REDACTED

SECOND REVISED

REBUTTAL TESTIMONY

OF

ERIC LOUNSBERRY

Engineering Department

Energy Division

Illinois Commerce Commission

Illinois Power Company

Proposed General Increase For Gas Rates

Confidential Information Identified As
BEGIN CONF END CONF

Docket No. 04-0476

February 2, 2005

Table of Contents

Q. Please state your name and business address.

A. My name is Eric Lounsberry and my business address is: Illinois Commerce Commission ("Commission"), 527 East Capitol Avenue, Springfield, Illinois 62701.

Q. Are you the same Eric Lounsberry that previously provided testimony in this proceeding?

A. Yes. I previously presented Direct Testimony in this proceeding, ICC Staff Exhibit 7.0.

Q. What is the purpose of your rebuttal testimony?

A. My rebuttal testimony responds to the rebuttal testimony of Illinois Power Company ("IP" or "Company") witnesses Brian W. Blackburn, H. Gene Eagle, Wayne G. Hood, Curtis D. Kemppainen, Timothy L. Hower, and Kevin D. Shipp. I also respond to the direct testimony of John W. Mallinckrodt that was presented on behalf of the Illinois Industrial Energy Consumers ("IIEC").

Q. What recommendations did you make in your direct testimony?

A. I recommended that the Commission reduce the working capital allowance associated with the value of natural gas in storage by $3,070,743, revise the value of the natural gas storage layers in Hillsboro by $10,367,837, find that the Company's Hillsboro storage field is currently less then 100% used and useful,

and that IP account for an error in the value of a capital addition (storage well) in its rebuttal testimony.

Q. Does your rebuttal testimony address any topics other than those raised in your direct testimony?

A. Yes. My rebuttal testimony will also discuss IIEC's request to alter the level of unaccounted for gas losses that IP charges its customers.

Q. Do you have any schedules attached to your rebuttal testimony?

A. Yes. I have the following schedules attached to my rebuttal testimony:

Schedule 17.01 2nd Rev	Hillsboro Used and Useful Calculation
Schedule 17.02 2nd Rev	Value of Hillsboro Peak Day Capacity
Schedule 17.03 2nd Rev	Hillsboro Seasonal Value

Q. Did the Company agree with any of the recommendations you made in your direct testimony?

A. Yes. In Mr. Kevin Shipp's rebuttal testimony, IP Exhibit 13.1, page 3, the Company agrees with my recommendation to reduce the working capital allowance associated with the value of natural gas in storage by $3,070,743. Further, in Mr. Gene Eagle's rebuttal testimony, IP Exhibit 12.1, pages 4-5, the Company agreed to revise the cost of the storage well. These topics are no longer at issue between the Company and myself.

Q. What recommendations are you making in your rebuttal testimony regarding your proposals to which the Company did not agree?

A. I recommend that the Commission direct IP to not make any changes at this time to the manner that it accounts for unaccounted for gas, direct IP to revise the value of the natural gas storage layers in Hillsboro by $10,367,837, and find that the Company's Hillsboro storage field is currently less then 100% used and useful.

Unaccounted for Gas

Q. Has any party raised a concern with the manner that IP calculates it unaccounted for gas?

A. Yes. IIEC witness John Mallinckrodt, in his direct testimony, IIEC Exhibit 1, pages 16 and 17, discussed the unaccounted for gas ("UFG") values that the Company has charged historically, provided the gas loss numbers that IP provided to the Federal Department of Transportation ("DOT"), noted that those numbers varied from the UFG values, and asked that IP change the manner that it calculates the UFG from a year to year value to a three year average.

Q. How did IP respond to Mr. Mallinckrodt's comments?

A. Company witness Brian Blackburn provided rebuttal testimony, IP Exhibit 8.6, pages 18 and 19, that addressed Mr. Mallinckrodt's comments. In particular, Mr. Blackburn explained why the UFG values used by IP differ from the DOT

numbers relied upon by Mr. Mallinckrodt, explained why making the changes requested by Mr. Mallinckrodt are not warranted, and noted that the UFG is simply a pass through cost incurred by IP, from which IP cannot profit in any way. Finally, Mr. Blackburn provided the UFG value that would go into place as of January 1, 2005.

Q. Based upon the information presented by Mr. Mallinckrodt and Mr. Blackburn, do you have an opinion on the manner in which IP calculates its UFG value?

A. Yes. I found no reason to disagree with the explanation and information provided by Mr. Blackburn in his rebuttal testimony; therefore, I agree with him that IP should not make any changes in the manner that it calculates its UFG value.

Hillsboro Storage Field Base Inventory Value

Q. What did you recommend to the Commission in your direct testimony regarding IP's request to increase the value of its recoverable base gas inventory at the Hillsboro storage field by $10,367,838 for the test year?

A. I recommended the Commission reject IP's request and instead recommended that the Commission direct the Company to use Hillsboro's recoverable base gas value that the Company used prior to it making any corrections to Hillsboro base gas inventory. This recommendation resulted in the value of Hillsboro storage field's recoverable base gas volumes (Account 117 – Gas stored underground – noncurrent) being reduced by $10,367,838. The calculation for this value was provided in my direct testimony, ICC Staff Exhibit 7.0R, Schedule 7.03R.

Q. Why did you recommend the Commission reject IP's request to increase the recoverable base gas value for its Hillsboro storage field during the test year?

A. IP's adjustment is premised on its hindsight determination that gas measurement errors during the period November 1993 through October 1999 caused it to withdraw recoverable base gas (gas not normally expected to be withdrawn from a storage field before it is retired) from the Hillsboro storage field. Based on the amount of recoverable base gas that IP contends was withdrawn from the Hillsboro storage field (based on its estimate of the gas measurement errors), IP estimates that the value of its base gas inventory for the test year increased by $10,367,838 to reflect the higher price of gas that IP placed in the field to replace the volume of lower priced recoverable base gas that it estimates was withdrawn. I recommended that the Commission reject IP's request because its estimate of the gas measurement error experienced during the period November 1993 through October 1999 was not accurate enough to base a recalculation of the non-current gas (recoverable base gas) amounts. I noted that IP's review determined a likely total volume error for the Hillsboro storage field and then applied a constant correction factor throughout the period during which IP believes the error existed at the field. However, IP does not have sufficient information to determine if a constant correction factor is appropriate or if some other value is necessary. Further, the total volume error, while supported by analysis from an outside entity, is also just a best guess at the volume that was not measured.

In particular, I raised seven concerns in my direct testimony regarding the methods IP used to calculate the amount of gas that was incorrectly measured from the Hillsboro storage field and other associated events. These concerns were:

1. The well charts used to obtain an estimate of the gas measurement error relied upon a 5-day snapshot as a proxy for the month;
2. Well chart data came from individual well meters that were not installed to American Gas Association guidelines for custody transfer meters;
3. IP failed to compile well chart data for all time periods in question;
4. IP applied a constant correction value when correction factor was likely not a constant value;
5. The reservoir simulation model is limited by the quality of its inputs;
6. The historical matching of the reservoir model to actual data relies upon information that is suspect since the inventory volume at Hillsboro has been in error for an extended period of time; and
7. Another study will be done in the future that could impact the ultimate correction number.

Q. Did IP address each of your seven concerns?

A. Yes. Witnesses Wayne Hood, Curt Kemppainen, and Timothy Hower commented on or disputed my statements in their rebuttal testimony.

Q. Did IP's rebuttal testimony persuade you to alter or amend your recommendation to deny IP's request to increase the value of its recoverable base gas inventory at the Hillsboro storage field by $10,367,838?

A. No. As explained below, the Company's estimate of the monthly gas measurement errors remains unreliable and does not provide a reasonable or

sufficient basis to increase the value of the base gas inventory at the Hillsboro storage field.

Well Charts

Q. What information did IP provide in response to your first concern that IP used only five days of data as a proxy for the whole month in estimating the measurement error correction factor?

A. The rebuttal testimony of Wayne Hood and Curtis Kemppainen ("Panel"), IP Exhibit 14.1, pages 20 and 21, explained why the Company used only five days of information per month. According to the Company's testimony, the primary reasons the Company had for relying upon only 5 days of data per month was that attempting to use the well charts for every day, or even just 10 days per month, for the six year period was an unmanageable task because the outside vendors used to integrate the well charts would have been overwhelmed and unable to complete the task. Further, due to various reasons, the Panel indicates that well charts would not be available from all 14 injection wells on a daily basis, so there were limits on what time periods IP could conduct an integration.

Q. Approximately how many well charts did the Company have integrated by an outside service?

A. According to the Company's response to Staff data request ENG 1.92, IP had about 1,500 of the 1994 charts integrated during the mid-1990s and out of those 624 were later analyzed for use in the Company's Hillsboro Deliverability Study

(IP Exhibit 14.2) dated September 16, 2004. In 2003, IP also had 309 of the 1998 charts integrated for its Hillsboro Deliverability Study.

It is also my understanding that at about the same time that IP sent the 1998 charts for integration, IP also sent out charts for the years 1996, 2000, 2002 and 2003. IP had 224 and 234 well charts integrated for the years 2000 and 2002, respectively[1]. IP also had 357 well charts integrated from the year 1996 and 199 well charts integrated from the year 2003[2]. The total number of charts that IP had integrated, during 2003, for years 1996, 1998, 2000, 2002, and 2003 equaled about 1,323.

Q. How many well charts did the Panel contend was a reasonable amount for a chart service to integrate?

A. The Panel indicates, IP Exhibit 14.1, page 2 that approximately 3,400 charts were a reasonable volume of well charts to have integrated.

Q. Do you agree that 3,400 charts was a reasonable volume limit to assign to a chart integration service?

A. Not necessarily. The Panel indicated that one chart integration service declined to provide a price quote for integrating 5,000 charts. This lends some support to IP's claim that the potential volume of charts could have overwhelmed a chart integration service. However, the goal here is to arrive at an accurate

[1] Company response to Staff data request ENG 1.95.
[2] Company response to Staff data request ENG 1.98.

measurement correction factor. The potential for one chart integration service to be overwhelmed does not explain why IP could not send charts to several different integration services. Moreover, difficulty in obtaining more complete data does not address or demonstrate in and of itself that is it reasonable or appropriate to use some incomplete set of data. Further, the information that IP provided indicates that IP did not even approach its 3,400 limit on chart integration.

Q. Did the Company do any review of its use of the five days of data?

A. Yes. The Panel testimony, page 24, indicated that the Company calculated the correction factor subsequent to 1999 as a validity check for using 5 days of data per month to estimate a correction factor for any measurement error. The Panel indicated the errors IP calculated when comparing the data from the well charts and the Hillsboro plant metering for 2000 and 2002 were -0.95% and -2.7%, respectively. IP claimed this calculation showed the chart integration technique was a valid means for estimating the measurement error. The Panel also indicated the 2000 and 2002 check confirmed that changing the mode of operating the compressors after 1999 had increased the accuracy of the Hillsboro storage field's turbine injection metering.

Q. Do you consider the Panel discussion about why more well charts were not integrated a sufficient basis for not choosing a larger sample?

A. No. The Panel admits using a larger sample would provide a better statistical sample[3]. Further, as noted above, IP only had about 1323 charts integrated[4] for its Hillsboro Deliverability Study (IP Exhibit 14.2) to determine its measurement errors, but admitted that a larger number of charts (3,400) was a reasonable amount to integrate. Further, IP could have sent off more data for integration, not only from the years that no information was estimated, but also from the two years that IP used its in-house program.

Q. Does the Company's response cause you to alter your area of concern?

A. No. I agree that if IP did not have a chart for every well for every day then it could not easily integrate the data for that day, but to not attempt to use more days of chart data, if it was available, sounds more like a situation of economic concerns outweighing a full review of the available information.

Q. What did IP state to address your second concern that the well charts from the 14 individual injection/withdrawal wells used data from orifice meters that were not set up according to AGA standards?

[3] IP Exhibit 14.1, pages 20-21.
[4] The 1,500 well charts associated with 1994 are not included in this value because those charts were previously integrated in the mid-1990s.

A. The Panel testimony noted that the Company did not agree with my concern and indicated that the Peterson Study indicated "For injection, the meter runs are in general accordance with AGA Report #3, Part II for the installed orifice plates.[5] Further the Panel indicated that my reference to the Peterson study's comment that the injection metering should be considered for estimates only was directed to the use by the Company's gas operators of the in-house integration spreadsheet for flow computations or volumetric processing and that these comments would not apply to the 1994 and 1998 well charts that were sent to an outside integration service.

Q. Do you agree with Company?

A. No. While I agree the Peterson study makes the statement IP quoted, the fact remains the individual well meters were not set up according to AGA standards for custody transfer meters. In particular, the Peterson Study, page 17, noted, However, for well production gas metering, the metering measurements should not be used as an engineering basis due to the insufficient length of straight piping upstream of the orifice plates and a protrusion in the flow path. Thus the ultimate accuracy of the meters cannot be determined short of removing them (and their associated piping) and testing them at the appropriate facility. This is one reason why the Peterson study's comment that the injection metering should be considered for estimates only also applies to the use of the 1994 and 1998 well charts that were sent to an outside integration service.

[5] IP Exhibit 14.1, pp. 21-22.

I believe that the Company's decision to conduct a post-1999 accuracy check between its individual well data and its turbine meter was an appropriate action, but the values IP obtained from that exercise are not comforting. The analysis showed a difference between the turbine meter reading and the individual well meter reading of -.95% and -2.7% for the years 2000 and 2002, respectively. These errors indicate the possibility that measurement error continued to exist after IP revised its method of operating the storage field compressors in 1999, or the well chart estimates are not completely accurate, or some combination of the two. Therefore, the original concerns that I raised in my direct testimony are still valid.

Q. Why did the Company's analysis of its meter accuracy from 2000 and 2002 when it found errors of -.95% and –2.7% concern you?

A. Aside from my overall misgivings from using the chart data (use of limited data and meters not set up to custody transfer specifications) the error shown for 2002, -2.7%, exceeds the allowance provided in Commission rules for metering. 83 Illinois Administrative Code Part 500 ("Part 500"), Section 500.190 contains the Commission's customer meter accuracy requirements, and this section notes that an in-service meter should not be more than 2% fast or slow. As I noted in my direct testimony, the Commission's Part 500 does not apply to storage field metering, but for IP to show it still had errors of that magnitude even after making operating changes to its system does cause concern about the overall injection measurement accuracy after 1999.

Q. Do you have any other reason to suspect that the post 1999 injection metering at the Hillsboro storage field was not completely accurate?

A. Yes. The Company replaced the three turbine meters used to measure the storage field injections with ultrasonic meters. One meter was replaced in 2003, the other two meters were replaced in 2004.[6] If IP was confident about the accuracy of the injection metering, then it would not need to replace those meters.

Q. What information did IP provide to address your third concern that IP failed to compile well chart data for all time periods in question?

A. The Panel testimony noted that the 1996 and 1997 well chart data was not used because those records were not kept on the same basis as the data it was trying to adjust.[7] This occurred because in 1996, the "pipeline day" was changed to a 9:00 AM to 9:00 AM from a noon-to-noon basis that IP had historically used on its storage well charts. It was not until 1998 that IP shifted its storage well charts to correspond to the revision in the pipeline day.

Q. Does the Panel testimony provide sufficient basis to you regarding why the Company did not integrate more charts?

A. No. I do understand that it would have been difficult for IP to have the 1996 and 1997 well charts integrated to match the revised pipeline day. However, I do not

[6] According to the Company's response to Staff data request ENG 1.55.
[7] IP Exhibit 14.1, page 23.

believe it was an insurmountable task. It was possible for IP to have the chart integration service to provide it with hourly information. Using this method would have allowed IP to recreate correct 24-hour day from its 1996 and 1997 well charts. Therefore, I conclude that if IP really wanted to use the 1996 and 1997 data it could have requested the chart integration service provide it in a format where IP could recreate its pipeline day. Thus, IP could have integrated more charts, but chose not to. IP has not provided any rationale for why it was unnecessary to integrate more charts. The decision appears to be based upon expediency rather then the goal of attaining the most accurate estimate possible.

Q. Did IP's witness make any other claims regarding this topic?

A. Yes. The Panel testimony, pages 24-25, indicated the Peterson Study noted that the range of difference between the turbine injection meters and the well meters is 1.2% to 32% and that the 22% correction factor used in the chart integration study is well inside that range. Further, as of the end of November 2004, IP had injected an additional 2.6 Bcf of gas into Hillsboro over a two-year time span without gas being seen in two key observation wells. Based on that, IP concluded it was reasonable to conclude the 1995 and 1999 correction factors of 7% and 8.9%, respectively, were too low. The Panel then concluded that review indicated the reasonableness of the 22% correction factor.

Q. Do you agree that the 22% correction factor is reasonable?

A. No. I agree with IP that the 22% value did fall within the range of measurement errors provided from the Peterson Study. The range provided from the Peterson study, 1.2% - 32% was extremely broad. Every number that IP calculated from the well chart data also met that criterion, which means that fact, in and of itself, is virtually meaningless.

Further, IP discussed how its actual experience with the re-injection of 2.6 Bcf of gas through November 2004 indicated that the two smallest values, 7.0% and 8.9%, that it calculated from the well chart data were incorrect. However, IP indicated both of those values were calculated from using IP's in-house program, which the Peterson Study indicated was not completely accurate, instead of having the data from those years integrated. Therefore, all IP has done is to confirm the Peterson Study conclusion that using well chart data with IP's in-house program provides inaccurate results.

Finally, IP admitted it only used the more accurate integration procedure to estimate the metering error for two years, while four other years of data was not integrated for the purpose of calculating a correction factor value. The bottom line is that while IP did find a number through the chart integration process that matched the value it ultimately determined to use, but it is also obvious that the values calculated through the chart integration process are not consistent with each other (22.1% and 12.7%). Based on all of the above concerns, I consider the Company's reliance on the chart integration values to be unreasonable and insufficient.

Constant Factor

Q. How did IP respond to your fourth concern that the Company used a constant correction value to calculate the corrections needed to the Hillsboro storage field's inventory values?

A. The Panel testimony, pages 25-26, indicated that compressor loading is not a function of time; rather, it is dependent on suction pressure, outlet pressure, required hourly throughput, and the number of compressors on line, all of which change on a daily basis, depending on system requirements for the day. Therefore, the Panel concluded that using an average of the daily value is appropriate.

The Panel also indicated that it had created a "stepped profile" of correction factors. The Panel indicated the measurement volume calculated from that exercise was 5.2 Bcf, which the Panel indicated was not significantly different from the results obtained from using the constant correction factor. The constant correction factor determined a measurement correction of 5.8 Bcf.

Next, the Panel indicated that I made an error in my testimony by suggesting the compressors changed speeds, because the compressors are constant speed compressors.

Finally, Mr. Hower, IP Exhibit 17.1, page 12, indicated that he thought I meant "constant correction" instead of "consistent correction" when I discussed the Company's measurement correction assumptions.

Q. Did the Panel's discussion alleviate your concern about the Company assuming a constant correction factor for the metering error?

A. No. Although I agree that my direct testimony reference to "same average speed" for the compressor should have been to "same average loading" and that using the phrase "constant correction" is more appropriate then the phrase "consistent correction"; my original conclusion remains unchanged. In my opinion, there are too many variables (suction pressure, outlet pressure, required hourly throughput, and the number of compressors on line) in play for the meter correction factor to be a constant value. This is demonstrated most obviously by the varying metering correction values provided from the well chart data. Further, as the Panel indicated, making somewhat different assumptions, such as a stepped profile, will provide different results. In particular, the example provided by the Panel showed a variance of .6 Bcf (5.8 – 5.2). This variance, using a $5.00/Mcf gas cost, corresponds to about a difference of $3,000,000 (600,000 Mcf x $5.00/Mcf) in value. Therefore, I maintain my original conclusion.

Reservoir Simulation Model

Q. What was your fifth concern regarding the methods used by the Company to calculate the amount of gas that was incorrectly measured from the Hillsboro storage field?

A. My fifth concern was that the reservoir simulation model is limited by the quality of its inputs. In particular, I noted that the Hillsboro storage field covers an area

equal to 5,247 acres (8.2 square miles), and the reservoir models makes use of various data from 24 wells to reach conclusions regarding the operations of the field.

Q. How did the Company respond to your fifth concern?

A. Company witness Hower provided rebuttal testimony, IP Exhibit 17.1, page 13, that noted Mr. Hower routinely uses reservoir simulation to evaluate hydrocarbon reservoirs that are much larger than 8.2 square miles and contain significantly fewer wells than the 24 wells at Hillsboro. Next, Mr. Hower indicated that those evaluations are used to assess the proved reserves volume associated with the reservoirs. Further, the reserves certifications that he prepares using the reservoir simulator models adhere to the standards defined by SPE and SEC that that those standards are used by companies, financial institutions, and in some cases countries, as a basis for investing hundreds of millions of dollars.

Q. How do you respond to Mr. Hower's comments?

A. For the most part, I do not disagree with Mr. Hower's comments. However, Mr. Hower's observations are not relevant for the purposes of setting regulated rates. The discussion about how the simulator model is used primarily involve companies who are providing that information to meet government disclosure requirements or for investors to use in determining whether or not to invest in the company. In this proceeding, the Commission is making ratemaking decisions for ratepayers who have no or very little choice about how IP manages its

operations. Instead, the Commission is charged with ensure that only "just and reasonable" rates are charged to those customers. My review indicated the Company's number is an estimate. Further, Mr. Hower agrees with that position. In particular, Mr. Hower indicated, IP Exhibit 17.1, page 5, that there is of course uncertainty associated with any study or interpretation of a sub-surface reservoir. In order to be relied upon for ratemaking purposes the Company must provide a reliable methodology that results in an accurate calculation of the amount of gas that was incorrectly measured from the Hillsboro storage field.

Further, much of Mr. Hower's discussion on this topic appears to involve natural gas production reservoir. However, there is a distinction between a production reservoir and an aquifer storage reservoir. In particular, Mr. Hower references "proved reserves", IP Exhibit 17.1, page 13, which is a term generally used for production reservoirs[8]. Once a company locates a natural gas bearing reservoir, the analysis discussed by Mr. Hower provides an estimate of the total volume of gas in the production reservoir. This estimate forms a basis for various entities to perform economic evaluations on the reservoir in question.

An aquifer storage reservoir, such as Hillsboro, did not originally contain natural gas. When it was developed, the utility requested the Commission's permission to develop the reservoir. In developing the reservoir a known volume of gas was injected into the reservoir, then a known amount of gas was withdrawn and

[8] A production facility refers to a natural gas reservoir located in the production area whose purpose is to provide daily supply capacity to the interstate pipeline system. These reservoirs are produced (gas

injected into the reservoir every year. However, in IP's case with the Hillsboro storage field, the volume actually maintained in the field is no longer a known value due to the various reasons discussed in this proceeding.

Therefore, my recommendation for how IP would recover the costs associated with replacing the gas caused by the measurement error involves passing the cost of the replacement gas (a known volume) through the PGA once it was injected into the field. This approach would ensure only the just and reasonable costs associated with IP's actions are charged to ratepayers.

Q. What was your sixth concern regarding the methods used by the Company to calculate the amount of gas that was incorrectly measured from the Hillsboro storage field?

A. I raised the concern that the historical matching of the reservoir model to actual data relies upon information that is suspect since the inventory volume at Hillsboro has been in error for an extended period of time.

Q. How did the Company respond to your sixth concern?

A. Mr. Hower, IP Exhibit 17.1, page 14, indicated that the Hillsboro reservoir simulation model was constructed on a foundation of a large amount of data, such as the 3-D seismic, the core data, the special core analysis, the petrophysical calculations, and measurements of well and field pressures. He indicated that this data is accurate and known. Next, he indicated that only the

withdrawn) until the reservoir is depleted.

historic gas injection volumes are in question. Therefore, Mr. Hower concluded that the approach used in the simulation study was to treat all of the other critical variables in the numerical model as known and to vary the gas injection volumes as the sensitivity parameter. The result selected from the simulation studies was the run that produced the best comparison with the measured field data.

Q. How do you respond to Mr. Hower's comments?

A. Although I do not disagree with Mr. Hower's statements in general, his comments do not provide a basis for changing my recommendation. The fact remains that as IP adds more gas into the field the Company has very little or no data regarding the behavior of the Hillsboro storage field once all or even a portion of the gas from the measurement error is replaced. Therefore, until the gas associated with the measurement error at Hillsboro is replaced and the data associated with that volume of inventory is obtained, the model will not have any basis upon which to make its predictions.

Further, it appears that the reservoir model was only matched to very recent data. Mr. Hower, IP Exhibit 17.1, page 10, indicates that the model was calibrated, or matched, against observation well pressures, shut-in field pressures, gas saturation data from the fall 2003 neutron logs, and gas-water contact levels from the fall 2003 neutron logs. I would expect that additional refinements will be made in the model as more data becomes available. This model refinement could impact the amount of gas the Company ultimately

determines to replace in the Hillsboro storage field. Therefore, I continue to find the use of the reservoir simulation model unreliable.

Updated Study

Q. What was your seventh concern?

A. My seventh concern was that IP had indicated it was conducting an additional study and could revise its 5.8 Bcf estimate of the volume of gas it needs to replace at the Hillsboro storage field.

Q. How did the Company respond to your seventh concern?

A. Mr. Hower, IP Exhibit 17.1, page 15, indicated that he found it remarkable that I would question IP for continuing to monitor, collect information, and refine its interpretations of the Hillsboro storage field. Specifically, Mr. Hower indicated that IP would be acting as a prudent operator by continuing to collect data and continuing to refine its interpretations of the Hillsboro storage field.

Q. How do you respond to Mr. Hower's comments?

A. First, I believe Mr. Hower has misinterpreted my direct testimony comments. I agree with Mr. Hower that IP would be remiss if it did not continue to collect data and continue to refine its interpretations of the Hillsboro storage field. However, my point was and continues to be that as IP gathers more information regarding the operation of the field, as I discussed above, the model will likely change. Further, as IP continues to replace the gas into the Hillsboro storage field, the

Company will start to gather data from the field for inventory levels that have not been seen for almost ten years. I conclude that this also means the ultimate volume of gas that IP determines to inject into the Hillsboro storage field could also change. This ultimate measurement error correction could be larger or smaller then the 5.8 Bcf volume that IP has calculated thus far. Any change to the measurement error volume directly impacts the Company's estimate of its use of recoverable base gas and the monetary impact on this gas as well.

Q. Based upon the above discussion of your seven concerns, do you continue to recommend that the Commission reject IP's request?

A. Yes. For the reasons articulated earlier in my testimony, I continue to find the Company's data to be insufficient for purposes of calculating a revised recoverable base gas value for the Hillsboro storage field. I recommend that the Commission direct the Company to use Hillsboro's recoverable base gas value that the Company used prior to making any corrections to Hillsboro base gas inventory.

Used and Useful Review of Hillsboro Storage Field

Q. What did you conclude in your direct testimony regarding Hillsboro storage field?

A. I concluded that given the manner that the Company is currently operating the storage field, I do not believe it is 100% used and useful at this time.

Q. What used and useful percentage did you determine for the Hillsboro storage

field in your direct testimony?

A. As shown on ICC Staff Exhibit 7.0R, Schedule 7.04R, I calculated the Hillsboro's used and useful percentage to be 53.94%.

Q. Did IP agree with your conclusion that the Hillsboro storage field was 53.94% used and useful?

A. No.

Q. Have you recalculated the used and useful percentage for the Hillsboro storage field in your rebuttal testimony?

A. Yes. As shown on ICC Staff Exhibit 17.0 2nd Rev, Schedule 17.01 2nd Rev, I calculated the Hillsboro's used and useful percentage to be 53.44%.

Q. Why did you change your recommended used and useful percentage value?

A. Company witness Shipp indicated in rebuttal testimony, IP Exhibit 13.1, page 9, that I had an error on Schedule 7.05R, line 2. Once that error was corrected, the resulting used and useful percentage was slightly less then my original value. ICC Staff Exhibit 17.0 2nd Rev, Schedule 17.02 2nd Rev, corrects the error pointed out by Mr. Shipp. The correction to this schedule also impacted one other schedule involving the used and useful calculation. ICC Staff Exhibit 17.0 2nd Rev, Schedule 17.03 2nd Rev was also impacted by the error, discussed above, in ICC Staff Exhibit 7.0R, Schedule 7.02R, line 2.

Q. Why did you consider a portion of the Hillsboro storage field to not be "used and useful"?

A. In my direct testimony, I indicated that the Hillsboro storage field is not currently and has not for some time operated in the manner it was designed to operate. IP expanded the field in 1993 and passed the cost of this expansion to ratepayers in its last rate case, Docket No. 93-0183. Since the rates from that case were implemented, IP's ratepayers have paid rates based on a 100% used and useful Hillsboro storage field.

My direct testimony also indicated that IP has an obligation to its customers to provide "…adequate, efficient, reliable, environmentally safe and least-cost public utility services which accurately reflect the long-term cost of such services and which are equitable to all citizens." (PUA, Section 1-102) As part of that obligation, IP is responsible for maintaining its storage fields in an appropriate manner.

Next, I indicated that IP failed to maintain its storage fields in an appropriate manner and it is not equitable for ratepayers to continue paying for the Hillsboro storage field as if it were operating at 100% used and useful, when in reality, the Hillsboro storage field is not and has not been so operating for quite some time.

Finally, I noted several overall concerns with IP's storage operations. In particular I noted the following four items:

1. It is rare and unusual for a utility to reduce the peak day capacity rating at a storage field;
2. The reduction in management manpower for IP's storage fields;
3. A reduction to the capital expenditures at the storage fields; and
4. Several events indicate that IP's poor oversight caused it to fail to properly identify problems or conduct effective root cause analyses.

Q. How did IP respond to your rebuttal testimony?

A. IP provided the rebuttal testimony of witnesses Kevin Shipp, Wayne Hood, Curt Kemppainen, and Timothy Hower.

Q. Did IP's rebuttal testimonies persuade you to alter or amend your used and useful recommendation?

A. No. With the exception of the correction of an error discussed above, my recommendation remains the same.

Used and Useful Calculation

Q. Did IP take issue with the manner that you calculated the used and useful percentage of the Hillsboro storage field?

A. Yes. Aside from pointing out the error in my calculation, Mr. Shipp also made several recommendations regarding the manner the used and useful calculation could be calculated if the Commission were to determine some disallowance was appropriate. In particular, Mr. Shipp made the following recommendations and observations:

1. Use a different 3-year period to calculate the used and useful values;
2. Use different capacity costs;
3. Use of a different methodology to calculate seasonal savings associated with storage; and
4. There is an alternative method to calculate used and useful values.

Period Selected for Used and Useful Calculation

Q. What 3-year period did Mr. Shipp recommend that the Commission use if it determines a used and useful disallowance is appropriate?

A. Mr. Shipp stated, IP Exhibit 13.1, page 10, that the appropriate three-year period for the purpose of this case would be the following winter seasons, 2003-2004, 2004-2005, and 2005-2006. His basis for these years was that when the Commission calculated a used and useful disallowance associated with IP's Clinton nuclear plant in prior dockets, he stated the Commission more typically used three year periods consisting of the year prior to the order, the year of the order, and the year following the order.

Q. Do you agree with Mr. Shipp's rationale?

A. No. I agree that generally the Commission dealt with the used and useful issue for the Clinton nuclear plant using the three-year period discussed by Mr. Shipp. However, that is not the manner the Commission always determined any used and useful values. The Commission in its February 24, 1993, Revised Order on Remand from Docket Nos. 87-0427/87-0169/88-0219/88-0253/90-0169

Consolidated made use of a three-year average that centered on the test year. Obviously, the Commission can use its discretion to select the appropriate used and useful period to review based upon the circumstances surrounding the calculation.

Q. Are the circumstances involving your used and useful calculation unique from those employed by the Commission in determining the used and useful status of nuclear plants?

A. Yes. Unlike the nuclear plants examples, my recommendation for the Hillsboro storage field involves an asset that was already found fully used and useful, but based upon its operation, it is no longer 100% used and useful. To the best of my knowledge, the Commission has not faced this situation in any prior case.

Q. What three-year period do you use in your direct testimony in making your used and useful calculation?

A. My direct testimony indicated that I used the years 2001-2003. However, it is more accurate to note that I used the actual results from the 2001-2002, 2002-2003, and 2003-2004 winter seasons.

Q. Do you continue to support the use of the three-year period that was used in your direct testimony?

A. Yes. My three-year time period uses the most recent actual data available and correctly accounts for the actual operation of the Hillsboro storage field. Further,

the manner that I calculated the used and useful value is dependent on the actual operating performance of the storage field, therefore, only historical information can be used with my calculation.

Value of Storage Field Capacity

Q. What value did you direct testimony assign to the peak day capacity of the Hillsboro storage field?

A. I assigned a value of ***BEGIN CONF xxxxxxxxx END CONF*** in my direct testimony to the peak day capacity of the Hillsboro storage field. However, as a result of correcting the error on ICC Staff Exhibit 7.0R, Schedule 7.05R, line 2, discussed above, the revised value is ***BEGIN CONF xxxxxxxxxxx END CONF***, which is shown on ICC Staff Exhibit 17.0 2nd Rev, Schedule 17.02 2nd Rev.

Q. Did Mr. Shipp take issue with this value?

A. Yes. Mr. Shipp, IP Exhibit 13.1, page 12, indicated the assumption that I made regarding the peak day capacity value of the Hillsboro storage field was not representative of the cost IP would expect to incur to replace that capacity. Mr. Shipp indicated that the Hillsboro storage field is currently used to displace the capacity costs from both the Natural Gas Pipeline Company of America ("NGPL") and Panhandle Eastern Pipe Line Company ("PEPL"), but my analysis only took into account the NGPL contract. Mr. Shipp then conducted an analysis that used the price IP paid for capacity on both NGPL and PEPL and arrived at a revised

peak day capacity value for the Hillsboro storage field of ***BEGIN CONF xxxxxxxxxxxxxxxx END CONF***. Further, Mr. Shipp indicated that he thought his value was a conservatively low price assumption.

Q. Do you agree with Mr. Shipp that your assumed value for the peak day capacity of the Hillsboro storage field is not the proper representation of that value?

A. No. I do agree with Mr. Shipp that the Hillsboro storage field does displace capacity from both the NGPL and PEPL systems; however, I believe that Mr. Shipp has overstated the peak day value of the Hillsboro storage field. The NGPL capacity rate that I used came from a recent contract that IP signed with NGPL for a large amount of capacity (the NGPL contract was for ***BEGIN CONF xxxxxxxxxx END CONF*** per day). This level of capacity is close to the peak day capacity rating for the storage field (125,000 Mcf).

Also, if IP were to actually replace the capacity from the Hillsboro storage field, I would expect IP to make use of the lowest cost option. Under that circumstance the PEPL capacity is not the lowest cost option. A review of the Company's responses to Staff data requests in its most recent PGA proceeding 03-0699 indicates that its PEPL capacity is actually the most expensive transportation supply option.

Further, if IP were to purchase a significant amount of capacity off of the PEPL system or any other interstate pipeline system, IP should obtain more of a discount then it currently receives from those pipelines. This viewpoint is also

consistent with the testimony that IP and Ameren filed in its recent merger proceeding, Docket No. 04-0294. In that testimony, Applicants' Ex. 43.0, page 4, line 101, indicates that "However, with the proposed acquisition of IP, Ameren will greatly increase negotiating leverage with the interstate pipelines on behalf of IP due to the size and scale of the firm transportation and storage capacities held by all Ameren affiliates negotiating as a combined group." Therefore, I consider the value that I assigned to the peak day storage field as representative of the value it provides to IP.

Q. Do you have any other comments about the value of storage field capacity?

A. Yes. In a prior IP PGA proceeding, Docket No. 01-0701, I determined the annual value associated with 25,000 Mcf/day increment of capacity on IP's system to equal $900,000. When this value is applied to the Hillsboro peak day capacity level of 125,000 Mcf/day, it is equivalent to $4,500,000. Obviously, the value that I assigned in this proceeding is consistent with the value from that prior case.

Q. Mr. Shipp, IP Exhibit 13.1, page 13, also made the comment that he is concerned as to whether IP would be able to obtain 125,000 Mcf of additional FT capacity if Hillsboro did not exist, do you agree with his statement?

A. I do not know if there currently exists sufficient surplus pipeline capacity to replace the Hillsboro storage field. However, I believe Mr. Shipp has missed the point of the exercise of valuing the Hillsboro storage field. I attempted to determine, in theory, what value the field's peak day capacity provides IP. To

conduct that analysis, I used the most relevant example of IP purchasing a significant amount of capacity. In my opinion, the cost to IP of purchasing a significant amount of capacity is the truest measure of the value of peak day capacity of the Hillsboro storage field.

Seasonal Savings Calculation

Q. How did you calculate the benefit associated with the seasonal savings associated with the Hillsboro storage field in your direct testimony?

A. I compared IP's weighted average cost of gas in storage for the past five winter seasons to the weighted average price of commodity gas purchased by IP for the same time period. From the comparison I determined the average per unit savings per month IP achieved by having storage.

Q. Did Mr. Shipp agree with that calculation?

A. No. Mr. Shipp contended that the appropriate calculation would be to compare the cost of gas when it is injected into the storage field to the price of spot gas at the time of withdrawal using future prices and not historical prices.

Q. Do you agree with Mr. Shipp's analysis?

A. No. My calculation provided the actual historical seasonal savings value that the storage field has provided to ratepayers on a monthly basis. Since the Company selected a historical test year, the use of historical information is more

appropriate, while the use of future forecasted information, such as that used by Mr. Shipp, is obviously not a known and measurable value.

Q. Mr. Shipp, IP Exhibit 13.1, page 14, also indicates that your analysis used an inappropriate comparison of the weighted average cost of gas to spot purchases. How do you respond?

A. I disagree with Mr. Shipp's conclusion that my analysis is an inappropriate comparison. I made use of the available information to develop a reasonable proxy of the seasonal value of the storage field. Further, prior to my calculation, I requested, in ENG 1.47, that IP provide its estimated savings that resulted from the operation of the company owned storage fields from the prior five years. IP simply indicated in its response, in part, that it had not performed this calculation.

Q. Do you agree with Mr. Shipp's discussion regarding the valuation of the seasonal storage value?

A. No. My analysis used actual results to determine the value of storage. Mr. Shipp's analysis attempts to look at forward prices to estimate the value of storage in the future. Since my analysis relies on actual operating history, I consider my values to more accurately reflect the seasonal price differential and resulting savings associated with storage.

Alternative Used and Useful Calculations

Q. Aside from disagreeing with the manner that you calculated your used and useful values, did Mr. Shipp have any other comments regarding used and useful calculations?

A. Yes. Mr. Shipp, IP Exhibit 13.1, page 14, discussed a potential alternative means of determining any used and useful calculation. Mr. Shipp noted that in the original order that placed the Hillsboro storage field into rate base (Docket No. 93-0183), the peak day capacity value of Hillsboro accounted for 93% of the projected savings, while seasonal savings value accounted for only 7%. Mr. Shipp then took these values and made various calculations under varying assumptions and years to calculate different used and useful values.

Q. Does Mr. Shipp recommend that these values be used instead of the one he calculated?

A. No, it appears Mr. Shipp is attempting to show that his used and useful calculation is consistent with the savings assumptions from over ten years ago when the Hillsboro storage field was expanded.

Q. Do you agree with Mr. Shipp's discussion about this topic?

A. No. It appears that Mr. Shipp is attempting to show how his analyses provide results that are similar to the results in Docket No. 93-0183. However, his approach ignores reality. Any reliance on his discussion of alternative used and

useful calculations would suggest that the natural gas industry has been static over the last ten years. Instead, it is obvious that many changes have occurred over the last ten years, including the apparent reduction to the cost of peak day transportation capacity. Therefore, the reliance on recent actual data, which is used in Staff's analysis, is the preferable option.

Overall Storage Concerns

Q. Aside from your used and useful analysis, did your direct testimony discuss any other topics regarding storage?

A. Yes. My direct testimony mentioned several overall concerns regarding the manner that IP has operated its natural gas storage fields. I consider these concerns relevant to the used and useful discussion because IP has the responsibility to maintain the capabilities of its storage facilities. In particular I noted the following four areas of concern:

1. It is rate and unusual for a utility to reduce the peak day capacity rating at a storage field;
2. The reduction in management manpower for IP's storage fields;
3. A reduction to the capital expenditures at the storage fields; and
4. Several events indicate that IP's poor oversight caused it to fail to properly identify problems or conduct effective root cause analyses.

<u>Reduction in Peak Day Capacity</u>

Q. What did you indicate in your direct testimony regarding your experience with Illinois utilities reducing their storage field's peak day capacities?

A. I noted that during my 15-year tenure at the Commission, I can recall only one other utility that reduced the peak day capacity of one of its storage fields. However, on that occasion the basis for the reduced peak day capacity dealt with the purposeful reduction in inventory at the field. IP, on the other hand, experienced an unintended reduction in inventory of such magnitude that it had to reduce the peak day capacity of its storage fields. Therefore, that fact that IP had to reduce the ratings at its two largest storage fields is not a positive indication of its management or oversight over those facilities.

Q. How did the Company respond to your comments?

A. Mr. Shipp, IP Exhibit 13.1, pages 21 and 22, correctly noted that IP had previously reduced the peak day capacities at its two largest storage fields (Hillsboro from 1999 – 2003, and Shanghai 2001-2002 winter season), and that both of the fields are currently at their original peak day rating.

Further, Mr. Hower, IP Exhibit 17.1, page 18, expressed surprise that I was concerned that IP had experienced a deliverability decline at its two largest storage fields. In particular, Mr. Hower indicated that deliverability decline has been reported to be the most common problem in the gas storage industry. In particular, Mr. Hower noted that a press release regarding a U.S. Department of Energy study on storage fields indicated that one of the primary reasons for initiating the project was that gas storage well and fields often suffer a decline in productivity after several years of withdrawal and injection cycling.

Q. Do you dispute the Company's above statements?

A. No. I agree with Mr. Shipp that IP, at the present time, is operating its storage fields at their rated peak day capacities. I intended in my direct testimony to be clear that my reference was to recent reduction to the peak day capacity. I also agree with Mr. Hower that storage well and field deliverability declines are not uncommon in the industry.

However, both Mr. Shipp and Mr. Hower missed the point of my comments, which were aimed at the magnitude of IP's problems. Even though IP and every other storage operator in the State of Illinois and likely the United States knows of the potential for storage deliverability decline, IP is the only storage field operator in the state to experience problems to such depth that it needed to reduce the peak day capacity rating at its two largest storage fields. I would expect every storage operator in Illinois has experienced some problems at their fields over the past 15 years, but IP is the only utility to reduce the peak day capacity of its fields as a result.

Q. Did IP provide any other information on this topic?

A. Yes. Mr. Hower, IP Exhibit 17.1, pages 19 and 20, references IP Exhibit 17.2 and IP Exhibit 17.3. IP Exhibit 17.2 is a comparison of the various performance parameters of U.S. aquifer gas storage reservoirs assuming IP had its full 7.6 Bcf of gas within the field. Mr. Hower took the information and ranked the fields based on their ratio of working gas to base gas inventory. In particular, Mr.

Hower claimed that the higher the ratio, the more efficient the storage field. Next, Mr. Hower, in IP Exhibit 17.3, took the same ratios, but used IP's latest estimated inventory level for the Hillsboro storage field. Mr. Hower noted that even using the lower inventory level, IP's ratio ranking was still "more efficient" then nine other Illinois/Indiana aquifer storage fields. Mr. Hower concluded, that based on that review, IP had done a commendable job keeping the field operating as efficiently as it has.

Q. How do you respond to Mr. Hower's analysis?

A. The "efficiency" (ratio of working gas to base gas) of a particular field is largely dependent on the geology and physical characteristics of the reservoir itself. The utility itself has only a limited impact on this value unless it experiences a problem. This facet is shown in Mr. Hower's analysis when IP's actions (measurement error causing drastic reduction in working gas inventory) caused its efficiency rating to drop.

Further, a review of IP Exhibit 17.2 shows that the utility that operates the top rated field in Illinois (Nicor with the Troy Grove field) also operates many of the fields shown toward the bottom of the list. Obviously, Nicor's overall storage management should not differ significantly from field to field. Therefore, something else, such as the geology and physical characteristics of the reservoir itself, is being shown on this Exhibit, not any true measure of efficiency.

Q. Do you agree with Mr. Hower contention that his analysis on IP Exhibit 17.4 that compares the ratio of maximum storage pressure to original reservoir pressure indicates that IP is operating its storage fields in a safe and reliable fashion?

A. No. Again, Mr. Hower puts together a chart whose variables are highly dependent on the physical characteristics of the reservoir itself. Therefore, I continue to support my original conclusion.

Manpower

Q. What conclusion did you reach in your direct testimony regarding the Company's storage field manpower levels?

A. I indicated that IP had reduced the number of storage field supervisors, over time, starting with four supervisors in 1991 and eventually dropping to one person at the beginning of 2000. This reduction occurred because IP determined that its storage field operations could be conducted in a safe, reliable and efficient manner with one supervisor and by modifying the responsibilities of the operators and changing work practices. However, facts (1) that IP had recently reduced the peak day capacities of its two largest storage fields and (2) poor root cause analyses when reviewing storage problems leads me to the conclusion that IP's reduction in oversight has caused it to operate its storage fields in a manner that is not sufficiently safe, reliable and efficient.

Q. How did the Company respond to your statement?

A. Mr. Shipp, IP Exhibit 13.1, pages 17-18, indicated that "Manpower" levels were an issue in Docket No. 01-0701, but that the Commission did not accept Staff's recommendation for a prudence disallowance in that proceeding. Further, Mr. Shipp indicated on page 20 that the storage fields have an excellent safety record, and on pages 20-21 discussed IP's decision to institute a self-directed work team philosophy.

Q. Do you disagree with Mr. Shipp's statements?

A. No. I do not disagree with Mr. Shipp's statements. However, these facts do not explain why IP did not discover its problems at its various field earlier or why IP is the only Illinois utility experiencing these significant storage field operating problems. Therefore, I continue to support my original conclusion.

Capital Expenditures

Q. What conclusion did you reach in your direct testimony regarding the Company's capital expenditures for its storage operations?

A. I concluded that IP is unwilling to spend capital on its storage activities, which, in turn, has contributed negatively to IP's ability to maintain its storage operations.

Q. How did the Company respond?

A. Mr. Shipp indicated that he is not aware of any capital projects that were viewed as necessary or desirable that was omitted from the Company's five-year plan due to the lack of adequate capital budget. Further, he indicated that during his

tenure in his present position there was not any requested project that was rejected by management due to capital budget limitations. Finally, he indicated that Staff had failed to identify any storage field projects that IP should have implemented that have not been implemented.

Q. How do you respond to Mr. Shipp's comments?

A. While I cannot dispute Mr. Shipp's statements, since I am not in possession of any detailed information regarding the Company's natural gas storage budgeting procedures that in and of itself does not detract from my conclusion. The fact remains that IP's capital expenditures levels have been reduced over time and IP has also experienced problems at its two largest storage fields. Mr. Shipp would have the Commission believe that this is a coincidence. For the reasons discussed in my direct testimony; Staff does not believe it is a coincidence.

Further, no IP witness discussed or disputed the information contained in the due diligence reports from Docket No. 04-0294 that were quoted in my direct testimony. Therefore, my conclusion on this topic has not changed.

Identification of Problems

Q. What conclusion did you reach in your direct testimony regarding the Company's ability to identify or conduct thorough root cause analyses?

A. I concluded that the Company's poor oversight did not allow it to properly identify and act upon the various problems facing its storage operations. IP's inability to

operate its storage in a safe, reliable, and efficient manner also causes its ratepayers to incur additional costs. I provided four examples of situations where I believed the Company failed to act properly regarding some event regarding its storage operations. These four events were as follows:

1. IP's actions regarding its December 16, 2000 investigation into an incident at the Hillsboro storage field ("Hillsboro Incident");
2. IP's overall Hillsboro metering quality;
3. IP's Hillsboro meter review study as well as the Peterson Engineering Study; and
4. IP's ability to track its gas usage.

Hillsboro Incident

Q. What did you conclude in your direct testimony regarding the Hillsboro incident?

A. I concluded that IP failed to properly investigate the root cause of the problems at Hillsboro and that it took the Company five months after the incident to determine that the tank had sufficient relief capacity to vent the pressurized gas. (See Staff Exhibit 7.0, p. 39)

Q. How did the Company respond to your comments?

A. The Panel testimony, IP Exhibit 14.1, page 29, indicated that they disagreed with my assessment and noted that IP promptly hired Packer Engineering to conduct an investigation and that the Packer report concluded the failure of the emergency relief on the produced water tank caused the explosion.

The Panel also indicated, IP Exhibit 14.1, page 31, that they disagreed with my statement that IP did not know about the relief capacity of the produced water tank because the Packer Engineering Report discussed this topic in its Engineering Analysis.

Finally, the Panel noted, IP Exhibit 14.1, page 32, the various corrective actions that were implemented as a result of the Packer Engineering Report.

Q. How do you respond to the Panel's statements?

A. I agree that IP promptly hired Packer Engineering for the purpose of determining the origin and cause of the explosion of the produced water tank. I also agree that IP implemented several corrective actions as a result of the Packer Engineering Report.

However, I dispute that the Company knew about the relief capacity from the Packer Engineering Report or that the Company was proactive in its root cause analysis.

Q. Why do you dispute the Panel's statement?

A. I reviewed the Packer Engineering Report to refresh my memory of the statements it made regarding the relief capacity of the produced water tank. The Packer Engineering Report does mention that under normal conditions the 24-inch manway provides adequate relief capacity. However, my comments in direct testimony (ICC Staff Exhibit 7.0, page 44) involved IP discovering that the

combined relief capacity associated with the 6-inch and 3-inch openings in the produced water tank were sufficient to relieve the pressure buildup as a result of a Staff data request in a separate proceeding after Packer Engineering issued its report. This specific information was not discussed in the Packer Engineering Report; therefore, my conclusion that IP was not aware of this fact until Staff requested it remains unchanged.

Further, IP only had Packer Engineering determine the cause of the produced water tank explosion. I have seen no indication that IP followed up with any review to determine what set of events allowed or caused the separator to release high pressure gas into the produced water tank in the first place. As I noted in my direct testimony, (ICC Staff Exhibit 7.0, pages 41-42), IP indicated "The contributing factors that resulted in the over-pressurization of Tank 402 are still being investigated. IP hasn't established a "position" on what caused the over-pressurization…" I consider the factors that lead to the over-pressurization as the real root cause problem with the Hillsboro Incident; however, I have not seen any indication that IP conducted any further studies regarding that topic. Therefore, I continue to support my original conclusion that IP's investigation into this event was lacking.

Hillsboro Storage Field Metering

Q. What did you conclude in your direct testimony regarding IP's metering at Hillsboro?

A. I concluded that IP did not place a high priority on accurate measurement for withdrawals from the Hillsboro storage field immediately after the expansion of the field. IP failed to follow the minimum requirements from the AGA guidelines in order to ensure accurate measurement from its Hillsboro storage field.

Q. How did the Company respond?

A. The Panel testimony, IP Exhibit 14.1, page 33 noted that I admitted that the meter testing rules in Part 500 do not apply to metering used by utilities at storage fields and therefore saw no point in using them to making any comparisons. The Panel also indicated (IP Exhibit 14.1, page 34) that it had reviewed Section 500.180 (which deals with orifice meter testing) and found it was obsolete and in need of updating, and that some of its requirements are unreasonable and inapplicable to current metering technology or would be unreasonable if applied to current technology.

The Panel also indicated that AGA Report #3 contains the guidelines for installation of orifice meters, but does not cover operation and maintenance; that the orifice plates used in the orifice meters when checked after six years of service were still service worthy; and the Panel discussed the inspection practices the Company used at Hillsboro prior to the Peterson Study.

Q. How do you respond to the Panel's statements?

A. With a few exceptions, I do not disagree with the Panel's statements, but I do disagree with the conclusion it draws from them.

I agree that the Section 500.180 provision contains somewhat dated language, but this does not mean its requirements are not valid. In fact, Staff, through its enforcement of Part 500, ensures every Illinois utility follows the intent of the requirements contained in that section.

I also agree that the operation and maintenance section of AGA Report #3 does not specify a required inspection cycle on the orifice plate. However, another AGA document does provide some basic guidance for orifice meters. The AGA Gas Measurement Manual, Orifice Meters, Part No. Three, contains under "Inspection Schedules" the following information:

> The continued accuracy of an orifice meter state depends on keeping all of the station in proper operating condition. This depends on establishing and maintaining a fixed routine of inspection. Obviously, some items in a station should be inspected more often then others. Moreover, the inspection schedule for any station will depend upon many factors such as the importance of the station, the size in terms of gas flow, the location, the several types of equipment, company policies, etc. Therefore, the following is offered only as a guide to a minimum inspection schedule.
>
> Primary Element
>
> Orifice meter tubes should be removed annually for internal inspection and cleaning. This need may be satisfied by inspection caps where these are installed. Orifice plates should be removed and examined at least every three months.

Q. How does the above information apply to your current analysis?

A. The information contained in the AGA measurement manual further supports my contention that IP did not place a high priority on accurate measurement for withdrawals from the Hillsboro storage field immediately after the expansion of

the field. As was indicated above, the post-expansion volume of gas that IP wanted to cycle from the field was 7.6 Bcf. Given the large volume of gas that would pass through the meter, I would expect that IP would operate under inspection and testing guidelines more stringent then used by IP at that time.

Hillsboro Metering Review

Q. What did you indicate in your testimony about IP's review of its metering error at Hillsboro?

A. I indicated that IP's latest estimate of the injection overstatement at Hillsboro (5.8 Bcf) was almost 6 times larger than IP's original estimate (997,000 Mcf). I then indicated that this was just another indication of IP not fully investigating a problem at its storage fields.

Q. Did IP dispute your comments?

A. No.

Q. Did IP provide any additional information about its metering review?

A. Yes. The Panel testimony provided information about the use of the well charts to estimate the volume of injection overstatement and to determine a correction factor to use on the metering. The Company's response to Staff data requests ENG 1.92, 1.93 and 1.94 provide basic information regarding the timing and number of well charts IP had integrated. These responses indicate that IP had about 1500 of the 1994 well chart data integrated in the mid-1990s. These

responses also indicate that the integration data from 624 of those charts was used when IP calculated the 22.1% correction factor in 2004 “Hillsboro Storage Field Deliverability Study Final Report”. Therefore, in 1999 when IP determined the metering errors offset each other (IP Exhibit 14.1, page 9), IP was in possession of information that disputed that conclusion. This information lends further support for my conclusion that IP failed to fully investigate the metering problem at its Hillsboro storage field.

Gas Dispatch Tracking

Q. What did you indicate in your direct testimony about IP’s ability to track its gas deliveries?

A. I indicated that even though IP had significant measurement errors that primarily occurred during the injection months when gas usage is the lowest, its load forecasting and dispatch group failed to notice an extra Bcf of gas entering its system every year for 6 years. I noted that this was another example of IP’s failure to adequately oversee its operations.

Q. How did the Company respond to your testimony?

A. Mr. Shipp, IP Exhibit 13.1, pages 24-25, indicated that the 1 Bcf of gas that I noted in my direct testimony would equate to about 4,000 Mcf per day assuming an equal injection pattern throughout the injection season. Mr. Shipp then indicated that during the shoulder months of April, May, October and November the purchase volume runs around 300,000 – 400,000 Mcf. Mr. Shipp then

indicated that a 4,000 Mcf error during that time period would not stand out as a significant error. Finally, he noted that IP maintains line pack on its system in the range of 0 – 10,000 Mcf, thus the amount of gas IP's dispatchers failed to notice was less then the line pack IP typically maintains on its system.

Q. How do you respond to Mr. Shipp's comments?

A. I believe that Mr. Shipp has over simplified the problem. In response to Staff data request ENG 1.50, Schedule ENG 1.50-1, IP provided the daily throughput volumes for IP's system for the period July 7, 2003 through July 13, 2003. Using this response, I reviewed the data for July 7, 2003. This data indicated that the system throughput for non-transportation customers was about 294,874 therms. Using the 4,000 Mcf/day value provided by Mr. Shipp, which is roughly equivalent to 40,000 therms/day, IP during the summer months was seeing a customer load forecasting error for its customers in excess of 13%. I would expect a utility would be aware of errors of that magnitude regarding its forecasting and dispatch. Therefore, I continue to support my original conclusion.

Conclusion

Q. What does all of the above information regarding your concerns about IP's overall storage operations indicate to you?

A. The above information tells me IP's actions over several years contributed to the problems that IP encountered at the Hillsboro storage field. First, it is very uncommon for a utility to reduce the peak day capacity of a storage field, yet IP

has reduced the peak day capacity of both of its largest storage fields, Shanghai in 2001 and Hillsboro in 1999.

Second, IP reduced the manpower levels associated with the oversight of its storage fields. After reducing its manpower levels, IP's ability to identify and act upon problems at its storage fields declined.

Third, the Company reduced its capital spending at the storage fields below historical levels. This may indicate that IP is being reactive rather than proactive when determining when to make upgrades or other improvements at its storage fields. A potential reason for a utility to behave in this fashion is that a utility will not earn a return on its investments for improvements or upgrades at its storage facilities until it requests and receives a natural gas rate increase from the Commission. However, increased gas supply costs resulting from this behavior, unless deemed imprudently incurred, are automatically passed through to customers through the PGA.

Finally, the events surrounding the Hillsboro incident and metering review discussed above indicate that the Company's poor oversight does not allow IP to properly identify and act upon the various problems facing its storage operations. IP's inability, or more accurately, unwillingness to operate its storage in a safe, reliable, and efficient manner also causes its ratepayers to incur additional costs. Therefore, IP should be held accountable for its actions, or lack thereof, and the

Hillsboro storage field should be found to only be 53.44 percent used and useful in this proceeding.

Q. Does this conclude your rebuttal testimony?

A. Yes.

Hillsboro Used and Useful Calculation

		Peak Day Capacity 93-0183	Peak Day Capacity Actual	Percent of Maximum
1	2002	125,000	100,000	80.00
2	2003	125,000	100,000	80.00
3	2004	125,000	125,000	100.00
4	Average			86.67

		Inventory to Cycle 93-0183	Volume Cycled Actual	Percent of Maximum
5	2002	7,600,000	2,759,938	36.31
6	2003	7,600,000	2,576,839	33.91
7	2004	7,600,000	2,616,540	34.43
8	Average			34.88
9	Peak Day Allocation			35.83
10	Seasonal Inventory Allocation			64.17
11	Used and Useful Percentage			53.44

Line 1 = Capacity of Hillsboro in 2002 per ENG 1.77
Line 2 = Capacity of Hillsboro in 2003 per ENG 1.77
Line 3 = Capacity of Hillsboro in 2004 per ENG 1.77
Line 4 = Sum of percentage values (lines 1-3) divided by 3
Line 5 = Inventory Cycled from Hillsboro in 2002 per ENG 1.77
Line 6 = Inventory Cycled from Hillsboro in 2003 per ENG 1.77
Line 7 = Inventory Cycled from Hillsboro in 2004 per ENG 1.77
Line 8 = Sum of percentage values (lines 5-7) divided by 3
Line 9 = Per ICC Staff Exhibit 17.0 2nd Rev, Schedule 17.03 2nd Rev, line 8
Line 10 = Per ICC Staff Exhibit 17.0 2nd Rev, Schedule 17.03 2nd Rev, line 7
Line 11 = (line 4 * line 9) + (line 8 * line 10)

Docket No. 04-0476
ICC Staff Exhibit 17.0 2nd Rev
Schedule 17.02 2nd Rev
Redacted

Value of Hillsboro Peak Day Capacity

	January	February	March	April	May	June	July	August	September	October	November	December
Firm Pipeline Cost												
Reservation Cost												
Total Cost												
Volume	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000
Total												
Annual Value												

Line 1 = Cost for Firm Pipline Capacity per Company Response to Staff Date Request ENG 2.26 in Docket No. 03-0699
Line 2 = Cost for Swing Contract Reservation per Company Response to Staff Data Request ENG 2.43, page 17, in Docket No. 03-0699
Line 3 = Line 1 + Line 2
Line 4 = Peak Day Capacity of Hillsboro Storage Field

Docket No. 04-0476
ICC Staff Exhibit 17.0 2nd Rev
Schedule 17.03 2nd Rev
Redacted

Hillsboro Seasonal Value

		November	December	January	February	March
1	5-Year Savings Average					
2	Inventory Cycle	1,462,340	1,573,853	1,781,569	1,541,108	1,224,741
3	Volumetric Savings					
4	Total Volumetric Savings					
5	Peak Day Capacity Value					
6	Total Savings					
7	Volumetric Percentage	63.21				
8	Peak Day Percentage	36.79				

Line 1 = Per ICC Staff Exhibit 7.0R, Schedule 7.06R
Line 2 = Inventory IP cycled from Hillsboro in winter season 1993-1994 (per ENG 1.73)
Line 3 = Line 1 * Line 2
Line 4 = Sum of Monthly Values from Line 3
Line 5 = Per ICC Staff Exhibit 17.0 2nd Rev, Schedule 17.02 2nd Rev, line 6
Line 6 = Line 4 + Line 5
Line 7 = Line 4 / Line 6 * 100
Line 8 = Line 5 / Line 6 * 100