

APPENDIX C TO REPORT OF INVESTIGATION
BY THE SPECIAL INVESTIGATIVE COMMITTEE OF
THE PJM BOM

TIMELINE

MIC EXEMPT INTERFACE PRESENTATION ALLEGATION

(Bowring alleges that in January 2007, PJM Management prevented him from making a presentation to the Markets Implementation Committee (MIC) on the exemption of certain interfaces from mitigation when PJM Management disagreed with the MMU's analysis.)

(PJM responds that Bowring provided a report on the exempt interface issue in October 2006. PJM did not accept the MMU's recommendation due to PJM's eight years of operating experience and because it disagreed with aspects of the MMU's supporting analysis. In December 2006, PJM posted to its website the MMU's report along with a detailed response by the Markets Services Division. At the December 20, 2006 MIC meeting, Mr. Ott and Dr. Bowring discussed the respective positions and additional information was promised for the January 2007 meeting. On January 22, 2007, Mr. Ott provided his slides with additional analysis to Dr. Bowring anticipating that Dr. Bowring would provide the MMU additional analysis at the same time. Nothing was provided by Dr. Bowring as of January 24, 2007. On January 25, 2007, Mr. Ott and Dr. Bowring met with the MMU staff. Some MMU additional preliminary analysis was provided with a promise that more would be forthcoming. At that meeting Mr. Ott voiced concern regarding certain assumptions made in the analysis, as well as concern that the time for posting for the MIC meeting was overdue. At a January 26, 2007 meeting, Mr. Ott provided a revised version of the Markets Services Division's slides. Dr. Bowring committed to provide the MMU slides as soon as possible. Dr. Bowring did not provide the MMU slides until the evening of January 28, 2007. Mr. Ott then informed Ms. Zibelman that the additional analysis provided by the MMU on the 28th was incorrect and based on invalid assumptions. Ms. Zibelman then advised Dr. Bowring that the MMU slides could not be posted because they were received too late to receive appropriate review pursuant to the PJM internal procedures. Although Dr. Bowring's slides were not posted, he did participate in the January MIC meeting and did provide additional details on the analysis performed by the MMU. Dr. Bowring never informed PJM Management or the PJM Board of any complaint about the failure to post the slides.)

We are tasked to investigate the factual circumstances surrounding efforts, if any, by PJM Management to prevent or delay the MMU from making presentations to the MIC concerning the MMU's position on the continuation of exemption of certain interfaces from required mitigation, the timing of the Market Monitor's submission of proposed presentations as may be related to any delay, and the circumstances under which the MMU ultimately made any report or published any information about the issue thereafter.

<u>DATE/TIME</u>	<u>DESCRIPTION OF EVENT</u>
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10/18/2006	Bowring forwards to Zibelman, Ott, Kormos and Duane the Second Quarterly Report from MMU regarding the exemption of internal PJM interfaces.
10/18/2006	<p>Ott replies to Zibelman and Kormos:</p> <p>“This report is essentially the same as the previous one. Same conclusion same recommendation.</p> <p>He really did not answer the concerns that were raised with the previous report.”</p>
11/20/2006	<p>Ott forwards to Bowring and Zibelman the PJM Markets staff evaluation of the MMU report regarding Exempt interfaces in rebuttal to Bowring’s report.</p> <p>Ott states, “Joe, once you have reviewed this, I would like to discuss it with you and get your comments . Mike, Audrey, Vince and Stu please contact me with any comments.”</p>
11/20/2006	<p>E-mail chain between Ott and Zibelman re: Markets Staff’s Evaluation Of MMU Report.</p> <p>Zibelman notes it was insightful and supports the conclusions. Asks what Bowring reported to CMC.</p> <p>Ott replies Bowring only briefly discussed it at CMC but Ott expressed concern with Bowring’s conclusion. Zibelman states, “I know, but in the report, how did he convey the failures.”</p>
11/20/2006	<p>Ott responds to Zibelman:</p> <p>“He stated that APSouth failed 50% of the time. Because he only considered hours when it was binding in the assessment. His technique is misleading at best.”</p>

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11/20/2006	<p>Duane e-mail to Ott, Kormos, Bresler and Zibelman.</p> <p>“I haven’t copied Bowring for a couple of reasons. ...Have we made a decision to reject the MMU recommendation? . . I would be more direct and say PJM has decided (based on the facts) not to seek to remove the exemptions . . . (I say seek, because we would need a stakeholder and FERC process to in fact make any changes to the exemptions) . .</p>
11/29/2006	<p>Ott replies to Duane:</p> <p>“I discussed this document with Joe and I asked if the issues that are discussed within the document have changed his opinion on his original analysis. He states that he does not think his analysis needs to be changed and he does not think the issues we have raised are relevant enough to change his conclusions.</p> <p>Therefore I suggest we proceed with posting this document and discuss it at an upcoming MIC meeting...</p> <p>Would it be better if we also posted Joe's complete report rather than my summary, the report is only 7 pages and it might be better to just post it to avoid any appearance that we are trying suppress anything.”</p> <p>Duane replies: “I have no objection to posting Joe’s full report.”</p>
12/4/2006	<p>Ott e-mail to Zibelman (cc: Kormos, Duane, & Bresler) attaching updated response to the MMU interface exemption report, writing, “I want to confirm you are OK with us proceeding to release these to stakeholders and to schedule stakeholder discussion through MIC?”</p>
12/5/2006	<p>Kormos replies:</p> <p>“Just a thought but you might want to mention that generators bids are for the entire day and therefore looking at all hours not just constrained hours make sense. Joe continues not to look at the ability to predict when these events will happen and the downside a generator would face in attempting to bid to try and exercise market power in less than 1% of the hours and the expense of not being competitive in the other 99%. I think the daily bidding is another reason not to go with Joe's recommendation.”</p>

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12/13/2006	Bowring reminder re: TPS slides “Need to finalize slides on TPS examples. These can be general and available for any TPS discussion. I will use them at next week’s MIC to discuss regulation TPS.”
12/14/2006	Bowring e-mail to MMU employee and MMU employee forwarding Markets Response to MMU exempt interfaces “Comments? I will be debating with Andy at MIC.”
12/14/06	E-mail to MIC Committee attaching agenda for meeting and links to material on website for meeting
12/19/06	Ott e-mail to Zibelman Duane & Kormos forwarding PJM ICC e-mail raising issue re MIC exempt interface agenda item and apparent inconsistency in PJM Staff response to MMU Interface Analysis.
12/20/2006	MIC Meeting Minutes MMU/PJM INTERFACE ANALYSIS Mr. Bowring reviewed the results of the quarterly MMU analysis regarding exempt Interface constraints required by the PJM Operating Agreement. Mr. Ott reviewed the PJM staff response to the MMU analysis. The Committee discussed the MMU report and the associated PJM staff response. Mr. Bowring and Mr. Ott will present additional information regarding the Interface analysis at the next Committee meeting.

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12/20/2006	<p>Ott email to Zibelman re:</p> <p>Ott’s concern due to need to present the detailed analysis of the 250 intervals that failed the three pivotal supplier test for APSouth. Markets’ analysis showed that only three of the intervals would have resulted in any price impact from offer capping, which is not significant. Markets has shared its analysis with MMU. Bowring has indicated that he may disagree with Markets’ analysis and will do its own analysis. Ott is concerned due to Bowring’s habit of keeping his analysis to himself until the last minute and then revealing it to us right before the meeting, then we have no time to react. Ott wants Zibelman to instruct the MMU to complete analysis well before the meeting to give Markets time to review. Ott asks Zibelman to require Bowring to have final analysis no later than January 12</p>
12/20/2006	<p>Bowring e-mail to MMU employee instructing him to talk with Dean tomorrow . . . “and tell him the problems we have with his method for analyzing APS South. Let me know how it goes and what his response is. I told Andy that we thought their approach was incorrect and that we would start by you meeting with Dean to discuss. We also need to develop our own analysis, as they plan to present some version of their analysis to the MIC in January.”</p> <p>MMU employee responds, “OK.”</p>
1/18/2007	<p>Raymond Fernandez e-mail to Ott, Bresler, Bowring re: 1/31/07 MIC Agenda. Needs Meeting Materials for posting by 1/24/07.</p>
1/22/2007	<p>Ott sends Bowring his slides on APS South Interface Analysis.</p>
1/22/2007	<p>Bowring sends Ott’s slides to MMU employee for review. “Please update me on the status of the mark up analyses by MMU employee and Tom Z for APS South. Andy wants to discuss this week.”</p>
1/23/2007	<p>Ott sends AP South unit bidding markup analysis to Bowring.</p>
1/23/2007	<p>Fernandez e-mail to Ott, Bresler, Bowring re: Reminder to send materials for the January 31 MIC no later than noon, January 24 so can get the information posted on pjm.com.</p>

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1/23/07	MMU employee e-mail to Bowring re need for materials for MIC Meeting.
1/24/2007	Hartung sends MMU employee slides of Interface Analysis; MMU employee forwards to Bowring with message stating that MMU employee is meeting with Hartung tomorrow to discuss.
1/24/2007	Bowring forwards Hartung's slides to MMU employee and MMU employee stating, "please take a look . . . we should talk . . Andy wants to talk today also . . . has Dean told you what he did in his analysis?"
1/25/2007	<p>The "Ott Incident" in MMU. Ott appeared at MMU and demanded the slides the MMU staff was preparing. MMU staff refused to provide because they had not been reviewed by Bowring.</p> <p>At later meeting that afternoon with Ott, Breslar, MMU employee, Hartung & Bowring (by phone) some of MMU slides were reviewed.</p> <p>Ott apologized for earlier outburst.</p> <p>In Bowring's June 12, 2007 FERC Submission, Bowring contends that at that meeting both "sides" agreed to do more work on the analysis and exchange slides again.</p>
1/25/2007	MMU employee sends MMU Response Slides to PJM AP South Interface Analysis to Bowring.
1/25/2007	MMU employee sends Bowring an e-mail attaching slides stating, "This one."
1/25/2007	Bowring sends the e-mail to Ott re: Draft Preliminary Slides stating, "These are a rough draft."
1/25/2007	Bowring sends follow-up e-mail to Ott re: "Apparently MMU employee inadvertently sent the wrong slides. There were two slides not in what I had sent - slides 9 and 11."

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1/26/2007	Bowring e-mail to Ott re: slides “Please email me your slides – thanks.”
1/26/2007	Bowring e-mail to Ott – Let me know when we will get revised dollar impact numbers.
1/26/2007	Ott e-mail to Bowring & MMU employee re: “I asked the guys to get me a list of the TPS results for each of the days where we had found an impact. The attached spreadsheet provides the information. I will be proposing to use this table in the presentation to illustrate that we need to look into this further before making any conclusion. Also FYI, the four hours we discussed did not have the unit as marginal so the impact will be small because the units were CTs.”
1/26/2007	Bowring sends MMU Slides to MMU employee.
1/27/2007 7:30 a.m. 1/27/07 7:31 am	Ott e-mail to Bowring re: slides “[A]ttached are the slides I had at the meeting yesterday afternoon. I will be cleaning these up to forward to AAZ tomorrow. I will copy you on that version also.” Bowring forwards Ott’s slides to MMU employee.
1/27/07	Ott E-mail to Bowring (cc:Bresler, MMU employee & Hartung) There are no revised impact numbers because in the 4 hours we discussed the CTs were not marginal so there was no price impact. The only impact would have been an OR payment to the unit but that is only a few thousand dollars.

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1/27/2007	<p>MMU employee responds to Bowring re Markets' slides:</p> <p>In each scenario: There are three suppliers in the market: X, Y, Z. All have the same marginal cost structure. Demand is variable, but predictable. Suppliers can put in one offer for the year.</p> <p>Scenario A: There is no mitigation (no TPS, no capping for constraints, etc).</p> <p>Scenario B: There is a TPS test on localized markets caused by constraints. There are four constraints. When out of merit for a constraint, given the number of suppliers, the participants will fail and be capped at cost. Over the year (considering all hours) each participant faces a 15% chance of being called out of merit order for a constraint (15% of hours are capped for each participant).</p> <p>Scenario C: The TPS test on localized markets is removed on one of the 4 constraints. There is now a 12% chance of being capped (12% of hours will be capped) for being called out of merit order for a constraint.</p> <p>100 Point question: Are there incentives to offer energy over cost in scenario X, Y, and Z? (10 pts) Do the incentives vary over scenario X, Y, and Z for the participants? (20 pts) Will it be rational for the participants to change their bid strategy (mark-up) depending on the scenario? (50 pts) Why or why not? (20 pts).</p> <p>I'll send the answer key later.</p>
1/27/2007	<p>MMU employee later e-mail to Bowring :</p> <p>"I countered the oscillation "observation." The mark-up figures provide a LOT of information. We should discuss. The behavioral arguments outline the discussion from my original e-mail below. The LMP impact page was adjusted as well. We may need to adjust it more."</p>
1/28/2007	<p>MMU employee performs additional analysis and sends new MMU slides to Bowring.</p>

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1/28/2007	Bowring e-mail to MMU employee: See revised slide 9 "I will send slides to AAZ by 8:00."
1/28/2007 8:11 p.m.	Email from Ott to Kormos, Zibelman, Bresler, Bowring re: APSOUTH Interface Analysis "As we discussed on Friday afternoon, I have created a draft version of the slides that I propose to post tomorrow for the MIC discussion of this topic on Wednesday. These slides are similar to those we reviewed on Friday but I removed the specific dates/hours and revised the comments in prep. for public posting. I would like to have any comments of discussion on these completed by noon tomorrow. Joe, please forward any slides you may have as soon as you can."
1/28/2007	Bowring forwards Ott's email to MMU employee
1/28/2007 8:15 p.m.	Bowring e-mail to Ott, Kormos and Zibelman; cc: MMU employee, Bresler "I have attached the draft MMU slides for the discussion at the MIC."
1/28/2007 8:57 p.m.	E-mail from Bresler to Bowring re: "I agree these cover what we discussed. Arlene – please distribute and post these along with the other follow-up materials we have for MIC tomorrow."
1/29/2007	MMU employee e-mail to Bowring re: Reviewed the MMU slides and corrected a chart
1/29/2007	Bresler e-mails Bowring and MMU employee "Could one of you send Dean and I the data behind the scatter plots on slides 11 and 12?"

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1/29/2007	Bowring e-mail to MMU employee re: “Please review graphs with MMU employee and forward the relevant data.”
1/29/2007	E-mail to PJM MIC list“. . . Attached please find additional materials for the subject meeting . . . FTR/ARR Allocation and Funding Issues; SPS Schemes; AP South Interface Analysis; MIC Market Operations Report (Bowring’s slides were not attached)
1/29/2007	Bowring email to Alan Haymes re: MMU issue “Just a heads up that the MMU prepared slides for the MIC meeting on Wednesday on the issue of the application of the TPS test to exempt interfaces. Andy and I both prepared slides over the weekend and exchanged them Sunday evening. Audrey told me this morning that she would not permit the MMU slides to be posted. One of the areas that she deemed "inflammatory" is that we prepared two graphs showing the mark up of units that were included in the supply stack for the APSouth interface. This seems to me to be a clear infringement of MMU independence and a violation of the tariff Attachment M. Nonetheless, Andy Ott has posted his slides presenting what to me is a misleading analysis of our results and the application of the TPS test.”
1/29/2007	Bowring e-mail to Noonan forwarding 1/28/2007 Bresler email: “I don’t think you included these slides in what you just sent out? Do you plan to send them? Thanks.”
1/29/2007	Bowring e-mail to Bresler: “Is Arlene going to send the regulation slides?”
1/29/2007	Noonan replies, “These just went out. Note that I wasn’t copied in the original e-mails.”

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1/31/2007	<p>MIC Meeting Minutes</p> <p>3. MMU/PJM INTERFACE ANALYSIS Mr. Ott presented further analysis that had been conducted by PJM staff in support of the PJM staff response to the MMU exempt interface report. Mr. Bowring then provided additional details on the analysis performed by the MMU. Mr. Ott and Mr. Bowring both stated that PJM will continue to perform ongoing analysis on the test results.</p>
1/31/2007	<p>Bowring e-mail to Ott and Zibelman re: MIC Slides</p> <p>“I would like to post our proposed slides, leaving out, for now, the mark up slides to which you objected. I would also like to have the discussion about the markup graphs as soon as Andy's folks have had a chance to look at the data. I would also like to start a group process to analyze the application of the TPS test as soon as possible.”</p>
2/2/2007	<p>Ott requests that Bill Hogan, Professor of Global Energy Policy at Kennedy School of Government, Harvard University, provide an assessment and opinion on the current mitigation strategy and application of the three pivotal supplier test.</p> <p>Ott forwards for his review the three pivotal supplier test for Day Ahead Market and Real Time; 2005 Bowring Declaration and PJM Comments; and Markets AP South Interface Analysis.</p>
2/12/2007	<p>Bowring e-mail to Ott re: MIC slides</p> <p>“Audrey indicated that she is Ok with posting my slides, perhaps excluding make up slides. Have your folks looked at the mark up data? Do you have any other concerns about the slides?”</p>
2/12/2007	<p>Ott replies to Bowring:</p> <p>“I have big problems with the markup slides that were not resolved. The other slides were fine I think but I question the value at this point of just posting them w/o a meeting scheduled to discuss them. Logistically what are you suggesting we do?”</p>

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2/12/2007	<p>Bowring replies to Ott:</p> <p>“I am proposing to post the slides as a written record of my side of the discussion. I don’t understand what your problems are with the markup slides? Do you not agree that we calculated it correctly?”</p>
2/12/2007	<p>Ott Replies to Bowring:</p> <p>“You misunderstand my questions. I know you want to post slides, what I want to know is how do you want to post them. I don’t know how we should go about posting slide related to a past agenda item. Do you want to blast an email to the world stating they are posted so that we need to deal with many questions about what they are? Do you want to post them on the MMU site as a response to the MIC presentation that was covered? Or do you want to post them related to a future agenda item in response to the MIC item</p> <p>In response to your question. No I do not agree that the markups were correctly calculated. I think your slides overstated the issue. Also, I thought MMU employee had admitted the analysis method needed to be refined.”</p>
2/12/2007	<p>Bowring Replies:</p> <p>“On posting, I would like them posted to the MIC page, as an after the fact item for last meeting. No email is necessary. If that is too awkward, we can post them to the MMU web page.</p> <p>I need to know whether you disagree with the way in which we actually calculated the mark ups or whether it is a philosophical issue, or both.</p> <p>We don’t agree that the method needs to be refined. (Although everything can be improved.)”</p>
2/12/2007	<p>Bowring e-mail to MMU employee:</p> <p>“fyi – Does Andy quote you correctly?”</p>

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2/13/07	<p>MMU employee Reply to Bowring :</p> <p>“I had indicated that our ‘counterfactual’ analysis of the effect of not capping/not capping for the APSouth exempt interface needed refinement. I did not say that our mark-up numbers, as provided in the slides, needed refinement. The mark-up presented on the slides was calculated on the basis of the area under the price offer and cost offer curves . . between the min and max gen values. If min=max, the calculation was made at that point. These mark-up values are therefore ‘actual’ not ‘counterfactual.’ On one side, the markups were of units that were included in the test for the APSouth exempt interface. In the other, for units that were tested and would have failed the TPS test for the APSouth interface.”</p>
2/12/2007	<p>Ott Replies to Bowring:</p> <p>“OK, if you want to send me the slides w/o the markup stuff I can get them posted.</p> <p>I do disagree with the way you actually calculated markups.”</p>
2/12/2007	<p>Bowring Replies to Ott:</p> <p>“Tell me how you disagree so that I can understand and discuss.”</p>
2/12/2007	<p>Ott Responds to Bowring:</p> <p>“Same issue as with your other markup analysis. It is flawed because you fail to account for competition from other units with the marginal unit.</p> <p>But I do not think email exchange is the way to address complex items like this so . . . Please, Joe, schedule an in person meeting to discuss this the next time you plan to be in this office.”</p>
2/12/2007	<p>Bowring e-mail to Ott re: Response to Comments</p> <p>“Let me know what you think. I do not believe that there is a huge gap, but let’s discuss later today or tomorrow.”</p> <p>Attachment: SOM – Response to Ott Peer Review</p>

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2/20/2007	Fernandez forwards draft minutes for 1/31/07 Meeting to Bowring, Ott et al. for review
3/2/2007	<p>E-mail thread from Weishaar (McNees Wallace & Nurick LLC) to Bowring re: 1/31 MIC Agenda item states that MMU performed “additional analysis of the exempt interface issue, but he doesn’t recall “seeing any materials or analysis.” He requests Bowring to post or send to him without “violating any confidentiality concerns.”</p> <p>Bowring responds, “I had prepared some slides for the meeting but PJM did not want me to post them. I will check, but I believe I can post at least some of them.”</p>