsay

**Importance:** High  
**RSOCEntryID:** RSOE\_20070418233449014  
**RsSchedID:** 0

On Thursday, April 19, 2007, 1:00 pm, B1, the MMU staff is invited to a meeting to discuss the design of the MMU retention plan, any employee concerns and retention.

If you should have any questions, please feel free to contact HR Business Partner, Dionne Wright, ext 4618.

\*It is our hope that Joe Bowring maybe available via mobile phone for this session.

SMM - 01/68

Mtg w/ Lindsay and Dionne - 1:00 pm Thurs 4/19/07  
Re: MMU Retention Plan

Get together to discuss retention

- Not suggesting that MMU will be disbanded.
- Not implying there is a definite ending.
- There will be an MMU function
  - just the format changing
  - just a study by the Board about the future.

Ask about AAZ - comments about transition  
this is Audrey's opinion

Putting together a retention plan - b/c anyone who knows that a study is being done would have concerns.

Lindsay say she understands our concerns.

Ask questions at end - if she can't answer, she commits to get answer

Her job is to be our advocates - so that they can represent our interests to mgmt.

Also available to speak us as a group again and one-on-one.

SMIM - 07/69

Reemphasize

- from mgmt perspective - value the role the MMU plays; valuable part of organization goal - to have functioning MMU during this time of uncertainty.

Designed plan to address issues:

- CDTF transition to mktg, no more

transfers

- even when COTF transferred, not taking away functions <sup>of MMU</sup>, of oversight + opinions
- no more functions moving out

II Hope staff will stay in MMU.

- no freeze - don't want to preventing posting for other positions
- Joe + other mgr + Lindsay will discuss transitions

III - Project completion bonus/retention bonus  
- for all employees who stay until decision is made or until outsourced or transition is made  
- if no outsourcing / then when decision

IV - Retention <sup>is made</sup> / project completion bonus:  
Band III - \$10,000

IV - \$15,000

V - \$20,000

- trying to retain people

II normally - If outsourced or no longer internal  
90 days to post for job  
- put ASM in this situation, ASM will "place" us in jobs  
- or outsourcing company may give you a job (ASM will work with outsourcing organization)  
- not be our job to find job - HE will

with us to place us in jobs  
Q: Jack - To be clear, could be outside  
PSM

Lindsay - If outside, with outsourcing  
organization, but will work to keep  
us @ PSM

- Discuss it with you, in terms of  
placement within PSM - not just transfer.

Q HH - ~~be~~ same grade  
LT - "equivalent" job

Q MM - Retention/project bonus  
- commitment to stay a certain  
period of time

Lindsay - yes, but not extremely long one.

Tom Blair - promising not to leave MMU or PSM?

LT - give them at end of time when  
decision is made

- if in June Board says leaving MMU  
as is - get check

- if in <sup>in June - stay</sup> Sept, then Board says leave as  
is - get project/retention bonus then

WLT - asked

AE - asked about if you stay until bonus paid,  
do you get it if you transfer to another  
department

SMIM - 07/11

LG - use ex of MM - Frank Koca -

MM - put it into MMU schedule - are they taking this into account

LS - <sup>-no idea</sup> why would they upset the apple cart

MM - said "that's mgmt"

LS - mgmt has ~~the~~ responsibilities -  
MMU is an essential responsibility and  
FSM has accountability for this

JD - <sup>will</sup> hiring mgt be aware that 15-16 people may be available - hold back positions?

LS - doesn't know - but mgmt will to make guarantee

LS - Tiny minute possibility - lack of work  
3 wk pay/svc min 12 max

- Medical + dental during that time  
(pay continuation)

- outplacement ~~over~~ program  
- sign separation agreement + release  
+ project completion bonus.

Don't think that this is where it is going to end up.

SMM - 07/12

FR - will MMUers being considered same



as other ees even though new dept  
LS - will depend on hiring mgr + position  
+ situation

EK - if you post + commit to other job

LS - ~~present~~ <sup>+ MMU stays</sup> make decision at that time  
that you want to do.

JO - Investigation timeframe?

LS - Don't know - engaged someone -  
very quickly; distressing to everyone;  
need to assure functionality/monitoring (?? <sup>not</sup> sure  
what she said)

BG - study of what is best?

LS - in Strategic Report; discussion at  
annual meeting  
believe - Board decision in June meeting  
- 2 parts of study  
- Board of S.R.  
- If yes, then study of options,  
outside consultant  
- Difference of opinion about who gets  
to make decision about MMU structure  
- Board  
- FERC  
- Like a pending merger -  
- Hope it is quick

AE - Investigation complete + Board study  
<sup>both impact</sup>

LS - only impact investigation could have

on structure

- yes - independence impacted
- No - ~~not problem~~ independence not impinged
- Recommendation

undue influence

JD - investigation look for root causes? He think they may see root cause as being employees - particularly Joe - and recommend  $\Delta$

LS - she thinks investigation will not make recommendations

TB - will lawyers want to talk to us?

LS - depends on their conversations with Joe. They will follow up on where it leads them

TB - deposition? Under oath?

LS - doesn't know. In HR, they take statement + then ask ees to sign statement - affirm truthfulness of deposition  
- don't know enough about case to know

JS - FJB - thinks it inappropriate to discuss in this venue b/c that's not what this meeting is for

SMM - 01/14

JD - other mgrs know? <sup>LS</sup> Has not been broadly shared - generally don't make details

broadcast.

HH - separation letter -

LJ - release of claims - standard letter  
- what you get if you, what happens  
if you don't

JO - allow for return to work?

LJ - not generally - but ~~we~~ could be changed  
- typical one has no return.

MM - Next steps? expect anything from them

LJ - summary, if helpful

HH - yes that would be helpful

DW - FAQ documents too

Feel free to call Dionne and/or Lindsay.

**Bowring, Joseph**

**From:** Bowring, Joseph  
**Sent:** Wednesday, April 18, 2007 7:10 PM  
**To:** Johnston, Lindsay  
**Cc:** Wright, Dionne; Haas, Howard  
**Subject:** RE: We tried to get you on the phone at the appointed time

Lindsay,

- First, please coordinate with Howard and Susan for a time tomorrow, if you think such a meeting is essential. Howard must be at the meeting as I cannot be there tomorrow.
- Second, I believe, given recent events, that PJM should offer all MMU staff a significant single sum retention bonus, payable only if staff stays. I understand that Toby has denied this request. I am again asking you to resubmit this - it is critical in order for the MMU to survive the current situation.
- Third, I think that PJM should cease hiring MMU staff until the MMU issues are resolved. This is entirely consistent with your view that there should be a transition period. I believe that there needs to be an immediate stand down until the MMU issues are resolved.
- Fourth, PJM staff and management should immediately cease all efforts to recruit MMU staff. These conversations are occurring daily and they are inappropriate.
- Fifth, I think that PJM should guarantee every MMU employee a job at PJM should the MMU be eliminated. If you do not think this is appropriate for particular individuals, you should explain why in each case.
- I do not think the actions of PJM or of HR are helpful and in fact I believe that HR's actions are actively harming morale in the MMU. The level of uncertainty that has been created has substantially harmed the ability of the MMU to do its work and there needs to be an immediate remedy. The solutions you described to me when we met and that you plan to propose to MMU staff tomorrow are not adequate as a remedy to the problem created by PJM.
- It is not appropriate for you to tell either me or my staff that there will be a transition when neither the Board or FERC has reached such a conclusion. You and your staff have been assuming and stating in your conversations with MMU staff that there will be a transition that the MMU will not survive. That is neither correct or appropriate until a decision has been made by FERC.
- During this period of uncertainty I request that HR assist us in maintaining a viable and vibrant MMU rather than exacerbating uncertainty, offering condolences for events that have not occurred and encouraging staff to take other jobs in PJM.

Thanks,  
Joe

-----Original Message-----

**From:** Johnston, Lindsay  
**Sent:** Wednesday, April 18, 2007 4:43 PM  
**To:** Bowring, Joseph  
**Cc:** Wright, Dionne  
**Subject:** We tried to get you on the phone at the appointed time

I will be here past 5pm, Dionne has a hard stop. If we don't catch you tonight we can talk by phone tomorrow but I want to meet with the staff tomorrow morning and we will include you by phone and of course Howard.

*J. Lindsay Johnston*  
*Vice President Human Resources*  
PJM Interconnection, L.L.C.  
955 Jefferson Avenue

SMM - 01776

Valley Forge Corporate Center  
Norristown, PA 19403-2497  
610-666-3195 Phone  
610-666-4628 Fax  
610-659-7868 Cell  
[johnsl@pjm.com](mailto:johnsl@pjm.com)

SMM - 01777

6/6/2007



## INTEROFFICE MEMORANDUM

**Date:** 4/24/07  
**To:** MMU employees  
**From:** Lindsay Johnston  
**Subject:** Retention Plan

As discussed, enclosed is a copy of the MMU Retention Plan and PJM Lack of Work Policy for your review.

The Frequently Asked Questions ("FAQ") document will be available for viewing by Friday, April 27, 2007.

If you should have any questions, please feel free to contact, Lindsay Johnston, VP, HR, ext. 3915 or Dionne Wright, HR Business Partner, ext 4618.

## MMU Retention Plan

### Purpose:

To enable MMU staff to work effectively during the consideration of a potential change to the structure of the MMU.

### Retention Plan:

- **Current Structure**
  - No changes to the current MMU structure will be made while the structural study is being considered or conducted or until any required changes are accepted by FERC.
  - No further changes to MMU functions and responsibilities will be made while the structural study is being considered and conducted or until any required changes are accepted by FERC.
- **Interim Postings**
  - MMU Staff may review and consider all postings however, to afford MMU work continuity; staff will be encouraged to remain with MMU unless promotional opportunities are posted. Should MMU staff be the successful candidate for another PJM position outside the MMU, HR will work with Joe Bowring and the hiring manager to establish an appropriate transition plan.
- **Post-Study Employee Placement**
  - In order to allay some of the MMU staff concerns, PJM will commit to make every effort to match each MMU staff member to a comparable PJM position at the conclusion of the MMU Structural Study and when any required changes are accepted by FERC, if the end result is a modification of the MMU structure such that current MMU staff is not required to perform MMU functions.
- **Project Completion Bonus**
  - All MMU staff who remain employed in MMU through the completion of the consideration and conduct of the study and when any required changes are accepted by FERC, will receive a project completion bonus payment according to his or her band level.

Band 2 and 3 employees – \$10,000

Band 4 employees – \$15,000

Band 5 employees – \$20,000

- **Severance**
  - Although considered very unlikely, should PJM be unable to locate an equivalent position for an employee that is satisfactory to the employee, that employee will receive a severance pay continuation equivalent to three weeks per year of service, minimum 12 weeks severance, maximum 52 weeks.
  - Severance will include medical and dental coverage continuation for the severance period and outplacement.
  - In return for severance pay and benefits, a separation agreement and release will need to be signed.



## CORPORATE POLICY

**DIVISION:** Corporate Services

**Version Number:** 3

**DEPARTMENT:** Human Resources

**Version Issue Date:** 7/23/03

**SECTION:**

**Original Issue Date:** 7/1/93

### Lack of Work / Severance Pay Plan

---

**Policy Statement**

It is the policy of PJM Interconnection to take into account the needs of both the business and the employees to be affected when confronted with the necessity to eliminate employment positions due to business requirements.

The policy intent is to maximize the capability of the business to effectively meet present and future needs and to treat the employees whose positions are eliminated fairly and with dignity.

---

**Audience**

This policy applies to all exempt and non-exempt employees of PJM.

---

**Revision Reference**

[Ctrl Click here to view the Revision Reference.](#)

---

**Policy**

This policy shall be implemented by establishing and maintaining the following rules:

A lack of work situation exists when PJM decides that:

- There is no further need for a position.
- Position requirements have been so altered that the incumbent cannot meet them.
- Positions have been consolidated.
- No comparable position is available upon a scheduled return from an approved leave of absence of ninety (90) days or less.
- A general reduction in force is necessary.

**Notification**

- Regular employees are given as much advance verbal notice as practical when they are to be affected by a lack of work situation.
- Formal notification is to be made by letter from the PJM President or his designee.
- PJM endeavors to provide formal notification at least four (4) weeks before any expected layoff or other change in job assignment due to a lack of work situation, if circumstances permit.



## Lack of Work / Severance Package

---

### Retraining of Affected Employees

- Employees in a lack of work situation are permitted to bid on PJM available positions during their formal notice period.
- An employee can be considered for placement in PJM available jobs which he or she may not have previously held if there is reason to believe that the work could be performed satisfactorily within a reasonable time (e.g., 90 days).
- PJM will make reasonable training available to employees to assist them in learning the skills necessary to perform such jobs.

### Layoff

- Employees in a lack of work situation who do not obtain another position within PJM by the end of their formal notice period will be laid off.
- Subject to the approval of PJM, an employee who is not in a lack of work situation may request that he or she be considered for layoff in place of another employee in the same or similar position who otherwise would be laid off.

### Severance Benefits

- As provided in more detail in the PJM Interconnection Severance Pay Plan (Severance Plan), regular full-time and regular part-time employees with at least one year of service who are laid off due to a lack of work situation and who are not offered comparable positions by PJM generally receive severance benefits.
- The following description of the severance benefits is intended only to highlight some of the provisions which are more fully described in the Severance Plan.
- The formal Plan Document is the official document that governs severance benefits, and its terms take precedence over any inconsistent statements made in this policy or elsewhere.
- In general, an eligible employee receives severance pay equal to three weeks of base pay per year of service, but not less than twelve (12) weeks of base pay.
- The maximum severance amount is fifty-two (52) weeks of base pay.
- If a laid-off employee elects to continue medical and/or dental insurance coverage under COBRA, PJM provides continuation of its then-current contribution to the premiums for those benefits during the severance period, or until the employee becomes covered as a result of other employment, whichever occurs first.

### Outplacement Services

- PJM generally provides outplacement services to those regular full-time and regular part-time employees who are laid off under the provisions of this policy to assist them in making the transition to new employment.
- The provider of those services and the extent of the services are selected by PJM.
- The outplacement services are provided at PJM's cost.

---

### Exceptions

None.

---

## **Lack of Work / Severance Package**

---

### **Related Documents**

This policy has the following related documents:

Policy Title(s): Employee Benefits  
Standard Title(s): None  
Procedure Title(s): None  
Document Title(s): PJM Interconnection Severance Pay Plan

---

**Haas, Howard**

---

**From:** Mannheimer, Toby  
**Sent:** Friday, May 18, 2007 4:40 PM  
**To:** Market Monitoring Unit  
**Cc:** Zibelman, Audrey A.; Wright, Dionne  
**Subject:** Enhancements to Retention Program



PJMDOCS-#415235  
-v7-MMU\_Retenti...

The enhanced MMU Retention Program discussed on Monday, May 14, 2007 is attached.

TSM

SMM - 01783



## INTEROFFICE MEMORANDUM

**Date:** May 18, 2007  
**To:** MMU Staff  
**From:** Toby Mannheimer  
**Subject:** Enhancements to MMU Retention Program

---

In recognition of the unique circumstances, PJM will enhance the previously announced MMU retention program.

To reduce anxiety and distraction in the MMU during this period of uncertainty, PJM guarantees a position in PJM or any successor organization to the MMU, to all MMU staff employed as of June 1, 2007. This guarantee is contingent on maintaining acceptable performance as evaluated by the Market Monitor and remaining in the MMU through the duration of the study and its implementation. The company will do its best to provide equivalent positions.

Employees will have the choice whether to accept the offered position. If an employee elects not to accept the position, he or she will be eligible for the severance package previously outlined.

At this time PJM is hopeful that the process be completed within six months. In the event that it extends beyond the end of the year, PJM will enhance the previously announced completion bonuses by \$10,000 in recognition of the extended period of uncertainty.

	<b>Completion Bonus</b>	<b>Enhanced Bonus (eff. 1/1/08)</b>	<b>Potential Total</b>
Band 2 and 3 Employees	\$10,000	+ \$10,000	= \$20,000
Band 4 Employees	\$15,000	+ \$10,000	= \$25,000
Band 5 Employees	\$20,000	+ \$10,000	= \$30,000

cc: Audrey Zibelman  
Joe Bowring  
Dionne Wright

SMM - 01784

## MMU Retention Plan

### Purpose

To enable MMU staff to work effectively during the consideration of a potential change to the structure of the MMU.

### Retention Plan

- Current Structure
  - No changes to the current MMU structure will be made while the structural study is being considered or conducted or until any required changes are accepted by FERC.
  - No further changes to MMU functions and responsibilities will be made while the structural study is being considered and conducted or until any required changes are accepted by FERC.
- Interim Postings
  - MMU Staff may review and consider all postings however, to afford MMU work continuity; staff will be encouraged to remain with MMU unless promotional opportunities are posted. Should MMU staff be the successful candidate for another PJM position outside the MMU, HR will work with Joe Bowring and the hiring manager to establish an appropriate transition plan.
- Post-Study Employee Placement
  - In order to allay some of the MMU staff concerns, PJM will commit to make every effort to match each MMU staff member to a comparable PJM position at the conclusion of the MMU Structural Study and when any required changes are accepted by FERC, if the end result is a modification of the MMU structure such that current MMU staff is not required to perform MMU functions.
- Project Completion Bonus
  - All MMU staff who remain employed in MMU through the completion of the consideration and conduct of the study and when any required changes are accepted by FERC, will receive a project completion bonus payment according to his or her band level.

Band 2 and 3 employees:	\$10,000
Band 4 employees:	\$15,000
Band 5 employees:	\$20,000

- Severance
  - Although considered very unlikely, should PJM be unable to locate an equivalent position for an employee that is satisfactory to the employee, that employee will receive a severance pay continuation equivalent to three weeks per year of service, minimum 12 weeks severance, maximum 52 weeks.
  - Severance will include medical and dental coverage continuation for the severance period and outplacement.
  - In return for severance pay and benefits, a separation agreement and release will need to be signed.



May 14, 2007

From: Special Investigatory Committee on behalf of the PJM Board of Managers

To: The Staff of PJM

Re: **Statement of Board Regarding No Retribution**

The Board wishes to express its appreciation to the PJM employees who have been cooperating openly, fully and candidly with the Special Counsel in the Board's investigation of the allegations of Dr. Joseph Bowring made before the Federal Energy Regulatory Commission on April 5, 2007.

The Board also wishes to reiterate its position expressed at the Annual Meeting of PJM. The Board has directed that there be no retribution or retaliation to employees who are interviewed by Special Counsel or otherwise cooperate in the investigation. If an employee has any questions with respect to this directive, they should be raised with the Board's Special Counsel. Again, thank you for also remaining dedicated to the performance of your normal responsibilities at PJM.

The Board of Managers



*Working to Perfect the Flow of Energy*

PJM Manual 15:  
**Cost Development  
Guidelines**

Revision: 07

Effective Date: August 3, 2006

Prepared by  
Cost Development Task Force

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SMM - 01787



## PJM Manual 15:

**Cost Development Guidelines****Table of Contents**

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## Approval

Approval Date: 08/03/2006  
Effective Date: 08/03/2006

Joseph E. Bowring, Chairman  
Cost Development Task Force

## Revision History

### ***Revision 07 (08/03/2006)***

Exhibit 1—Updated to include the new Manual 30: Alternative Collateral Program.

Section 4—Added definition for Total Fuel-Related Costs for Pumped Storage Hydro Plant Generation.

Section 5—Added guidelines for Long Term Service Contract Cost Recovery.

Exhibit 2—Updated Chronology of Maintenance Adder Escalation Index Numbers for the year 2006.

Section 7—Modified terminology for Spinning Synchronized Reserve.

### ***Revision 06 (03/02/06)***

Added guidelines for no-load fuel costs for Combustion Turbines to Section 1 and Section 2.

Added "Long Term Maintenance Expenses" definition for Combustion Turbine and Combined Cycle Plants to Section 5.

Revisions were made on the following pages: 8, 9, and 20-22.

### ***Revision 05 (08/18/05)***

Updated Exhibit 1 to include new PJM Manuals.

Updated Exhibit 2, Chronology of Maintenance Adder Escalation Index Numbers, for the year 2005.

### ***Revision 04 (09/01/04)***

Insert new section nine into the CDTF manual

### ***Revision 03 (06/01/04)***

Revised table "Chronology of Maintenance Adder Escalation Index Numbers" in Section 5 to reflect figures for the year 2004.

Reformatted to reflect the new PJM format and style.

Updated list of PJM manuals to reflect title changes and additional manuals

***Revision 02 (06/01/03)***

Revised table in Section 5.6, "Chronology of Maintenance Adder Escalation Index Numbers", for the year 2003

***Revision 01 (12/01/02)***

This revision incorporates changes to Section 7: Spinning Cost Guidelines. These changes reflect the rules associated with the new PJM Spinning Reserve Market.

***Revision 00 (12/01/02)***

This revision is the preliminary draft of the PJM Manual for ***Cost Development Guidelines (M-15)***. Prior to Revision 00 of this manual, a document with this name existed under direction of the PJM Operating Committee. Revision 00 was the first issuance of this manual under the approval of the PJM Board of Directors, pursuant to Schedule 2 of the Operating Agreement of the PJM Interconnection, L.L.C.

## Introduction

Welcome to the PJM Manual for **Cost Development Guidelines**. 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 PJM for the operation, planning, and accounting requirements of the PJM RTO and the PJM Energy Market. Exhibit 1 lists the PJM Manuals.

<b>Transmission</b>	M01: Control Center Requirements	M02: Transmission Service Request	M03: Transmission Operations
	M04: PJM OASIS Operation	M05: Power System Application Data	M06: Financial Transmission Rights
<b>PJM Energy Market</b>	M09: PJM eSchedules	M10: Pre-Scheduling Operations	M11: Scheduling Operations
	M12: Dispatching Operations	M13: Emergency Operations	M15: Cost Development Guidelines
	M36: System Restoration		
<b>Generation and Transmission Interconnection</b>	M14A: Introduction to the Generation and Transmission Interconnection Process	M14B: Generation and Transmission Interconnection Planning	M14C: Generation and Transmission Interconnection Facility Construction
	M14D: Generator Operational Requirements	M14E: Merchant Transmission Specific Requirements	M16: eDART Operations
<b>Reserve</b>	M17: Capacity Obligations	M19: Load Data Systems	M20: PJM Reserve Requirements
	M21: Rules and Procedures for Determination of Generating Capability	M22: Generator Resource Performance Indices	M23: eGADS User Manual
	M24: PJM eCapacity	M25b: eFuel 2.0 – User Manual	
<b>Accounting &amp; Billing</b>	M27: Open Access Transmission Tariff Accounting	M28: Operating Agreement Accounting	M29: Billing
	M30: Alternative Collateral Program		
<b>PJM</b>	M33: Administrative Services for PJM Interconnection Agreement	M35: Definitions and Acronyms	

Exhibit 1: List of PJM Manuals

## About This Manual

The PJM Manual for **Cost Development Guidelines** is one of a series of manuals within PJM set of manuals. This manual is maintained by the PJM Cost Development Task Force (CDTF) under the auspices of the PJM Energy Market Committee.

## CDTF Mission

The Cost Development Task Force (CDTF) reports to the PJM Energy Market Committee (EMC) and is responsible for developing, reviewing, and recommending to the EMC standard procedures for calculating the costs of products or services provided to PJM when those products or services are required to be provided to PJM at a cost-based rate.

## CDTF Responsibilities

- Maintain the PJM Cost Development Guidelines Manual. Recommend updates as appropriate.
- Respond to emerging issues and propose appropriate changes in the area of cost development.
- Respond to assignments from the PJM Energy Market Committee (EMC). Provide expertise in the area of cost development and cost data issues to other PJM affiliated groups.
- Recommend improvements to PJM systems, tools, and procedures that facilitate the accurate, practical, and appropriate use and handling of cost data.
- Respond to PJM or regulatory agency audits in the area of cost development.
- Support PJM eMKT System by serving as OI/company interface for cost-based unit data.
- Develop annual maintenance cost escalation factors.
- Implement quarterly update for cost of station service for steam unit startup.

## Purpose

This document exists for the purpose of defining the standard methodologies that are recognized by PJM as appropriate for determining various cost components for use on those occasions and in those markets where products or services are required to be provided to PJM at cost-based rates, as referenced in Schedule 1, Section 6 of the Operating Agreement of PJM Interconnection, L.L.C. Throughout this manual the term "MBTU" is defined as millions of BTUs.

## Accounting Principal Regarding FERC System of Accounts

Whenever there is reference in this manual to a FERC Account it is implicitly understood that the FERC System of Accounts may be replaced by any other accounting method mapped back to the current FERC System of Accounts (see Attachment B) if approved for use by the PJM Market Monitoring Unit (MMU).

## Section Breakdown

The PJM Manual for **Cost Development Guidelines** consists of nine sections. The sections are as follows:

- Section 1: Incremental Heat (or Fuel) Input Guidelines
- Section 2: No-Load Cost Guidelines
- Section 3: Performance Factor Guidelines
- Section 4: Fuel Cost Guidelines
- Section 5: Operating and Maintenance Cost Guidelines
- Section 6: Start Cost Guidelines
- Section 7: Synchronized Reserve Cost Guidelines
- Section 8: Opportunity Cost Guidelines
- Section 9: Regulation Cost Guidelines

## Intended Audience

The intended audiences for the PJM Manual for **Cost Development Guidelines** are:

- PJM Members
- PJM Generator Owners
- PJM staff

## References

The References to other documents that provide background or additional detail directly related to the PJM Manual for **Cost Development Guidelines** are:

- Operating Agreement of PJM Interconnection, L.L.C.
- PJM Open Access Transmission Tariff
- Transmission Owners Agreement
- Reliability Assurance Agreement among Load Serving Entities in the PJM RTO

- PJM West Reliability Assurance Agreement among Load Serving Entities in the PJM West Region
- PJM Manual 10: Pre-Scheduling Operations
- PJM Manual 11: Scheduling Operations
- PJM Manual 14d: Generator Operational Requirements
- PJM Manual 27: Open Access Transmission Tariff Accounting
- PJM Manual 28: Operating Agreement Accounting
- PJM Manual 35: Definitions and Acronyms

## Using This Manual

Because we believe that explaining concepts is just as important as presenting the procedures, we start each section with an overview. Then, we present details and procedures. This philosophy is reflected in the way we organize the material in this manual. The following paragraphs provide an orientation to the manual's structure.

## What You Will Find In This Manual

- A table of contents
- An approval page that lists the required approvals and revision history
- This introduction
- Sections containing the specific guidelines, requirements, or procedures including PJM actions and PJM Member actions
- Attachments



## Section 1: Incremental Heat (or Fuel) Input Guidelines

Welcome to the *Incremental Heat (or Fuel) Input Guidelines* section of the PJM Manual for **Cost Development Guidelines**. In this section, you will find the following information:

- A description of the PJM Incremental Heat (or Fuel) Input Policy and Definitions (see "*Policy and Definitions*").

### Policy and Definitions

#### Cost Development Task Force Heat (or Fuel) Input Policy

All PJM member companies shall develop total heat (or fuel) input versus MW output curves for each of their generating units. The curves then serve as the basis for the theoretical incremental heat (or fuel) input curves for fuel consumption and performance factor development. A company is allowed to use either net or gross MW values in determination of the curves as long as consistency is maintained throughout the cost development process. Information provided to the OI should be on a net MW basis.

#### Incremental Heat (or Fuel) Input Definition

##### *Incremental Heat (or fuel) Input*

The first derivative of the total heat (or fuel) input versus MW output curve determined mathematically or graphically.

#### Guideline for development of Incremental Heat (or Fuel) Input Curves for Steam Units

##### *Standard Curve*

- a. Unit total heat (or fuel) input-output curves will be based on design or comparable unit data modified by actual unit test data (when available).
- b. Data for the total heat (or fuel) input-output curve development ideally would include minimum and maximum load points plus at least two intermediate load points. The input-output curve will be fitted from available data by manual or computer techniques.
- c. This total heat (or fuel) input-output curve (or curves) will be used as the basis for incremental cost and performance factor calculations.
- d. An incremental heat (or fuel) input curve shall be determined mathematically or graphically, based on company practices.

**Guideline for development of Incremental Heat (or Fuel) Input Curves for Combustion Turbines, Diesels and Combined Cycle Units**

***Standard Curve***

- a. Unit total heat (or fuel) input-output curves will be based on design or comparable unit data modified by actual unit test data (when available).
- b. Data for the total heat (or fuel) input-output curve development ideally would include minimum, base and peak (if applicable) load points. The input-output curve will be fitted from available data by manual or computer techniques.
- c. This total heat (or fuel) input-output curve (or curves) will be used as the basis for incremental cost and performance factor calculations.
- d. An incremental heat rate (or fuel) curve shall be determined mathematically or graphically, based on company practices.
- e. For Combustion Turbine generating units, no-load fuel shall be the theoretical or actual fuel burn rate at the point of electric bus synchronization.

## Section 2: No-Load Cost Guidelines

Welcome to the *No-Load Cost Guidelines* section of the PJM Manual for **Cost Development Guidelines**. In this section, you will find the following information:

- A description of the PJM No-Load Cost Guidelines Policy and Definitions (see "*Policy and Definitions*").

### Policy and Definitions

#### Cost Development Task Force No-Load Policy

- No-load fuel consumed shall be at zero net output from test data or through extrapolation of the theoretical input-output curve.
- All PJM member companies shall use the no-load fuel consumed value to develop no-load costs for their units.

#### No-Load Definitions

##### No-Load Cost (\$/Hr)

The No-Load Cost is defined as the total theoretical heat or fuel input at zero net output multiplied by the performance factor, multiplied by the (Total Fuel-Related Cost (TFRC)), plus the No-Load Additional Labor Cost.

##### No-Load Fuel Consumed (MBTU/hour)

The total fuel in MBTU's per hour input to sustain zero net output.

##### No-Load Additional Labor Cost

Additional labor costs in excess of normal station manning requirements for no-load operations.

#### Guidelines for development of No-Load Costs for Generating Units

- a. The fuel associated with unit no-load may be a theoretical value extrapolated from other unit operating data, or may be the result of a specific test performed to document the no-load fuel consumed. Sufficient documentation for each generating unit's no-load point in MBTUs (or fuel) per hour shall consist of a single company contact person and/or document to serve as a consistent basis for scheduling, operating and accounting applications.
- b. Since generating units cannot normally be run stable at zero net output, the fuel input may be determined by extrapolating the total fuel input-output curve to zero net output.
- c. For Combustion Turbine generating units, no-load fuel shall be the theoretical or actual fuel burn rate at the point of electric bus synchronization.

## Section 3: Performance Factor Guidelines

Welcome to the *Performance Factor Guidelines* section of the PJM Manual for **Cost Development Guidelines**. In this section, you will find the following information:

- A description of the PJM Performance Factor Guidelines Policy and Definitions (see "*Policy and Definitions*").

### Policy and Definitions

#### Cost Development Task Force Performance Factor Policy

- The calculated performance factor may be superseded by estimates based on sound engineering judgment. If the period during which estimated performance factors are used exceeds three months, documentation concerning reasons for the override must be maintained and available for review.

#### Performance Factor Definitions

##### Performance Factor

Performance Factor is a factor representing the predicted ratio of actual to theoretical fuel burn for a particular period of time. Actual burn may vary from standard burn due to factors such as unit age or modification, changes in fuel properties, seasonal ambient conditions, etc.

##### Heating Value of Fuel

The heating value of fuel represents the Higher Heating Value (HHV) of fuel, and may be based on any and/or all of:

- As burned test,
- In stock test,
- As received test,
- As shipped test,
- Contract value,
- Seller's invoice,
- Seller's quote,
- Nominal value based on Industry Standard, and
- Any value implied by using primary units of fuel (tons, bbl, gal, etc.) throughout the Performance Factor Calculation, and in the development of Costing Data.

### Like Steam Units

Units having similar ratings and steam conditions and same site location.

### Like Combustion Turbines

1. Same primary manufacturer (not necessarily engine or generator manufacturer, but one with overall system responsibility. For example, Worthington sells CT's with P&W engines and a GE generator. Worthington would be considered the primary manufacturer).
2. Same general frame size - a manufacturer may modify a basic design to produce units with varying capabilities. Units built with such variations may be placed in a single group.

### **Guidelines for development of Performance Factor for Generating Units**

- a. The performance factor represents the predicted ratio of actual to standard (theoretical) fuel burn for a particular period of time. Actual burn may vary from standard burn due to factors such as unit age or modification, changes in fuel properties, seasonal ambient conditions, etc.
- b. The performance factor shall be calculated on either a total fuel consumed or spot check test basis. The performance factor for steam units shall be reviewed (and updated if changed) at least once every twelve months. Factors for combustion turbine, diesel units, and combined-cycle units shall be updated at least once during:
  1. twelve months, or
  2. the year in which a unit reaches 1,000 accumulated running hours since its last performance factor update, whichever represents a longer period of time, not to exceed five years. Requests for exemptions from these time frames should be submitted to the PJM MMU for approval.
- c. Unit performance factors should be applied to start fuel as well as operating fuel. Conditions encountered during the start of certain units may make it preferable to assign separate performance factors for start and operating fuel. If the total fuel approach is used, the performance factor would represent the ratio:

$$\frac{\text{Total Actual Fuel Consumed}}{\text{Total Theoretical Fuel Consumed}}$$

If a separate performance factor is calculated for start fuel prior to calculating the "operating fuel" performance factor, this operating fuel performance factor will represent the ratio:

$$\frac{\text{Total Actual Fuel Consumed} - \text{Actual Start Fuel Consumed}}{\text{Total Theoretical Fuel Consumed} - \text{Theoretical Start Fuel Consumed}}$$

Due to the variability and difficulty in measuring actual start fuel, a company may choose to set a fixed start performance factor of 1.0, implicitly assigning all performance variations to no-load and incremental loading costs. In order to account for all fuel actually consumed, the operating fuel performance factor will represent the ratio:

$$\frac{\text{Total Actual Fuel Consumed} - \text{Total Theoretical Start Fuel Consumed}}{\text{Total Theoretical Fuel Consumed} - \text{Total Theoretical Start Fuel Consumed}}$$

Where:

Total Theoretical Start Fuel Consumed = Fuel quantity used in the start cost calculations

- d. If the total fuel approach is used, fuel quantities measured during start tests should be modified by the performance factor in effect at the time of the test so that theoretical or standard start fuel quantities will be on the same basis as the standard operating fuel quantity.
- e. The overall performance factor can be modified by a seasonal performance factor to reflect ambient conditions.
- f. The calculated performance factor may be superseded by estimates based on sound engineering judgment. If the period during which estimated performance factors are used exceeds three months, documentation concerning reasons for the override must be maintained and available for review.
- g. An average performance factor may be calculated and applied for groups of like units burning the same type of fuel.

## Section 4: Fuel Cost Guidelines

Welcome to the *Fuel Cost Guidelines* section of the PJM Manual for **Cost Development Guidelines**. In this section, you will find the following information:

- A description of the PJM Fuel Cost Guidelines Policy and Definitions (see "Policy and Definitions").

### Policy and Definitions

#### Cost Development Task Force Fuel Cost Policy

- Any PJM member with generating units that may be cost-capped or that choose to bid on a cost-basis must submit a fuel cost policy to the PJM MMU for approval.
- A request to change the method of calculation of Basic Fossil or Nuclear Fuel Cost should be submitted to the PJM MMU for approval in advance of the proposed change.
- If any action by a governmental or regulatory agency external to a company causes a company to change its method of fuel cost calculation, the affected company can institute the revised procedure as soon as practical and shall notify the PJM MMU for approval of any such changes.
- Each company must review and document their fuel costs at minimum once per month (12 times per year). Additionally, each review must occur within forty (40) days of the preceding review. The results of this review will be used to determine whether or not a fuel cost update is necessary.

### Fuel Cost Definitions

#### Total Fuel-Related Costs -

Fossil Steam and Diesels - The sum of the Basic Fuel Cost, applicable Other Fuel-Related Costs and the Maintenance Adder, and SO<sub>2</sub> and NO<sub>x</sub> emission allowance costs.

Combustion Turbine - The sum of the Basic Fuel Cost and the Other Fuel Related Costs and SO<sub>2</sub> and NO<sub>x</sub> emission allowance costs. Combustion Turbine Maintenance Adder is included directly with the individual operating cost components on a \$/hour basis.

Nuclear - The sum of the Basic Fuel Cost and the Maintenance Adder.

#### Basic Fuel Cost –

Cost of fuel as stated in the companies' fuel pricing policy (excluding fixed lease expenses).

#### Leased Fuel Transportation Equipment Cost –

Expenses incurred using leased equipment to transport fuel to the plant gate. If expenses are fixed they must be excluded from fuel cost determination.

#### Incremental Energy Cost –

The Incremental Energy Cost is defined as the incremental heat or fuel required to produce an incremental MWh at a specific unit loading level multiplied by the applicable performance factor, multiplied by the fuel cost plus the appropriate maintenance cost.

#### Total Cost –

The Total Cost is defined as the total theoretical heat or fuel input minus the no-load heat or fuel input at a specific unit loading level, multiplied by the applicable performance factor, multiplied by the fuel cost plus the appropriate maintenance cost, plus the no-load cost.

### **Total Fuel-Related Costs for Fossil Units**

Total fuel-related costs (TFRC) for all fossil-fired steam and diesel units shall be defined as follows:

$$TFRC = A + B + C + D + E$$

Where:

TFRC = Total fuel-related costs

A = Basic fossil-fuel cost

B = Other fuel-related costs

C = SO<sub>2</sub> emission allowance cost

D = NO<sub>x</sub> emission allowance cost

E = Maintenance Adder

Total fuel-related costs for combustion turbines shall be defined as:

$$TFRC = A + B + C + D$$

CT Maintenance Adder is included directly in start, no-load and peak segment components.

#### Basic Fossil-Fuel Cost

1. Each company will be responsible for establishing its own method of calculating delivered fossil-fuel cost, limited to inventoried cost, replacement



cost, or combination thereof, that reflect the way fuel is actually purchased or scheduled for purchase.

2. Each company will thoroughly document its method by letter to the PJM MMU for approval. The documentation will contain examples of the calculation as well as supportive sources of information to be used in the calculation.
3. The method of calculation may be changed by notifying and receiving approval from the PJM MMU in advance of the proposed change.
4. Fossil fuel cost adjustments compensating for previous estimate inaccuracies should not be considered when determining the basic fossil cost component of Total Fuel Related Cost.
5. If any action by a governmental or regulatory agency external to a company causes that company to change its method of fuel cost calculation, the affected company can institute the revised procedure as soon as practical and shall notify the PJM MMU for approval of any such changes.

#### Other Fuel-Related Costs

1. Definition: Fossil Other Fuel-Related Costs. The dollars in FERC Account 501 plus incremental expenses for fuel treatment and pollution control excluding SO<sub>2</sub> and NO<sub>x</sub> emission allowance costs that were not included in Account 501; minus the fuel expenses from FERC Account 151 that were charged into Account 501, all divided by the fuel (heat content or quantity) shifted from Account 151 into Account 501.
2. Definition: Combustion Turbine and Diesel other Fuel-Related Costs. The dollars in FERC Account 547, plus incremental expenses for fuel treatment and pollution control excluding SO<sub>2</sub> and NO<sub>x</sub> emission allowance costs that were not included in Account 547; minus the fuel expenses from FERC Account 151 that were charged into Account 547, all divided by the fuel (heat content or quantity) shifted from Account 151 into Account 547.
3. Escalation of previous year dollar amounts is permitted when the term of calculation exceeds twelve months. When used, escalation factors will be the same as those developed for calculation of incremental Maintenance Adders.
4. The other fuel-related cost components of TFRC may be calculated based on a fixed or rolling average of values from one to five years in length, reviewed (and updated if changed) annually, or a rolling average from twelve to sixty months in length, reviewed (and updated if changed) monthly. Both the term and the frequency of the other fuel-related costs calculation shall be included in the company fuel cost policy.

### SO<sub>2</sub> Emission Allowance

1. Each unit that requires SO<sub>2</sub> emission allowances (EAs) to operate may include in the unit's TFRC the cost (\$/MBTU) of the EAs as determined in the company's SO<sub>2</sub> allowance cost policy.
2. Each company must submit a policy that would state the company's method of determining the cost of SO<sub>2</sub> EAs for approval by the PJM MMU. An example of the calculation must be included in the policy. The method of calculation may be changed by notifying the PJM MMU and receiving approval in advance of the proposed change.
3. The time period used for determining the projected SO<sub>2</sub> discharge and the MBTUs burned must be included in the company's policy and may be based on historical or projected data.
4. For units that have dual fuel firing capability, a company should use different EA factors based on the SO<sub>2</sub> emitted for each particular fuel or fuel mix.

### NO<sub>x</sub> Emission Allowance

1. Each unit that requires NO<sub>x</sub> emission allowances (EAs) to operate may include in the unit's TFRC the cost (\$/MBTU) of the EAs as determined in the company's NO<sub>x</sub> allowance cost policy.
2. Each company must submit a policy that would state the company's method of determining the cost of NO<sub>x</sub> EAs to be approved by the PJM MMU. An example of the calculation must be included in the policy. The method of calculation may be changed by notifying the PJM MMU and receiving approval in advance of the proposed change.
3. The time period used for determining the projected NO<sub>x</sub> discharge and the MBTUs burned must be included in the company's policy and may be based on historical or projected data.
4. For units that have dual fuel firing capability, a company should use different EA factors based on the NO<sub>x</sub> emitted for each particular fuel or fuel mix.
5. NO<sub>x</sub> emissions costs will be included in TFRC only during a NO<sub>x</sub> compliance period and only by affected generating units. Details of the cost calculation methodology and example calculations will be contained in each company's NO<sub>x</sub> Cost Policy. Compliance requirements and dates may vary by geographic region.

### Maintenance Adder

1. Refer to Maintenance Adder sections of "Operating and Maintenance Cost Guidelines".

## Total Fuel-Related Costs for Nuclear Units

Total fuel-related costs for all nuclear units shall be defined as follows:

$$TFRC = A + E$$

Where:

TFRC = Total fuel-related costs

A = Basic nuclear fuel cost

E = Maintenance Adder

### **DEFINITIONS:**

#### **Basic Nuclear Fuel Cost**

Basic nuclear fuel cost shall be based on the dollars in FERC Account 518, less in-service interest charges (whether related to fuel that is leased or capitalized). This quantity shall be calculated in units of dollars per MBTU, as forecast for the applicable fuel cycle.

#### **Maintenance Adder**

Refer to Maintenance Adder sections of "Operating and Maintenance Cost Guidelines".

#### **Method of Changing Nuclear Fuel Pricing Policy**

If, in the future, a company wishes to change its method of calculation of nuclear TFRC, the company shall notify the PJM MMU in writing, to be approved before the beginning of the fuel cycle in which the new method is to become effective.

If any action by a government or regulatory agency external to a company causes that company to change its method of fuel cost calculation, the affected company can institute the revised procedure as soon as practical. The company shall notify the PJM MMU for approval of any such change.

#### **Sample Calculation**

Each company which operates a nuclear unit will thoroughly document its method by letter to the PJM MMU for approval. The documentation will contain examples of the calculation as well as supportive sources of information to be used in the calculation.

### Total Fuel-Related Costs for Pumped Storage Hydro Plant Generation

Total fuel-related costs for all pumped storage hydro units shall be defined as follows:

$$TFRC = A + E$$

Where:

TFRC = Total fuel-related costs

A = Basic pumped storage fuel cost

E = Maintenance Adder

#### **DEFINITIONS:**

##### Basic Pumped Storage Fuel Cost

Pumped storage fuel cost shall be calculated on a seven (7) day rolling basis by multiplying the real time bus LMP at the plant node by the actual power consumed when pumping divided by the pumping efficiency. The pumping efficiency is determined annually based on actual pumping operations or by Original Equipment Manufacturer (OEM) curves if annual data is not available due to the immaturity of the unit. The following equations govern pumping storage fuel cost:

$$PPC = [RT\ LMP \times PP]$$

Where:

PPC = Pumping Power Cost (\$/MWh) based on a 7 day rolling total

RT LMP = Real Time LMP (\$/MWh)

PP = Pumping Power (MWh)

$$PSFC = [PPC / PE]$$

Where:

PSFC = Pumped Storage Fuel Cost (\$/MWh)

PPC = Pumping Power Cost (\$/MWh) based on a 7 day rolling total

PE = Pumping Efficiency (expressed in decimal format)

Pumping Efficiency (PE) is calculated by dividing the MWh of generation produced while operating in generation mode by the MWh required to pump the water required

to produce that generation MWh. For example, it requires 1,000 ft<sup>3</sup> to produce 1 MWh of generation as water flows from the pond to the sink and it requires 2 MWh of pumping load to pump 1,000 ft<sup>3</sup> of water from the sink to the pond. The resultant efficiency is:

$$1 \text{ MWh (generation)} / 2 \text{ MWh (pumping load)} = 0.50$$

In order to account for environmental and physical factors associated with the characteristics of the pond and pumping operations that limit the accuracy of calculating short term pumping efficiency, a seven day rolling total of pumping and generation MWh are utilized for pumping efficiency calculations.

PE can be calculated by one of three methods. An owner must make the choice of method by December 31<sup>st</sup> prior to the year of operation and can not change to another method for a period of one calendar year.

Option 1: Twelve month calendar actual Pumping Efficiency.

The previous 12 month calendar year average Pumping Efficiency based on actual pumping operations.

Option 2: Three month rolling Pumping Efficiency.

The previous three months rolling actual efficiency where the average monthly availability is 50% or greater. The calculation must be updated after each month.

Option 3: The previous month actual Pumping Efficiency.

The previous month actual efficiency where the availability is 50% or greater. The calculation must be updated monthly.

#### Maintenance Adder

Refer to Maintenance Adder sections of "Operating and Maintenance Cost Guidelines."

#### Method of Changing Pumped Storage Fuel Pricing Policy

If, in the future, a company wishes to change its method of calculation of pumped storage TFRC, the company shall notify the PJM MMU in writing by December 31<sup>st</sup> prior to the year of operation, to be approved before the beginning of the cycle in which the new method is to become effective. The new cycle starts on February 1<sup>st</sup> and continues for a period of one year. If any action by a government or regulatory agency external to a company causes that company to change its method of fuel cost calculation, the affected company can institute the revised procedure as soon as practical. The company shall notify the PJM MMU for approval of any such change.

### **Charges for Leased Fuel Transportation Equipment**

- When calculating the total fuel related costs, fixed charges for transportation equipment (e.g., pipelines, train cars, and barges) should be excluded. Dollars that represent lease charges are considered fixed charges if the total amount to be paid over a period of time is fixed regardless of the amount of fuel transported. Should the terms of the lease agreement be such that there is a fixed charge plus a charge for every unit of fuel delivered, the "charge per unit of fuel delivered" should be included in the FOB delivered cost or in the calculation of the "other fuel related costs" as per the documented fuel pricing policy of each company.
- The above guideline applies when a unit, plant, or system is served totally by leased fuel transportation equipment. When fuel is supplied by both leased and common carrier fuel transportation systems, the common carrier rate should be included in the FOB delivered cost or included in the calculation of the "other fuel related costs" as per the documented fuel pricing policy of each company. This assumes that the leased fuel transportation equipment would serve base fuel requirements, while common carrier deliveries would change, based on incremental generation changes.

## Section 5: Operating and Maintenance Cost Guidelines

Welcome to the *Operating and Maintenance Cost Guidelines* section of the PJM Manual for **Cost Development Guidelines**. In this section, you will find the following information:

- A description of the PJM Operating and Maintenance Cost Guidelines Policy and Definitions (see "*Policy and Definitions*").

### Policy and Definitions

#### Cost Development Task Force Operating and Maintenance Cost Policy

- The PJM MMU will review the Maintenance Adders for all units to which Schedule 1, Section 6 of the Operating Agreement of PJM Interconnection, L.L.C. applies.
- The Maintenance Adder is based on all available maintenance history for the defined Maintenance Period regardless of unit ownership. The Maintenance Adder should be reviewed (and updated if changed) at least annually.
- If a company feels that a unit modification or required change in operating procedures will affect the unit's Maintenance Adder, the revised Maintenance Adder must be submitted to the PJM MMU for approval.
- Steam units at a plant, or like CT units, may be grouped for maintenance cost development.

#### Operating and Maintenance Adder Definitions

##### Fossil Steam or Nuclear - Maintenance Adder

The dollars per unit of fuel (or heat) as derived from FERC Accounts 512 and 513 for fossil steam units and FERC Accounts 530 and 531 for nuclear steam units.

##### Combustion Turbine - Maintenance Adder

Total dollars from FERC Account 553 divided by Equivalent Service Hours (ESH).

##### Industrial Combustion Turbine

One in which the generator is tied to the prime mover via a mechanical linkage.

##### Aircraft - Type Combustion Turbine

One in which the generator is driven by a free turbine. Hot exhaust gases from one or more engines are used to spin the free turbine.

##### Diesel - Maintenance Adder

Total dollars from FERC Account 553 divided by total fuel burned (in MBTUs or other unit of fuel).

### Escalation Factor

The annual escalation factor is derived from the July Handy - Whitman Index Table E-1, line 6, "construction cost electrical plant".

### Combustion Turbine Start

For the purpose of calculating combustion turbine maintenance cost, only the number of successful starts to synchronization shall be used. Successful starts should include those for PJM, a company and for test.

### Combined Cycle - Maintenance Adder

The dollars per unit of fuel (or heat) as derived from FERC Accounts 512, 513, and 553. If submitting as a simple cycle combustion turbine, use total dollars from FERC Account 553 divided by Equivalent Service Hours (ESH).

### Maintenance Period

A rolling 20-year historical period based on calendar year.

### Incremental Adjustment Parameter

Any variable cost incurred in the production of energy for PJM dispatch, not included in the CDTF guidelines for Total Fuel Related Costs or Maintenance Adder. This includes water injection costs, Title 5 emission fees, and any other variable cost which has been previously approved by the PJM MMU for inclusion.

### Long Term Maintenance Expenses

Combustion Turbine and Combined Cycle Plant major inspection and overhaul expenses may be included in variable maintenance expenses regardless of accounting methodology if they meet specific criteria. In order to be included in variable maintenance expenses, these costs must represent actual expenditures that are due to incremental degradation of generating equipment directly related to generation, starts or a combination of both. Expenditures that are not directly related to such operation may not be included in variable maintenance expense. It must be clear that these costs would have been included in the appropriate FERC Accounts as described in this section. A detailed listing of all proposed long term maintenance costs must be submitted to the PJM MMU for approval.

Combustion Turbine and Combined Cycle Plant major inspection and overhaul costs categories include but are not limited to the following:

1. Combustion Turbine Generator Inlet Air System
  - a. Inlet Air Filter Replacement
  - b. Evaporative cooling system media replacement
  - c. Mechanical inlet air cooling chiller and pump inspection and overhaul
2. Fuel System
  - a. Fuel Gas Compressors Inspection and Overhaul
  - b. Distillate Fuel Pumps Inspection and Overhaul



3. Water Treatment
  - a. Resin Replacement
  - b. RO Cartridges Replacement
4. Environmental
  - a. SCR and/or CO Reduction Catalyst Replacement
5. Combustion Turbine Generator ("CTG")
  - a. Combustion Inspections
    - i. Parts
    - ii. Labor
    - iii. Rentals
    - iv. Specialized technical expertise and support
  - b. Hot Gas Path Inspect
    - i. Parts
    - ii. Labor
    - iii. Rentals
    - iv. Specialized technical expertise and support
  - c. Major Overhaul
    - i. Parts
    - ii. Labor
    - iii. Rentals
    - iv. Specialized technical expertise and support
  - d. Electric Generator Inspection and Overhaul
    - i. Parts
    - ii. Labor
    - iii. Rentals
    - iv. Specialized technical expertise and support
6. Heat Recovery Steam Generator ("HRSG")
  - a. Chemical Cleaning or Hydro-Blasting of Heat Transfer Surfaces
  - b. BFW Pump Inspection and Overhaul
  - c. Heat Transfer Surface Replacements
  - d. Casing Repair and Replacements
7. Steam Turbine Generator ("STG")
  - a. Major Overhaul
    - i. Parts
    - ii. Labor
    - iii. Rentals
    - iv. Specialized technical expertise and support
  - b. Electric Generator Inspection and Overhaul
    - i. Parts
    - ii. Labor
    - iii. Rentals
    - iv. Specialized technical expertise and support

8. Surface Condenser
  - a. Chemical Cleaning or Hydro-Blasting of Heat Transfer Surfaces
  - b. Condensate Pump Inspection and Overhaul
  - c. Heat Transfer Surface Replacements
9. Cooling Tower
  - a. Circulation Pump Inspection and Overhaul
  - b. Cooling Tower Fan Motor and Gearbox Inspection and Overhaul
  - c. Replacement of Cooling Tower Fill and Drift Eliminators

### Nuclear and Fossil Steam Units

Sample Formula of Maintenance Adder for the Year 1998

$$TMD = (A + B - C)_{97} \times \frac{F_{98}}{F_{97}} + (A + B - C)_{96} \times \frac{F_{98}}{F_{96}} + \dots + (A + B - C)_{78} \times \frac{F_{98}}{F_{78}}$$

$$TFuel = Fuel_{97} + Fuel_{96} + Fuel_{95} + \dots + Fuel_{78}$$

$$TSD = C_{97} \times \frac{F_{98}}{F_{97}} + C_{96} \times \frac{F_{98}}{F_{96}} + \dots + C_{78} \times \frac{F_{98}}{F_{78}}$$

$$TS = S_{97} + S_{96} + S_{95} + \dots + S_{78}$$

$$MA_{98} = \frac{TMD}{TFuel}$$

$$SMA_{98} = \frac{TSD}{TS}$$

Where:

TMD = Total Maintenance Dollars (for the Maintenance Period)

A = Total dollars in FERC Account 512 (FERC Account 530 for nuclear units).

B = Total dollars in FERC Account 513 (FERC Account 531 for nuclear units).

Where:

- C = Costs included in FERC Accounts 512 and 513 (FERC Accounts 530 and 531 for nuclear units) that a company determines are start-up related.
- F = Escalation Factor for a particular year, as developed by the CDTF - based on Handy - Whitman Index. (See Chronology of Maintenance Adder Escalation Index Numbers, exhibit 2.)
- TFuel = Total fuel burn or heat released (for same years as used in TMD).
- Fuel = Total annual fuel consumed (expressed in tons, barrels, gallons, or etc.) total annual heat released (expressed in MBTUs, etc.).
- TS = Total Starts
- TSD = Total Start maintenance Dollars
- S = Number of Starts per year.
- MA = Maintenance Adder (\$/unit of fuel or heat)
- SMA = Start Maintenance Adder (\$/start-up)

Comments:

1. Total Maintenance Dollars (TMD) plus Total Start maintenance Dollars (TSD) cannot exceed Total dollars in FERC Accounts 512 and 513 (FERC Accounts 530 and 531 for nuclear units).
2. Units with less than seven years of history are considered immature. Such units can be assigned their calculated MA and/or SMA, or a forecast value, subject to approval by the PJM MMU.

### Combustion Turbine Maintenance Cost Calculation

- The Maintenance Adder for combustion turbines will be calculated and applied on a "per equivalent service hour" basis. The calculation will be based on actual operation and escalated maintenance expenses for all available years in the Maintenance Period.

### Combined Cycle / Combustion Turbine Long Term Service Contract Cost Recovery

A generation owner that has a currently effective Long Term Service Contract (LTSA) with a third party vendor to provide overhaul and maintenance work on a Combustion Turbine (CT) either as part of a Combined Cycle (CC) plant or as a

stand alone CT, may file with the PJM MMU for inclusion of any variable long term maintenance costs in cost based offer bids if the following conditions are met:

1. the included variable long term maintenance costs are consistent with the definition of such costs in the Cost Development Guidelines;
2. the dollar value of each component of the variable long term maintenance costs is set specifically in the LTSA.

LTSA contracts must be submitted directly to the PJM MMU for review and approval and must be currently effective.

### ***CALCULATION OF HISTORICAL RATE***

#### **Equivalent service hours (ESH)**

$$ESH = (A \times \text{number of starts}) + Z \text{ hours} + (B \times Y \text{ hours})$$

Where:

A = Cyclic starting factor (A = 5.0 for aircraft - type CT's; A = 10.0 for industrial - type CT's)

For example, the incremental maintenance charged to one start on an industrial - type CT is equivalent to the incremental maintenance attributable to ten hours of base load operation.

B = Cyclic peaking factor (B = 3.0 for all CT's)

This means that the additional incremental maintenance charged to the incremental energy between base and peak loads is equivalent to the incremental maintenance attributable to three hours of base load operation.

Z = Total unit operating hours at any load level.

Y = Hours above base load temperature limit.

**Note:** ESH must be calculated using all available history in the Maintenance Period. PJM members may propose alternative cyclic starting factors or cyclic peaking factors for individual units. Such alternative factor proposals should include supporting documentation (e.g., manufacturer recommendation) of this new factor, to be reviewed for approval by the PJM MMU, on a case-by-case basis.

Total Maintenance Dollars (TMD) sample calculation for 1998

$$TMD = D_{97} \times \frac{F_{98}}{F_{97}} + D_{96} \times \frac{F_{98}}{F_{96}} + \dots + D_{78} \times \frac{F_{98}}{F_{78}}$$

Where:

D = Total dollars in FERC Account 553 for a particular year.

F = Escalation Factor for a particular year as developed by the CDTF - based on Handy - Whitman Index. (See Chronology of Maintenance Adder Escalation Index Numbers, exhibit 2.)

**Note:** TMD must be calculated for the same historical period as ESH.

### Equivalent Hourly Maintenance Cost (in \$/hour) (EHMC)

$$EHMC = \frac{TMD}{ESH}$$

Where:

TMD = Total maintenance dollars

ESH = Equivalent service hours

#### Comments:

1. Units with less than seven years of history are considered immature. Such units can be assigned either their calculated EHMC, or a forecast value, subject to approval by the PJM MMU.
2. If any unit in a block is at least seven years old, then all like units on the block may be considered mature.

### APPLICATION OF EHMC TO FUTURE OPERATION

Rates assigned to future operation.

$$\text{Starting Maintenance Cost } (\$/\text{Start}) = A \times EHMC$$

Where:

A = Cyclic starting factor as defined under Section 5.4

$$\text{Hourly Maintenance Cost } (\$/\text{Hour}) = EHMC$$

This hourly value is assigned as a capacity cost and is independent of unit loading.

$$\text{Peak Incremental Maintenance Rate } (\$/\text{MWh}) = \frac{B}{\text{peak pickup}} \times EHMC$$

Where:

B = Cyclic peaking factor as defined under Section 5.4

Peak pickup is equal to the difference between a CT's energy outputs at base and at peak loading levels.

**Note:** This dollars-per-MWh value is included in the peak energy block.

#### Comments:

1. The above formulations are applicable for determination of Maintenance Adders for both aircraft and industrial type combustion turbines.

- CT incremental costs can be developed and applied on either a unit-by-unit basis or by groups of units.

### **Combustion Turbine Maintenance Adder Example**

(Industrial Unit)

Peak Hours  
y = 200 Hrs.

Service Hours  
Z = 2000 Hrs. (Total Base Peak Hours)  
No. of Starts = 300      Peak Pickup = 5 MW

#### Calculation

- TMD = \$100,000 (Actual historical maintenance data escalated to present value).
- A = 10, B = 3 (**Note:** A = 5 for aircraft engine CT's).

$$\text{Equivalent Hourly Maintenance Cost (EHMC)} = \frac{\$100,000}{(10 \times 300) + 2,000 + (3 \times 200)} \\ = \$17.86/\text{Hr.}$$

- Calculation of maintenance rates

$$\begin{aligned} \text{Starting Maintenance Cost} &= A \times \text{EHMC} \\ &= 10 \times \$17.86 \\ &= \$178.60 \text{ per start} \end{aligned}$$

$$\begin{aligned} \text{Hourly Maintenance Rate} &= \text{EHMC} \\ &= \$17.86/\text{Hr.} \end{aligned}$$

$$\begin{aligned} \text{Peak Incremental Maintenance Rate} &= \frac{B}{\text{peak pickup}} \times \text{EHMC} \\ &= \frac{3 \times \$17.86}{5} \\ &= \$10.72/\text{MWh} \end{aligned}$$

### **Diesel Incremental Maintenance Adder Calculation**

- The incremental Maintenance Adder for diesel units will be calculated and applied on a "per MBTU (or other unit of fuel)" basis. The calculation will be based on actual operation and escalated maintenance expenses for all available history in the Maintenance Period.

### **CALCULATION OF MAINTENANCE ADDER**

- a. Total maintenance dollars (TMD) must be calculated for all years in the Maintenance Period.

#### **1998 Sample Calculation**

$$TMD = D_{97} \times \frac{F_{98}}{F_{97}} + D_{96} \times \frac{F_{98}}{F_{96}} + \dots + D_{78} \times \frac{F_{98}}{F_{78}}$$

Where:

D = Total dollars in FERC Account 553 for a particular year.

F = Escalation Factor for a particular year, as developed by CDTF - based on Handy - Whitman Index (See Chronology of Maintenance Adder Escalation Index Numbers, exhibit 2.)

- b. Total fuel burned (in MBTU or other unit of fuel) is summed for the same historical period used in the TMD calculation.
- c. The Maintenance Adder (MA) to be applied to future operation is equal to TMD divided by total fuel burned.

#### **Notes:**

1. Units with less than seven years history are considered immature. Costs for such units can be developed using either an assigned Maintenance Adder (subject to acceptance by the PJM MMU) or their actual calculated MA value.
2. Diesel Maintenance Adders can be calculated on either a unit by unit basis or by groups of units.
3. If any unit in a group is at least seven years old, then all units in the group are considered mature.

### Chronology of Maintenance Adder Escalation Index Numbers

YEAR	INDEX	ESCALATION FACTOR
1986	260	1.958
1987	265	1.921
1988	287	1.774
1989	300	1.697
1990	308	1.653
1991	315	1.616
1992	322	1.581
1993	334	1.524
1994	346	1.471
1995	358	1.422
1996	363	1.402
1997	375	1.357
1998	383	1.329
1999	389	1.308
2000	415	1.227
2001	425	1.198
2002	438	1.162
2003	441	1.154
2004	465	1.095
2005	493	1.032
2006	509(est.)	1.000

*Exhibit 2: Chronology of Maintenance Adder Escalation Index Numbers*



## Section 6: Start Cost Guidelines

Welcome to the *Start Cost Guidelines* section of the PJM Manual for **Cost Development Guidelines**. In this section, you will find the following information:

- A description of the PJM Start Cost Guidelines Policy and Definitions (see "Policy and Definitions").

### Policy and Definitions

#### Cost Development Task Force Start Cost Policy

- Companies may apply engineering judgment to manufacturers' data, operational data, or the results of start tests in order to derive the components of unit start cost. A record of the results of these determinations shall be kept on file by each company for use as a single, consistent basis for scheduling, operating, and accounting applications. These records shall be made available to the PJM MMU upon request.

#### Definitions

##### **Start Cost**

The dollars per start as determined from start fuel, total fuel-related cost, performance factor, electrical costs, start maintenance adder, and additional labor cost, if required above normal station manning levels.

##### **Ramping**

Unit ramping data shall be developed for all fossil-fired marginal steam units based on an operating test, historical operating data, unit operating instructions/procedures, technical and/or operational specifications.

Unit Ramping should define the rate of unit MW pickup:

- From unit synchronization to normal minimum,
- From/to unit normal minimum to/from unit normal maximum, and
- From unit normal minimum to breaker opening

These rates should be expressed as megawatts per minute and may be differentiated based on fuel type and start condition for each unit.

##### Fossil Steam Ramping

Ramping shall be defined as the time to move from one operating level or condition to another.

### Ramp Time

Shall be expressed in minutes and shall be the typical value for average conditions. Separate values for hot, intermediate, and cold start conditions can be used if available.

### Normal Ramp Rate to Normal Minimum

This ramping segment shall be the normal minimum energy divided by the ramping time from synchronization to minimum. This value will be expressed as megawatts per minute. The theoretical energy available for this period will be the area of the triangle defined by these points.

### Normal Shutdown Ramp Rate from Normal Minimum

A similar process shall be used for units being taken off line but the normal shutdown ramp rate may be different from the ramp rate to normal minimum.

### Unit Operating Ramp Rate

The unit operating ramp rate shall be in effect at all times other than during the ramp up and ramp down defined above. The rates are expressed as megawatts per minute.

UNIT RAMP RATES SHOULD BE EVALUATED ONCE A YEAR AND REFLECT CURRENT OPERATING PHILOSOPHY.

### **Station Service Rate**

A \$/MWh value based on the 12-month rolling average off-peak energy prices updated quarterly by the Office of the Interconnection.

### **Start Fuel**

Fuel consumed from first fire of start process (initial reactor criticality for nuclear units) to breaker closing (including auxiliary boiler fuel) plus fuel expended from breaker opening of the previous shutdown to initialization of the (hot) unit start-up, excluding normal plant heating/auxiliary equipment fuel requirements.

### **Steam Unit Start Cost Components**

Detailed below are the components of hot start cost, intermediate start cost, and cold start cost.

#### Hot Start Cost

Hot start cost is the expected cost to start a steam unit, which is in the "hot" condition. Hot conditions vary unit by unit, but in general, a unit is hot after an overnight shutdown. Components of hot start cost include:

- a. Total fuel-related cost from first fire of start process (initial reactor criticality for nuclear units) to breaker closing (including auxiliary boiler fuel) priced at the cost of fuel currently in effect, plus (+) shutdown fuel cost defined as the cost of fuel

expended from breaker opening of the previous shutdown to initialization of the (hot) unit start-up, excluding normal plant heating/auxiliary equipment fuel requirements.

- b. Plus (+) station service from initiation of start sequence to breaker closing (total station use minus normal base station use) priced at the Station Service rate.
- c. Plus (+) station service after breaker opening during shutdown (station service during shutdown should be that associated with the normal unit auxiliary equipment operated during shutdown in excess of base unit use, this station service is not to include maintenance use or non-normal use) priced at the Station Service rate.
- d. Plus (+) additional labor costs in excess of normal station manning requirements that are incurred when starting the unit.
- e. Plus (+) Start Maintenance Adder.

#### Intermediate Start Cost

Intermediate start cost is the expected cost to start a steam unit during a period where neither hot nor cold conditions apply. Use of intermediate start cost is optional based on company policy and physical machine characteristics. The only restriction is that once an intermediate start cost is defined for a unit, the cost must be used consistently in scheduling and accounting. Components of intermediate start cost include:

- a. Total fuel-related cost from first fire (initial reactor criticality for nuclear units) to breaker closing (including auxiliary boiler fuel) priced at the cost of fuel currently in effect, plus (+) shutdown fuel cost defined as the cost of fuel expended from breaker opening of the previous shutdown to initialization of the (intermediate) unit start-up, excluding normal plant heating/auxiliary equipment fuel requirements.
- b. Plus (+) station service from initiation of start sequence to breaker closing (total station use minus normal base station use) priced at the Station Service rate.
- c. Plus (+) station service after breaker opening during shutdown (station service during shutdown should be that associated with the normal unit auxiliary equipment operated during shutdown in excess of base unit use, this station service is not to include maintenance use or non-normal use) priced at the Station Service rate.
- d. Plus (+) additional labor costs in excess of normal station manning requirements that are incurred when starting the unit.
- e. Plus (+) Start Maintenance Adder.

### Cold Start Cost

Cold start cost is the expected cost to start a steam unit which is in the "cold" condition. Cold conditions vary unit by unit, but in general, a unit is cold after a two or three-day shutdown. Components of cold start cost include:

- a. Total fuel-related cost from first fire (initial reactor criticality for nuclear units) to breaker closing (including auxiliary boiler fuel) priced at the cost of fuel currently in effect, plus (+) shutdown fuel cost defined as the cost of fuel expended from breaker opening of the previous shutdown to shutdown of equipment needed for normal cool down of plant components, excluding normal plant heating/auxiliary equipment fuel requirements.
- b. Plus (+) station service from initiation of start sequence to breaker closing (total station use minus normal base station use) priced at the Station Service rate.
- c. Plus (+) station service after breaker opening during shutdown (station service during shutdown should be that associated with the normal unit auxiliary equipment operated during shutdown in excess of base unit use, this station service is not to include maintenance use or non-normal uses) priced at the Station Service rate.
- d. Plus (+) additional labor costs in excess of normal station manning requirements that are incurred when starting the unit.
- e. Plus (+) Start Maintenance Adder.

### Time Line Breakpoint

The downtime duration limits (in hours) for hot, intermediate, and cold start conditions vary unit by unit based on physical unit characteristics and company operating policy. However, a breakpoint must be established for all units with start-up costs.

### **Combustion Turbine and Diesel Unit Start Cost Components**

Start costs for all non-regenerative combustion turbines and diesel units shall include only the following components:

- a. Cost of start fuel (basic fuel cost plus fuel handling and other fuel-related costs) from first fire to unit breaker closing, Plus (+) cost of shutdown fuel from unit breaker opening to fuel valve closure (basic fuel cost plus fuel handling and other fuel-related costs).
- b. Plus (+) incremental labor costs in excess of normal station manning requirements (only when necessary to start a combustion turbine unit).
- c. Plus (+) station service from initiation of start sequence to breaker closing (total station use minus normal base station use) priced at the Station Service rate.

- d. Plus (+) station service after breaker opening during shutdown (station service during shutdown should be that associated with the normal unit auxiliary equipment operated during shutdown in excess of base unit use, this station service is not to include maintenance use or non-normal uses) priced at the Station Service rate.
- e. Plus (+) Starting Maintenance Cost.

### **Combined Cycle Cost Components**

Start costs for Combined Cycle (CC) plants shall include only the following components:

- a. Cost of start fuel (basic fuel cost plus fuel handling and other fuel-related costs) from first CT fire to breaker closing for the steam turbine generator, as measured during a normal start sequence, plus (+) the cost of shutdown fuel (components as defined above) from breaker opening for the steam turbine generator to fuel valve closure.
- b. Plus (+) cost of start fuel (components as defined above) from CT first fire to the point where heat recovery steam generator (HRSG) steam pressure matches steam turbine inlet pressure, for any CT unit/HRSG combinations started after synchronization of the steam turbine generator.
- c. Plus (+) station service from initiation of start sequence of initial combustion turbine to breaker closing of the steam turbine generator (total station use minus normal base station use) priced at the Station Service rate.
- d. Plus (+) station service after breaker opening of the last component when finished operating as a combined cycle unit, priced at the Station Service rate. (Station service during shutdown should be that associated with the normal unit auxiliary equipment operated during shutdown in excess of base unit use. This station service is not to include maintenance use or non-normal uses.)
- e. Minus (-) the integration of net generation from CT synchronization to steam turbine generator synchronization (1) or to HRSG steam output at line pressure (2), priced at the actual cost of the unit.
- f. Minus (-) the integration of net generation during the shutdown period, priced at the actual cost of the unit.
- g. Plus (+) incremental labor costs in excess of normal station manning requirements (only when necessary to start the CC unit).
- h. Plus (+) Start Maintenance Adder. This quantity includes both the previously defined CT Starting Maintenance Cost and equivalent hourly maintenance for the periods from CT breaker closing to steam turbine generator breaker closing and from steam turbine generator breaker opening at the start of unit shutdown to CT breaker opening.

- i. The total of (a) through (h) above will never be less than \$0.

## Section 7: Synchronized Reserve Cost Guidelines

Welcome to the *Synchronized Reserve Cost Guidelines* section of the PJM Manual for **Cost Development Guidelines**. In this section, you will find the following information:

- A description of the PJM Synchronized Reserve Cost Guidelines Policy and Definitions (see “*Policy and Definitions*”).

### Policy and Definitions

#### Cost Development Task Force Synchronized Reserve Cost Policy

- Companies that request and receive reimbursement from PJM for the costs associated with operating a generating unit in the condensing mode or for altering the output of a generator at the request of PJM in order to provide Spinning Synchronized Reserves must maintain records to document how those costs were calculated. These records shall be made available to PJM upon request.

#### Combustion Turbine and Diesel Unit Costs to Condense

Total synchronous condensing costs for combustion turbines and diesel units shall include the following components:

- a. Start costs, if applicable. Start costs shall be applied when a unit moves from cold to condensing operations and also when a unit moves from condensing operations to energy generation, but shall not be applied when a unit moves from energy generation to condensing operations.
- b. Plus (+) variable Operating and Maintenance cost (EHMC from section 5.4.1) in \$/Hr divided by the Spinning MW provided.
- c. Plus (+) the actual cost of power consumed during condensing operations at real time bus LMP as determined by Market Settlements. MW consumed must be included in the offer.
- d. Plus (+) opportunity costs (for the MW of spin provided) as determined by PJM Market Settlements.
- e. Plus (+) margin up to \$7.50 per MW of spinning reserve service provided.

The combustion turbine and diesel unit condensing offers must be expressed in dollars per hour per MW of Spin (\$/MWh) and must specify the total MW of spin offered.

### Hydro Unit Costs to Condense for Spinning Reserve

Total synchronous condensing costs for Hydro units shall include the following components:

- a. Start costs, if applicable. Start costs shall be applied when a unit moves from cold to condensing operations and also when a unit moves from condensing operations to energy generation, but shall not be applied when a unit moves from energy generation to condensing operations.
- b. Plus (+) identified variable Operating and Maintenance cost in \$/Hr. divided by the Spinning MW provided. These costs shall be totaled over the Maintenance Period and divided by total MWh generated over the maintenance period. These variable Operating and Maintenance costs shall include:
  - Maintenance of Electric Plant as derived from FERC Account 544.
  - Maintenance of Reservoirs as derived from FERC Account 543.
- c. Plus (+) the actual cost of power consumed during condensing operations at real time bus LMP as determined by Market Settlements. MW consumed must be included in the offer.
- d. Plus (+) opportunity costs (for the MW of spin provided) as determined by PJM Market Settlements.
- e. Plus (+) margin up to \$7.50 per MW of spinning reserve service provided.

Total hydro condensing offers must be expressed in dollars per hour per MW of Spin (\$/MWh) and must specify the total MW of spin offered.

### Steam Unit Cost to Supply Tier 2 Spinning Reserve

Total costs to provide Tier 2 spinning reserve from a steam unit shall include the following components:

- a. The costs (in \$/MW) to provide Tier 2 spinning service from steam units shall equal (1) the heat rate increase resulting from operating the unit at lower MW output resulting from the provision of spinning reserve service from 7.4 (i) multiplied by (2) the variable cost rate from 7.4 (ii), divided by (3) the MW of spinning reserve provided.
- b. Plus (+) margin up to \$7.50 per MW of spinning reserve service provided.
- c. Plus (+) opportunity costs (for the MW of spin provided) as determined by PJM Market Settlements.

Total Steam Unit offers must be expressed in dollars per hour per MW of Spin (\$/MWh) and must specify the total MW of spin offered.



**Reference Parameters:**

- Steam Unit heat Rate Curve – Outlined in Section 1: Incremental Heat (or Fuel) Input Guidelines of this Manual.
- Variable O&M - Costs to be calculated as outlined in Section 5: Operating and Maintenance Cost Guidelines of this Manual. These costs shall be totaled over the Maintenance Period divided by the total MBTU burned over that same period.

**For Example:**

	Output	Heat Rate
Steam Unit Full Load:	100 MW	9,000 BTU/kWh
Steam Unit Reduced Load:	70 MW	9,500 BTU/kWh
VOM Rate:	\$0.50/MBTU	
Heat Rate Penalty =	$(9,500 - 9,000)/9,000 = 5.56\%$	
Adjusted VOM =	$\$0.50 * 1.0556 = \$0.5278/\text{MBTU}$	
Steam Unit Reduced Load Heat Input =	$9,500 * 70 / 10e6 = 665 \text{ MBTU/Hr}$	
Heat Rate VOM Penalty =	$(\$0.5278/\text{MBTU} - \$0.50/\text{MBTU}) * 665 \text{ MBTU/Hr} = \$18.50/\text{Hr}$	
Spinning Reserve VOM Adder =	$\$18.50/\text{Hr} / (100 \text{ MW} - 70 \text{ MW}) = \$0.62/\text{Spinning MW}$	

**Combustion Turbine Costs to Condense for Reactive Voltage Support**

Total synchronous condensing costs for combustion turbines for Reactive Voltage Support shall include the following components:

- a. Start costs, if applicable. Start costs shall be applied when a unit moves from cold to condensing operations and also when a unit moves from condensing operations to energy generation, but shall not be applied when a unit moves from energy generation to condensing operations.
- b. Plus (+) variable Operating and Maintenance cost (EHMC from section 5.4.1) in \$/Hr.
- c. Plus (+) the actual cost of power consumed during condensing operations at real time bus LMP as determined by Market Settlements. MW consumed must be included in the offer.
- d. Plus (+) opportunity costs (for the MW of unit output not produced while providing Reactive Voltage Support) as determined by PJM Market Settlements.
- e. Plus (+) margin up to \$7.50 per MW of unit output not produced while providing Reactive Voltage Support.

Total synchronous condensing costs for combustion turbines for Reactive Voltage Support must be expressed in dollars per hour.

### Hydro Costs to Condense for Reactive Voltage Support

Total synchronous condensing costs for Hydro units for Reactive Voltage Support shall include the following components:

- a. Start costs, if applicable. Start costs shall be applied when a unit moves from cold to condensing operations and also when a unit moves from condensing operations to energy generation, but shall not be applied when a unit moves from energy generation to condensing operations.
- b. Plus (+) identified variable Operating and Maintenance cost in \$/Hr. These costs shall be totaled over the Maintenance Period and divided by total MWh generated over the maintenance period. These variable Operating and Maintenance costs shall include:
  - Maintenance of Electric Plant as derived from FERC Account 544.
  - Maintenance of Reservoirs as derived from FERC Account 543.
- c. Plus (+) the actual cost of power consumed during condensing operations at real time bus LMP as determined by Market Settlements. MW consumed must be included in the offer.
- d. Plus (+) opportunity costs (for the MW of unit output not produced while providing Reactive Voltage Support) as determined by PJM Market Settlements.
- e. Plus (+) margin up to \$7.50 per MW of unit output not produced while providing Reactive Voltage Support.

Total synchronous condensing costs for hydro units for Reactive Voltage Support must be expressed in dollars per hour.

### Demand Side Response (DSR) Cost to Provide Synchronous Reserves

The cost to provide synchronous reserves from DSR resources shall equal the margin up to \$7.50 per MW of reserves provided.

## Section 8: Opportunity Cost Guidelines

Welcome to the *Opportunity Cost Guidelines* section of the PJM Manual for **Cost Development Guidelines**. In this section, you will find the following information:

- A description of the PJM Opportunity Cost Guidelines Policy and Definitions (see “*Policy and Definitions*”).

### Policy and Definitions

#### Cost Development Task Force Opportunity Cost Policy

- Opportunity Cost may be a component of cost under certain circumstances.
- Specific business rules for Opportunity Costs have been defined in the Operating Agreement of PJM Interconnection, L.L.C. for various products including energy and regulation.
- Requests for recovery of Opportunity Costs not defined in the Operating Agreement of PJM Interconnection, L.L.C. should be submitted to the PJM MMU for approval.

#### Definitions

An Opportunity Cost exists when the provision of a product prevents the provision of another product with a higher value.

- For example, if a unit is providing regulation service, it may produce less energy as a result. The opportunity cost in that case is the difference between the energy market price and the unit's offer price, on a per MWh basis.
- For example, if a unit is must run by PJM for a transmission constraint and if that unit has only a significantly limited number of available annual run hours, the opportunity cost associated with providing must run output is the value associated with the lost opportunity to produce energy during a higher valued time period within the year.

## Section 9: Regulation Cost Guidelines

### Cost Development Task Force Regulation Cost Policy

Companies in the PJM RTO that request and receive reimbursement from PJM for the costs associated with operating a generating unit in the Regulating mode or for altering the output of a generator at the request of PJM in order to provide Regulation service must maintain records to document how these costs were calculated. These records shall be made available to PJM upon request.

### Steam Unit Cost to Supply Regulation Service

Total costs to provide Regulation Service from a steam unit shall include the following components:

- The costs (in \$/MW) to provide regulation service from steam units shall equal the fuel cost increase due to the heat rate increase resulting from operating the unit at lower MW output incurred from the provision of regulation.
- Plus (+) the cost increase (in \$/MW) of variable cost rate resulting from operating the unit at lower MW output incurred from the provision of regulation.
- Plus (+) margin up to \$7.50 per MW of regulation service provided.
- Plus (+) opportunity costs (for the MW of regulation provided) as determined by PJM Market Settlements.

Total Steam Unit offers must be expressed in dollars per hour per MW of Regulation (\$/Hr/MW) and must specify the total MW of regulation offered.

#### Reference parameters:

- Steam Unit heat Rate Curve – Outlined in Section 1: Incremental Heat (or Fuel) Input Guidelines of this Manual.
- Variable O&M - Costs to be calculated as outlined in Section 5: Operating and Maintenance Cost Guidelines of this Manual. These costs shall be totaled over the Maintenance Period divided by the total MBTU burned over that same period.

### Regulation Cost Adder Example

#### For Example:

Unit Operating Mode	Output	Heat Rate
Steam Unit Full Load:	100 MW	9,000 BTU/kWh
Steam Unit Regulation Band:	10 MW	
Steam Unit Band Minimum Load	90 MW	9,200 BTU/kWh



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Cost Development Guidelines  
Section 9: Regulation Cost Guidelines

Base Prices	
VOM Rate =	\$0.50/MBTU
Fuel Cost (TFRC):	\$1.50/MBTU
Heat Rate Adjustment	
Unit Base Load Heat Rate Fuel Input =	$9,000 * 90 / 10e3 = 810.0$ MBTU/Hr
Unit Reduced Load Heat Rate Fuel Input =	$9,200 * 90 / 10e3 = 828.0$ MBTU/Hr
Difference =	18.0 MBTU/Hr
Total Regulation Cost:	
(a) Fuel Cost Adder	
Fuel Cost Adder =	$18.0 \text{ MBTU/Hr} * \$1.50/\text{MBTU} / 10 \text{ MW Regulation Band}$
Fuel Cost Adder =	\$2.70/Hr/MW of Regulation
(b) VOM Adder	
Adjusted VOM =	$18.0 \text{ MBTU/Hr} * \$0.50/\text{Mbtu} / 10 \text{ MW Regulation Band}$
Regulation VOM Adder	\$0.90/Hr/MW of Regulation
(c) Margin Adder	
Margin Adder =	\$7.50/Hr/MW of Regulation
Total Regulation Cost	
Total Regulation Cost =	(a) Fuel Cost Adder + (b) VOM Adder + (c) Margin Adder
Total Regulation Cost =	$\$2.70 + \$0.90 + \$7.50$
Total Regulation Cost =	\$11.10/Hr/MW of Regulation

## Attachment A: Cost Calculation Equations for Use in PJM eMKT

### Total Fuel Related Cost for Fossil Fuels: Steam, CTs, Diesel Units

$$TFRC(\$ / MBtu) = \left\{ \begin{array}{l} A(\$ / MBtu) + \\ B(\$ / MBtu) + \\ C(\$ / MBtu) + \\ D(\$ / MBtu) + \\ E(\$ / MBtu) \end{array} \right\}$$

Where:

- TFRC = Total Fuel Related Costs (See Fuel Cost Guidelines)
- A = Basic Fossil-Fuel Cost (See Basic Fossil-Fuel Cost definition)
- B = Other Fuel Related Cost (Other Fuel Related Cost definition)
- C = SO<sub>2</sub> Emission Allowance Cost See SO<sub>2</sub> Emission Allowance Cost Definition
- D = NO<sub>x</sub> Emission Allowance Cost (See NO<sub>x</sub> Emission Allowance Cost definition)
- E = Maintenance Adder (See Maintenance Adder equation)

**Note:** CT Maintenance Adder is included directly in start, no-load and peak segment components.

### Total Fuel Related Cost for Nuclear Units: Nuclear Units

$$TFRC(\$ / MBtu) = \left\{ \begin{array}{l} A(\$ / MBtu) + \\ E(\$ / MBtu) \end{array} \right\}$$

Where:

- TFRC = Total Fuel Related Costs (See Fuel Cost Guidelines)
- A = Basic Nuclear-Fuel Cost (See Basic Nuclear-Fuel Cost)
- E = Maintenance Adder (See Maintenance Adder equation)

## Steam Unit Cost Calculation Formulas:

### Start Cost (\$/Start) For Hot, Intermediate or Cold Start: Steam Units

$$\text{Start Cost}(\$/\text{Start}) = \left\{ \left[ \frac{\text{Start Fuel Consumed}(\text{MBtu} / \text{Start}) \times \text{TFRC}(\$/\text{MBtu})}{\text{Performance Factor}} \right] + \left[ \text{Station Service}(\text{MWh}) \times \text{Station Service Rate}(\$/\text{MWh}) \right] + \text{Start Maintenance Adder}(\$/\text{Start}) + \text{Start Additional Labor Cost}(\$/\text{Start}) \right\}$$

Where:

- Start Cost = (See Start Cost equation)
- Start Fuel Consumed = Theoretical or Test (See Steam Unit Start Cost Components)
- TFRC = Total Fuel Related Costs (See Fuel Cost Guidelines)
- Performance Factor = Start Performance Factor or Total Performance Factor depending upon which performance factor determination methodology a company utilizes (See Section 3 Performance Factor Guidelines)
- Station Service = (See Station Service definition)
- Station Service Rate = Posted by PJM (See Station Service Rate)
- Start Maintenance Adder = Maintenance Adder (See Maintenance Adder equation)
- Start Additional Labor Cost = (See Steam Unit Start Cost Components)

### No Load Cost: Steam Units

$$\text{No-Load Cost}(\$/\text{Hour}) = \left\{ \left[ \frac{\text{No-Load Fuel Consumed}(\text{MBtu} / \text{Hour}) \times \text{TFRC}(\$/\text{MBtu})}{\text{Performance Factor}} \right] + \text{No-Load Additional Labor Cost}(\$/\text{Hour}) \right\}$$

Where:

- No-Load Cost = No-Load Cost (See No-Load Cost definition)
- No-Load Fuel Consumed = Theoretical or Test (See No-Load Fuel Consumed equation)
- TFRC = Total Fuel Related Costs (See Fuel Cost Guidelines)

Performance Factor = Operating Performance Factor or Total Performance Factor depending upon which performance factor determination methodology a company utilizes. (See Section 3 Performance Factor Guidelines)

No-Load Additional Labor Cost = Additional costs in excess of normal station manning requirements for no-load operations.

### Maintain Minimum Cost: Steam Units

$$\text{Maintain Minimum Cost}(\$/\text{Hour}) = \left\{ \begin{array}{l} \text{Theoretical Minimum Segment Incremental Fuel} \\ \text{Burn}(\text{MBtu} / \text{Hour}) \times \\ \text{TFRC}(\$/\text{MBtu}) \times \\ \text{Performance Factor} \end{array} \right\} + \left\{ \begin{array}{l} (\text{Incremental Adjustment Parameter}(\$/\text{MWh}) \times \\ \text{Minimum Rating}(\text{MW}) \end{array} \right\}$$

Where:

Maintain Minimum Cost = The dollars per hour cost determined at the normal minimum energy output including Total Fuel Related cost and applicable performance factor.

Theoretical Minimum Segment Incremental Fuel Burn = Incremental fuel burn from no-load condition to Minimum Rating

TFRC = Total Fuel Related Costs (See Fuel Cost Guidelines)

Performance Factor = Operating Performance Factor or Total Performance Factor depending upon which performance factor determination methodology a company utilizes (See Section 3 Performance Factor Guidelines)

Incremental Adjustment Parameter = (See Incremental Adjustment Parameter Definition)

Minimum Rating = Lowest non-restricted economic generating level as defined in the Markets Database Dictionary (<http://www.pjm.com/etools/downloads/emkt/markets-database-data-dictionary.pdf>).



### Segment Upper End Point Energy Rate: Steam Units

$$\text{Segment Upper End Point Energy Rate} (\$/\text{MWh}) = \left\{ \begin{array}{l} \text{Theoretical Segment Upper End Incremental} \\ \text{Heat Rate} (\text{MBtu} / \text{MWh}) \times \\ \text{TFRC} (\$/\text{MBtu}) \times \\ \text{Performance Factor} \\ \text{Incremental Adjustment Parameter} (\$/\text{MWh}) \end{array} \right\} +$$

Where

Segment Upper End Point Energy Rate = Cost associated with the upper end segment of the cost curve.

Theoretical Segment Upper End Incremental Heat Rate = The slope of the incremental fuel burn curve measured in fuel burn per MW of the upper end segment

TFRC = Total Fuel Related Costs (See Fuel Cost Guidelines)

Performance Factor = (See Section 3 Performance Factor Guidelines)

Incremental Adjustment Parameter = (See Incremental Adjustment Parameter Definition)

### Segment Mill Rate Slope: Steam Units

$$\text{Segment Mill Rate Slope} (\$/\text{MWh} / \text{MW}) = \left\{ \begin{array}{l} \text{Segment Heat Rate Slope} (\text{MBtu} / \text{MWh} / \text{MW}) \times \\ \left( \begin{array}{l} \text{Segment Upper End Point Energy} \\ \text{Rate} (\$/\text{MWh}) - \\ \text{Incremental Adjustment Parameter} (\$/\text{MWh}) \end{array} \right) \\ \text{Theoretical Incremental Heat Rate} (\text{MBtu} / \text{MWh}) \end{array} \right\} \div$$

Where:

Segment Mill Rate Slope = Cost of the specific segment measured in dollars per MWh per MW.

Segment Heat Rate Slope = The slope of the incremental fuel burn curve measured in fuel burn per MW of the specific segment.

Segment Upper End Point Energy Rate = Cost associated with the upper end segment of the cost curve.

Incremental Adjustment Parameter = (See Incremental Adjustment Parameter Definition)

Theoretical Incremental Heat Rate = (See Theoretical Incremental Heat Rate Definition)

### Total Energy Cost per Segment: Steam Units

$$Total\ Energy\ Cost\ Per\ Segment(\$ / Hour) = \left\{ \left[ \left( \frac{Segment\ Upper\ End\ Point(MW) - Segment\ Lower\ End\ Point(MW)}{2} \right) \times \left( Segment\ Upper\ End\ Point\ Energy\ Rate(\$ / MWh) - Segment\ Mill\ Rate\ Slope(\$ / MWh / MW) \right) \right] \times \left( Segment\ Upper\ End\ Point(MW) - Segment\ Lower\ End\ Point(MW) \right) \right\}$$

Where:

- Total Energy Cost Per Segment = Total hourly cost of the specific segment of the cost curve.
- Segment Upper End Point Energy Rate = Cost associated with the upper end segment of the cost curve.
- Segment Upper End Point = Upper end point of the specific segment of the cost curve
- Segment Mill Rate Slope = See Segment Mill Rate slope equation

### Full Load Total Cost: Steam Units

$$Full\ Load\ Total\ Cost(\$ / Hour) = \left\{ No - Load\ Cost(\$ / Hour) + Maintain\ Minimum\ Cost(\$ / Hour) + \sum Total\ Energy\ Cost\ Per\ Segment(\$ / Hour)\ from\ minimum\ to\ full\ load \right\}$$

Where:

- Full Load Total cost = (See Fuel Cost Definition)
- No-Load Cost = See No-Load Cost Equation
- Maintain Minimum Cost = See Maintain Minimum cost equation.
- Total Energy cost per Segment = See Total Energy Cost Per Segment equation.
- From Minimum to Full Load = Minimum and full load points as described in the Markets Database Dictionary (<http://www.pjm.com/etools/downloads/emkt/market-database-data-dictionary.pdf>).

### Full Load Operating Rate: Steam Units

$$\text{Full Load Operating Rate}(\$/MWh) = \left\{ \frac{\text{Full Load Total Cost}(\$/\text{Hour}) \div}{\text{Economic Maximum Rating}(MW)} \right\}$$

Where:

Full Load Operating Rate = Operating cost at unit economic maximum rating.

Full Load Total Cost = See Full Load Total Cost equation

Economic Maximum Rating = Maximum non-restricted economic generating level as defined in the Markets Database Dictionary (<http://www.pjm.com/etools/downloads/emkt/market-database-data-dictionary.pdf>).

### Full Load Scheduling Start Rate: Steam Units

$$\text{Full Load Scheduling Start Rate}(\$/MWh) = \left\{ \frac{\text{Full Load Operating Rate}(\$/MWh) + \left[ \frac{\text{Start Cost}(\$/\text{Start}) \div}{\left( \text{Economic Maximum Rating}(MW) \times \text{Scheduling Hours}(3, 6 \text{ or } 12 \text{ hours}) \right)} \right]}{\left( \text{Economic Maximum Rating}(MW) \times \text{Scheduling Hours}(3, 6 \text{ or } 12 \text{ hours}) \right)} \right\}$$

Where:

Full Load Scheduling Start Rate = Full load operating cost including scheduled start cost over specified operating period.

Full Load Operating Rate = See Full Load Operating Rate equation.

Start Cost = (See Start Cost equation)

Economic Maximum Rating = Maximum non-restricted economic generating level as defined in the Markets Database Dictionary (<http://www.pjm.com/etools/downloads/emkt/market-database-data-dictionary.pdf>).

Scheduling Hours = Pre-defined operating period of 3, 6 or 12 hours

## Combustion Turbine Cost Calculation Equations:

### Start Cost (\$/Start): CTs

$$\text{Start Cost}(\$/\text{Start}) = \left\{ \begin{aligned} & \left[ \begin{aligned} & \text{Start Fuel Consumed}(\text{MBtu} / \text{Start}) \times \\ & \text{TFRC}(\$/\text{MBtu}) \times \\ & \text{Performance Factor} \end{aligned} \right] + \\ & (\text{Station Service}(\text{MWh}) \times \text{Station Service Rate}(\$/\text{MWh})) + \\ & \text{Starting Maintenance Cost}(\$/\text{Start}) + \\ & \text{Start Incremental Labor Cost}(\$/\text{Start}) \end{aligned} \right\}$$

Where:

- Start cost = (See Start Cost equation)
- Start Fuel consumed = Theoretical or Test (See Steam Unit Start Cost Components)
- TFRC = Total Fuel Related Costs (See Fuel Cost Guidelines)
- Performance Factor = Start Performance Factor or Total Performance Factor depending upon which performance factor determination methodology a company utilizes. (See Section 3 Performance Factor Guidelines)
- Station Service = (See Steam Unit Start Cost Components)
- Station Service Rate = Posted by PJM (See Station Service Rate)
- Starting Maintenance Cost = See Section 6: Combustion Turbine and Diesel Unit
- Start Incremental Labor Cost = (See Steam Unit Start Cost Components)

### No Load Cost: CTs

$$\text{No-Load Cost}(\$/\text{Hour}) = \left\{ \begin{aligned} & \left[ \begin{aligned} & \text{No-Load Fuel Consumed}(\text{MBtu} / \text{Hour}) \times \\ & \text{TFRC}(\$/\text{MBtu}) \times \\ & \text{Performance Factor} \end{aligned} \right] + \\ & \text{No-Load Incremental Labor Cost}(\$/\text{Hour}) \end{aligned} \right\}$$

where:

- No-Load Cost = See No Load Definitions
- No-Load Fuel Consumed = Theoretical or Test (See Steam Unit Start Cost Components)
- TFRC = Total Fuel Related Costs (See Fuel Cost Guidelines)

where:

Performance Factor = Operating Performance Factor or Total Performance Factor depending upon which performance factor determination methodology a company utilizes. (See Section 3 Performance Factor Guidelines)

No-Load Additional Labor Cost = Additional costs in excess of normal station manning requirements for no-load operations.

### Minimum Energy Cost: CTs

$$\text{Minimum Energy Cost}(\$/\text{Hour}) = \left\{ \left[ \begin{array}{l} \text{Theoretical Minimum Incremental HeatRate}(\text{MBtu} / \text{MWh}) \times \\ \text{TFRC}(\$/\text{MBtu}) \times \\ \text{Performance Factor} \end{array} \right] + \left[ \begin{array}{l} \text{Incremental Adjustment Parameter}(\$/\text{MWh}) \\ \text{Minimum Rating}(\text{MW}) \end{array} \right] \right\} \times$$

where:

Minimum Energy Cost = Hourly cost to operate at minimum rating.

Theoretical Minimum Incremental Heat Rate = Incremental heat rate from no-load to minimum rating

TFRC = Total Fuel Related Costs (See Fuel Cost Guidelines)

Performance Factor = Operating Performance Factor or Total Performance Factor depending upon which performance factor determination methodology a company utilizes (See Section 3 Performance Factor Guidelines)

Incremental Adjustment Parameter = (See Incremental Adjustment Parameter Definition)

Minimum Rating = Lowest non-restricted economic generating level as defined in the Markets Database Dictionary (<http://www.pjm.com/etools/downloads/emkt/market-database-data-dictionary.pdf>).

### Base Energy Cost: CTs

$$\text{Base Energy Cost}(\$/\text{Hour}) = \left\{ \left[ \begin{array}{l} \text{Theoretical Base Incremental HeatRate}(\text{MBtu} / \text{MWh}) \times \\ \text{TFRC}(\$/\text{MBtu}) \times \\ \text{Performance Factor} \end{array} \right] + \left[ \begin{array}{l} \text{Incremental Adjustment Parameter}(\$/\text{MWh}) \\ \text{Base Rating}(\text{MW}) \end{array} \right] \right\} \times$$

where:

Base Energy Cost = Hourly cost to operate at base rating.

Theoretical Base Incremental Heat Rate = Incremental heat rate from no-load to base rating.

where:

TFRC = Total Fuel Related Costs (See Fuel Cost Guidelines)

Performance Factor = Operating Performance Factor or Total Performance Factor depending upon which performance factor determination methodology a company utilizes (See Section 3 Performance Factor Guidelines)

Incremental Adjustment Parameter = (See Incremental Adjustment Parameter Definition)

Base Rating = Base non-restricted economic generating level as defined in the Markets Database Dictionary (<http://www.pjm.com/etools/downloads/emkt/market-database-data-dictionary.pdf>).

### Peak Pickup Cost: CTs

$$Peak Pickup Cost(\$ / Hour) = \left\{ \left[ \begin{array}{l} Theoretical Peak Segment Incremental HeatRate(MBtu / MWh) \times \\ TFRC(\$ / MBtu) \times \\ Performance Factor \end{array} \right] + \begin{array}{l} Peak Segment Maintenance Adder(\$ / MWh) + \\ Incremental Adjustment Parameter(\$ / MWh) \end{array} \right\} \times Peak Pickup(MW)$$

where:

Peak Pickup Cost = Incremental cost to operate from base rating to peak rating.

Theoretical Peak Segment Incremental Heat Rate = Incremental heat rate from base to peak rating.

TFRC = Total Fuel Related Costs (See Fuel Cost Guidelines)

Performance Factor = Operating Performance Factor or Total Performance Factor depending upon which performance factor determination methodology a company utilizes (See Section 3 Performance Factor Guidelines)

Peak Segment Maintenance Adder = See Operating and Maintenance Adder Definitions

Incremental Adjustment Parameter = (See Incremental Adjustment Parameter Definition)

Peak Pickup = See Operating and Maintenance Adder Definitions

### Base Energy Total Cost: CTs

$$Base Energy Total Cost(\$ / Hour) = \left\{ \begin{array}{l} No - Load Cost(\$ / Hour) + \\ Base Energy Cost(\$ / Hour) \end{array} \right\}$$

where:

Base Energy Total Cost = See Base Energy Total Cost equation

where:

No-Load Cost = See No-Load Cost equation

Base Energy Cost = See Base Energy Cost equation

### Base Rating Operating Rate: CTs

$$\text{Base Rating Operating Rate}(\$/\text{MWh}) = \left\{ \frac{\text{Base Energy Total Cost}(\$/\text{Hour}) \div}{\text{Base Rating}(\text{MW})} \right\}$$

where

Base Rating Operating Rate = Operating rate at base load.

Base Energy Total Cost = See Base Energy Cost equation

Base Rating = Base non-restricted economic generating level as defined in the Markets Database Dictionary (<http://www.pjm.com/etools/downloads/emkt/market-database-data-dictionary.pdf>).

### Scheduling Start Rate: CTs

$$\text{Scheduling Start Rate}(\$/\text{MWh}) = \left\{ \frac{\text{Base Rating Operating Rate}(\$/\text{MWh}) + \left[ \frac{\text{Start Cost}(\$/\text{Start}) \div}{\left( \text{Base Rating}(\text{MW}) \times \text{Scheduling Hours}(3, 6 \text{ or } 12 \text{ hours}) \right)} \right]}{\left( \text{Base Rating}(\text{MW}) \times \text{Scheduling Hours}(3, 6 \text{ or } 12 \text{ hours}) \right)} \right\}$$

where:

Scheduling Start Rate = Base rate operating cost including scheduled start cost over specified operating period.

Base Rating Operating Rate = See Base Rating Operating Rate equation.

Start Cost = (See Start Cost equation )

Base Rating = Base non-restricted economic generating level as defined in the Markets Database Dictionary (<http://www.pjm.com/etools/downloads/emkt/market-database-data-dictionary.pdf>).

Scheduling Hours = Pre-defined operating period of 3, 6 or 12 hours.

## Combined Cycle Cost Calculation Equations:

### Start Cost (\$/Start): Comb Cycle

$$Start\ Cost(\$ / Start) = \left\{ \begin{array}{l} \left[ \frac{Start\ Fuel\ Consumed(MBtu / Start) \times TFRC(\$ / MBtu)}{Performance\ Factor} \right] + \\ (Station\ Service(MWh) \times Station\ Service\ Rate(\$ / MWh)) + \\ Start\ Maintenance\ Adder(\$ / Start) + \\ Start\ Incremental\ Labor\ Cost(\$ / Start) \end{array} \right\}$$

where:

- Start Cost = (See Start Cost equation)
- Start Fuel Consumed = Theoretical or Test (See Steam Unit Start Cost Components)
- TFRC = Total Fuel Related Costs (See Fuel Cost Guidelines)
- Performance Factor = Start Performance Factor or Total Performance Factor depending upon which performance factor determination methodology a company utilizes. (See Section 3 Performance Factor Guidelines)
- Station Service = (See Station Service definition)
- Station Service Rate = Posted by PJM (See Station Service Rate)
- Start Maintenance Adder = See Operating and Maintenance Adder Definitions
- Start Incremental Labor Cost = See Operating and Maintenance Adder Definitions

## Diesel Unit Cost Calculation Equations:

### Start Cost (\$/Start): Diesel Units

$$Start\ Cost(\$ / Start) = \left\{ \begin{array}{l} \left[ \frac{Start\ Fuel\ Consumed(MBtu / Start) \times TFRC(\$ / MBtu)}{Performance\ Factor} \right] + \\ Start\ Maintenance\ Adder(\$ / Start) + \\ Start\ Incremental\ Labor\ Cost(\$ / Start) \end{array} \right\}$$

where:

- Start Cost = (See Start Cost equation)
- Start Fuel Consumed = Theoretical or Test (See Steam Unit Start Cost Components)
- TFRC = Total Fuel Related Costs (See Fuel Cost Guidelines)



where:

- Performance Factor = Start Performance Factor or Total Performance Factor depending upon which performance factor determination methodology a company utilizes (See Section 3 Performance Factor Guidelines)
- Start Maintenance Adder = See Operating and Maintenance Adder Definitions
- Start Incremental Labor Cost = See Operating and Maintenance Adder Definitions

### No Load Cost: Diesel Units

$$No - Load Cost(\$ / Hour) = \left\{ \begin{array}{l} \left[ \begin{array}{l} No - Load Fuel Consumed(MBtu / Hour) \times \\ TFRC(\$ / MBtu) \times \\ Performance Factor \end{array} \right] + \\ No - Load Adjustment Parameter(\$ / Hour) + \\ No - Load Incremental Labor Cost(\$ / Hour) \end{array} \right\}$$

where:

- No-Load Cost = See No Load Definitions
- No-Load Fuel Consumed = Theoretical or Test (See Steam Unit Start Cost Components)
- TFRC = Total Fuel Related Costs (See Fuel Cost Guidelines)
- Performance Factor = Operating Performance Factor or Total Performance Factor depending upon which performance factor determination methodology a company utilizes (See Section 3 Performance Factor Guidelines)
- No-Load Additional Labor Cost = Additional costs in excess of normal station manning requirements for no-load operations.

### Base Energy Cost: Diesel Units

$$Base Energy Cost(\$ / Hour) = \left\{ \left[ \begin{array}{l} Theoretical Base Incremental HeatRate(MBtu / MWh) \times \\ TFRC(\$ / MBtu) \times \\ Performance Factor \end{array} \right] + \begin{array}{l} Incremental Adjustment Parameter(\$ / MWh) \\ Base Rating(MW) \end{array} \right\} \times$$

where:

- Base Energy Cost = Hourly cost to operate at base rating.
- Theoretical Base Incremental Heat Rate = Incremental heat rate from no-load to base rating.

- TFRC = Total Fuel Related Costs (See Fuel Cost Guidelines)
- Performance Factor = Operating Performance Factor or Total Performance Factor depending upon which performance factor determination methodology a company utilizes (See Section 3 Performance Factor Guidelines)
- Incremental Adjustment Parameter = (See Incremental Adjustment Parameter Definition)
- Base Rating = Base non-restricted economic generating level as defined in the Markets Database Dictionary (<http://www.pjm.com/etools/downloads/emkt/market-database-data-dictionary.pdf>).

### Base Energy Total Cost: Diesel Units

$$\text{Base Energy Total Cost}(\$/\text{Hour}) = \left\{ \begin{array}{l} \text{No-Load Cost}(\$/\text{Hour}) + \\ \text{Base Energy Cost}(\$/\text{Hour}) \end{array} \right\}$$

where:

- Base Energy Total Cost = Base Energy Total Cost equation:
- No-Load Cost = See No Load Cost Diesel Equation.
- Base Energy Cost = See Base Energy Cost equation.

### Base Rating Operating Rate: Diesel Units

$$\text{Base Rating Operating Rate}(\$/\text{MWh}) = \left\{ \begin{array}{l} \text{Base Energy Total Cost}(\$/\text{Hour}) \div \\ \text{Base Rating}(\text{MW}) \end{array} \right\}$$

where:

- Base Rating Operating Rate = Operating rate at base rating
- Base Energy Total Cost = See Base Energy Total Cost Diesel Equation
- Base Rating = Base non-restricted economic generating level as defined in the Markets Database Dictionary (<http://www.pjm.com/etools/downloads/emkt/market-database-data-dictionary.pdf>).

## Attachment B: Applicable FERC System of Accounts

The information included in this Attachment B provides the descriptions and definitions of several account numbers and Operating Expenses Instructions as they appear in the *FERC System of Accounts* and named in this document.

The *FERC System of Accounts* was created when a predominant amount of the nation's electrical generating resources were "*utility owned*". Although many of those resources are now owned by non-vertically integrated entities, such as, Independent Power Producers (IPPs) and Generating Companies (GENCOs), the descriptions of the accounts are the important concepts.

The accounts named in this document provide the information to allow the development of cost based bids for submission to PJM.

### Balance Sheet Accounts

#### Fuel Stock (Major only).

This account shall include the book cost of fuel on hand.

##### Items

- (1) Invoice price of fuel less any cash or other discounts.
- (2) Freight, switching, demurrage and other transportation charges, not including, however, any charges for unloading from the shipping medium.
- (3) Excise taxes, purchasing agents' commissions, insurance and other expenses directly assignable to cost of fuel.
- (4) Operating, maintenance and depreciation expenses and ad valorem taxes on utility-owned transportation equipment used to transport fuel from the point of acquisition to the unloading point.
- (5) Lease or rental costs of transportation equipment used to transport fuel from the point of acquisition to the unloading point.

### Expense Accounts

#### Fuel

- a. This account shall include the cost of fuel used in the production of steam for the generation of electricity, including expenses in unloading fuel from the shipping media and handling thereof up to the point where the fuel enters the first boiler plant bunker, hopper, bucket, tank or holder of the boiler-house structure. Records shall be maintained to show the quantity, BTU content and cost of each type of fuel used.

- b. The cost of fuel shall be charged initially to Account 151, Fuel Stock (for Non-major utilities, appropriate fuel accounts carried under Account 154, Plant Materials and Operating Supplies), and cleared to this account on the basis of the fuel used. Fuel handling expenses may be charged to this account as incurred or charged initially to Account 152, Fuel Stock Expenses Undistributed (for Non-major utilities, an appropriate sub account of Account 154, Plant Materials and Operating Supplies). In the latter event, they shall be cleared to this account on the basis of the fuel used. Respective amounts of fuel stock and fuel stock expenses shall be readily available.

***Items***

**Labor:**

- (1) Supervising purchasing and handling of fuel.
- (2) All routine fuel analysis.
- (3) Unloading from shipping facility and putting in storage.
- (4) Moving of fuel in storage and transferring fuel from one station to another.
- (5) Handling from storage or shipping facility to first bunker, hopper, bucket, tank or holder of boiler-house structure.
- (6) Operation of mechanical equipment, such as locomotives, trucks, cars, boats, barges, cranes, etc.

**Materials and expenses:**

- (1) Operating, maintenance and depreciation expenses and ad valorem taxes on utility-owned transportation equipment used to transport fuel from the point of acquisition to the unloading point (Major only).
- (2) Lease or rental costs of transportation equipment used to transport fuel from the point of acquisition to the unloading point (Major only).
- (3) Cost of fuel including freight, switching, demurrage and other transportation charges.
- (4) Excise taxes, insurance, purchasing commissions and similar items.
- (5) Stores expense to extent applicable to fuel.
- (6) Transportation and other expenses in moving fuel in storage.
- (7) Tools, lubricants and other supplies.
- (8) Operating supplies for mechanical equipment.
- (9) Residual disposal expenses less any proceeds from sale of residuals.

**NOTE:** Abnormal fuel handling expenses occasioned by emergency conditions shall be charge to expense as incurred.

### **Allowances**

This account shall include the cost of allowances expensed concurrent with the monthly emission of sulfur dioxide.

### **Maintenance of Boiler Plant (Major only).**

- a. This account shall include the cost of labor, materials used and expenses incurred in the maintenance of steam plant, the book cost of which is includible in Account 312, Boiler Plant Equipment. (See operating expense instruction 2.)
- b. For the purposes of making charges hereto and to Account 513, Maintenance of Electric Plant, the point at which steam plant is distinguished from electric plant is defined as follows:
  - (1) Inlet flange of throttle valve on prime mover.
  - (2) Flange of all steam extraction lines on prime mover.
  - (3) Hotwell pump outlet on condensate lines.
  - (4) Inlet flange of all turbine-room auxiliaries.
  - (5) Connection to line side of motor starter for all boiler-plant equipment.

### **Maintenance of Electric Plant (Major only).**

This account shall include the cost of labor, materials used and expenses incurred in the maintenance of electric plant, the book cost of which is includible in Account 313, Engines and Engine-Driven Generators, Account 314, Turbogenerator Units, and Account 315, Accessory Electric Equipment. (See operating expense instruction 2 and paragraph B of Account 512.)

### **Nuclear Fuel Expense (Major only).**

- a. This account shall debit and Account 120.5, Accumulated Provision for Amortization of Nuclear Fuel Assemblies, credited for the amortization of the net cost of nuclear fuel assemblies used in the production of energy. The net cost of nuclear fuel assemblies subject to amortization shall be the cost of the nuclear fuel assemblies plus or less the expected net salvage of uranium, plutonium, and other byproducts and unburned fuel. The utility shall adopt the necessary procedures to assure that charges to this account are distributed according to the thermal energy produced in such periods.
- b. This account shall also include the costs involved when fuel is leased.

- c. This account shall also include the cost of other fuels, used for ancillary steam facilities, including superheat.
- d. This account shall be debited or credited as appropriate for significant changes in the amounts estimated as the net salvage value of uranium, plutonium, and other byproducts contained in Account 157, Nuclear Materials Held for Sale and the amount realized upon the final disposition of the materials. Significant declines in the estimated realizable value of items carried in Account 157 may be recognized at the time of market price declines by charging this account and crediting Account 157. When the declining change occurs while the fuel is recorded in Account 120.3, Nuclear Fuel Assemblies in Reactor, the effect shall be amortized over the remaining life of the fuel.

**Maintenance of Reactor Plant Equipment (Major only).**

This account shall include the cost of labor, materials used and expenses incurred in the maintenance of reactor plant, the book cost of which is includible in Account 322, Reactor Plant Equipment.

**Maintenance of Electric Plant (Major only).**

This account shall include the cost of labor, materials used and expenses incurred in the maintenance of electric plant, the book cost of which is includible in Account 323, Turbogenerator Units, and account 324, Accessory Electric Equipment.

**Maintenance of Reservoirs, Dams, and Waterways (Major only).**

This account shall include the cost of labor, materials used and expenses incurred in the maintenance of plant, includible in Account 332, Reservoirs, Dams, and Waterways. (See operating expense instruction 2.) However, the cost of labor materials used and expenses incurred in the maintenance of fish and wildlife, and recreation facilities, the book cost of which is includible in Account 332, Reservoirs, Dams, and Waterways, shall be charged to Account 545, Maintenance of Miscellaneous Hydraulic Plant.

**Maintenance of Electric Plant (Major only)**

This account shall include the cost of labor, materials used and expenses incurred in the maintenance of plant includible in Account 333, Water Wheels, Turbines and Generators, and Account 334, Accessory Electric Equipment. (See operating expense instruction 2.)

**Fuel**

This account shall include the cost delivered at the station (see Account 151, Fuel Stock, for Major utilities, and Account 154, Plant Materials and Operating Supplies,

for Non-major utilities) of all fuel, such as gas, oil, kerosene, and gasoline used in other power generation.

### **Maintenance of Generating and Electrical Equipment (Major only)**

This account shall include the cost of labor, materials used and expenses incurred in the maintenance of plant, the book cost of which is includible in Account 343, Prime Movers, Account 344, Generators, and Account 345, Accessory Electric Equipment.

## **Operating Expense Instructions 2 and 3**

### **Maintenance**

- a. The cost of maintenance chargeable to the various operating expense and clearing accounts includes labor, materials, overheads and other expenses incurred in maintenance work. A list of work operations applicable generally to utility plant is included hereunder. Other work operations applicable to specific classes of plant are listed in functional maintenance expense accounts.
- b. Materials recovered in connection with the maintenance of property shall be credited to the same account to which the maintenance cost was charged.
- c. If the book cost of any property is carried in Account 102, Electric Plant Purchased or Sold, the cost of maintaining such property shall be charged to the accounts for maintenance of property of the same class and use, the book cost of which is carried in other electric plant in service accounts. Maintenance of property leased from others shall be treated as provided in operating expense instruction 3.

### **Items**

- (1) Direct field supervision of maintenance.
- (2) Inspecting, testing, and reporting on condition of plant specifically to determine the need for repairs, replacements, rearrangements and changes and inspecting and testing the adequacy of repairs which have been made.
- (3) Work performed specifically for the purpose of preventing failure, restoring serviceability or maintaining life of plant.
- (4) Rearranging and changing the location of plant not retired.
- (5) Repairing for reuse materials recovered from plant.
- (6) Testing for locating and clearing trouble.
- (7) Net cost of installing, maintaining, and removing temporary facilities to prevent interruptions in service.

- (8) Replacing or adding minor items of plant which do not constitute a retirement unit. (See electric plant instruction 10.)

### Rents

- a. The rent expense accounts provided under the several functional groups of expense accounts shall include all rents, including taxes paid by the lessee on leased property, for property used in utility operations, except (1) minor amounts paid for occasional or infrequent use of any property or equipment and all amounts paid for use of equipment that, if owned, would be includible in plant Accounts 391 and 398, inclusive, which shall be treated as an expense item and included in the appropriate functional account and (2) rents which are chargeable to clearing accounts, and distributed there from/to the appropriate account. If rents cover property used for more than one function, such as production and transmission, or by more than one department, the rents shall be apportioned to the appropriate rent expense or clearing accounts of each department on an actual, or if necessary, an estimated basis.
- b. When a portion of property or equipment rented from others for use in connection with utility operations is subleased, the revenue derived from such subleasing shall be credited to the rent revenue account in operating revenues; provided, however, that in case the rent was charged to a clearing account, amounts received from subleasing the property shall be credited to such clearing account.

The cost, when incurred by the lessee, of operating and maintaining leased property, shall be charged to the accounts appropriate for the expense if the property were owned.



## **Regulation Issue Timeline**

**May 12, 2004** – PJM emails requesting that MMU evaluate proposed West/South regulation and spinning markets to determine whether structure supports price-based offers.

**June 30, 2004** – PJM Legal Department emails seeking internal guidance in responding to question from North Carolina Commission regarding who will decide if West/South Regulation and Spinning markets will be competitive. PJM Markets Division leadership responds via email that the decision will originate from the MMU.

**August 17-18, 2004** – MMU email exchange with AEP regarding how/when decision to be made regarding West/South Regulation Market offers. MMU responds providing citation from PJM Operating Agreement establishing cost-based market by default pending further analysis.

**August 18, 2004** – Wright & Talisman emails MMU providing citation and confirming for the MMU that the PJM Operating Agreement calls for West/South regulation market to be cost-based by default.

**August 18, 2004** – MMU reiterates at PJM/AEP Integration Team conference call that PJM Operating Agreement calls for cost-based regulation market in PJM West/South. MMU states that it will perform ongoing analysis to determine whether actual operating experience supports transition to price-based market. MMU taken aside and instructed not to make this statement to AEP and that decision had not yet been made.

**August 19, 2004** – MMU emails PJM Market Integration Team citing PJM Operating Agreement language as the basis for their August 18th statement regarding cost-based regulation offers in PJM West/South. MMU notes in their email that there seemed to be a perception on the part of AEP that a decision had been made that the regulation market will be price-based, and a corresponding sense of surprise when a statement made to the contrary. MMU urged that communications with stakeholders remain consistent with current PJM Operating Agreement provisions, specifically July 30, 2004 revisions regarding West/South Regulation Market.

**September 15, 2004** – At AEP/PJM Project Planning meeting, MMU responds to questions from AEP regarding status of West/South Regulation Market analysis by MMU. MMU reiterated recommendation that the West/South Regulation Market begin as cost-based, with ongoing analysis to determine if actual market experience supports transition to price-based offers. The MMU reiterated that this plan was consistent with PJM Operating Agreement language incorporated July 30<sup>th</sup> calling for cost-based offers, and that the results of the MMU analysis did not support a change in status at this time.

**September 16, 2004** – Mr. Bowring (PJM Market Monitor) emails MMU staff with decision to issue formal memo on MMU conclusions regarding West/South regulation market noting heavy pressure from AEP.

**September 17, 2004** – Mr. Bowring (PJM Market Monitor) emails Mr. Harris (PJM Pres & CEO) documenting September 17, 2004 discussion with representatives from AEP, initiated by AEP, regarding the price/cost based issue with the West/South Regulation Market. Mr. Bowring (PJM Market Monitor) notes their initially aggressive behavior during the discussion.

**September 22, 2004 (1318)** – Mr. Hagele (PJM General Counsel) emails PJM leadership team outlining plan to file on September 30, 2004 with Bowring Affidavit in support. Mr. Hagele's email incorrectly states that Mr. Bowring (PJM Market Monitor) has agreed to support this plan.

**September 24, 2004 (0203)** – Mr. Bowring (PJM Market Monitor) emails Mr. Harris (PJM Pres & CEO) reaffirming that his conclusions are contrary to that which PJM intends to file with the Commission.

**September 24, 2004 (0636)** – Mr. Pfirrmann (PJM EVP & COO) emails PJM leadership team asking for details of plan to file for price-based offers in West/South Regulation Market. Mr. Pfirrmann (PJM EVP & COO) cites receipt of request for this and other information from AEP previous evening.

**September 24, 2004 (1646)** – Mr. Hagele (PJM General Counsel) emails Mr. Bowring (PJM Market Monitor) and PJM leadership team stating that the conclusion in section 33 of the MMU Affidavit constitutes "a very serious breach of the integrity of the internal process for reaching agreement and moving forward on important issues". Mr. Hagele (PJM General Counsel) states that "the default should be to market based rates". Mr. Hagele (PJM General Counsel) recommends sections 16 and 32 of the Affidavit expressing concerns of the MMU be modified or deleted. Mr. Hagele (PJM General Counsel) urges PJM leadership to take the matter of Mr. Bowring's nonconforming affidavit to Mr. Harris (PJM Pres & CEO) if unable to resolve otherwise.

**September 24, 2004 (1806)** – Mr. Bowring (PJM Market Monitor) responds to the comments in Mr. Hagele's email and reaffirms that he does not concur with PJM's intended direction.

**September 24, 2004 (2206)** – Mr. Ott (PJM VP) emails Mr. Bowring (PJM Market Monitor) stating that in regard to paragraph 33 of the MMU Affidavit that, "I do agree with Jack [Mr. Hagele (PJM General Counsel)] that your wording does not coincide with our 'agreement' ". Mr. Ott (PJM VP) asks Mr. Bowring (PJM Market Monitor) if he would revise the conclusions in his Affidavit to state that, "given these facts, there are two ways to proceed". Mr. Ott (PJM VP) states that this would allow him to "make the fateful decision to go with market based".

**September 26, 2004** – Mr. Pfirrmann (PJM EVP & COO) emails Mr. Bowring (PJM Market Monitor) and PJM leadership team in support of Mr. Hagele's statements made in his email of September 24 stating, "All said, Jack's [Mr. Hagele's] representation of our agreement is exactly as I recall it". Mr. Pfirrmann (PJM EVP & COO) also contends that, "competitive markets should be the default". Mr. Pfirrmann (PJM EVP & COO) states that "Others, and I'll opine that I believe this includes Joe [Mr. Bowring] but of course he can confirm or deny, believe that regulated, cost based markets should prevail in the absence of rock hard data that competitive markets won't have a chance of bringing harm to market participants." Mr. Pfirrmann (PJM EVP & COO) concludes, "We in PJM must decide which approach we'll use to guide our decisions moving forward".

**September 27, 2004 (1043)** – Mr. Duane (PJM Deputy General Counsel) circulates to PJM leadership team draft of proposed major domo notice and regulation filing. The draft describes PJM's plan to file with the Commission a showing of competitiveness in the PJM West/South Regulation market and a request that the Commission authorize the conversion of the market from a cost-based to a market-based structure. Proposed notice states that if PJM's observations of the Regulation market following the AEP/Dayton integration indicate that the assumptions underlying the request no longer hold, PJM will so advise the Commission and request that the Commission suspend conversion to a market-based structure.

**September 27, 2004 (1205)** – Mr. Bowring (PJM Market Monitor) circulates draft of proposed major domo notice and regulation filing to MMU staff for comment.

**September 27, 2004 (1301)** –MMU staff responds to Mr. Bowring's request for comment on draft of proposed major domo notice and regulation filing, noting that MMU application of the FERC screens for market based rate authority demonstrate a failure by multiple participants. MMU staff recommends that a review be undertaken of any supporting material PJM intends to provide to support a transition to market based rates.

**September 27, 2004 (1312)** – Mr. Bowring (PJM Market Monitor) responds to the PJM leadership team in regard to the proposed major domo notice. Mr. Bowring (PJM Market Monitor) states, "If PJM is planning to make a 'showing of competitiveness', I am not sure what that is."

**September 27, 2004 (1654)** – PJM sends proposed major domo notice to PJM members stating their conclusion that the West/South regulation market is sufficiently competitive to warrant a market based structure, and their intent to file for such approval from the Commission.

**September 28, 2004 (1133)** – Mr. Duane (PJM Deputy General Counsel) emails PJM leadership team stating that "the approach taken by the transmittal [cover letter for October 1, 2004 market based rate authorization filing for the West/South Regulation Market] is very good and reflects PJM's internal discussions."

**September 28, 2004 (2303)** – Mr. Bowring (PJM Market Monitor) email exchange with PJM Leadership Team and Wright & Talisman. Mr. Bowring (PJM Market Monitor) states "I have not ruled out changing the recommendation but don't see how at this point. This includes the additional data that John Baranowski provided yesterday - while the data was not accurate we tracked down the specified units and determined that there is an additional 255 MW of regulation. I am open to your suggestions. If you think I am being too negative based on the data, tell me why specifically you think that. I continue to rethink the conclusions but it is hard to avoid the conclusion that the market does not pass the tests specified in the FERC Order. Again, if you disagree please explain why. Another option is to go to market based but with some very specific transition mitigation measures, e.g. an adder higher than \$7.50 but less than the \$100 in PJM MidAtlantic. I think we should all decide exactly what the objective is - please let me know your thoughts. My objective is to present the results of an objective market power analysis following the FERC specifications and draw conclusions based on those results. Please pass on to anyone else at PJM who should be reviewing this. "

**September 29, 2004 (1835)** – Mr. Duane (PJM Deputy General Counsel) emails Mr. Bowring (PJM Market Monitor) and PJM leadership team asking for their consideration of his revisions to the MMU's affidavit to "reflect the internal discussion had here at PJM today". Mr. Duane (PJM Deputy General Counsel) suggests that the conclusions should be left to the Commission and not be provided by the MMU.

**October 1, 2004 (1106)** – Mr. Duane (PJM Deputy General Counsel) emails Mr. Bowring (PJM Market Monitor) and PJM leadership team recommending change to statement in MMU Affidavit which commits the MMU to provide the Commission a report on actual operating experience with the West/South regulation market prior to rendering its decision on price-based offers. Mr. Duane (PJM Deputy General Counsel) suggests language allowing such decision support material to be provided to the Commission only "if necessary" and not drawing a linkage between the report and the Commission's decision on price-based offers.

**October 1, 2004** – PJM Submits request to the Commission for price-based regulation offers in West/South market. The basis for PJM's support for price-based offers hinges on the notion of excess supply. It was not the MMU's position excess supply that it would ultimately exist, how concentrated the ownership would be, or its effectiveness in mitigating market power. (Declaration at pp 45-47). PJM nonetheless cites certain of this content in its cover letter to give the impression that the MMU supported its contentions.

PJM commits in its cover letter that if the excess supply it relies on as support for its request does not bear out as expected in actual operations, either prior to or after the granting of market-based rates, that its MMU will inform PJM and the Commission and may request that the regulation market be cost-based (PJM cover letter at p 16). Attempts by the MMU to notify the Commission of such developments are later limited through:

- PJM decision to not provide the Commission with the MMU's interim report on actual regulation market operations in November 2004. This report demonstrated a lack of excess supply, and failure of the Commission's market power tests presented in the MMU's October 1, 2004 Affidavit.
- Attempts by PJM management to have the MMU remove explicit recommendations from its April 25, 2005 declaration
- Misrepresentation of the MMU's findings, conclusions and recommendations in PJM's April 25<sup>th</sup> cover letter accompanying the MMU declaration
- PJM statements in its April 25, 2005 filing cover letter which misrepresented the participation of excess supply in the market in spite of the fact that the MMU declaration explicitly noted a contrary result based on actual operating experience in West.
- Delay of the April 25, 2005 filing which allowed only five days prior to the requested effective date for the Commission to weigh the merits of the request, or to allow stakeholder comments.

PJM's accompanying cover letter mischaracterized the findings, conclusions and recommendations of the MMU:

- Nowhere does PJM's cover letter acknowledge or cite the contrary conclusion or recommendations of its Market Monitor. In fact, the MMU explicitly recommended against price-based offers based upon the present analysis. (declaration at p 47)
- PJM's use of out-of-context references to the MMU Declaration to support their recommendation for price-based offers on the basis of excess supply. The MMU

declaration in fact explicitly states that reliance upon excess supply as a mitigating factor to rebut the presumption of market power as evidenced by the failure FERC's structural screens and delivered price tests is premature and not recommended. (Declaration at p 46)

- PJM cites partial results of the MMU's application of the Commission's structural screens and suggests that HHIs < 2500 are significant. The MMU declaration in fact states explicitly that the Commission does not specify an HHI test as part of the market share screen (declaration at p 17)
- Nowhere does PJM's cover letter acknowledge or cite the application and resulting failure of the Commission's delivered price test by the MMU and reported in its declaration. The Commission explicitly specifies the delivered price test as a means to overturn a rebuttable presumption of market power resulting from a failure of the indicative screens.

**October 22, 2005** – PJMICC and AMP-Ohio file motions to intervene and protest with the Commission. The inconsistencies between the support offered by PJM in its request for market based offers in the PJM West/South Regulation Market and the findings of its Market Monitor are called into question in these filings.

**November 10, 2004** (0608) – Mr. Duane (PJM Deputy General Counsel) emails Mr. Bowring (PJM Market Monitor) and Mr. Ott (PJM VP) acknowledging and approving Mr. Bowring's request to file a summary of the October 2004 regulation market results to support PJM's request for a decision from the Commission on December 1, 2004. Mr. Duane (PJM Deputy General Counsel) cites a projected filing date of November 19, 2004.

**November 17, 2004** – On November 17, 2004, PJM submitted an answer to the protests of AMP-Ohio and PJMICC. In its answer, PJM reiterates its position that the large amount of excess supply in the market mitigates any potential that suppliers may have to exercise market power and that its MMU supports market-based pricing when such excess supply is present. The MMU Declaration of October 1, 2004 however states that the existence of substantial excess supply along with the nature of the associated supply curve must also be taken into consideration (Declaration at p 47).

**November 22, 2004** (0712) – Mr. Bowring (PJM Market Monitor) emails Mr. Haymes of FERC asking if the Commission desires a summary of the October 2004 regulation market results.

**November 24, 2004** (0849) – Mr. Bowring (PJM Market Monitor) emails PJM leadership team seeking permission to file with FERC today, the MMU's summary of the October 2004 regulation market results to support PJM's request for a decision from the Commission on December 1. The actual market results the MMU seeks to provide the Commission in this report bear out the lack of excess supply, and failure of the Commission's market power tests presented in the MMU's October 1, 2004 Affidavit.

**November 24, 2004** (0950) – Ms. Zibelman (PJM Exec VP & COO) emails Mr. Bowring (PJM Market Monitor) instructing him that nothing may be filed until the PJM leadership discusses it at their November 30<sup>th</sup> Cabinet meeting, one day prior to the date PJM requested a decision from the Commission.

**November 30, 2004** – At PJM Leadership Team meeting, attended by Mr. Bowring (PJM Market Monitor), it is decided that the MMU may not file its summary of the October 2004 regulation market results to support PJM's request for a decision from the Commission on December 1. The report that the MMU provided to PJM is, as a result, never provided to the Commission.

**December 30, 2004** – AMP-Ohio files a pleading entitled "request for rehearing" with the Commission, raising concerns about, among other things, that the recommendations of the Market Monitor in the October 1, 2004 PJM filing were ignored.

**February 9, 2005** – MMU has reached preliminary conclusions on regulation market using actual market participation data gathered following AEP integration. MMU notes that level of excess supply offered into market, upon which PJM based its recommendation, is significantly less than expected.

**March 17, 2005** - AMP-Ohio files a pleading entitled "motion for reconsideration" of the November 30, 2004 and January 31, 2005 Notices. Among other issues, AMP-Ohio again raises objections that the concerns raised by the Market Monitor in the October 1, 2004 filing appear to have been ignored.

**April 1, 2005** – PJMICC files an answer in support of AMP-Ohio's motion for reconsideration

**April 8, 2005 (1648)** – Mr. Bowring (PJM Market Monitor) emails PJM leadership team chronicling meeting with Mr. Harris (PJM Pres & CEO) and Ms. Zibelman (PJM Exec VP & COO) in which he presented MMU determination that West/South regulation market is structurally uncompetitive and plans to notify FERC of MMU findings.

**April 8, 2005 (1757)** – Ms. Zibelman (PJM Exec VP & COO) emails PJM leadership team and Wright & Talisman instructing, "Joe before we move on this, lets have a call with Karl [Mr. Pfirrmann (PJM EVP & COO)], Jim [Mr. Hinton], Andy [Mr. Ott (PJM VP)], Mike [Mr. Kormos (PJM Sr. VP - Reliability Services)] and the lawyers to make sure that the tactic we talked about this AM is one we want to take."

**April 8, 2005 (1807)** – Mr. Duane (PJM Deputy General Counsel) emails PJM leadership team and Wright & Talisman stating, "Of course, simply filing Joe's [Mr. Bowring's] opinions and accompanying report and letting the Commission decide whether it wishes to do something based on that filing is a straightforward alternative that doesn't involve 205 or 206 questions."

**April 13, 2005 (0919)** – Mr. Hinton email to Mr. Bowring (PJM Market Monitor), Mr. Kormos (PJM Sr. VP - Reliability Services) and Mr. Pfirrmann (PJM EVP & COO) stating with regard to regulation market that, "Does not seem to be a big deal for Dominion if its cost based for now."

**April 15, 2005 (0121)** – Ms. Zibelman (PJM Exec VP & COO) emails Mr. Bowring (PJM Market Monitor) and states, "I will try to reach you today. In the meantime please talk to Karl [Mr. Pfirrmann (PJM EVP & COO)] re AEP. He has already spoken with them and can fill you in. I get back on Monday let's wait until after then to file anything."

**April 18, 2005 (1640)** – Mr. Duane (PJM Deputy General Counsel) emails Mr. Bowring (PJM Market Monitor) stating that, “based on conversations I’ve had with Audrey and others, I think there is still not a consensus with the sorts of recommendations you are making at the close of the declaration.”

**April 18, 2005 (1923)** – Mr. Bowring (PJM Market Monitor) emails Mr. Duane (PJM Deputy General Counsel) of desire to file Affidavit next day on April 19<sup>th</sup>.

**April 18, 2005 (2220)** – Mr. Duane (PJM Deputy General Counsel) emails members of PJM leadership team alerting them that the MMU Affidavit still “has all the recommendations at the end that I thought y’all had agreed with him should be removed”.

**April 19, 2005 (0715)** – Mr. Bowring (PJM Market Monitor) circulates draft MMU declaration to PJM leadership team noting removal of specific recommendations that the West/South regulation market remain cost-based. Mr. Bowring (PJM Market Monitor) states, “I have attached a revised version of the declaration in which I take Craig’s [Mr. Glazer’s (PJM VP)] suggestions of presenting the facts but not making an explicit recommendation about market based rates.”

**April 19, 2005 (0853)** – Email from Wright & Talisman recommending deletion of additional material from Affidavit in view of the removal of the MMU’s recommendation.

**April 19, 2005 (1224)** – Mr. Duane (PJM Deputy General Counsel) emails Mr. Bowring (PJM Market Monitor) stating that per Ms. Zibelman (PJM Exec VP & COO)’s instruction, MMU may not file Declaration,” until Joe [Mr. Bowring (PJM Market Monitor)], Andy [Mr. Ott (PJM VP)] and Mike [Mr. Kormos (PJM Sr. VP - Reliability Services)] agree on the right facts and assumptions underpinning the analysis.”

**April 25, 2005** – PJM Submits its second request to the Commission for price-based regulation offers in West/South market. The basis for PJM’s support for price-based offers again hinges on the notion of excess supply. In its October 1, 2004 filing, PJM committed to the Commission that if the excess supply it relied on as support for its request did not bear out as expected in actual operations, either prior to or after the granting of market-based rates, that its MMU would inform PJM and the Commission and may request that the regulation market be cost-based (PJM cover letter at p 16). Though the MMU’s analysis was completed well in advance of this date, PJM delayed its release until just 5 days before the scheduled May 1, 2005 integration of Dominion. During this time, PJM made repeated attempts to have the MMU remove its conclusions from the report. The potential economic consequence to PJM Markets could be significant should the Commission be denied timely and objective notification of concerns identified by the Market Monitor. Such delay could have the effect of not allowing the Commission sufficient time to consider the merits of the filing, or to allow public comment on the matter before issuing its determination. In spite of the fact that its Market Monitor explicitly notified it that the excess supply upon which its October 1, 2004 petition to FERC relied upon did not bear out as expected in actual operations, and its commitment to FERC to notify it of such, PJM issued the following conclusion in its April 25, 2005 filing to FERC :

“PJM does not believe that there is any material change in the expected excess supply of regulation, which formed the factual bases for the requested market-based regulation

authority in this docket, accepted by the Commission by notice dated November 30, 2004” (PJM April 25, 2005 filing at page 2)

The Commission in its April 29, 2005 response to PJM's filing acknowledged the validity of the conclusions reached by the MMU in regard to excess supply. The Commission stated, “Again, the concerns of PJM's Market Monitor in the regard have been confirmed by actual operating experience in the PJM West Regulation Market after the integration of AEP, DP&L and Duquesne”.(FERC's April 29, 2005 response at p 23)

**April 26, 2005** – Mr. Bowring (PJM Market Monitor) emails Mr. Haymes and Mr. Hederman of FERC providing a copy of PJM's April 25, 2005 filing and reaffirming the MMU's conclusion that the West/South Regulation market is not structurally competitive.

**April 27, 2005** – As was the case following PJM's October 1, 2004 filing, the inconsistencies between the support offered by PJM in its request for market based offers in the PJM West/South Regulation Market and the findings of its Market Monitor are called into question. AMP-Ohio files a pleading with the Commission entitled “supplement to its motion for reconsideration and an emergency motion for the suspension of the tariff sheets”. In this filing, AMP-Ohio draws attention to the concerns raised by the Market Monitor in its April 25, 2005 Declaration.

**April 28, 2005** – PJMICC files with the Commission in support of the concerns referenced by the AMP-Ohio pleading

**April 29, 2005** – The Commission rules on PJM's April 25, 2005 filing. In its Order, the Commission concludes that “the concerns about the potential of certain suppliers to exercise market power expressed by PJM's Market Monitor in the October 1 Filing have been substantiated by actual operation of the PJM West Regulation Market after the integration of AEP, DP&L and Duquesne, as discussed in the State of the Market Report” (April 29, 2005 FERC Order at p 22) The Commission goes on to conclude that, “Again, the concerns of PJM's Market Monitor in the regard have been confirmed by actual operating experience in the PJM West Regulation Market after the integration of AEP, DP&L and Duquesne”.(FERC's April 29, 2005 response at p 23) The Commission calls for an assessment of the actual operating experience in the PJM West/South Regulation Zone for a period (e.g., six months) after the integration of Dominion. The Commission requests that the assessment include an independent confirmation, under actual operating conditions, of the amount of excess regulation supply in these regions. (April 29, 2005 FERC Order at p 26).

**April 29, 2005 (1915)** – Mr. Duane (PJM Deputy General Counsel) emails PJM leadership team a message entitled “UNEXPECTED FERC ORDER – REGULATION MARKET WEST/SOUTH” in which he states, “In admittedly a surprise, the Commission issued the attached Order this evening on the eve of the Dominion integration. The Order addresses the MMU's declaration filed this past Monday and the ‘emergency’ protests filed by AMP-Ohio and the Industrials.”

**April 29, 2005 (1939)** – Mr. Harris (PJM Pres & CEO) responds to Mr. Duane's announcement of FERC's Order with an email to the PJM leadership team in which he directs specific persons to, “Please advise asap of AEP dominion reaction.”



**July 26, 2005** - PJM commits in an email to the MIC and EMC Committees to a six month combined regulation market trial during the period August 1, 2005 through January 31, 2006, with a report on the competitiveness of this trial construct to stakeholders within 3 months.

**February 28, 2006 (1321)** – Mr. Bowring (PJM Market Monitor) emails Mr. Smith (PJM Consultant - Project Manager on 2005 State of the Market Report) and states “I am going to have to modify the Ancillary section [of the State of the Market Report].”

**February 28, 2006 (1730)** – Mr. Bowring (PJM Market Monitor) emails Ms. Zibelman (PJM Exec VP & COO) in response to her verbal direction that the MMU revert to an earlier draft version of the Ancillary Services section of the State of the Market Report. Mr. Bowring (PJM Market Monitor) cites difficulty in doing so as the underlying analyses and write-up have been updated and improved there as elsewhere in the report since then. Mr. Bowring (PJM Market Monitor) seeks clarification from Ms. Zibelman (PJM Exec VP & COO) that her objections center on the conclusions regarding the competitiveness of the combined regulation markets.

**February 28, 2006 (1808)** – Ms. Zibelman (PJM Exec VP & COO) emails Mr. Bowring (PJM Market Monitor) describing concerns on the part of the PJM leadership team with the analysis performed by the MMU and the resulting conclusions appearing in the Ancillary Services Section of the State of the Market Report. Ms. Zibelman (PJM Exec VP & COO) also cites concerns regarding her perception of the manner in which the report has evolved since the PJM Board had the opportunity to review a previous draft. Ms. Zibelman (PJM Exec VP & COO) suggests that Mr. Bowring (PJM Market Monitor) work with members of the PJM leadership team to ensure that they agree with the MMU's current analysis as compared to the previous draft of the Ancillary Services section of the State of the Market Report.

**February 28, 2006 (2018)** – Mr. Bowring (PJM Market Monitor) emails Mr. Smith (PJM Consultant - Project Manager on 2005 State of the Market Report) and states “I am dealing with interventions from up the ladder - have made changes [to the Ancillary section of the State of the Market Report] but not sure they are yet final.”

**March 1, 2006 (0943)** – Mr. Ott (PJM VP) emails Ms. Zibelman (PJM Exec VP & COO) and Mr. Harris (PJM Pres & CEO) to inform them that the “immediate issue has been resolved by changing the conclusions section of the SOM [State of the Market Report]”

**March 1, 2006 (1100)** – Ms. Zibelman (PJM Exec VP & COO) emails Mr. Ott (PJM VP) expressing her thanks, copying Mr. Harris.

#### **2005 State of the Market Report (Regulation Section) Released March 8, 2006**

PJM applied significant pressure and ultimately ordered the removal of the MMU's conclusions and recommendations regarding the lack of a competitive structure in the PJM West/South Regulation market. The material PJM ordered removed was consistent with that which it attempted to delay, censor and mischaracterize in the MMU Declaration accompanying the October 1, 2004 West/South Regulation Market filing to FERC, again in the MMU Declaration accompanying the April 25, 2005 West/South Regulation Market filing to FERC as well as the MMU's interim report on regulation market operation that PJM declined to provide the Commission in November 2004.

The MMU was ordered to remove the following statement from the Ancillary Services Section of the 2005 State of the Market Report:

However, the improvement in HHI and maximum market share metrics was not enough to overcome the fact that there are still dominant suppliers in the Combined Regulation Market that are frequently pivotal and that, therefore, have the ability to exercise market power, aggravated by the presence of inelastic demand. Consistent with the FERC's order affecting the offer capping of dominant suppliers in the Western Region Regulation Market, an effective means of reducing the probability of the exercise of market power would be to offer cap the dominant suppliers in the Combined Regulation Market. There is little downside to this approach in the presence of dominant suppliers.

Which was replaced with the inconclusive statement:

The MMU will make a recommendation in the near future as to whether the consolidation has resulted in a market that is structurally competitive.

The MMU was also ordered to remove the following statement from the Ancillary Services Section of the 2005 State of the Market Report:

Based on this analysis, the MMU recommends that PJM continue to operate the Regulation Market as a single Combined Regulation Market. This recommendation is based on improved operational results and on the increased competitiveness of the Combined Market. Nonetheless, based on these market structure results, the MMU concludes that the market structure of the PJM Combined Regulation Market was not consistent with a competitive outcome. For Phase 5-b, the PJM Combined Regulation Market was operated by PJM, with the two dominant suppliers offer-capped, as a price-based market with market-clearing prices. It would be reasonable, consistent with the results of the analysis and with FERC's actions regarding the Western Region Regulation Market, to offer cap only the two dominant market participants identified in the analysis of the Combined Regulation Market. These results are based on the first five months of operation of the combined market. The MMU will continue to analyze market outcomes and market structure for the Combined Regulation Market.

Which was similarly replaced with the statement:

The MMU will make a recommendation to PJM members in the near future regarding the structural competitiveness of this market.

**March 13, 2006 (0917)** – Mr. Bowring (PJM Market Monitor) receives email from AEP asking, "Soooo, what does the State of the Market Report mean for AEP and the regulation market?"

**May 10, 2006** – PJM Client Manager for AEP emails Mr. Bowring (PJM Market Monitor) conveying question from AEP. AEP requests an analysis of the West Regulation Market. They believe they were promised an analysis by mid-December of 2005.

**May 10, 2006 (1832)** – PennFuture releases an overview of the 2005 PJM State of the Market Report. The report notes, “Probably not one elected official in the entire PJM Interconnection region, few utility regulators and even fewer journalists have read the PJM Market Monitor’s 2005 State of the Market Report. That is too bad, especially when knowledge is indispensable to sound policy in these worst of energy times for consumers. Known for its integrity and credibility, the Market Monitoring Unit (MMU), PJM’s independent market oversight body, marked its seventh year within PJM in 2005.” PennFuture concludes, “The Market Monitor should be thanked for another year of important work and for making real facts available.”

**May 10, 2006 (1857)** – Mr. Ott (PJM VP) forwards PennFuture’s article to Mr. Bowring (PJM Market Monitor) precluded by the statement, “you should use this guy as your PR agent in Virginia”

**August 15, 2006 (0730)** – Mr. Bowring (PJM Market Monitor) emails Mr. Ott (PJM VP) and Mr. Bresler (PJM General Manager and Chairman of the PJM MIC) expressing his desire to release the Combined Regulation Market Report and asking to be placed on the upcoming PJM Committee meeting agendas to brief stakeholders. A report on the regulation market results following the May 1, 2005 integration of Dominion was committed to in the MMU Affidavit accompanying the April 25, 2005 West/South Regulation Market filing to the Commission. Further, PJM committed in a July 26, 2005 email to the MIC and EMC Committees to a six month combined regulation market trial during the period August 1, 2005 through January 31, 2006, with a report on the competitiveness of this trial construct to stakeholders within 3 months.

**August 15, 2006 (0744)** – Mr. Bresler (PJM General Manager and Chairman of the PJM MIC) emails Mr. Bowring (PJM Market Monitor) and Mr. Ott (PJM VP) stating that he recommends presenting the MMU findings at the upcoming PJM MRC and PJM MIC Committee meetings.

**August 15, 2006 (0816)** – Mr. Ott (PJM VP) responds via email stating that Mr. Bowring (PJM Market Monitor) “never closed the loop” with him on a final recommendation to be contained in the MMU report.

**August 15, 2006 (0821)** – Mr. Bowring (PJM Market Monitor) replies via email to Mr. Ott (PJM VP) stating that the report’s recommendations have been under discussion with PJM for four months and that the MMU needs to release it and would like to describe it at a stakeholder meeting.

**August 15, 2006 (0848)** – Mr. Ott (PJM VP) emails Mr. Bowring (PJM Market Monitor) contending that he is not yet satisfied with the analytical methods underlying the MMU recommendations and states “don’t want to create too much more email traffic on this....”

**August 20, 2006 (1405)** – Mr. Bowring (PJM Market Monitor) emails Mr. Ott (PJM VP) asking that, “regardless of the disagreements over the results etc, do you agree that this is an MMU report, owed to membership per a vote at the MIC? I believe that we have provided you all the requested information. Let me know exactly what information you would like to see in addition to what has been provided.”

**October 18, 2006** – In oral testimony before the FERC in the matter of transparency provisions of the Energy Policy Act of 2005, Mr. Ott (PJM VP) states,

"The PJM market monitor produces extensive analyses on the market, produces a state of the market report, and the conclusions of the market report are his own. Obviously, I don't [think] anyone is questioning the independence of PJM, the organization, so I would take issue with Mr. Spinner saying that we need an independent entity doing an analysis of the competitiveness of the market. We have one."

**October 18, 2006 (Report on Combined Regulation Market for August 1, 2005 through July 31, 2006)** – The release of this report was delayed for several months, until October 18, 2006, again due to significant pressure applied by PJM to alter its conclusions and recommendations. The conclusions which PJM sought to prevent being released were consistent with that which it attempted to delay, censor and mischaracterize in the MMU Declaration accompanying the October 1, 2004 West/South Regulation Market filing to FERC, the MMU's interim report on regulation market operation that PJM declined to provide the Commission in November 2004, the MMU Declaration accompanying the April 25, 2005 West/South Regulation Market filing to FERC and the content which it ordered removed from the 2005 State of the Market Report.

**April 5, 2007** – Mr. Bowring (PJM Market Monitor) raises concerns regarding independent functioning of the MMU at FERC's Technical Conference on Market Monitoring in Washington DC.

**April 6, 2007 (1151)** – Mr. Harris (PJM Pres & CEO) emails Mr. Bowring (PJM Market Monitor) requesting a written response as to whether he stands behind the conclusions of the 2006 State of the Market Report.

**April 6, 2007 (1430)** – Mr. Bowring (PJM Market Monitor) meets with Mr. Harris (PJM Pres & CEO), Ms. Zibelman (PJM Exec VP & COO) and Mr. Duane (PJM Deputy General Counsel) to discuss allegations raised at April 5, 2007 FERC technical conference on market monitoring, specifically the allegation that Mr. Bowring (PJM Market Monitor) was directed to remove material from the 2005 State of the Market Report relative to the competitiveness of the West/South Regulation Market. Mr. Bowring (PJM Market Monitor) states that Ms. Zibelman (PJM Exec VP & COO) directed him to remove the MMU conclusion that the West/South Regulation market was uncompetitive. Ms. Zibelman (PJM Exec VP & COO) acknowledges that she issued this directive and provides her justification for doing so. Ms. Zibelman (PJM Exec VP & COO) then asks Mr. Harris (PJM Pres & CEO) if he intends to allow Mr. Bowring (PJM Market Monitor) to defame her through his allegations.

**April 6, 2007 (1531)** – In response to a request from Mr. Harris (PJM Pres & CEO), Mr. Bowring (PJM Market Monitor) provides a memo summarizing the nature of the materials which he alleges he was ordered to remove from the 2005 State of the Market Report by Ms. Zibelman (PJM Exec VP & COO). Mr. Bowring (PJM Market Monitor) notes in his memo that he was asked directly by Ms. Zibelman (PJM Exec VP & COO) whether he intended to comply with the order, to which he replied that he believed that it was wrong but that he would do as ordered. Mr. Bowring (PJM Market Monitor) also confirms that he stands behind the conclusion in the 2006 State of the Market Report. Also in his memo, Mr. Bowring (PJM Market Monitor) notes the following statement from a FERC Order (96 FERC ¶ 61,061 July 12, 2001):

The Commission has the statutory responsibility to ensure that public utilities selling in competitive bulk power markets do not engage in market power abuse

and also to ensure that markets within the Commission's jurisdiction are free of design flaws and market power abuse. To that end, the Commission will expect to receive the reports and analyses of an RTO's market monitor at the same time they are submitted to the RTO.

Before the  
Federal Communications Commission  
Washington, D.C. 20554

In the Matter of	)	
	)	
	)	
Second Periodic Review of the	)	MB Docket No. 03-15
Commission's Rules and Policies	)	
Affecting the Conversion	)	RM 9832
To Digital Television	)	
	)	
Public Interest Obligations of TV	)	MM Docket No. 99-360
Broadcast Licensees	)	
	)	
Children's Television Obligations of	)	MM Docket No. 00-167
Digital Television Broadcasters	)	
	)	
Standardized and Enhanced Disclosure	)	MM Docket No. 00-168
Requirements for Television Broadcast Licensee	)	
Public Interest Obligations	)	

**NOTICE OF PROPOSED RULE MAKING**

**Adopted: January 15, 2003**

**Released: January 27, 2003**

**Comment date: April 14, 2003**

**Reply Comment date: May 14, 2003**

By the Commission: Commissioners Copps and Adelstein issuing separate statements.

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#### APPENDIX A: Initial Regulatory Flexibility Analysis

#### APPENDIX B: List of PSIP Tables

### I. INTRODUCTION

1. With this *Notice of Proposed Rule Making*, we commence our second periodic review of the progress of the conversion of the nation's television broadcast system from analog technology to digital television ("DTV"). In the Commission's DTV proceeding (MM Docket No. 87-268), we stated our intention to hold periodic reviews of the progress of the digital conversion and to make any adjustments necessary to our rules and policies to "ensure that the introduction of digital television and the recovery of spectrum at the end of the transition fully serves the public interest."<sup>1</sup> In our first DTV periodic review, begun in March 2000, we addressed a number of issues important to the transition.<sup>2</sup> In this second periodic review, we revisit, as we indicated we would, several issues addressed in the first periodic review, and also seek comment on a number of additional issues that we consider essential to resolve in order to

<sup>1</sup> *Fifth Report and Order* in MM Docket No. 87-268, 12 FCC Rcd 12809, 12856 (1997) ("Fifth Report and Order"), *on recon.*, *Memorandum Opinion and Order on Reconsideration of the Fifth Report and Order*, 13 FCC Rcd 6860, *on further recon.*, *Second Memorandum Opinion and Order on Reconsideration of the Fifth and Sixth Report and Orders*, 14 FCC Rcd 1348 (1998), *recon. dismissed*, DA 99-1361 (rel. July 12, 1999), *recon. dismissed*, FCC 00-59 (rel. Feb. 23, 2000).

<sup>2</sup> *In the Matter of Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television*, 16 FCC Rcd 5946 (2001) ("First DTV Periodic Review Report and Order"), *on recon.*, *Memorandum Opinion and Order on Reconsideration*, 16 FCC Rcd 20594 (2001) ("First DTV Periodic Review MO&O"), *Second Report and Order and Second Memorandum Opinion and Order*, 17 FCC Rcd 15978 (2002) ("First DTV Periodic Review Second Report and Order") (addressing DTV receiver standards and labeling requirements), *Third Memorandum Opinion and Order on Reconsideration*, 17 FCC Rcd 18571 (2002) (denying a Petition for Reconsideration of the determination in the MO&O that DTV area expansion applications must protect certain earlier-filed NTSC applications).