STATE OF ILLINOIS
ILLINOIS COMMERCE COMMISSION

Illinois Commerce Commission	**)**	
On Its Own Motion	**)**	
	)	
vs.	**)**	
	)	**Docket No. 03-0699**
Illinois Power Company	**)**	
d/b/a AmerenIP	**)**	
	)	
Reconciliation of revenues collected under	**)**	
gas adjustment charges with actual costs	**)**	
prudently incurred.	**)**	

INITIAL BRIEF OF ILLINOIS POWER COMPANY d/b/a AMERENIP

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October 27, 2005

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I. Introduction and Summary

This docket is the annual reconciliation of revenues collected under the gas adjustment charge with costs of gas prudently incurred for Illinois Power Company d/b/a AmerenIP ("IP" or "Company") for the year 2003, pursuant to §9-220(a) of the Public Utilities Act, 220 ILCS 5/9-220(a). Staff witnesses proposed gas cost disallowances or adjustments in three areas. The record shows that based on the standard for prudence adopted by this Commission and the courts (discussed in §II below), two of Staff's three proposed adjustments are unwarranted and should be rejected. AmerenIP has not contested the third adjustment.

Pipeline Overrun Charges. This disallowance proposal is discussed in §III below. IP incurred pipeline overrun charges totaling $15,718 on two pipelines on two days in 2003. Staff witness Eric Lounsberry contended these charges were imprudently incurred. On its other pipelines on these two days, and on all five pipelines on the other 363 days of the year, IP incurred no overrun charges. In fact, these were the only two overrun charges IP incurred in the three years 2002-2004 – a total of two overrun charges out of 5,475 "pipeline days." As indicated by the low amount of the overrun charges on the two days, the amounts of the overruns were modest. IP used the same systems and procedures on the two days it incurred overruns that it used on all the other days when it kept its daily deliveries on each of its five pipelines within allowed limits. Further, for several reasons (including that the actual Btu content of pipeline gas deliveries is not available in real time), it is impossible for IP's gas dispatchers to know, in the course of a day, exactly how much gas is being delivered on each pipeline that day, or to precisely control the gas in-flows. IP's track record of avoiding overruns more than 99.8% of the time demonstrates that it has prudently managed this function, and should not be penalized by a disallowance for the small amount of overrun charges incurred in these two instances. Further,

Staff witness Lounsberry's hindsight-oriented suggestions as to how IP could have avoided these overruns would have required actions that would be much more costly to customers than the small amount of overrun charges IP has incurred.

Hillsboro Storage Field. Staff witness Lounsberry contended that IP was imprudent in failing to commence reinjecting gas inventory into the Hillsboro Storage Field ("Hillsboro", "HSF" or the "Field") during the 2000 injection season, in order to begin restoring the Field's gas inventory which had been depleted. Had IP commenced reinjecting gas into HSF in 2000, it would have had more working gas inventory available for supply to customers during the winter months of 2003. Mr. Lounsberry contended that as a result, IP's recoverable gas costs for 2003 should be reduced by $6,885,827. He also presented an alternative disallowance calculation of $3,864,268, which would be applicable should the Commission conclude that IP should have commenced reinjecting working gas into HSF during the 2001 (not 2000) injection season.

As discussed in §IV below, AmerenIP believes that the record shows it acted prudently in all respects in its investigation, management and resolution of the Hillsboro deliverability issues, and that there should be no gas cost disallowance relating to Hillsboro. As described in §IV.B, IP prudently and aggressively pursued the causes of the decline in gas deliverability from Hillsboro that began to occur after the capacity of the storage reservoir was approximately doubled in 1993. The Company applied significant attention and substantial internal and external resources to investigation of the problem and identification of its causes. Based on the fact that the deliverability issues occurred after the storage reservoir was expanded, IP prudently focused on possible structural causes for the deliverability decline, including the possibility of an unidentified sub-structure to which injected gas was migrating, losses of gas through leaks or fractures in the reservoir structure or the caprock, unusual dispersion of injected gas rendering it

inaccessible, and underground impediments in the area of withdrawal wells that limited the ability to access and withdraw the gas inventory. IP also acted prudently and reasonably in refraining from commencing massive reinjections of gas inventory while it was still investigating possible structural causes, since until these possibilities were fully investigated and ruled out, reinjected gas could have been lost and become non-recoverable.

It was ultimately determined, however, that the cause of the Hillsboro deliverability decline was over-registration of gas injections by the main plant injection meters, so that for several years the meters recorded more gas being injected into the Field than was actually the case. IP discovered and remediated the metering problem in 1999, but underestimated the cumulative effect of the measurement error. In 2003, IP both eliminated remaining possible structural causes for the Hillsboro deliverability decline, and determined the true extent of the metering error. IP then commenced reinjecting gas inventory in 2003.

As discussed in §IV.C below, Staff witness Lounsberry contended that IP should have recognized the true extent of the injection metering error in 1999-2000 and commenced reinjecting gas into Hillsboro in 2000, even while it continued to investigate possible structural causes. He asserted that IP had three "opportunities" to detect that the injection metering error was much larger than IP originally believed, but failed to do so. However, each of his three arguments is hindsight-oriented, fails to take into account all of the information and circumstances confronting IP at the time, and does not demonstrate any imprudence by IP.

First, Mr. Lounsberry contended that IP should have used a methodology in 1999-2000 that it in fact employed in 2003 – the use of temperature and pressure data recorded at the individual injection/withdrawal ("I/W") wells at Hillsboro – to estimate the cumulative impact of the measurement error at the main plant injection meters. However, as discussed in §IV.C.1, the

I/W well data was not historically or normally used for this purpose; in fact, its use in 2003 was a creative step by IP engineers to find a method to evaluate the extent of the measurement error at the main plant injection meters. There is no basis to conclude that reasonable management should have hit upon using this approach in 1999-2000. Further, the estimate of the cumulative injection metering error that IP made in 1999, although ultimately found to be in error, was reasonable at the time based on the information available to the Company.

Second, Mr. Lounsberry contended that IP failed to place a sufficiently high priority on accurate measurements for *withdrawals* from the Hillsboro Field after its expansion, resulting in the failure to find a problem in one of the four plant *withdrawal* meters that resulted in an understatement of *withdrawals* from the Field. However, as discussed in §IV.C.2, the essence of his argument is that IP should have followed maintenance and inspection practices for the HSF withdrawal meters embodied in a Commission regulation and American Gas Association documents that by their terms are *not applicable* to storage field meters that are non-custody transfer meters not used for customer billing. IP had maintenance and inspection practices for these meters that were reasonable and adequate for the use to which the meters were put. Further, the Hillsboro deliverability decline was not due to the *withdrawal* meter error; and even if IP had discovered the problem with the *withdrawal* meter sooner, this would not have changed its underestimation of the main plant *injection* meter measurement error, which ultimately proved to be the cause of the deliverability decline.

Third, Mr. Lounsberry contended that IP failed to recognize the significance of the fact that in the 1999-2000 and 2000-2001 seasons, IP withdrew less gas from Hillsboro than it was able to withdraw prior to the 1993 expansion; he asserted that this should have caused IP to realize that Hillsboro had an "inventory problem". However, as shown in §IV.C.3, he

misconstrued the significance of this information. Although IP was unable in those years to *withdraw* as much gas as it had prior to the expansion, this did not tell IP what *volume* of gas inventory was in the reservoir. Based on the information available to IP at the time and the potential causes it was investigating, it was quite possible that the Field contained sufficient gas inventory *volumes*, but that IP was unable to *access and withdraw* the gas due to structural problems such as leakage or migration from the main reservoir underground structure or obstructions in the vicinity of withdrawal wells.

Further, and perhaps more significantly, each of Mr. Lounsberry's three arguments about missed "opportunities" that should have led IP to commence reinjecting gas inventory in 2000 was misplaced because at the time, IP was continuing to investigate, and had not eliminated the possibility of, plausible structural causes for the Hillsboro deliverability decline. Even had IP recognized the significance of the three "opportunities" Mr. Lounsberry cited, it would have been *imprudent* for IP to begin reinjecting gas inventory into the storage field until it had satisfactorily eliminated the plausible structural and reservoir problems that could have resulted in reinjected gas inventory becoming lost and inaccessible. Thus, Mr. Lounsberry's arguments that IP was imprudent failed to properly apply the prudence standard, in that he failed to take into account all of (and only) the information and circumstances facing management at the time.

Mr. Lounsberry also contended that even if was reasonable for IP not to commence reinjections in 2000, IP should have commenced reinjections in 2001 after it drilled a new well at the location where a sub-structure was believed to exist to which gas was migrating, but failed to locate a substructure. As discussed in §IV.C.4, however, this argument also misapplied the prudence standard, because in 2001 and 2002 IP was continuing to investigate other plausible structural problems which could have been causing the deliverability decline. It was not until

2003 that IP was able to rule out the plausible structural causes and therefore commence reinjections without risking that the reinjected gas would be lost.

In addition to his Hillsboro-specific arguments, Mr. Lounsberry also raised several "overall storage concerns" which he contended led to the Hillsboro deliverability problems. As discussed in §IV.D, these "overall storage concerns" included the reduction in peak day capacity at another storage field for one winter (2000-2001), an event with respect to which the Commission, in IP's 2001 reconciliation case (Docket 01-0701) rejected Mr. Lounsberry's recommendation for an imprudence disallowance (see §IV.D 1); a reduction in the number of supervisors at IP's storage fields (see §IV.D.2); a reduction in IP's storage field capital expenditures in certain years (see §IV.D.3); and a purported inability (manifested by two examples he cited) to conduct adequate root cause analysis and identify problems with its storage fields (see §IV.D.4).

This is the third docket in which Mr. Lounsberry has raised these "overall storage concerns", and the Commission has yet to adopt them as the basis for a disallowance. As shown in §IV.D, each of these "overall storage concerns" is unfounded. Perhaps more significantly, there is no causal connection between the "overall storage concerns" and the Hillsboro deliverability decline or the speed with which IP investigated, identified and remediated the Hillsboro deliverability decline. To the contrary, IP devoted significant resources to the investigation and remediation of the Hillsboro problem, and was not constrained in its efforts by lack of manpower or capital.

Finally, while IP believes that there is no basis for a finding of imprudence or imposition of any disallowance with respect to its operation of the Hillsboro Storage Field, IP disputes one component of Mr. Lounsberry's disallowance calculation. This issue is addressed in §IV.E.

Cost of Gas Lost Due to Damage by Third Parties. Staff witness Burma Jones recommended that IP's recoverable gas costs be reduced by $40,009, representing the cost of gas lost due to damage to gas lines by third parties. Ms. Jones' rationale is that the Company was reimbursed for these amounts by the third parties causing the damage. (Staff Ex. 1.00, pp. 4-5 and Sched. 1.02.) AmerenIP has not presented any testimony or argument contesting this proposed adjustment.

In summary, the Commission should adopt IP's proposed reconciliation statement for 2003, as presented in IP Exhibit 1.1, adjusted only for the reduction of gas costs by $40,009 for cost of gas lost due to damage by third parties for which the Company was reimbursed.

II. The Standard for Prudence

This Commission has adopted the following well-recognized standard for determining the prudence of a utility's management decisions and actions:

> Prudence is that standard of care which a reasonable person would be expected to exercise under the same circumstances encountered by utility management at the time decisions had to be made. In determining whether a judgment was prudently made, only those facts available at the time judgment was exercised can be considered. Hindsight review is impermissible.
>
> Imprudence cannot be sustained by substituting one's judgment for that of another. The prudence standard recognizes that reasonable persons can have honest differences of opinion without the one or the other necessarily being "imprudent." (*Illinois Commerce Commission v. Commonwealth Edison Co.*, Docket 84-0395 (Oct. 7, 1987), p. 17.)

This standard has been confirmed by the Illinois courts. See, e.g., *Illinois Power Co. v. Commerce Commission*, 245 Ill. App. 3d 367, 371 (3d Dist. 1993) (reversing a Commission finding of imprudence); *Illinois Power Co. v. Commerce Commission*, 339 Ill. App. 3d 425, 428, 435 (5th Dist. 2003) (reversing a Commission finding of imprudence that was based on Staff witness Lounsberry's recommendation). The Commission has also recognized in applying the

prudence standard that, when humans are involved, errors are reasonable to expect. (Order in Docket 84-0395, p. 19.) See also *Business & Professional People for the Public Interest v. Commerce Commission*, 279 Ill. App. 3d 824, 833 (1st Dist 1996) ("a small amount of human error is an unavoidable cost of any human endeavor").

As the Commission stated in its Order in Docket 01-0701, IP's PGA reconciliation case for 2001, in applying the prudence standard to a gas cost disallowance proposed by Staff witness Lounsberry based on the Company's operation of its storage fields:

> As indicated above, the Commission has previously defined prudence as the standard of care which a reasonable person would be expected to exercise under the same circumstances encountered by utility management at the time decisions had to be made. (Order in Docket 01-0701, p. 22)
>
> . . . This is not to say, however, that the circumstances identified by Staff and listed in [IP's] Shanghai Report could not have been perceived by some at the time of their occurrence as warnings of potential problems in the future. The question, though, is whether in light of *all* of the circumstances at Shanghai, was IP imprudent in its failure to realize that Shanghai's deliverability may be impaired in the future. (*Id*., p. 23; emphasis in original)
>
> . . . Admittedly, IP's perception of Shanghai's performance was obscured by an error in computer settings which affected the meters at Shanghai. As a result of this error, IP withdrew 743,313 Mcf of gas above what its meters reflected from 1995 to 1999. Although this mistake was certainly avoidable, its detection was hampered by the results of an earlier well casing leak. IP acknowledges the error but argues that it cannot be expected to be perfect. The Commission agrees. The potential for human error is inherent in all human endeavors. Data input is obviously no exception. (*Id*., p. 23)
>
> . . . In light of the foregoing, the Commission is persuaded by IP that IP acted reasonably and prudently with regard to its decision to reduce the peak day deliverability of Shanghai by 25,000 Mcf/d for purposes of its 2001 PGA reconciliation. While certain errors occurred and hindsight shows that some of IP's observations and beliefs were incorrect, a natural gas storage aquifer is a complex physical system and the Commission finds that under the circumstances IP's actions with respect to Shanghai were not imprudent. (*Id*., p. 25)

The record in this case shows that under the foregoing standards, IP's management decisions and actions in the areas questioned by Staff were prudent, based on the information

known and available to IP at the relevant times and considering all of the circumstances faced by management. Staff witness Lounsberry's recommended imprudence disallowances are based on his hindsight review of all of the relevant events, from a perspective not available to management at the time decisions had to be made and actions taken. Further, in contending that IP acted imprudently, Staff witness Lounsberry seeks to substitute his judgment (again, arrived at with the benefit of hindsight and complete retrospective information) for that of the Company's management (which had to be exercised in real time based on the information then available and in light of all the circumstances) as to the actions that should have been taken. Mr. Lounsberry's recommendations constitute an inappropriate application of the prudence standard. As AmerenIP witness Scott Glaeser, Vice President, Gas Supply and System Control for Ameren Energy Fuels and Services Company, explained:

> Staff witness Lounsberry's opinions that IP was imprudent in the actions it took to investigate the decline in deliverability of its Hillsboro Storage Field . . . and the two instances of unauthorized overrun charges in 2003 are based on hindsight and do not adequately take into account the circumstances faced by IP at the time the decisions and actions were being made. His recommendations are based on an after-the-fact analysis of what he thinks IP should have done or should have known based on certain information (to the exclusion of other information that IP had to take into account) at particular points in time. Mr. Lounsberry also greatly oversimplifies the difficulties associated with evaluating the multiple potential causes of the Hillsboro deliverability problems and eliminating potential causes to arrive at the actual cause or combination of causes. His analysis fails to adequately take into account that underground storage reservoirs such as Hillsboro are complex geological systems whose characteristics cannot be known with complete certainty. (IP Ex. 4.0, pp. 4-5.)

Further, as Mr. Glaeser pointed out, "in some respects Mr. Lounsberry is holding Illinois Power to a standard of absolute perfection." (*Id*., p. 5.)

> This is most apparent in his proposed imprudence disallowances for unauthorized pipeline overrun charges, which occurred on two days out of 365 days in the reconciliation year and constituted a fraction of one percent of the gas entering IP's system on that day. Again, Mr. Lounsberry greatly oversimplifies the operation of natural gas utilities which are vast, complex systems covering large

> geographic areas driven by constantly changing weather conditions and the individual choices of hundreds of thousands of gas consumers. To demand perfection in the management and operation of such complex and variable systems is unrealistic and unreasonable. (*Id*., pp. 5-6.)

Additionally, Mr. Lounsberry's recommendations take "prudence" to a point that introduces a level of risk to the gas distribution business that is inconsistent with the level of return AmerenIP is allowed to earn from this regulated business. (*Id*., p. 6.) AmerenIP, of course, earns no return on its sales of gas to its customers. It is allowed to earn a return only on its investment in gas delivery facilities, at a rate which reflects the supposedly low level of risk of this regulated business. Further, AmerenIP cannot recover more than its actual cost of gas incurred for supply to customers, but it is subject to imprudence disallowances that reduce its recovery of actually incurred costs. As Mr. Glaeser again explained:

> [I]n 2003 IP had total purchased gas costs of over $337 million, which is equal to about 74% of IP's total gas utility operating revenues. Illinois Power earns no return on the sale of this gas to customers and earns no return for acquiring this gas for its customers. IP's return on its gas utility business is earned only from the allowed rate of return applied to its assets included in rate base. In 2003, Illinois Power had net gas utility income of approximately $20.1 million, which represented only about a 4.4% margin on its gas operating revenues. Mr. Lounsberry's proposed imprudence disallowances of more than $7.6 million in this case represent about 38% of IP's total gas operating income. Thus, Mr. Lounsberry's proposed disallowances impose a very substantial risk of loss on IP's relatively modest rewards from the gas utility business.[1] (IP Ex. 4.0, p. 6.)

[1]The $7.6 million disallowance was Mr. Lounsberry's recommendation in his direct testimony. In his rebuttal testimony, he made adjustments to his Hillsboro disallowance calculation which reduced it to approximately $6.9 million. (Staff Ex. 4.00R, Sched. 4.01R.) Still, this disallowance is equal to almost 35% of IP's 2003 net gas utility income.

III. Staff Witness Lounsberry's Proposed Disallowance for Unauthorized Overrun Charges Should Be Rejected

A. Overview

During 2003, IP incurred unauthorized overrun charges on two pipelines on a total of two days.[2] One overrun charge (incurred on Natural Gas Pipeline Company of America ("NGPL") on March 9) was $11,435. (Staff Ex. 2.00R, p. 6.) The other overrun charge (incurred on Panhandle Eastern Pipe Line Company ("PEPL") on April 6) was $4,283.[3] (*Id*., p. 9.) Staff witness Lounsberry contended that the incurrence of these two unauthorized overrun charges was imprudent and that the total cost in the amount of $15,718 should be disallowed. His position should be rejected.

The starting point – and, AmerenIP submits, the ending point – for analyzing Mr. Lounsberry's recommendation is to put the two incidents in question into perspective. IP incurred unauthorized overrun charges on two days in 2003, or 0.5% of the days that year. In fact, IP incurred no unauthorized overrun charges in 2002 or 2004, so Mr. Lounsberry is contending IP was imprudent in incurring overrun charges on two days out of a 1,095-day period, or 0.18% of those days. Further, IP is served by five pipelines and must keep its daily deliveries within daily nominations plus allowed tolerances on *each* of these pipelines to avoid unauthorized overrun charges. Thus, IP had 5,475 "opportunities" during the three years 2002-2004 to incur a pipeline overrun charge (i.e., 365 days times 3 years times 5 pipelines) but only

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[2]Unauthorized overrun charges may be imposed by a pipeline when the gas delivered by the pipeline to (i.e., taken by) a customer (e.g., IP) on a day exceeds the customer's nominations for the day plus tolerances allowed by the pipeline. (Staff Ex. 2.00R, p. 4.)

[3]In his testimony, Staff witness Lounsberry refers to the April 6 overrun charge as $4,583. The correct number is $4,283. This figure plus the $11,435 overrun charge incurred for March 9 sum to $15,718, the total disallowance recommended by Staff.

incurred overrun charges in two instances, representing 0.04% of the "opportunities." (Rev. IP Ex. 2.1, pp. 3-4.) Additionally, the aggregate amount of overrun gas on the two days constituted 0.002% of IP's total gas sendout during the reconciliation period. (*Id*., p. 4.) On the March 9 pipeline day, the volume of overrun gas constituted 0.2% of the total gas entering IP's system and 0.6% of the total gas received by IP on NGPL, the pipeline that imposed the overrun charge. (*Id*.) On the April 6 pipeline day, the volume of overrun gas constituted 0.1% of the total gas entering IP's system and 0.5% of the total gas received on PEPL, the pipeline that imposed the April 6 overrun charge. (*Id*.)

Thus, the amounts of overrun gas were minute in both absolute and relative terms, as well as in frequency of occurrence. (*Id*.) Mr. Lounsberry's recommended disallowance gives new meaning to the word "trivial." Further, IP did not do anything different in nominating and managing its gas deliveries on March 9 and April 6 than it did on the other 1,095 days in 2002, 2003, 2004 – except that on just those two days, IP incurred an overrun on one of its five pipelines on each of the two days. As Kevin Shipp, Managing Executive of Gas Supply for Ameren Energy Fuels and Services Company, testified:

> Although Mr. Lounsberry has criticized several aspects of the processes the Company employed on March 9 and April 6, 2003, and has asserted that IP should have done things differently or in addition on those days, the manner in which IP operated on those two days to nominate, monitor and control gas flows and sources of supply were essentially the same processes it follows all the time. . . [T]he Company incurred unauthorized overrun charges only two times out of 5,475 pipeline gas days over the past three calendar years (2002-2004), with overrun charges equaling approximately $15,000 out of almost $1 billion dollars of gas purchases in that period. In short, IP obviously had systems, practices and procedures in place that were designed and implemented so as to avoid pipeline overrun charges more than 99.5% of the time, so IP should not be penalized with a disallowance due to the fact that these systems, practices and procedures failed to prevent small overruns on two occasions in three years. (IP Ex. 2.11, pp. 7-8.)

Given that the Commission and the courts have recognized, in applying the prudence standard, that a small amount of human error is unavoidable, the fact that the Company incurred daily overrun charges on just two pipelines in a 1,095-day period, totaling only $15,718, should be sufficient, standing alone, to conclude that IP has not acted imprudently in its management of its gas nominations and deliveries on the pipelines.

Further, review of the specific circumstances on the two days in question shows there is no basis to impose a disallowance on IP for the overrun charges incurred on those two days.

B. March 9 Pipeline Day

The March 9 gas day ran from 9 A.M. on Sunday, March 9, to 9 A.M. on Monday, March 10.[4] Because suppliers charge a premium for changes made across a weekend, IP purchased supply on Friday, March 7 to cover the Saturday, Sunday and Monday loads. (Rev. IP Ex. 2.1, pp. 4-5.) Reservations for supply and the nominations to the pipelines were required to be made prior to 9 A.M. on Friday, March 7. On Friday morning, March 7, IP was forecasting load on its system from system supply customers plus transportation customers of 421,900 MMBtu for the March 9 pipeline day, based on a forecasted mean temperature from an independent weather service of 20 degrees. (*Id*., p. 5.) Supply purchased and nominated on March 7 for March 9, including transportation customer nominations, was 256,254 MMBtu; the remainder of IP's March 9 load was to be served from leased or Company-owned storage. (*Id*.) However, the actual mean temperature on March 9 was 13 degrees, and the actual telemetered load for the March 9 gas day was 466,067 MMBtu. (*Id*.) The actual pipeline receipts for the March 9 gas day were 466,351 MMBtu, but this number was not known until after the end of the month of March when all pipeline data became available. (*Id*.)

[4]The "pipeline day" or "gas day" is a 24-hour period from 9 A.M. to 9 A.M.

Mr. Lounsberry indicated that IP receives telemetered data every 4 to 8 seconds throughout the day at its central gas dispatch center in Decatur on the volumes of gas being delivered to its system by the pipelines. (Staff Ex. 2.00R, p. 5.) He therefore contended that short of extraordinary events, a utility should never incur unauthorized pipeline overrun charges. (*Id*.) He concluded that there were no extraordinary events on March 9 and therefore IP should not have incurred an overrun on NGPL, because "at some point it must have been apparent that the Company was not within tolerance and would incur unauthorized use charges." (*Id*., p. 8.) His analysis, however, was overly simplistic and failed to appreciate the limitations involved in the real-time use of the telemetered data.

IP's dispatch center receives telemetered information on volumes calculated and registered by IP's equipment at pipeline delivery gate stations. This metering equipment is not the "custody transfer" metering and in most cases is not used for billing purposes. Further, this equipment records the gas data volumetrically (Mcf), not on a heat content basis (MMBtu) which is how the pipeline bills are rendered. (Rev. IP Ex. 2.1, pp. 5-6.) As a result, there is an inherent discrepancy between the telemetered load data seen by IP's dispatchers in real time and the data used by pipelines for billing purposes (including calculation of any unauthorized overruns). IP telemeters individual pipeline loads on an Mcf basis and then adjusts this data for Btu content, specific gravity and other factors, to be consistent with the pipeline's billing basis.[5] As a result, in almost all instances there is a difference in the telemetered load data seen by IP's dispatchers for a day and the delivery amounts actually billed by the pipelines. (*Id*., p. 6.) Additionally, the delivery stations that IP has telemetered to the dispatch center deliver only about 95%-98% of

[5]As illustrated in IP Exhibit 2.12, the Btu content on a given day is not uniform for all deliveries from a particular pipeline, but rather varies from delivery station to delivery station.

the gas IP receives from pipelines. While the dispatchers can estimate the gas deliveries received at the other delivery stations by extrapolation, the possibility for minor deviations obviously exists. (*Id*., p. 7.)

Due to the factors described in the preceding paragraph, differences will exist between the telemetered data seen by the dispatchers in real time and the actual values billed by the pipelines (and used to determine whether overruns have occurred) at the end of the month. The dispatchers must constantly monitor and correct the telemetered values to adjust for the Btu content of the gas and other factors. The pipelines post Btu content data on their websites, but the posted data is usually a day old. It is not unusual for the actual Btu factor of pipeline gas on a day to vary from the value that the dispatchers were using during the course of that day (based on previous days' information). Any difference between previous days' Btu factors and the actual Btu content of the gas on the current day will cause the adjusted telemetered load data for the current day to be slightly incorrect.[6] (Rev. IP Ex. 2.1, pp. 7-8.)

On the March 9 pipeline day, the amount of overrun gas was only 0.6% of IP's total actual deliveries from NGPL. This percentage is representative of the differences between the telemetered load data and the final, actual load data that can be caused by variations in the Btu factor and by the fact that on a real-time basis, not all pipeline deliveries are telemetered. (Rev. IP Ex. 2.1, p. 8.)

Additionally, although Mr. Lounsberry pointed to the fact that telemetered data is received at the dispatch center every 4 to 8 seconds, this data is not an accumulation of gas flows in real time, but rather only updates the average for the flow for the hour, then projects what the

[6]IP Exhibit 2.12 illustrates this fact by showing the daily Btu adjustment factors for April 2003 for four of IP's delivery stations on PEPL. On the majority of days at each delivery station, the Btu content factors were different than on the preceding day.

remaining hourly flow rates should be for the day in order to hit the contract limit (nominations plus allowed tolerances). Only after each hour ends do the dispatchers have an accumulation of the real gas flows that have occurred. Thus, it is possible, for example, that the gas flow averages could appear to be exactly where they need to be to stay within contract limits for most of the hour but still end up being over the contract limits at the end of the hour. (IP Ex. 2.11, pp. 3-4.) Again, all of this real–time data is subject to the inaccuracies inherent in the use of an estimated Btu content factor and the fact that not all deliveries are telemetered.

Further, the gas loads of IP's customers, and therefore the gas taken by IP's system from the pipelines, are not uniform throughout the gas day. A surge in load at the end of the pipeline day (i.e., in the hours leading up to 9 A.M. of the following calendar day) could result in an overrun even though, based on analysis of the telemetered data, deliveries appeared to be within the contract limits throughout most of the gas day. This can be particularly problematic if the gas day in question is 9 A.M. Sunday to 9 A.M. Monday (as it was on both March 9 and April 6), because system load can surge in the last several hours of the gas day as businesses, schools and other users that were not operating on Sunday resume operations on Monday morning. This impact is exacerbated if the actual temperature on the gas day is colder than it was predicted to be on the previous Friday when load forecasts and pipeline nominations were made – again, as was the case on both March 9 and April 6. In these circumstances, the dispatchers simply might not be able to react quickly enough (i.e., by increasing withdrawals from Company-owned and leased storage while remotely adjusting valves at delivery stations to reduce pipeline receipts) to avoid an overrun in the last few hours of the pipeline day.

Moreover, even when the telemetered data provides indications to the dispatchers that the Company may be in danger of incurring an overrun, the dispatchers do not have the ability to

make instantaneous changes throughout IP's gas system. For example, the dispatchers monitor and control mechanical devices throughout the gas system, including pressure control devices that allow the amount of gas to flow that will maintain a set pressure. If a dispatcher calls for a change in one of these devices, such as by calling for a lower flow rate, the response by the device is not instantaneous; rather, it takes some time (up to 20 minutes) for the device in the field to operate in response to the desired condition. Additionally, pressure drops on the system will result in *increased* gas in-flows, and it may take several minutes for the dispatchers to respond to this change in conditions. (IP Ex. 2.11, p. 4.)

As explained by AmerenIP witness Kevin Shipp, on the March 9 gas day the IP dispatchers monitored the telemetered load data throughout the day and adjusted storage activity during the course of the day in response to customer loads that differed from projections, in order to attempt to remain within the pipeline allowed limits and avoid any overruns. (Rev. IP Ex. 2.1, p. 8.) Staff witness Lounsberry acknowledged that it was believed that these actions, based on forecasted temperatures and customer demand for the remainder of the gas day, in combination with the available pipeline services, would be sufficient to keep within allowable pipeline tolerances. (Staff Ex. 2.00R, p. 8.) However, the real time data available to the dispatchers is incomplete and not completely accurate, for the reasons described above, and the amount of the inaccuracy cannot be known in real time. (Rev. IP Ex. 2.1, pp. 8-9.) As a result, small overruns such as those on March 9 can occur despite the best efforts of the dispatchers – although it is notable that overruns only occurred on 0.1% of the pipeline days in 2003. (*Id*., p. 9.) As Mr. Shipp explained, the only way to systematically avoid overruns would be to have the dispatchers always work to a level of nominations or allowed pipeline tolerances lower than IP's actual nominations and allowed tolerances. However, this would result in the Company not utilizing a

portion of the pipeline resources for which its customers pay and (as discussed in §III.D below) would not be cost-effective for customers. (*Id*.; IP Ex. 2.11, p. 8.)

C. April 6 Pipeline Day

The gas day of April 6, 2003, began at 9 A.M. Sunday, April 6 and ended at 9 A.M. on Monday, April 7. IP purchased supply on Friday, April 4 to cover the Saturday, Sunday and Monday loads. (Rev. IP Ex. 2.1, p. 9.) Reservations for supply and nominations to the pipelines had to be made prior to 9 A.M. on Friday, April 4. On Friday morning, April 4, IP was forecasting load on its system from system supply customers plus transportation customers of 239,300 MMBtu for the April 6 pipeline day, based on a forecasted mean temperature of 37.5 degrees. (*Id*.) Supply purchased and nominated on April 4 for April 6, including transportation customer nominations, was 185,242 MMBtu; the remainder of IP's April 6 load was to be served from leased or Company-owned storage. (*Id*.) The actual mean temperature on April 6 was 36.6 degrees, and the actual telemetered load for the April 6 gas day was 322,630 MMBtu. (*Id*., p. 10.) The actual pipeline receipts for the April 6 gas day were 321,300 MMBtu, but this number was not known until after the end of the month of April when all pipeline data became available. (*Id*.) The unauthorized overrun on PEPL for April 6 was 415 dekatherms ("Dth") which was 0.5% of the total actual deliveries to IP on PEPL and 0.1% of the total pipeline deliveries to the IP system. (*Id*., pp. 4, 10.) There percentages are representative of the differences between the real-time telemetered load data and the final, actual load data that can be caused by variations in the daily Btu factors, as discussed above, and the fact that 3% to 5% of the pipeline deliveries are not telemetered. (*Id*.)

As Mr. Shipp explained, on April 6 the dispatchers monitored the telemetered gas data throughout the gas day and adjusted storage activity in response to variances between the actual

customer loads being experienced and the loads that were projected when supply was ordered. (Rev. IP Ex. 2.1, p. 10.) Staff witness Lounsberry acknowledged that it was believed these actions, based on forecasted temperatures and customer demand for the remainder of the gas day, in combination with the available pipeline tolerances, would be sufficient to keep IP within allowed tolerances. (Staff Ex. 2.00R, p. 10.) Again, however, the dispatchers' efforts could not be completely accurate due to the variance between the actual Btu factor for the day and the Btu factor the dispatchers were using during the course of the day to adjust the telemetered volumes, as well as the fact that the telemetered data does not encompass 100% of the pipeline deliveries in real time. (Rev. IP Ex. 2.1, pp. 10-11.)

D. Staff Witness Lounsberry's Assertions of Imprudence with Respect to the March 9 and April 6 Overruns Are Based on Hindsight and Substitution of Judgment and Must Be Rejected

In his direct testimony, Staff witness Lounsberry based his contention that the March 9 and April 6 pipeline overruns were imprudently incurred on the assertion that because the dispatchers receive telemetered data every 4 to 8 seconds, "at some point it must have been apparent that the Company was not within tolerance and would incur unauthorized charges", the Company had "the means to . . . confirm the Company usage was within tolerance levels", and "the Company should have become aware that actions needed to be taken to remain within tolerance." (Staff Ex. 2.00R, pp. 8, 11.) As the foregoing discussion shows, however, this is not necessarily the case. To the contrary, the facts show not that IP should have been able to avoid overruns on the two days on which they did occur, but rather that IP remarkably incurred pipeline overruns on only these two days in a three-year period, representing 0.1% of the pipeline days in 2003 and about 0.036% of the pipeline days in the three-year period.

In his rebuttal testimony, Staff witness Lounsberry resorted, with the benefit of hindsight, to second-guessing IP's actions. With respect to the March 9 gas day, Mr. Lounsberry testified that "at the end of its March 9, 2003 gas day", IP calculated it had incurred an overrun on NGPL. (Staff Ex. 4.00R, p. 6.) While this statement is correct, it ignores that fact that (i) the calculation IP made at the end of the gas day was not necessarily the final, actual pipeline calculation due to the use in real time of estimated Btu adjustment factors and the fact that not all delivery stations are telemetered; and (ii) more importantly, this determination was not made by the dispatchers until "the end of [the] March 9, 2003 gas day", when it was too late to take corrective action such as altering gas supply purchases or storage activity. (IP Ex. 2.11, p. 2.) As it turned out, the March 9 overrun on NGPL was equal to only 0.6% of the gas received on NGPL that day. (Rev. IP Ex. 2.1, p. 4.)

Staff witness Lounsberry also contended that IP had sufficient allowed tolerances on NGPL that it should have been able to avoid the March 9 overrun of 0.6%. (Staff Ex. 4.00R, p. 7.) As noted earlier, IP in fact used its allowed tolerances on NGPL to avoid overruns on 1,094 of 1,095 days in the three-year period 2002-2004. Further, as the discussion above under "March 9 Gas Day" showed, there is enough variance between the data available to the dispatchers in real time concerning pipeline deliveries and system loads and the final, actual pipeline delivery data for a day, as well as enough delay in the dispatchers' ability to alter system flows in response to information, that small overruns such as occurred on March 9 are not 100% avoidable. The only way to completely avoid overruns would be to require that the dispatchers always work to a level of nominations or allowed pipeline tolerances lower than IP's actual nominations and allowed tolerances. However, this would result in IP not utilizing a portion of the pipeline resources for which its customers pay. (Rev. IP Ex. 2.1, p. 9.) This would be an

unjustifiable action to take in light of the minimal level of overrun charges ($15,718 in three years) IP has incurred while employing its current practices. As IP witness Shipp testified, based on the factors discussed in his testimony and in light of the low incidence and amount of unauthorized overrun charges that IP has experienced, the costs of measures to achieve 100% avoidance of overrun charges would not be economically justifiable. (IP Ex. 2.11, p. 8.)

With respect to the April 6 overrun, Mr. Lounsberry contended that IP should have used different Btu heat content assumptions on that day to convert the telemetered Mcf data into MMBtu data. Specifically, he contended that on April 6, IP should have used the average of the PEPL Btu adjustment factors for April 3, 4 and 5, although he recognized that using this data would have only reduced the amount of the overrun, not eliminated it.[7] (Staff Ex. 4.00R, pp. 11-12.) This contention is completely hindsight oriented. Fortuitously for Mr. Lounsberry's argument, in hindsight the average of the April 3-5 Btu factors was quite close to the actual PEPL Btu factor for April 6. However, when the Btu adjustment factors are examined over a broader time period, it can be seen that the average of the prior three days' Btu factors will not consistently produce an accurate estimate of the current day's Btu factor. IP Exhibit 2.12 provides the Btu factors for each day of April 2003 at each of four major IP delivery stations on the PEPL system, and for each day and station, the average of the Btu factor for the three preceding days. This exhibit shows that on many days the actual Btu conversion factor varied significantly from the average of the three previous day's Btu information posted on PEPL. In fact, there were several days during April 2003 that had IP used the Btu values from the previous

[7]Mr. Lounsberry provided no explanation for using the arithmetic average of the previous 3 days' values, as opposed to using the previous 5 days or 2 days, or weighting the previous day's value more heavily than the values from the two preceding days, or any other use of the data. One must conclude therefore that, with the benefit of hindsight, he picked the arithmetic average of the Btu values for April 3, 4 and 5 because it came closest to the actual Btu value for April 6.

three days, the calculated gas volumes for the day in question, based on telemetered data and the Btu adjustment, still would have varied from the final, actual takes by a large amount. (IP Ex. 2.11, p. 5.)

Mr. Lounsberry also contended in his rebuttal testimony that IP should have operated by maintaining at least a one percent, or approximately 500 MMBtu, variance from the maximum tolerance allowed by PEPL, although he indicated that even this cushion likely would have been too small on April 6. (Staff Ex. 4.00R, pp. 10-12.) His contention is unsupported, factually incorrect, and hindsight oriented. Mr. Lounsberry provided no basis for his use of a one percent/500 MMBtu "cushion." (IP Ex. 2.11, p. 7.) In any event, IP already does what Mr. Lounsberry suggests. On PEPL, IP has tolerances of 10% of daily nominations (but not exceeding 4% of maximum contract capacity), and IP never plans on using these daily pipeline tolerances during its operations.[8] (*Id*., pp. 5-6.) Thus, IP already has a "cushion" in place to accommodate variances between its load forecast and actual loads, weather changes, operational issues and other factors affecting gas demand on the particular day. (*Id*, p. 6.)

Further, Mr. Lounsberry's position that a "prudent operator" should always maintain a "cushion" sufficient to eliminate any possibility of incurring unauthorized pipeline overruns would result in AmerenIP being unable to use a portion of its pipeline firm transportation ("FT") capacity, which its customers pay for, to transport gas. The data on IP Exhibit 2.12 (which covered only one pipeline and one month), shows that the pipeline Btu factor can change by as much as 10% from one day to the next. AmerenIP witness Shipp showed that if IP maintained a "cushion" of 10% on PEPL (based on this data) to avoid overruns, it could utilize only 93.6% of

[8]IP may plan on using no-notice service or other such agreements that are in place with a particular pipeline. (IP Ex. 2.11, p. 6.)

its contracted FT on PEPL that customers are paying for. It would then be necessary to contract for an additional amount of supply, or, alternatively, to contract for additional pipeline FT. (IP Ex. 2.11, p. 6.) Maintaining a "cushion" sufficient to avoid all unauthorized overruns would not be in the customers' best economic interests, because the cost of the unused FT capacity ($11.50 per Dth per month on PEPL), or of additional FT capacity, would be much greater than the infrequent overrun charges that IP has incurred ($4,283 on PEPL, and $15,718 on all pipelines, over a three-year period). (*Id.*)

In summary, Staff witness Lounsberry's recommendation that IP be found to have acted imprudently in incurring the only two pipeline overrun charges it has incurred in three years – totaling $15,718 – should be rejected. The Company followed the same practices and procedures on these two occasions, when it incurred small overruns, as it employed on the other 5,473 pipeline days in the three-year period on which it incurred no overruns. The record showed that it is not possible for the dispatchers to know in real time, during the course of a given day, exactly how much gas is being received from each pipeline, or to control the operation of the system with sufficient speed and precision, to completely eliminate any possibility of incurring overruns. Further, in light of the very low number and dollar amount of pipeline overruns that IP has incurred, it is clear that any additional measures the Company might employ to ensure there will never be overruns – such as increasing the size of the pipeline tolerances it utilizes in daily operations – would not be cost-effective for customers.

IV. Staff Witness Lounsberry's Proposed Disallowances Relating to the Operation of the Hillsboro Storage Field Should Be Rejected

A. Overview

Staff witness Lounsberry recommended that IP should be found imprudent for operating the Hillsboro Field at peak day capacity of 100,000 Mcf/day rather than 125,000 Mcf/day for a

portion of the reconciliation period, and for being unable to withdraw the full seasonal quantity of working gas inventory (7.6 Bcf) from the Field during the reconciliation period.[9] (Staff Ex. 4.00R, p. 15.) He contended that IP missed several opportunities to discover the cause of the declining deliverability at Hillsboro, and should have identified the cause of the reduced deliverability, and commenced reinjecting gas inventory into the Field, sooner than it did. (Staff Ex. 2.00R, p. 14; Staff Ex. 4.00R, pp. 15-16.) Specifically, he contended that IP should have commenced reinjecting gas inventory into Hillsboro during the 2000 injection season (rather than during the 2003 injection season, which is when IP in fact began to restore the depleted HSF gas inventory). Had IP commenced reinjections in 2000, it would have restored the full working gas inventory by the start of the 2003-2004 winter. (Staff Ex. 2.00R, p. 18.)

Mr. Lounsberry also based his disallowance recommendation on "IP's actions regarding its storage operations overall." (Staff Ex. 4.00R, p. 15.) Specifically, he cited "reduction in management oversight", "reduction in capital spending" and "inability to identify problems or conduct thorough root cause analysis." (*Id*., p. 16.) (These items are discussed in his testimony under the heading "Overall Storage Concerns.") He asserted that "All of these areas contributed to the Company's action of reducing the peak day and seasonal ratings for the Hillsboro storage field and increased the Company's gas costs during the reconciliation period." (*Id*.)

Mr. Lounsberry's disallowance recommendations should be rejected. The record demonstrates that IP acted prudently and reasonably in its investigation and remediation of the Hillsboro deliverability problems. Mr. Lounsberry's characterizations of certain of IP's actions

[9]Hillsboro's peak day capacity rating was restored to 125,000 Mcf/day after the 2002-2003 winter coverage period and was at the full 125,000 Mcf/day rating for the 2003-2004 winter. (Rev. IP Ex. 2.1, p. 21.) Therefore, Mr. Lounsberry's proposed disallowance relating to the Field's peak day capacity pertains only to the 2003 portion of the 2002-2003 winter.

as imprudent are based on hindsight and second-guessing, and fail to take into account all the circumstances faced by management at the points in time that Mr. Lounsberry contends IP should have taken different actions. In fact, contrary to Mr. Lounsberry's contentions, the record demonstrates that it would have been *imprudent* for IP to begin reinjecting gas inventory to Hillsboro in 2000, as Mr. Lounsberry contends, or even in 2001. With respect to Mr. Lounsberry's "overall storage concerns," the record shows that each of his "concerns" is unfounded. Moreover, the record does not indicate any causal connection between any of Mr. Lounsberry's "overall storage concerns" and either the Hillsboro deliverability issues or the speed with which the Company identified and remedied the Hillsboro deliverability decline.

Section II.B below recounts the history of the Hillsboro deliverability decline and IP's investigation and remediation of the HSF deliverability issues. Section II.C demonstrates that Mr. Lounsberry's specific claims of imprudence in IP's handling of the Hillsboro situation are unfounded. Section II.D shows that Mr. Lounsberry's "overall storage concerns" are unfounded, unrelated to the remediation of the Hillsboro delivery issues, and provide no basis for a finding of imprudence or a gas cost disallowance. Finally, Section II.E addresses issues relating to the calculation of Mr. Lounsberry's proposed gas cost disallowance.

B. Illinois Power Prudently and Aggressively Investigated the Cause of the Hillsboro Deliverability Decline

The history of the Hillsboro deliverability issues and IP's efforts to identify and remediate the sources of the declining deliverability were described by AmerenIP witnesses Wayne Hood, Curtis Kemppainen and Timothy Hower. Mr. Hood and Mr. Kemppainen are Consulting Engineers in AmerenIP's Gas Operations Support Group. Mr. Hood has been employed by AmerenIP or predecessor companies since 1977 and has been in positions directly supporting IP's gas storage fields since 1984. Mr. Kemppainen has 36 years of experience in the

gas and oil industries and has been employed by IP since 1992 in gas storage and transmission operations. (IP Ex. 5.0, pp. 1-2.) Mr. Hower is President of MHA Petroleum Consultants, a geology and engineering consulting firm. He holds undergraduate and graduate degrees in Petroleum and Natural Gas Engineering, is a registered professional engineer, and has 23 years of experience working in the oil and gas industry, with much of that experience in the area of underground storage. Specifically, he has been involved in the design, analysis and implementation of gas storage reservoirs for 15 years. (IP Ex. 6.0, pp. 1-2.) These witnesses have both extensive industry experience and personal experience in and knowledge of IP's investigation, identification and remediation of the Hillsboro deliverability issues.

In evaluating, under the standard for prudence, IP's actions in investigating and remediating the Hillsboro deliverability decline, the Commission should keep two important considerations in mind. First, as the Commission stated in its Order in Docket 01-0701 (p. 25), "a natural gas storage aquifer is a complex physical system." The actual characteristics of the underground reservoir and the manner in which the injected gas is dispersed into the aquifer cannot be observed directly but must be inferred from data such as seismic analysis, hydrogen ion concentrations, well pressures and other secondary information.

Second, industry experience shows that declines in deliverability are the most commonly-experienced problem in the gas storage industry, and that most gas storage operators experience a loss in deliverability over time. (IP Ex. 6.0, pp. 21-22.) Moreover, the most frequent causes of these deliverability declines are physical or structural problems. (*Id*., p. 22.) Thus, in investigating the cause of the Hillsboro deliverability decline, it was logical and appropriate for IP to focus its attention on possible structural or geologic causes, in light of both overall industry

experience and specific factors at Hillsboro such as (as discussed below), the recent significant expansion of the Field's storage capacity.

1. Expansion of the Hillsboro Storage Field

IP has had a storage field at Hillsboro since 1973; however, the Field was substantially upgraded in the early 1990s. As a result of the upgrade, which was completed in 1993, the Field's peak day deliverability was increased to 125,000 Mcf/day and its expected working gas volume was increased to 7.6 Bcf. Before the expansion, HSF had a working gas volume of 3.1 Bcf and a base gas volume of 7.1 Bcf for a total inventory of 10.2 Bcf. After the expansion, working gas volume more than doubled, to 7.6 Bcf, and base gas inventory almost doubled, to 14.1 Bcf. Total gas in the reservoir more than doubled, to 21.7 Bcf. (IP Ex. 5.0, p. 3.)

Before the expansion, the Hillsboro Field had five injection/withdrawal ("I/W") wells. In the expansion, nine additional I/W wells were drilled, as well as observation wells and a water disposal well. The pre-expansion wells were located at the crest of the underground reservoir structure. All of the additional I/W wells drilled during the expansion were drilled at locations surrounding the original wells, farther away from the top of the structure, hence intersecting the underground formation lower on structure and farther away from its crest. (*Id*., pp. 3-4.) Additionally, IP increased the number of compressors at HSF from one to three units, increased the number of dehydration systems from one to three, relocated two regulator runs from below ground to above ground and added a third regulator run, installed redundant programmable logic controllers and input/output devices to monitor and control the plant, and installed other new or additional above-ground plant equipment. In installing the new and additional above-ground plant equipment, IP essentially replicated existing facilities at the Field that had performed satisfactorily for many years. (*Id*., p. 5.)

2. Identification of a Deliverability Problem at Hillsboro

Initially, the expanded Field performed as expected. In each of the 1993-1994 through 1996-1997 heating seasons, Hillsboro tested at a peak day deliverability value of 125,000 Mcf/day or greater; and for the 1993-1994 winter, approximately 7.6 Bcf of working gas was cycled. (IP Ex. 5.0, p. 5.) In subsequent winters, however, the amounts of gas withdrawn from the Field declined, from 5.95 Bcf in 1994-1995 to 4.1 Bcf in 1998-1999. (*Id*., pp. 5-6.)

Based on several years of declining deliverability, IP first observed that there could be a potential problem with the Field following the 1995-1996 winter season. (*Id*., p. 6.) A low amount of gas withdrawals in a single inject-withdraw cycle would not necessarily lead one to suspect a problem, because exogenous factors such as weather and other load constraints could impact the volume of gas cycled in a given year. (In fact, one of the first winters following the Hillsboro expansion, 1994-1995, was warmer than normal, meaning that withdrawing less than 7.6 Bcf in the winter season would not be unusual.) Observation of reduced or declining deliverability over several years would be necessary for the storage field operator (i.e., IP) to suspect that there could be a physical or operating problem that was reducing deliverability. (*Id*., pp. 6-7.) However, when the amount of working gas withdrawn fell to approximately 4.9 Bcf in the third winter of operation of the expanded Field (1995-1996), IP became concerned that there was a potential problem with the Field. (*Id*., p. 7.)

3. IP's Investigation of Potential Structural Causes for the Hillsboro Deliverability Decline

IP initially focused its investigation on whether there was a reservoir or structural problem with the Hillsboro Field, that is, whether either (i) gas injected into the Field was migrating from the underground structure, or (ii) the shape of the underground structure was different than what had been expected. The result in either case would be that gas injected into

the Field was moving or being pushed to areas where it could not be reached by the withdrawal wells. In the expansion, the additional wells were placed at various points throughout the Field so as to enable IP to be able to inject and withdraw all the working gas inventory from the reservoir formation as the Company understood its structure. (IP Ex. 5.0, p. 7.)

IP initially investigated whether a reservoir problem was the source of the declining deliverability at Hillsboro because this was the most logical avenue to pursue, given that the Field had been significantly expanded in 1993 and the deliverability began to decline from what had been expected from the expanded Field in the second winter season after the expansion. Given the actions that had been taken to expand the storage reservoir, the possibility existed that the reservoir was physically breached during the expansion process, thereby allowing portions of the newly-injected, increased gas inventory to escape from the reservoir. (IP Ex. 5.0, pp. 7-8.) A related possibility was that one of the new I/W wells was drilled near an undetected fault, with the result that a portion of the gas injected into that well could migrate off structure. (*Id*., p. 8.) Yet another possibility was that the shape of the underground reservoir was not what it was believed to be, or that unknown substructures existed. In either case, the result could be that some of the additional 11.5 Bcf of gas injected into HSF with the new wells – which were farther away and down structure from the original underground formation – could be migrating to areas from which the gas could not be accessed by the withdrawal wells. (*Id*.) Finally, because in expanding the Field IP had replicated and expanded existing above-ground facilities that had worked well prior to the expansion, it was not thought to be likely that a problem with the above-ground facilities and equipment was the source of the deliverability problem. (*Id*., pp. 8-9.)

As Mr. Hower testified, there were a wide range of specific potential causes for the deliverability problems that IP first observed after the 1995-1996 winter, each of which could

have warranted a unique set of corrective actions, and therefore it was appropriate for IP to take a cautious approach to identifying the actual cause of the problem. The potential causes could have involved gas migration out of the storage reservoir, gas leaks to the surface or to geologic strata above the storage formation, or damage to the I/W wells which would have prevented efficient production of the gas inventory. (IP Ex. 6.0, pp. 6-7.) Taking corrective action without first properly identifying the cause of the problem could have been unproductive at best and catastrophic at worst. (*Id*., p. 7.)

Mr. Hower also explained that it was appropriate for IP to focus initially on a potential reservoir or structural problem as the cause. He pointed out that three years earlier, IP had completed a massive expansion of the HSF storage reservoir that increased the working gas capacity to approximately 250% of the capacity prior to the expansion. He noted that increased gas volumes in a storage reservoir can often lead to gas migration out of the field across structural spill points; alternatively, it can create breaches in the caprock that forms a seal to hold the stored gas in place. Because there was such a significant increase in the gas volumes during the expansion, it was logical and highly appropriate for IP to focus initially on a reservoir or structural problem as the cause of the deliverability decline. (*Id*., p. 7.)

To investigate the potential reservoir problem as a cause of Hillsboro's declining deliverability, in 1997 IP had a vertical seismic profile of the Field prepared by outside consultants, in order to evaluate whether conducting a three-dimensional ("3-D") seismic profile of the Field would be a viable approach to defining its structure. This study, which was conducted in 1998, concluded that a 3-D seismic profile would be a viable approach, and thus IP

retained another outside consultant to perform a 3-D seismic analysis.[10] (IP Ex. 5.0, p. 9.) The preliminary results of the 3-D seismic study indicated that approximately 3.5 Bcf of gas had migrated to another structure to the northeast of the Hillsboro Field. (*Id*., p. 10.)

Based on the results of the 3-D seismic study, in November 2000 IP drilled a new well, the Furness No. 1 well, to the northeast of the Hillsboro Field where it was believed a sub-structure existed to which gas had migrated from the main reservoir structure. (*Id*., p. 14.) The purpose of drilling the Furness well was to confirm or reject the existence of this sub-structure and to access the gas believed to be migrating to the sub-structure. (IP Ex. 6.0, p. 8.) When the new well was drilled, a substructure was not found. This result was not consistent with the 3-D seismic analysis which had indicated a separate sub-structure to the northeast of the main Hillsboro underground structure. IP therefore asked its external consultant to review and re-evaluate the results of the 3-D seismic survey. (IP Ex. 5.0, p. 15.)

However, the fact that the drilling of the Furness No. 1 well did not locate the additional sub-structure that was thought to exist to the northeast of the Field did not invalidate the structural variance theory that was believed to be the most likely cause of the Hillsboro deliverability problems. (IP Ex. 6.0, p. 17.) It was still a very distinct possibility that the general structural interpretation that had been developed using the 3-D seismic data, namely, that gas was migrating away from the main reservoir, was correct but not specifically manifested in the vicinity where the Furness well was drilled. (*Id*., pp. 17-18.) More generally, based on the

[10]A 3-D seismic profile is developed by measuring the travel times of sound waves propagated through the sub-surface; the signals reflect off the underground rock formations and bounce back to the surface where they are recorded. The reservoir structure is thereby identified in a 3-D image because the travel time of the reflected signal from structurally higher locations is shorter than in areas where the reservoir is deeper or farther below the surface. This process is conducted across the entire reservoir area, and the resultant recorded data is processed to yield a 3-D image of the reservoir. (IP Ex. 5.0, pp. 9-10.)

analyses that IP had completed as of 2001, including drilling the Furness well, there were still a number of structural or geologic causes that could have been the source of the Hillsboro deliverability decline (*Id*., p. 10), including the following:

- Gas losses into the caprock – in an underground reservoir, the caprock is assumed to form an impermeable seal on the top of the reservoir. In some cases, however, the caprock can be semi-permeable, so that gas can migrate out of the storage reservoir into the overlying formation where it is no longer accessible. (*Id*., p. 10.)

- Unfavorable or irregular growth of the gas bubble due to adverse gas-water mobility in the reservoir – although gas injected into an aquifer like Hillsboro typically displaces the water in a piston-like manner, the injected gas can sometimes advance as thin channels or "fingers". This results in a very irregularly shaped gas bubble where, in some locations, gas migrates beyond the area of the field developed for storage. Gas that has migrated out of the developed area of the field becomes trapped and is not available as part of the active working gas volume. (*Id*., p. 10.)

- Gas losses across a fault or fracture in the reservoir. It is common in the gas storage industry that undetected faults or fractures (breaks or cracks in the reservoir rock) are found within storage reservoirs. Such faults or fractures can be conduits or pathways for gas to migrate out of the storage formation, causing it to be lost from the storage formation and no longer available as part of the working gas volume. (*Id*., p. 11.)

To assist in the further analysis of the 3-D seismic data, IP had a crosswell seismic survey performed by an outside consulting firm in June 2001 between the Furness No. 1 and Snyder No. 2 wells and the Roth Boyle No. 1 and Snyder No. 2 wells.[11] The information obtained from this study was used to reprocess the 3-D seismic study data. (IP Ex. 5.0, p. 15.) Based on the results from drilling the Furness No. 1 well and the reprocessed 3-D seismic data, the consultant who had performed the original 3-D seismic analysis concluded that the additional structure that had been thought to exist to the northeast of the Hillsboro underground structure did not exist. (*Id*.)

[11]A crosswell seismic survey is a high resolution process capable of resolving features much smaller than those visible with 3-D surface seismic analysis. (IP Ex. 5.0, p. 15.)

The re-analysis of the 3-D seismic data was performed, and the foregoing conclusion reached, in the summer and fall of 2001. (*Id*.)

4. Peterson Metering Study

While investigating the possibility of structural causes or reservoir problems as the source of the Hillsboro deliverability decline, IP also retained an outside engineering firm, Peterson Engineering, to conduct an audit of the metering at the Hillsboro Field. Peterson Engineering was retained by IP in August 1999 and issued its report in December 1999. (IP Ex. 5.0, p. 10.) The Peterson metering audit identified two problems with the metering at the Field. (*Id*.)

First, it was determined that two new turbine injection meters that had been installed at the Field were over-registering gas volumes under certain operating conditions. Specifically, the plant compressors, when operating at certain loading steps, caused the turbine meters to over-spin thereby recording a greater amount of gas as having been injected than was in fact passing through the meters. As a result, over time, the meters were showing more gas injected into the Field than was in fact occurring. The turbine meter over-registration was calculated to be 26% when the compressors were operating at 50% loadings but only about 1.7% when the compressors were operating at 100% (i.e., full) loadings. (*Id*., pp. 10-11.)

Second, the Peterson audit found a problem with the orifice meter on the south secondary withdrawal run at Hillsboro.[12] Specifically, the actual size of the orifice plate opening on this meter was smaller than the size value stamped on the orifice plate. (The orifice opening size stamped on the equipment at the manufacturer's plant was the same size that IP had ordered, but was larger than the actual size of the opening.) The orifice diameter stamped on the plate was

[12]This meter is one of the four withdrawal meters at the Field. The "primary run" is the principal withdrawal facility into the south pipeline exiting the Field. The "secondary run" only operates occasionally, during high withdrawal periods. (IP Ex. 5.0, p. 11.)

10% larger than the actual diameter of the opening (5.5 inches versus 5.0 inches). The fact that the size of the orifice was smaller than the value stamped on the orifice plate by the manufacturer meant that less gas was being withdrawn from the Field than had been believed. (*Id*., pp. 11-12.)

To eliminate the measurement errors at the turbine meters, IP made operating procedure changes to avoid the 25% and 50% compressor loadings levels, since these were the compressor loadings that caused the most significant over-registration on the turbine meters. Additionally, the static pressure sensing point for the turbine meters was relocated from points upstream or downstream of the meter to the meter body of the turbine units, to improve the accuracy of the turbine meters. These steps, which were recommended in Peterson Engineering's report, were implemented in May 2000. (*Id*., pp. 12-13.) Thus, early in the 2000 injection season, the injection meter measurement problem had been corrected. (*Id*., pp. 20-21.) To eliminate the measurement error at the south secondary withdrawal meter, the correct value for the orifice opening was input into the meter's programmable logic controller so that it would accurately calculate the amount of gas passing through this meter. (*Id*., p. 13.)

Initially, it was determined that the measurement error associated with the injection meters and the measurement error associated with the mis-labeled orifice opening on the withdrawal meter were approximately equal and offsetting. (As discussed below, it was subsequently discovered that this was not the case and that the injection metering error was much larger than the withdrawal metering error.) (*Id*., p. 12.) The amount of the error on the withdrawal meter could be calculated with high accuracy, because the amount of this error was a function of the difference between the actual size of the orifice opening and the incorrect size that had been stamped on the orifice plate. (*Id*., p. 13.) The amount of error that had occurred on the injection meters could not be determined with the same level of certainty. Accordingly, IP

developed a range of the potential measurement error for the injection metering. The bottom end of this range, 5.4%, was developed based on the estimate that the compressors had operated at 50% loadings 15% of the time and at 100% loadings 85% of the time. (*Id*., p. 14.) The volumetric amount of the injection error at this end of the range was approximately the same as the volumetric amount of the orifice meter withdrawal error. (*Id*.)

5. Further Investigation and Analysis of Possible Structural Causes for the Hillsboro Deliverability Decline

With the conclusion having been reached (as described in §IV.B.3 above) that a separate, substantial structure did not in fact exist to the northeast of the Hillsboro Field, IP initiated additional studies and analyses focusing on other possible causes of the Field's deliverability decline. (IP Ex. 5.0, p. 16.) Although the determination had been reached that there was not a separate structure to the northeast of the Field to which gas was migrating, this did not enable IP to rule out a reservoir/structural problem or other physical problems as the source of the Field's deliverability decline. While the specific potential cause of a separate underground structure to which gas was migrating had been eliminated, other possible reservoir/structural causes remained. (*Id*.) These possible causes included the following:

- Gas was "fingering" off to the edges of the underground structure. ("Fingering", which results in gas becoming trapped and no longer available as part of the working gas inventory, is described in §IV.B.3 above.)

- Formation damage had occurred in the vicinity of one or more of the gas withdrawal wells, thereby limiting the ability to access all the working gas that had been injected into the Field.[13]

[13]In this context, "damage" is an oil and gas industry term defined as any barrier near the well bore that restricts injection or withdrawal. These restrictions can be caused by such things as drilling, casing, cementing operations, perforating, solids invasion, scales, fines migration, emulsions or bacteria. (IP Ex. 5.0, pp. 16-17.)

- Gas was leaking from the reservoir or was being lost due to recirculation through plant equipment. (*Id*., pp. 16-17.)

To address the possibility of formation damage in the vicinity of withdrawal wells as a cause of the HSF deliverability decline, IP performed a number of well stimulation treatments. Well stimulation treatments consist of injecting chemicals into a well bore and thus into the underground reservoir in order to clean up or remove any damage to the formation and thereby increase the productivity of the well. IP performed well stimulations on two wells in November 2000, on two additional wells in December 2001, and on two more wells in November 2002. (*Id*., p. 17.) Initially, the well stimulation treatments dramatically improved the performance of the individual wells. This lent credence to the possibility that the Field's performance issues were related to formation damage. (*Id*.) However, after the Company performed the well stimulation treatments on a total of six wells, it became apparent that formation damage was not the cause of the Hillsboro deliverability decline. (*Id*., pp. 17-18.)

IP also conducted a number of other analyses and investigations in the early Spring of 2003. (*Id*., p. 18.) These additional analyses and investigations included:

- Neutron log analyses – these analyses were used to determine if there was gas leakage from the reservoir to a shallower formation.[14] The neutron logs did not indicate any leakage. Additionally, a comparison of the neutron logs to neutron logs performed in earlier years indicated that the gas "bubble" in the reservoir was thinning. One possible cause of the thinning of the gas bubble was that gas was "fingering" to the edges of the underground structure. (*Id*., p. 18.)

- Flame ionization surveys – these tests are conducted at ground level to identify any migration of gas at the surface that would not be detected through neutron logs. These surveys detected no gas leakage at the surface. (*Id*.)

[14]A neutron log is a survey performed inside the well bore than can determine the gas saturation (i.e., the gas-water mix) within a reservoir by measuring the hydrogen ion concentration. (IP Ex. 5.0, p. 18.)

- Field metering versus plant metering comparison – IP compared the gas injected into the Field as measured by the plant meters (the turbine meters) to the gas injected as measured by the meters on the individual I/W wells. (*Id*., p. 19.)

- Analysis of reservoir performance – IP reviewed data on well water levels and water production over time at the Field's observation wells. A significant observation from this review was that the working gas volumes in the reservoir had declined to a level below the volume of the Field (3.1 Bcf) prior to the 1993 expansion. This observation indicated that the source of the deliverability problems for the expanded Field was not a structural one, because if the total working gas capacity of the reservoir was only 3.1 Bcf, then the annual withdrawal volumes should have stabilized at 3.1 Bcf. (*Id*.)

- Volumetric analysis – This technique used data on the volume of the HSF reservoir and gas saturation data from the neutron logs to develop an estimate of gas volumes in the reservoir. A comparison of the gas volumes in the Field in the Spring of 1993 to the Spring of 2002 indicated there was approximately 5.5 Bcf less gas in the Field in the Spring of 2002 than in 1993. (*Id*.)

Of these analyses, the field metering versus plant metering comparison and the volumetric analysis led to the conclusion that the gas volumes in the Hillsboro reservoir had been significantly depleted. (*Id*., p. 20.) Further, the aggregate information gained from the other analyses and activities that had been conducted, including drilling the Furness No. 1 well, the crosswell seismic surveys and reanalysis of the 3-D seismic data, the well stimulation treatments, the neutron logs and the flame ionization surveys, enabled IP to rule out the likelihood that the source of the Hillsboro deliverability decline was a structural or geological problem. (*Id*.) The results of these two analyses focused IP's attention on a measurement error as the source of the depletion of the gas volumes in the Field and thus of the Hillsboro deliverability decline. (*Id*.)

6. Determination of the Cause of the Hillsboro Deliverability Decline

As described in §IV.B.5 above, the analyses that the Company conducted in early 2003 led to the conclusions that (i) structural or geological problems could be eliminated as the source of the Hillsboro deliverability decline, and (ii) a measurement error should be pursued as the cause of the depletion of the gas volumes in the Field. IP compared the gas volumes registered

on the I/W well meters during specific time periods to the gas volumes registered on the plant turbine injection meters for the same time periods. These comparisons showed that the turbine meters had been recording substantially more gas than had actually been injected into the Field, over an extended time period. (IP Ex. 5.0, p. 20.) Specifically, the injection measurement error had occurred over the period 1994 through 1999 (as a result of the Peterson Engineering metering audit and the corrective actions that IP took following that study, the injection metering error had been largely mitigated in 2000). (*Id*., pp. 20-21.) IP therefore concluded, in early 2003, that the gas volumes n the Field had been substantially depleted as a result of the injection metering measurement error. (*Id*., p. 22.)

To make the comparison of injection data from the I/W well meters to measurement data for the turbine injection meters, IP used pressure and temperature data that had been recorded on charts at the injection meters for the individual I/W wells at the Field. There are 14 I/W wells at the Hillsboro Field; each well has an injection meter from which pressure and temperature data are recorded on a chart. The data recorded in the individual charts from the wells are used by the operators in adjusting methanol injection pump rates, opening or closing additional wells, monitoring wells and assessing the relative contribution of each well to the total injections or withdrawals at the Field. However, the pressure and temperature data recorded on these individual I/W well charts can be used to calculate the amount of gas being injected at the individual well meter.[15] (*Id*., p. 21.)

Historically, data was not recorded or not maintained for each individual I/W well for each day. However, for those days for which well charts with the necessary data existed for each

[15]The meters at the individual I/W wells are not used to record the gas volumes injected into the Field for accounting purposes. (IP Ex. 5.0, p. 21.)

of the 14 I/W wells that were operating that day, it was possible to combine, or "integrate", the data recorded on the individual well charts to develop an estimate of the total amount of gas injected into the Field through the I/W wells on that date. This total could then be compared to the volume of gas the turbine injection meters had recorded as injected on that date. (*Id*., pp. 21-22.) By comparing the injected volumes as determined by the integrated individual I/W well charts to the injection volumes as recorded on the turbine meters for several days in each month over the course of an injection season, IP was able to develop an estimate of the over-injection measurement error that had occurred on the turbine meters. (*Id*., p. 22.)

Based on the conclusion that was reached in the spring of 2003 that the gas volumes in the Hillsboro Storage Field had been significantly depleted as a result of the turbine injection meter measurement error, IP concluded that it would be necessary to substantially restate the gas volumes in the Field from the volumes shown by accounting records (which were based on the recorded injection measurements from the turbine meters). (*Id*.) Accordingly, IP (1) developed an estimate of the gas total gas inventory shortfall that had resulted from the metering error; and (2) developed a plan to reinject gas so as to restore the Field's base gas volume and working gas volume to the original post-expansion amounts of 14.1 Bcf and 7.6 Bcf, respectively. The Company commenced the reinjection of gas to restore the Field's working gas inventory during the 2003 injection season. (*Id*.)

7. Summary

The foregoing discussion in §IV.B shows that IP acted prudently in investigating the causes of the Hillsboro deliverability decline, isolating and eliminating potential causes, and ultimately identifying the cause and developing and implementing a plan to restore the Field to its initial post-expansion levels of operation. IP investigated multiple possible causes for the

deliverability decline, including structural or geological causes, which from the Company's perspective at the time were the most likely source of the problem in light of the fact that the storage reservoir had undergone a major expansion that more than doubled its capacity. Outside resources (external engineering and geological consulting firms) as well as internal resources were employed in the investigation. Corrective actions recommended by outside consultants for identified problems were implemented. Potential causes of the deliverability decline were eliminated based on the results of the analyses conducted by the Company, until IP ultimately determined that the cause of the deliverability decline was the depletion of the gas inventory in the Field resulting from the injection meter measurement error.

Mr. Hower of MHA Petroleum Consultants testified that the history of IP's efforts to identify and remediate the cause of the Hillsboro deliverability decline demonstrated that IP conducted a very thorough and logical work program to determine the cause of the deliverability decline. (IP Ex. 6.0, pp. 4-5.) The work program that IP carried out was a thorough root cause analysis – the Company followed a logical, well thought out and systematic approach to determine exactly what was the underlying cause of the problem. (*Id*., p. 6.) Even after receiving the initial results of the 3-D seismic analysis, which indicated that gas injected into reservoir was migrating to a separate sub-structure, IP did not simply wait for the Furness No.1 well to be drilled to confirm this analysis. Rather, IP continued to expend resources gathering data and investigating other possible causes, both structural and non-structural, including retaining Peterson Engineering to audit the plant metering. Geologic samples and other data gathered during this period proved useful in conducting studies into other potential causes after the Furness well was drilled and the separate sub-structure was determined not to exist. (*Id*., pp.

13-14.) Mr. Hower concluded that the Company was proactive and aggressive in its efforts to determine the cause of the deliverability problems at the Hillsboro Field. (*Id*., pp. 14-15.)

Moreover, Mr. Hower observed that the database of information IP compiled for the Hillsboro Storage Field is above and beyond what most storage operators typically collect, and in fact is one of the most comprehensive data sets he has seen in his experience evaluating gas storage reservoirs. IP incurred substantial costs to collect these data and analyses. All of the studies, analyses and data sets the Company compiled for Hillsboro provided value in its efforts to determine the root cause of the deliverability problem. (IP Ex.6.0, pp. 22-23.)

In summary, the record demonstrates that in investigating, and ultimately identifying and resolving, the cause of the Hillsboro deliverability decline, IP exercised the standard of care that a reasonable person would be expected to exercise under the circumstances encountered by management at the time its decisions were being made and actions being taken, based on the information available at those times.

C. The Specific Issues Raised by Staff Witness Lounsberry Relating to Hillsboro Do Not Show That IP Acted Imprudently in Investigating and Determining the Cause of the Hillsboro Deliverability Decline

Staff witness Lounsberry contended that IP should have concluded in 2000 that the cause of the Hillsboro deliverability decline was the injection meter measurement error, and should have commenced reinjecting gas into the Hillsboro Field in 2000 to restore the depleted inventory. (Staff Ex. 2.00R, p. 14.) Had IP done so, it would have been able to restore the peak day rating of the Field to 125,000 Mcf/day prior to 2003, and would have had a greater amount of working gas inventory in storage in 2003 for use in serving customers. Thus, he concluded that gas cost disallowances should be imposed in the 2003 reconciliation. Mr. Lounsberry contended that IP had several opportunities to detect the "large inventory problem" at the

Hillsboro Field, but failed to do so: (1) IP "had in its possession" in 2000 data that indicated "a large inventory shortfall", but instead concluded that the injection and withdrawal metering errors that had been discovered offset each other. (2) IP did not place a high priority on accurate measurement for withdrawals from HSF and failed to follow guidelines to ensure accurate measurement of withdrawals from the Field. (3) The volume of gas being withdrawn from HSF in the winters of 1999-2000 and 2000-2001 was less than the amount IP had historically withdrawn from Hillsboro prior to its expansion. (IP Ex. 4.00R, p. 20.)

Alternatively, Mr. Lounsberry contended that if it were determined that IP acted reasonably in waiting until it had drilled the Furness well (in November 2000) to determine if there was in fact a sub-structure to which gas was migrating, nevertheless, after the Furness well was drilled and a sub-structure was not found, IP should have concluded that the Hillsboro deliverability decline was due to an "inventory problem" and commenced reinjecting gas inventory into the Field. (Staff Ex. 2.00R, pp. 42-43; Staff Ex. 4.00R, pp. 32-33.)

As shown below, the particular points cited by Mr. Lounsberry do not demonstrate that IP acted imprudently, and do not demonstrate that IP reasonably and prudently could have commenced reinjections into the Field in either 2000 or 2001. To the contrary, consideration of the information known and reasonably available to management in these time frames demonstrates that it would have been *imprudent* to commence massive reinjections in either 2000 or 2001, because the distinct possibility remained that the cause of the Hillsboro deliverability decline was a structural or geological problem. Until these potential causes were adequately investigated and eliminated, commencing substantial reinjections of gas inventory into the Field (on the scale that IP initiated in 2003) ran the risk of loss of more gas into areas from which it could not be withdrawn. Mr. Lounsberry's recommendations do not constitute an

appropriate application of the prudence standard, because they fail to encompass *all* the circumstances and information that IP management had to take into account in 2000 and 2001. His recommendations are based on a few isolated items of information that support Mr. Lounsberry's position and whose significance could only be appreciated in hindsight.

1. Hillsboro Meter Study/Well Chart Data

As described in §IV.B.6 above, in 2003 IP used information from the well charts for the injection meters at the individual I/W wells at Hillsboro to compare injection volumes recorded on the individual I/W meters to injection volumes recorded on the plant turbine meters on specific days, and from this comparison determined that the turbine meters had significantly over-recorded injections. Mr. Lounsberry noted that about 1500 charts from the individual I/W wells had been "integrated" in 1994, and that IP used 624 of these 1994 well charts in 2003 when it performed its comparison of injections recorded on the plant metering to injections recorded on the individual well meters. Based on these facts, he contended that when IP determined in 1999 that the turbine injection meter measurement error and the orifice withdrawal meter measurement error approximately offset each other, IP "was in possession of information that disputed that conclusion" and in fact "squarely pointed to a significant inventory shortfall" at Hillsboro. (Staff Ex. 2.00R, pp. 34-35.) He also criticized the basis on which IP determined that the turbine injection meter measurement error and the orifice withdrawal meter measurement error approximately offset each other. (*Id*., pp. 32-34.) Therefore, he contended, IP should have discovered in 1999 or 2000 that it had a significant measurement error at HSF, and should have commenced to reinject gas to restore the inventory shortfall in 2000. (*Id*., p. 35.)

Mr. Lounsberry's contentions are based on unsupportable premises, are hindsight-oriented, and do not demonstrate any imprudence by IP. He criticized IP for using, in its initial

estimate of the extent of the injection metering error, what he contended were unsupportable assumptions that the Hillsboro compressors had run on average 15% of the time at 50% loading and 85% of the time at 100% loading, even though IP had not maintained logs of the operation of the compressors on a 24-hour basis.[16] (Staff Ex. 2.00R, pp. 33-34; IP Ex. 5.0, p. 24.) However, in making its calculations, IP relied on information in Peterson Engineering's report, and estimated the compressor loading levels based on its experience as to how the compressors had been operated over time. Since Peterson Engineering had calculated the turbine injection measurement error for two of the compressor loading steps (50% loading and 100% loading), these were the error measurements that IP had available to use in developing an estimate of the overall injection measurement error. (IP Ex. 5.0, p. 24.) Mr. Lounsberry did not suggest any basis on which IP could have made different or "better" estimates of the percentages of time at which the compressors had operated at various levels over the historical period in question. In short, IP's 1999 calculation of the cumulative amount of the turbine injection measurement error was based on the best (indeed the only) information it had available to make that calculation.[17]

Mr. Lounsberry's assertion that in 1999, IP should have used the 1994 well charts to determine that the turbine injection meter measurement error was much larger, is also unfounded and does not demonstrate any lack of prudence. Prior to the analysis it performed in 2003, IP historically had not integrated and aggregated the data from the individual well charts for the

[16]Mr. Lounsberry did not criticize IP for not maintaining historic, 24-hour-per-day logs of the levels at which the HSF compressors were loaded and operated, and did not suggest that a prudent operator would have maintained such data.

[17]There is no issue relating to IP's calculation of the cumulative amount of the withdrawal measurement error caused by the incorrectly-labeled orifice opening. The amount of the error in withdrawal volumes recorded by this meter due to the incorrectly-labeled orifice plate was calculable with a high degree of accuracy, because the amount of the error was a function of the difference between the actual size of the orifice and the incorrect size stamped on the orifice plate. (IP Ex. 5.0, p. 13.)

purpose of determining total daily injection volumes at the injection wells. (IP Ex. 5.0, p. 25.) The individual well charts did not even record volumetric injection data; rather, they recorded temperature and pressure data, which could be used to calculate the volumes that were injected at an individual well. (*Id*., p. 21.) The 1994 well charts had been integrated for a different purpose, specifically, to use in creating individual well histories to input into the Company's reservoir simulation model of the Hillsboro Field. (*Id*., p. 25.) Further, the individual injection well data historically was not even recorded or maintained for each individual well for each day. (*Id*., p. 21.) When IP did use the 1994 well chart data in its 2003 study, it had only about 45 days of well chart data to use.[18] (*Id*., p. 25.)

Mr. Lounsberry cited no information to indicate that it was a common (or even an occasional) practice in the gas utility industry to maintain well chart data, or to use it for the purpose of determining aggregate volumes of gas injected at a storage field's individual wells from day to day. Nor did he cite any information to suggest why IP should have recognized in 1999 that well chart data could be used for this purpose. The fact that IP was creative in 2003 in recognizing that data from the individual well charts could be integrated to get a total injection volume estimate for a day, which could then be compared to the injection volumes recorded on the main plant meters for that day, in no way shows that IP was imprudent in not recognizing this possibility in 1999 or 2000. To be blunt, if IP employees had not hit upon the idea in 2003 of using the well chart data to estimate aggregate injections at the individual I/W wells, the thought that this data should have been used in 1999 or 2000 to estimate the turbine meter measurement

[18]In order to use the well chart data to calculate the total amount of gas injected at the individual wells on a particular day, it was necessary for IP to have maintained the well chart for each individual I/W well that had operated on that day, which historically had not been done. (IP Ex. 5.0, pp. 21-22.)

error never would have crossed Mr. Lounsberry's mind. His assertion that IP should have used integrated well chart data in 1999 to estimate the turbine meter measurement error is nothing but hindsight and second guessing, and in no way shows that IP violated the prudence standard, i.e., what a reasonable person would be expected to do under the same circumstances encountered by IP management at the time.

In any event, Mr. Lounsberry's contention that IP should have commenced reinjecting gas into the Hillsboro Field in 2000 to restore the depleted gas inventory is unsupportable and would have been an *imprudent* action – *even if* IP had recognized that the turbine meter measurement error was much larger than estimated at the time. Even had IP recognized in 1999 or 2000 that the turbine injection measurement error was larger than believed at the time, that determination would not have enabled IP to rule out reservoir or structural problems as a cause of the Hillsboro deliverability decline. At the beginning of the 2000 injection season, IP's belief, based on the results of the 3-D seismic analysis, was that there was a sub-structure to the northeast of the Field to which approximately 3.5 Bcf of gas had migrated. (IP Ex. 5.0, p. 26.) This sub-structure, as well as other reservoir/structural causes IP was investigating, were plausible causes of the Field's deliverability decline following the significant expansion in 1993. Therefore, injecting additional gas to compensate for the accumulated metering error would have left the possibility that some or all of the additional gas injections would migrate off structure, and the Field's deliverability problems would continue. (*Id*.) Further, the turbine metering measurement error, the existence of the sub-structure and the other possible reservoir/structural issues being evaluated in 2000 were not mutually exclusive. (*Id*.)

In short, in the Spring of 2000, even knowing that the injection meter measurement error substantially exceeded the withdrawal metering error – which Mr. Lounsberry contends IP

should have known – would not have caused IP to conclude that the metering error was the sole cause of the Field's deliverability decline, or to rule out possible structural causes. (*Id*.) It was not until the Furness well was drilled in November 2000 that IP obtained additional information to cause the existence of a sub-structure to the northeast of the Field, to which gas was migrating, to be questioned. Further, IP also needed to perform well stimulation treatments, which were initiated in November 2000, to address the possibility that formation damage near I/W wells was causing or contributing to the deliverability problem. (*Id*., p. 27.)

Mr. Hower confirmed that it would have been imprudent for IP to commence reinjecting gas into the Field in 2000 to restore the depleted inventory. He emphasized that the purpose of drilling the Furness well in November 2000 was to confirm or reject the existence of a sub-structure, adjacent to the main reservoir, to which gas was migrating, as indicated by the 3-D seismic analysis. (IP Ex. 6.0, p. 8.) Mr. Hower stated that "To commence reinjecting large volumes of replacement gas at this time would have been unthinkable as the Company, based on the information available to it at that time, reasonably believed that any replacement gas would migrate further away from the storage field and possibly be lost." (*Id*.) Given the likelihood, in light of the recent expansion of the Field, that a structural problem was the cause (or one of the causes) of the deliverability decline, it was appropriate in 2000 for IP to continue with an investigation program relating to the structural hypothesis, including drilling the Furness well, before making a final determination as to the cause of the deliverability problem and taking specific corrective actions. (*Id*., pp. 8-9.)

In his rebuttal testimony, Mr. Lounsberry acknowledged that "I agree that had the Company found the inventory shortfall problem in a timely fashion the Company would have still had to consider potential problems with the reservoir or other structural problems".

Nevertheless, he asserted that "this does not mean that the Company could not have started replacing the inventory shortfall in 2000", but rather that "in my opinion, the Company would have begun replacing the inventory shortfall while it was investigating whether there were other problems with the reservoir." (Staff Ex. 4.00R, p. 22.) He also contended that there were other indications that the source of the deliverability problem was an "inventory shortfall."[19] (*Id*., p. 23.) Mr. Lounsberry continued to miss the point. It would have been extremely unwise for IP to have begun reinjecting gas into the Hillsboro Field before eliminating the realistic possibilities of structural or geologic-related problems with the reservoir. (IP Ex. 5.3, p. 2.) Given the information that IP had in early 2000, it would have been imprudent to begin injecting additional gas at that time, even had IP possessed better knowledge of the full extent of the turbine metering error, before it had fully investigated the implications of the data and analyses that indicated gas was migrating from the main reservoir structure to areas that were not accessible by the existing withdrawal wells. (*Id*., pp. 2-3.)

Mr. Lounsberry also argued in his rebuttal testimony that by reviewing observation well water levels and water production over time, IP had observed that the volume of gas in the reservoir was decreasing (Staff Ex. 4.00R, p. 23); and that through use of neutron logs, IP had observed the gas bubble thinning over time, which "could be caused by gas moving away from

[19]At least one of the other indications cited by Mr. Lounsberry was factually erroneous. He cited a statement in the Peterson Report that "During the past three or four years, IPC had been monitoring and reviewing the measured injected and withdrawn gas volumes as part of the review of the gas storage reservoir behavior. Computed volumes from the plant metering and well metering have not been satisfactorily reconciled." (Staff Ex. 4.00, p. 23.) As AmerenIP witness Hood explained, although IP had monitored injected and withdrawn gas volumes for the life of the Field, the operators first began tracking daily volumes for the individual I/W wells and the plant injection metering during 1999, and only for 1999 were the computed volumes for the plant injection metering and the well metering not reconciled. (IP Ex. 5.3, pp. 7-8.) Therefore, the suggestion that IP had been unable to reconcile injected and withdrawn gas volumes for several years prior to 1999 is incorrect. (*Id*., p. 8.)

the structure or from an inventory shortfall" (*Id*., p. 24). He contended that this information "provided a very strong case that the inventory shortfall was the problem." (*Id*.) His contentions are unfounded. Mr. Lounsberry's repeated assertions that IP should have recognized that there was an "inventory shortfall" or an "inventory problem" are meaningless. "Inventory shortfall" was never the cause of the deliverability problem at Hillsboro, it was the result of the problem. (IP Ex. 6.1, p. 2.) The issue confronting management was isolating why there was an "inventory shortfall." The inability to withdraw 7.6 Bcf of gas over several winter seasons (i.e., the "inventory shortfall") could have been due to previously-injected gas migrating to locations where it could not be accessed for withdrawal. Indeed, Mr. Lounsberry's own testimony quoted above recognized that the gas bubble thinning could have been caused by "gas moving away from the structure". Mr. Lounsberry's position that it would have been prudent for IP to commence reinjecting inventory into the Field, while still trying to determine if the loss of inventory was due to "gas moving away from the structure", is indefensible.

In any event, the specific observations cited by Mr. Lounsberry do not support his position that IP should have commenced reinjecting gas into the storage field in 2000. The water levels at the observation wells and the gas bubble thinning indicated by neutron logs, as well as the decline of the working gas volume below pre-expansion levels, are all consistent with the possibility of loss of gas from the underground reservoir by leakage. (IP Ex. 5.3, p. 5.) Based on this information, the cause of the problem could have been that the structure of the expanded reservoir was different than what was originally believed, or that gas was being lost due to several possible causes such as leakage through the caprock or across a fault or fracture in the reservoir, or irregular growth of the gas bubble (fingering). (IP Ex. 6.1, p. 2.)

Based on the information available to it at the time (early 2000), IP had a reasonable basis to believe that any replacement gas it injected into the Hillsboro Field would migrate away from the storage field and possibly be lost. (IP Ex. 6.1, pp. 1-2.) Mr. Lounsberry suggested that "the Company, in order to determine which avenue [i.e., a structural problem or an "inventory shortfall"] was the problem at Hillsboro should have started replacing inventory in the field, in order to determine the impact the replacement inventory would have, while at the same time continuing its investigation into potential reservoir problems." (Staff Ex. 4.00R, p. 24.) This is tantamount to saying that IP should have begun injecting replacement gas into the reservoir to see if it stayed there or not – sort of like injecting air into a suspect tire to see whether it leaks. But unlike the injection of air into a suspect tire, which is free (or at most would cost 25 cents to run the air compressor at your local gas station), injection of gas into a storage reservoir experiencing potential structural or geologic problems could be a costly mistake. If IP had commenced significant reinjections into Hillsboro in early 2000, but the potential causes of the deliverability problem that IP was investigating, based on the information it had at the time, had proved to be correct, we would be arguing in this case about whether IP should be allowed to recover the cost of lost and unrecoverable gas from ratepayers.[20] Mr. Lounsberry's position is entirely dependent on hindsight, which is inappropriate in a prudence review, and his arguments must be rejected.

[20]Moreover, it is inconceivable that if IP had presented Staff with all the information available in early 2000 and asked whether Staff thought IP should commence reinjecting significant quantities of replacement gas into the Hillsboro Field, Staff would have said "yes." In real time Staff, as did the Company, would have opted for caution.

2. Hillsboro Withdrawal Orifice Metering

The second Hillsboro-specific fact on which Mr. Lounsberry based his disallowance recommendation was that from 1993 to 1999, IP had not pulled and inspected the orifice plates on the four withdrawal meters. (Staff Ex. 2.00R, p. 36.) He asserted that this was inconsistent with the Commission's regulation at 83 Ill. Admin. Code 500.180(c), although he acknowledged that Code Part 500 is only applicable to customer billing meters, not to storage field metering, and stated that "I am not suggesting that IP violated a Commission rule." (*Id*., pp. 37-38.) He also cited two American Gas Association ("AGA") documents in support of his contention that IP should have inspected the orifice plates more frequently. (*Id*., pp. 38-39.) He cited an observation from the Peterson Report that when the orifice plates were inspected in 1999, they were found to be dirty to varying degrees. (*Id*.) His overall conclusions were 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" (*Id*., p. 39), and that if IP had found the orifice plate error sooner, this "would have allowed IP to focus solely on just the injection metering error" in 1999-2000. (*Id*., p. 40.) Mr. Lounsberry's criticisms and his overall conclusions on this point are misplaced, and they do not support his recommendation for an imprudence disallowance.

First, as Mr. Lounsberry acknowledged, Code Part 500.180 applies only to custody transfer meters, and in fact the Commission has no requirements that apply to storage field metering, including in particular with respect to the frequency with which orifice plates should be inspected. (IP Ex. 5.0, p. 30; IP Ex. 5.3, p. 8.) Code Part 500 simply is not a standard that IP was required to follow with respect to its storage field withdrawal meters. (IP Ex. 5.0, p. 30.) Mr. Lounsberry provided no explanation as to why prudence should require IP to expend resources complying with inapplicable Commission requirements.

Second, one of the AGA documents Mr. Lounsberry cited, Report No. 3, Part 2 – Specification and Installation Requirements, does not contain guidelines for inspection and maintenance of orifice meters, but rather for *installation* of orifice meters. (IP Ex. 5.0, pp. 30-31.) IP in fact *installed* the four HSF withdrawal orifice meters to the standards of this AGA document. (*Id*., p. 30.) Additionally, when the Hillsboro Field was expanded, IP added instrumentation to electronically measure and perform the computation of withdrawal volumes, which improved measurement accuracy (as well as reducing processing time). (*Id*., p. 32.)

Third, the other AGA document Mr. Lounsberry cited is a guideline document only, not a standard, and it suggests a higher inspection frequency than required even by this Commission's Code Part 500 for customer billing meters – which is not applicable to storage field metering. (*Id*., pp. 31-32.)

Fourth, any implication created by Mr. Lounsberry's testimony that IP did not perform maintenance on the Hillsboro orifice meters would be inaccurate. IP had (and continues to follow) an annual maintenance procedure for the HSF withdrawal meters.[21] (IP Ex. 5.0, p. 31.)

Fifth, when the four orifice plates were inspected in 1999, they were found not to be degraded and therefore were re-installed. The four plates are still in use today, subsequent inspections having shown no reason to replace them. (IP Ex. 5.0, p. 31; IP Ex. 5.3, p. 9.) Moreover, contrary to Mr. Lounsberry's position, there are good reasons not to remove the orifice plates for inspection on an annual (or more frequent) basis. The more frequently an orifice plate is removed, the greater the potential to damage the plate in handling or to re-install it

[21]IP annually calibrates the differential transmitters of each orifice fitting, calibrates the pressure transmitters for each pipeline, checks the calibration of the resistant temperature detectors for proper temperature indication, and checks the signal tubing between the orifice fitting and the differential transmitter for fluids. (IP Ex. 5.0, p. 31.)

improperly. (IP Ex. 5.3, p. 9.) Further, at Hillsboro, the orifice metering is located a short distance downstream of the dehydration towers; due to this location, the opportunity for contaminants such as grease or pipe scale to impinge or degrade the plates is remote.[22] (*Id*.) Additionally, there are other means of identifying potential problems with an orifice plate besides physical inspection of the plates, such as monitoring the pressure drops across the orifice openings to check that they are consistent (if one orifice has a significantly different pressure drop than the others, this would signal a potentially abnormal condition). (*Id*.)

Sixth, even if IP had discovered the mis-labeled orifice plate on one of the four Hillsboro withdrawal meters prior to 1999, this would not have resulted in IP focusing greater attention on the turbine meter measurement error when it was discovered in 1999. As noted earlier, the amount of the cumulative withdrawal measurement error could be accurately calculated since it was simply a function of the difference between the mis-labeled orifice diameter that had been used and the actual orifice diameter (10% smaller). (IP Ex. 5.0, pp. 12-13.) IP believed that the injection measurement error and the withdrawal measurement error were essentially offsetting *solely* because its calculation of the cumulative injection measurement error was inaccurate. That calculation was 997,000 Mcf (i.e., less than 1 Bcf in total over several years), which was not a large amount in the absolute, and certainly was not large enough to explain the Hillsboro deliverability decline. (IP Ex. 5.0, pp. 33-34.) Even if the withdrawal metering error had been zero in 1999, the calculated injection measurement error would not have been large enough to

[22]In his rebuttal, Mr. Lounsberry cited two papers on the potential impacts of dirty orifice plates on orifice meter accuracy. (Staff Ex. 4.00R, pp. 27-28.) However, the conditions modeled or studied in these papers were not representative of conditions at the Hillsboro orifice meters. For example, the measurement error he cited from one of the papers was based on an orifice plate coated entirely on both sides with ¼ inch of valve grease. This condition far exceeded what was experienced with the Hillsboro orifice plates. (IP Ex. 5.3, p. 10.)

cause IP, in 1999-2000, to focus on the injection metering error as the sole or even a primary cause of the deliverability decline. (*Id*., p. 34.)

In his rebuttal, Mr. Lounsberry acknowledged that "there are not any specific mandatory requirements for checking the orifice plate in an orifice meter in a storage field" (Staff Ex. 4.00R, p. 26), but he asserted without further support that "It is understood in the industry that in order to maintain accurate metering, frequent checking of the orifice plates is necessary." (*Id*.) However, AmerenIP witnesses Hood and Kemppainen, who have considerably more experience "in the industry" than Mr. Lounsberry, disputed his abstract statement, particularly with respect to non-custody transfer storage field metering. (IP Ex. 5.3, p. 8.) They reiterated that there are no Commission regulations and no other industry codes and standards that specify a frequency with which orifice plates used in non-storage field metering should be inspected. (*Id*.) Further, as described above, they cited reasons for inspecting storage field orifice plates with *less* frequency, both generally and in the specific Hillsboro configuration. (*Id*., p. 9.)

3. Top Gas Volume

The third Hillsboro-specific fact on which Mr. Lounsberry relied was that the amount of working gas that IP was able to cycle from the Hillsboro Storage Field in the 1999-2000 and 2000-2001 winter seasons was less than the pre-expansion working gas volume. Without being any more specific, he stated that he "considered this another missed opportunity to identify the inventory problem and return the gas to the field in a timely fashion." (Staff Ex. 2.00R, p. 41.) While Mr. Lounsberry was correct that in 1999-2000 and 2000-2001, IP withdrew less gas from HSF than the pre-expansion level, his analysis of the conclusions that should have been drawn from this development was off base.

Specifically, the fact that IP was unable to *withdraw* more than 3.1 Bcf (the pre-expansion working gas volume) from the Field did not tell the Company that the *volume* of gas in the Field had declined below 3.1 Bcf or that there was no structural problem or cause for the inability to withdraw more gas. To the contrary, there could have been adequate gas in the Field to support higher withdrawal levels, but the inability to withdraw more than 3.1 Bcf could have been due to reservoir/structural problems, such as injected gas migrating or fingering to inaccessible (by the existing withdrawal wells) locations, or formation damage in the vicinity of wells that limited the ability to access and withdraw all the working gas inventory in the Field. (IP Ex. 5.0, pp. 34-35.) Conversely, if the total annual gas withdrawal had *stabilized* at the pre-expansion volume, this would have indicated that the true working gas volume of the existing reservoir was 3.1 Bcf and that all the additional gas injected post-expansion had been lost off structure. (*Id*., p. 35.) In neither event, however, would the fact that working gas *withdrawals* had declined to or below the pre-expansion levels signal to IP that the cause of the deliverability decline was *not* a reservoir or structural problem. Further, as of the 2000-2001 winter, IP was still investigating a number of plausible reservoir or structural problems, including the possible sub-structure to the northeast of the existing Field, gas losses into the caprock, loss of injected gas due to "fingering", and gas losses through faults or fractures in the reservoir formation. (IP Ex. 6.0, pp. 9-11.)

4. Furness No. 1 Well

Finally, Mr. Lounsberry asserted that once the Furness well was drilled in November 2000 and did not locate the sub-structure that had been indicated by the 3-D seismic analysis, IP should have recognized that there was no reservoir problem and that "the Furness #1 well completely invalidated the structural variance theory." (Staff Ex. 2.00R, p. 42.) He asserted that

at this point there could not have been any other problem at the Field besides an "inventory problem."[23] (*Id.*) Once again, however, Mr. Lounsberry's assertion does not demonstrate imprudence, because he failed to take into account all the information that IP was trying to evaluate at the time.

Although drilling the Furness well in November 2000 did not locate a sub-structure in the area indicated by the 3-D seismic analysis, this result did not invalidate the possibility of a reservoir or structural cause, and it did not even invalidate the conclusion as to the existence of the substructure. (IP Ex. 5.0, pp. 28-29; IP Ex. 6.0, p. 17.) Nor did it eliminate the possibility that there were still deliverability issues based on the structure of the Field. (IP Ex. 5.0, p. 29.) It only specifically confirmed that there was not a sub-structure at the location indicated by the 3-D seismic analysis. It did not invalidate the more general conclusion that had been developed from the 3-D seismic data, namely, that gas was migrating away from the main reservoir to other structures.. (IP Ex. 6.0, pp. 17-18; IP Ex. 6.1, p. 3.) After drilling the Furness well, IP had conflicting information – the 3-D seismic analysis, which indicated the existence of a sub-structure to which approximately 3.5 Bcf of gas had migrated, and the results of drilling the Furness well, which did not confirm the existence of the sub-structure in the anticipated location. It was therefore necessary to have the 3-D seismic analysis results reinterpreted. (IP Ex. 6.0, p. 18; IP Ex. 5.0, p. 29.) The re-interpretation could have concluded that the sub-structure was in a different location than originally determined. (*Id.*)

[23]IP disputes Mr. Lounsberry's conclusion, as discussed immediately below. However, if in fact drilling the Furness well in November 2000 is the event that should have caused IP to recognize that the HSF deliverability decline was not due to a reservoir or structural problem, then IP could not be expected to have commenced reinjecting gas until 2001 at the earliest, not during the summer 2000 injection season, which is Mr. Lounsberry's primary position.

Further, had it been the case that the general conclusion originally drawn from the 3-D seismic analysis – that there was a substructure to which gas was migrating – was correct, then commencing a massive reinjection program after drilling the Furness well (as Mr. Lounsberry contends IP should have done) would have only resulted in more gas migration and more losses.[24] (IP Ex. 6.0, p. 18.)

In order to have the 3-D seismic analysis reinterpreted and resolve the conflicting information, it was necessary to gather additional data, by performing crosswell seismic surveys involving the Furness well and two other wells. (IP Ex. 5.0, p. 29; IP Ex. 6.0, p. 18.) A crosswell seismic survey, performed in a specific area, is a higher resolution process than the basic 3-D seismic process that was used to develop a profile of the entire reservoir. (IP Ex. 5.0, p. 15.) The crosswell seismic surveys were performed in June 2001. (*Id*.) Thereafter, using the results of the crosswell seismic surveys, the consultant who had analyzed the original 3-D seismic data re-analyzed it and concluded that there was not a sub-structure. (*Id*.) This re-analysis was completed in the Fall of 2001. (*Id*.)

However, even at this point, the possibility of a reservoir or structural problem as the cause of the Hillsboro deliverability problems could not be eliminated. Several remaining reservoir or structural possibilities that could have caused the deliverability decline remained, including formation damage in the wells or fingering of gas away from the withdrawal wells.

[24]Contrary to Mr. Lounsberry's assertions, the fact that IP did not observe migrating gas at the observation wells located around the perimeter of the Field did not invalidate the possibility of a separate sub-structure to which gas was migrating, either. The observation wells do not form a continuous "wall" around the perimeter of the storage field, but rather are drilled around the edge of the Field primarily for the purpose of measuring reservoir pressures. The individual observation wells are miles apart. The 3-D seismic data indicated structural features such as high and low points in the shape of the reservoir that could provide routes for gas migration that would never be detected by the observation wells. (IP Ex. 6.0, pp. 18-19.)

(*Id*., p. 30.) Other possible causes included gas losses to the caprock, gas migration via faults or fractures in the reservoir, or irregular growth of the gas bubble. All of these were very plausible causes that had not yet been eliminated. (IP Ex. 6.0, p. 3.) The results of drilling the Furness well did not rule out any of these potential structural causes for the Hillsboro deliverability issues. (*Id*.) In his rebuttal testimony, Mr. Lounsberry acknowledged that "the results of the Furness #1 well drilling did not necessarily eliminate the potential that other problems existed at the field." (Staff Ex. 4.00R, p. 32.)

In the Fall of 2001, therefore, additional analyses and studies were still needed to eliminate these remaining possible structural causes for the deliverability decline. (IP Ex. 5.0, p. 30.) It was very important, and prudent, for IP to continue to investigate the root cause of the problems observed at Hillsboro, so that the proper corrective actions could be taken, before commencing to inject replacement gas inventory. (IP Ex. 6.0, p. 3.) As described in §IV.B above, these additional analyses and studies were completed by the early Spring of 2003. (See IP Ex. 5.0, pp. 16-20.) If any of the potential causes had remained -- which IP had not ruled out as of the 2001 and 2002 injection seasons – commencing to reinject the gas inventory shortfall would have resulted in additional gas losses as well as potential environmental damage. (IP Ex. 6.0, p. 20.) In short, it would have been imprudent for IP to have followed the course of action suggested by Mr. Lounsberry in 2001 or even in 2002. (*Id*.)

D. Mr. Lounsberry's "Overall Storage Concerns" Do Not Demonstrate That IP Was Imprudent in its Investigation and Remediation of the Hillsboro Deliverability Issues

In addition to the Hillsboro-specific facts and events discussed in §IV.C above, Mr. Lounsberry also cited several "overall storage concerns" in support of his contention that there should be a gas cost disallowance imposed in connection with the Hillsboro deliverability

decline. Specifically, he cited (i) the fact that IP had reduced the peak day rating of the Hillsboro Field and had also reduced (for one season) the peak day rating of the Shanghai Storage Field; (ii) a reduction in the number of supervisors at the IP storage fields over the period from 1991 to 2000; (iii) what he characterized as a reduction in IP's capital expenditure budgets for the storage fields; and (iv) a purported inability to adequately identify problems. (Staff Ex. 2.00R, pp. 44-60.) As discussed below, none of Mr. Lounsberry's "overall storage concerns" are valid; and, more significantly, other than bald assertions, he has shown no causal connection between any of these "concerns" and the Hillsboro deliverability decline or the speed with which IP investigated, identified the cause of and remediated the Hillsboro deliverability problem.

This is the third case in which Mr. Lounsberry has raised some of his "overall storage concerns" in support of a proposed disallowance. Specifically, in Docket 01-0701, IP's PGA reconciliation case for 2001, Mr. Lounsberry raised the reductions in the capacities of the Shanghai and Hillsboro Storage Fields, the reduction in storage field supervisors, the purported reduction in IP's storage field capital expenditures budget, and IP's purported inability to conduct an adequate root cause analysis of a December 2000 accident at the Hillsboro Field involving above-ground equipment, in support of his recommendation that a disallowance should be imposed. (See Order in Docket 01-0701, Feb. 19, 2004, pp. 7-16.) However, the Commission, in its Order in that docket, did not impose any gas cost disallowance on IP relating to any of these matters. Next, in IP's recent gas rate case, Docket 04-0476, Mr. Lounsberry again raised each of these "overall storage concerns", as well as a purported inability to precisely track gas volumes entering its gas system, in support of his position that the Hillsboro Field should be found to be less than 100% used and useful. (See Order in Docket 04-0476, May 17, 2005, pp. 31-32.) Although the Commission found that the Hillsboro Field was less than 100%

used and useful, there was absolutely no indication in the Commission's conclusion on that issue that the Commission placed any weight on Mr. Lounsberry's "overall storage concerns." (Order in Docket 04-0476, May 17, 2005, p. 41.) Mr. Lounsberry's "overall storage concerns" should be given the same weight in deciding the prudence issue in this case that they were given in Dockets 01-0701 and 04-0476: none.

1. Reduction in Peak Day Capacity

Mr. Lounsberry's first "overall storage concern" was that on two occasions, IP has reduced the peak day capacity of a storage field. (Staff Ex. 2.00R, pp. 45-46.) One of those instances is the reduction in Hillsboro's peak day capacity from 125,000 Mcf/day to 100,000 Mcf/day, which is at issue in this case. (The rating was restored to 125,000 Mcf/day during the 2003 reconciliation year. (Rev. IP Ex. 2.1, p. 21).) However, Mr. Lounsberry is contending that there should be a prudence disallowance for the HSF peak capacity reduction based on specific actions of IP in its operation of the Field. Therefore, whether this peak capacity reduction occurred as a result of imprudent actions by IP should be decided on the basis of the specific facts and circumstances discussed in §IV.B and C above, and not based on the mere fact that the capacity rating was reduced.

The other occurrence was the reduction of the peak day capacity of IP's Shanghai Storage Field for one season, the 2001-2002 winter. (Staff Ex. 2.00R, p. 45.) Mr. Lounsberry stated in his testimony that he had "addressed" this capacity reduction in Docket 01-0701, IP's PGA reconciliation case for 2001, where he recommended a disallowance due to the reduction in the peak day capacity of the Shanghai Field. (*Id*., p. 46.) He neglected to mention, however, that in Docket 01-0701 the Commission *rejected* his recommendation and affirmatively found that (despite the fact that certain errors had occurred in IP's management of the situation), IP had

acted reasonably and prudently in its decision to reduce the peak day capacity of Shanghai for the 2001-2002 winter. (Order in Docket 01-0701, Feb. 19, 2004, p. 25.) This determination was made on the basis of an extensive review of the facts relating to the causes for the temporary derating of Shanghai and the actions IP had taken with respect to it. (*Id*., pp. 7-11, 16-19, 22-25.) In light of this prior, specific Commission finding, there should be no basis for using the Shanghai capacity reduction in the winter of 2001-2002 as grounds for an imprudence finding against IP in the 2003 reconciliation year (for a different storage field).

Mr. Lounsberry asserted that reduction of the capacity of a storage field is an "uncommon event" and thus "is not a positive indication" of the utility's management or oversight over the storage facility. (Staff Ex. 2.00R, p. 45.) He was incorrect in asserting that reduction of the capacity of a storage field is an "uncommon event". Deliverability decline has been reported to be the most common problem in the gas storage industry. (IP Ex. 6.0, p. 21.) According to information published by the U.S. Department of Energy ("DOE"), based on more than 350 U.S. storage reservoirs, most gas storage operators experience a loss in deliverability over time. (*Id*.) The DOE has funded research to attempt to address the causes of declining productivity experienced by gas storage reservoirs over time. (*Id*.) Mr. Lounsberry's characterization of the reduction in the capacity of a storage field as an "uncommon event" is not consistent with the experience of the U.S. gas storage industry. (*Id*., p. 22.)

In any event, whether the reduction in the peak day capacity of the Hillsboro Field, which was in effect for a portion of the 2003 reconciliation year, was the result of imprudent management by IP, should be determined (as it was in Docket 01-0701 with respect to the Shanghai Storage Field) based on review and analysis of IP's specific decisions and actions relating to the investigation and remediation of the Hillsboro deliverability decline.

2. Manpower

Mr. Lounsberry's second "overall storage concern" was that "manpower levels at the Company's storage field operations changed over time". (Staff Ex. 2.00R, p. 47.) Specifically, although the number of storage field operators has remained constant since 1991, the number of storage field supervisors was reduced from three or four during the 1991-1995 period to one person in 2000. (*Id.*) Without citing any specific facts, he made the general assertion that "IP's reduction in oversight has caused it to operate its storage fields in a manner that is not safe, reliable and efficient." (*Id.*, p. 48.)

Mr. Lounsberry has shown no relationship between the reduction in manpower he cited and the Hillsboro deliverability issues, and there is none. First, to put the manpower reduction in perspective, in 1991 IP had a total of 16 storage field operators and three supervisors. A supervisor was added in May 1992. The number of supervisors was reduced to two in 1995 and to one in 2000. Throughout this period, staffing of 16 operators was maintained. As of January 2003 (the start of the reconciliation period), IP had 16 storage field operators and one supervisor, for a total of 17 employees at the storage fields. Thus, the total number of personnel at the storage fields was 19 in 1991 and 17 in 2003. (Rev. IP Ex. 2.1, p. 28.)

The reduction in number of supervisors occurred in conjunction with the adoption in 1995 of a new manpower plan that included upgrading one of the operator positions at each storage field to a foreman's position. The manpower plan embodied a self-directed work team approach in which the work team for each storage field is both responsible and accountable for the functions to be performed at the field in order to provide safe and reliable service. (*Id.*, p. 29.) Further, IP's storage field operators have more than 240 total years of gas storage experience. (*Id.*, p. 28)

In addition to the employees at the storage fields, throughout this time frame IP has had a manager of storage who was responsible for supervision of all of the storage fields, as well as engineering and administrative personnel on its headquarters staff whose responsibilities include the storage fields. (*Id*., p. 29-30.) IP also makes use of outside consultants and contractors for specific projects and studies relating to the storage fields, including unusual problems or occurrences that may arise at a storage field. (*Id*., p. 30.) Using outside consultants and contractors and headquarters engineering personnel to investigate and analyze such problems and occurrences minimizes the need to distract the personnel at the storage fields from their day-to-day operating and maintenance responsibilities.

The record does not support Mr. Lounsberry's assertion that the reduction in storage field manpower he cited caused IP to operate its storage assets in a manner that is not safe, reliable and efficient. IP's storage fields have an excellent safety record. For the period from 1994 through 2004, IP had only three lost time accidents at its storage fields, with no lost time accidents from August 1998 through 2004. (Rev. IP Ex. 2.1, pp. 30-31.) Moreover, IP has never had an incident which endangered public safety at any of its storage fields. (*Id*., p. 31.) The storage field operators have received extensive training on numerous safety-related topics. (*Id*.) Further, the Commission's Office of Pipeline Safety ("OPS") performs annual audits of each of IP's storage fields, including all records at each field and verification that leakage surveys and pipeline patrols have been performed. The OPS issued only one "Non-Compliance" and two "Observations" in total to IP for all seven of its storage fields over the period 2002-2004. The issues involved in these findings were minor and IP addressed them immediately. (*Id*.)

Additionally, over the period cited by Mr. Lounsberry, IP has improved the efficiency of its storage fields through capital improvement projects. (*Id*., p. 32.) IP has increased efficiencies

at its storage fields by implementing advanced technologies as they have become available. (*Id*., p. 35.) The Company has improved the automation and remote control features of the control systems for the storage fields – all of the storage fields have updated control systems that have been installed over the past eleven years, with the control system upgrade for the final storage field completed in 2004. (*Id*.) The upgraded control systems make the storage plants more efficient operationally and improve IP's ability to monitor their operations, both on-site and from the Decatur gas dispatch center. As a result of these capital improvements, the gas system dispatchers in Decatur are now able to monitor the status and operations of the storage fields. (*Id*.) IP has also adopted a standardized set of operations software which enables operators from one field to go to any other field and control it.[25] (*Id.*)

In the face of all the information summarized above, which was provided in the Company's rebuttal testimony in response to Mr. Lounsberry, he stated in his own rebuttal, "I do not dispute any of the factual information that Mr. Shipp has presented regarding the Company's storage operations safety records." (Staff Ex. 4.00R, p. 38.) He then stated, however, that "the Company has experienced significant problems at its storage fields for some time", and concluded without any further explanation that "I continue to believe that the reduction in oversight at the storage fields played a role in this activity." (*Id*.) Mr. Lounsberry's characterization is hyperbole – IP has *not* "experienced significant problems at its storage fields for some time". IP temporarily reduced the peak day rating at the Shanghai Field for one winter, 2001-2002. Other than this event and the post-expansion deliverability issues at Hillsboro, IP has not experienced "problems" at any of its other five storage fields. Second, and more

[25]Obviously (just as has been the case in many segments of business and industry over the last decade), the implementation of standardized and centralized monitoring and control systems through technology impacts the need for manpower on site at the individual storage fields.

important, despite making the same assertion in three different dockets over a period of several years, Mr. Lounsberry has yet to provide any specific facts to support his unsubstantiated opinion that the modest reduction in manpower at the storage fields resulted in any operational problems at Hillsboro or at any others of the storage fields.

Moreover, as AmerenIP witnesses Hood and Kemppainen, who were directly involved in the investigation and remediation of the Hillsboro deliverability issues, testified:

> [W]ith respect to the impacts, if any, of the reduction in the number of storage field supervisors on the Company's ability to determine the causes of the Hillsboro and Shanghai deliverability declines, we have been involved in the investigation, discovery and remediation of the problems that led to the temporary reduction of peak day capacity at Hillsboro and Shanghai and the deliverability decline at Hillsboro. Based on our involvement, we do not believe there is any connection between the reduction in the number of storage field supervisors and the reduction of peak day capacity and deliverability or the time it took to determine the root cause of the problems. To the contrary, Illinois Power diligently investigated the source of the declining performance at the Hillsboro Field over a number of years until it was identified and corrected. These efforts were not hampered by a lack of supervisory resources. Similarly, there is no causal connection to support Mr. Lounsberry's assertion in the "Conclusion" to the "Overall Storage Concerns" section of his testimony (lines 1248-1249) that "After reducing its manpower levels, IP's ability to identify and act upon problems at its storage fields declined." (IP Ex. 5.0, pp. 35-36.)

Despite having investigated and raised the "manpower" issue in two prior dockets in addition to this one, Mr. Lounsberry provided no rebuttal to Mr. Hood and Mr. Kemppainen's testimony other than reiterating his generalized assertions. Mr. Lounsberry's assertions have not grown more reliable by repetition in three separate dockets. His unsubstantiated assertions should be given no weight in deciding the specific issues in this case.

3. Capital Expenditures

Mr. Lounsberry's third "overall storage concern" was that IP's capital expenditures for its storage fields have decreased. He specifically pointed to the storage field capital expenditures for 2002 through 2004 which were lower than the levels in 2000 or 2001 and among the lowest

years for storage field capital expenditures during the period 1995 through 2004. He stated that he was "concerned that IP is being reactive rather than proactive when determining when to make upgrades or other improvements at its storage fields", which, he asserted, "has contributed negatively to IP's ability to maintain its storage operations."[26] (Staff Ex. 2.00R, pp. 48-50.)

Mr. Lounsberry's "overall storage concern" regarding storage field capital expenditures cannot withstand exposure to the facts, and his contention that IP's levels of annual capital expenditures have "contributed negatively to IP's ability to manage its storage operations" is another unsubstantiated assertion. As with his assertion concerning manpower levels, he provided no facts demonstrating a causal relationship between IP's annual storage field capital expenditure levels and the speed with which the cause of the Hillsboro deliverability decline was identified and remediated.

AmerenIP witness Shipp presented an exhibit showing IP's annual storage field capital expenditures (actual, not budgeted), on both a direct cost and loaded (i.e., with overheads charged to construction) basis, for the years 1995-2003. (IP Ex. 2.7.) He observed that the annual capital expenditures have fluctuated up and down over this period, but pointed out that the expenditures have been higher in those years in which large, one-time projects were completed. (Rev. IP Ex. 2.1, p. 32.) He identified the specific large, one-time projects that were completed in those years that had higher capital expenditures. (*Id*., pp. 32-33.) He noted that due in part to the completion of several major initiatives over the period 1995-2001, IP simply did not identify any additional major projects that warranted capital expenditures in 2002 and 2003. (*Id*., pp. 34-35.) As he explained:

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[26]Note that the period Mr. Lounsberry cited included 2004, which is beyond this reconciliation period. Additionally, it is unclear from his testimony whether he was referring to <u>budgeted</u> capital expenditures or <u>actual</u> capital expenditures for the years he cited.

> [T]he year-to-year numbers shown on IP Exhibit 2.7 are exactly what one would expect to see in the context of a relatively small gas system segment, that is, annual capital expenditures are high in those years when specific, major capital projects are implemented and low in years in which there is not a major project being implemented. Illinois Power has not established its capital budgets in a manner intended to show relatively constant levels of spending from year to year, but rather has budgeted and scheduled significant larger projects as needed, which accounts for the year to year fluctuations in capital expenditures. (Rev. IP Ex. 2.1, p. 33.)

Additionally, Mr. Shipp provided an exhibit listing capital projects at each storage field in each of the years 1995 through 2003. (IP Ex. 2.8.) This exhibit lists numerous projects to replace or upgrade storage field facilities and equipment or to install new facilities and equipment. He explained that IP has been proactive in identifying and correcting problems at all of its storage fields, and has initiated numerous projects to avoid potential problems while trying to ensure maximum deliverability ratings. (Rev. IP Ex. 2.1, p. 33.) (IP's installation of new control systems at each of its storage fields, and of equipment that allows the storage field operations to be monitored from the centralized Decatur Gas dispatch center, was described in §IV.D.2 above.) He also presented an exhibit listing the studies performed by Company personnel and outside consultants on all of the storage fields over the period 1998-2003. (IP Exhibit 2.9.) Mr. Shipp testified that in his experience in his current management position, through four budgeting cycles, the storage fields have never had a requested project rejected by management due to capital budget limitations. (Rev. IP Ex. 2.1, p. 34.)

Another exhibit presented by Mr. Shipp showed IP's annual storage field O&M expenditures and combined capital and O&M expenditures for 1995-2003. (IP Ex. 2.10.) He noted that amounts spent on O&M, like capital expenditures, contribute to the ability of the storage fields to operate in a safe, efficient and reliable manner. (Rev. IP Ex. 2.1, p. 36.) IP Exhibit 2.10 showed that IP's storage field O&M expenditures in each of the years 2001, 2002

and 2003 were higher than in any of the preceding six years (1995-2000).[27] Mr. Shipp noted, with respect to Mr. Lounsberry's concern that IP may have been "reactive not proactive" in maintaining its storage fields, that many of the activities that would initially be undertaken to investigate a problem at a storage field, such as hiring a consultant to conduct a review or perform a study, would typically be expensed, not capitalized. (Rev. IP Ex. 2.1, p. 37.)

In the face of all this information, including the listing of specific capital projects completed by IP at each storage field during 1995 to 2003, Mr. Lounsberry was unable to identify any capital projects that IP should have undertaken but failed to undertake, whether for budgetary or other reasons, including any projects that would have enabled IP to identify and remediate the cause of the Hillsboro deliverability decline sooner than it did. (Rev. IP Ex. 2.1, p. 36.) He stated in his rebuttal testimony that "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"[28] (Staff Ex. 4.00R, p. 39), but he nevertheless asserted that his lack of information "does not detract from my conclusion." (*Id.*) He stated that IP's capital expenditures have been reduced over time and IP has had problems at its two largest storage fields and "for the reasons discussed in my direct testimony, Staff does not believe it is a coincidence." (*Id.*, p. 40.) The last assertion is a bit of a shell game by Mr. Lounsberry, since there is no "discussion"

[27]The two years cited by Mr. Lounsberry as having lower storage field capital expenditures, 2002 and 2003, had the second and third highest annual O&M expenditure totals in the 1995-2003 period. (Rev. IP Ex. 2.1, p. 38.)

[28]This is a surprising statement by Mr. Lounsberry since he has had ample opportunity to conduct discovery on this topic in the three dockets in which he has specifically raised the "capital expenditures" concern (Dockets 01-0701, 04-0476 and 03-0699) as well as in other PGA cases during this period (e.g., Docket 00-0714 for 2000 and Docket 02-0721 for 2002) in which he has been one of the Staff witnesses.

in his direct testimony explaining how the reduced capital expenditures in 2002 and 2003 resulted in the storage field problems at Shanghai and Hillsboro.

In fact, Mr. Lounsberry's argument is rather weak on correlation – the temporary reduction of the Shanghai peak day rating occurred in the winter of 2001-2002, and 2000 and 2001 are the years in which, Mr. Lounsberry contended, IP should have discovered the cause of the Hillsboro deliverability decline, yet 2000 and 2001 were two of the years with *higher* storage field capital expenditures. Mr. Lounsberry has not explained how the temporary reduction of Shanghai's peak day capacity during the 2001-2002 winter, or IP's inability to recognize the actual cause of the Hillsboro deliverability problems in 2000, were caused by reduced capital expenditures in *2002 and 2003*.

In any event, despite Mr. Lounsberry's "not a coincidence" comment, the record is clear that IP's investigation of the cause of the Hillsboro deliverability decline was not hampered by any lack of resources. As Mr. Hood and Mr. Kemppainen testified:

> [B]ased on our personal involvement in attempting to ascertain the cause of the Hillsboro deliverability decline, the failure to discover the underlying cause sooner did not result from the failure to undertake any particular capital projects or from the level of capital expenditures generally. As we have described in this testimony [IP Ex. 5.0], Illinois Power devoted considerable internal and external resources to determining the source of the Hillsboro performance decline. (IP Ex, 5.0, p. 36.)

Similarly, Mr. Shipp testified that:

> [I]n the one area that is specifically at issue in this case, i.e., the deliverability decline and inventory depletion of the Hillsboro Field, Illinois Power was extremely proactive, over an extended period of time, in trying to identify and correct the root causes of the problem. Mr. Lounsberry has not identified any capital projects, in either this case or in Docket 04-0476, which he contends could have enabled IP to identify and remediate the HSF deliverability issues sooner but which IP failed to undertake, for budgetary or any other reasons. In fact, Mr. Lounsberry contends that IP should have determined the cause of the Hillsboro deliverability decline by 2000 or 2001 at the latest, and yet the Company's

storage field capital expenditures for the years 1997 through 2001 were at levels he apparently believes were acceptable. (Rev. IP Ex. 2.1, p. 36.)

4. Identification of Problems

Mr. Lounsberry's final "overall storage concern" was that he questioned "IP's ability to identify problems or conduct thorough root cause analysis at its storage fields." (Staff Ex. 2.00R, p. 51.) His concern was based on two specific occurrences: (1) a December 2000 incident at Hillsboro Storage Field in which a produced water tank exploded and was launched from its foundation, and (2) the fact that, while the Hillsboro injection meters were recording more gas being injected into the Field than was actually the case over the 1993-1999 period, IP did not recognize the additional volumes of gas entering its gas system (rather than being injected into the storage field). (*Id.*)

a. December 2000 Hillsboro Incident

Mr. Lounsberry's contention was that IP failed to conduct an adequate investigation of the root cause of the December 2000 Hillsboro incident, which he contended was evidence of poor management oversight.[29] (Staff Ex. 2.00R, p. 58; Staff Ex. 4.00R, p. 41.) Without responding to every detail of Mr. Lounsberry's lengthy version of the history of this investigation, his characterization and conclusion are wrong, for these reasons:

- Within two days following the December 16 incident, IP hired a qualified outside consulting firm, Packer Engineering, which is a recognized forensic engineering expert[30], to conduct an investigation of the incident and submit a report, which Packer did on February 14, 2001. (IP Ex. 5.0, pp. 37-38.) Mr. Lounsberry did not question Packer Engineering's qualifications to conduct this investigation.

[29]Although the damage to plant facilities caused by this incident reduced the Hillsboro Field's deliverability from December 16, 2000 to January 16, 2001, Staff did not propose any disallowances relating to this incident in either the 2000 or 2001 PGA reconciliation cases and of course none were imposed by the Commission. (Rev. IP Ex. 2.1, pp. 38-39.)

[30]Packer Engineering specializes in investigating the causes of accidents involving chemicals, metallurgical failures, fire, explosions and similar circumstances. (IP Ex. 5.0, p. 37.)

- Packer Engineering's report identified a specific root cause of the explosion. (*Id*., pp. 37-38.)

- The Commission's Office of Pipeline Safety conducted a thorough, independent investigation of the December 2000 Hillsboro incident and issued a report, but did not make any findings of violations or non-compliances by IP, nor find any fault with the quality or completeness of IP's or Packer's investigation. (IP Ex. 5.2; IP Ex. 5.3, p. 11.) In fact, the OPS report relied heavily on information contained in Packer Engineering's report and on other information gathered by IP in its investigation. (IP Ex. 5.0, p. 39; IP Ex. 5.3, p. 11.)

- The OPS report, issued later in 2001, identified two possible causes of the incident, although it did not express an opinion as to which one was more likely. (IP Ex. 5.0, pp. 39-40.)

- Based on its investigation, including the recommendations of the Packer Engineering Report as well as the ICC OPS report, IP implemented a number of corrective actions for the purpose of preventing a repeat of the December 16 incident. (These corrective actions were listed at pages 41-42 of IP Exhibit 5.0.) Neither the ICC OPS, Mr. Lounsberry or any other Staff member has ever criticized the sufficiency or completeness of IP's corrective actions. (IP Ex. 5.0, p. 43; IP Ex. 5.3, pp. 11-12.)

The last point is perhaps the most important – although Mr. Lounsberry stated in his rebuttal testimony that "Without conducting a thorough review of what actually happened, IP cannot be assured that it took appropriate corrective actions" (Staff Ex. 4.00R, p. 44), yet in the three dockets in which he has raised this same issue, he has never identified any respect in which he contended that IP's corrective actions were insufficient or incomplete, nor identified any additional corrective actions that he believes IP should have implemented. (IP Ex. 5.0, pp. 42-43.) Although Mr. Lounsberry has criticized the sufficiency of IP's root cause analysis of the December 16, 2000 incident, the purpose of a root cause analysis for an incident such as this one is to identify corrective and preventative actions that can be taken to prevent the incident from occurring again. IP implemented numerous corrective and preventative actions following the

December 2000 incident, based on its investigation, and the sufficiency and completeness of these actions has not been questioned. (*Id*., p. 43; IP Ex. 5.3, pp. 11-12.)

In any event, there is no connection between the December 2000 incident or its causes and the turbine metering measurement error that was the cause of the deliverability decline at the Hillsboro Field. Further, even if the Commission were to conclude that IP's investigation of the root cause of the December 2000 incident was insufficient or not aggressive enough (a conclusion for which there would be no basis), this would provide no grounds to cast doubt on the sufficiency and diligence of IP's investigation into the causes of the Hillsboro Field deliverability decline, or to question the sufficiency of the resources and attention that the Company devoted to that problem.

b. Gas Dispatch Tracking

Mr. Lounsberry noted that over the period that the Hillsboro injection metering over-registration was occurring, an average of approximately 1 Bcf of additional gas per year entered IP's gas system (rather than being injected into the Field), but was not noticed by IP's gas dispatchers. He asserted that this was an "example of IP's failure to adequately oversee its operations." (Staff Ex. 2.00R, pp. 59-60.)

However, while Mr. Lounsberry's reference to 1 Bcf per year portrays the excess gas as a large amount, when this volume of gas is considered on a daily basis during the injection season, it can be seen why IP failed to notice the additional amounts of gas entering the system. The gas entered the IP system during the storage field injection season, which is approximately April through November. The 1 Bcf of gas equates to about 4,000 Mcf per day on average during the injection season. (Rev. IP Ex. 2.1, p. 39.) During the months of April, May, October and November, IP's purchased gas volumes (including gas to be injected to storage) are in the area of

300,000 Mcf to 400,000 Mcf per day. An amount of 4,000 Mcf per day during this period would not stand out as a significant error. (*Id*.) In addition to IP's gas purchases, volumes of customer-owned gas also enter the system each day. On a real-time basis, the dispatchers cannot distinguish between deliveries for transport customers and other deliveries into the system. (*Id*.) A variance of 4,000 Mcf per day would be even less apparent against the combined daily deliveries of transport customer purchases and IP gas purchases.

Further, IP's retail transportation tariff, Service Classification 76, as in effect during the 1993-1999 period, allowed transportation customers a daily variance of 50% between nominations and deliveries, which equates to a potential difference between aggregate nominations by and aggregate deliveries for transportation customers of 30,000 Mcf to 35,000 Mcf in a day. This variance is far in excess of the 4,000 Mcf average daily measurement error that occurred at Hillsboro. (*Id*., p. 40; IP Ex. 2.11, pp. 13-14.) Moreover, on any given day the line pack in IP's gas system could be up to 10,000 Mcf. Thus, the average daily amount of excess gas, 4,000 Mcf, that entered the IP system due to the Hillsboro metering error was less than the amount of line pack in the IP system. (Rev. IP Ex. 2.1, p. 40.)

During the summer months (June-September), the amount of gas entering the system (IP purchases plus transport customer gas) is less, due to lower usage, and is in the range of 220,000 Mcf to 280,000 Mcf per day. (*Id*., p. 40.) Again, a variance of 4,000 Mcf/day would not be noticeable in the context of these incoming daily volumes and the other factors mentioned immediately above. (*Id*.)

IP Exhibit 2.14 showed the gas delivery volumes to the IP system for every day of the injection season during the years 1994-1999, and the percent of each day's deliveries that 4,000 Mcf represented. On average, 4,000 Mcf/day was 1.99% of the daily deliveries to the IP gas

system. (IP Ex. 2.11, p. 14.) Review of IP Exhibit 2.14 shows that on only five days in the entire six-year period did the percentage reach as high as 3% of deliveries to the system.

Finally, although the IP gas dispatchers may know what the total pipeline deliveries to IP are on any given day, they do not know the actual customer consumption on a given day to enable them to compare the two values to determine if load equals deliveries. (Rev. IP Ex. 2.1, p. 40; IP Ex. 2.11, p. 13.) The vast majority of IP's end use customers are not metered on a daily basis but on a non-calendar month basis. (Rev. IP Ex. 2.1, p. 41; IP Ex. 2.11, p. 13.) Therefore, the dispatchers do not have the means to compare total daily deliveries from the pipelines to total daily deliveries to customers (system supply plus transport) to see if there are significant variances between the two values.[31]

In his rebuttal testimony, Staff witness Lounsberry attempted to bolster his contention that IP's dispatchers should have seen an average measurement error of 4,000 Mcf/day on the IP system, by presenting an analysis based on gas volumes on the IP system during a one-week period in July. (Staff Ex. 4.00R, pp. 44-45.) His presentation, however, was flawed and incomplete. Specifically, he compared the average daily measurement error to *only* the daily throughput for *non-transportation customers* (i.e., IP's system supply load), and failed to include the gas delivered for transportation customers. (IP Ex. 2.11, pp. 12-13.) As noted above, the dispatchers would not be able to distinguish on a daily basis between gas being delivered for transport customers and gas being delivered for system supply customers, but rather would see only the total deliveries to the system. (*Id*., p. 13.)

[31]Even if this comparison could be made on a daily basis, the two amounts would not be equal, because there is lost and unaccounted for gas in the system.

Mr. Lounsberry also argued in rebuttal that the delivery data for those delivery points on IP's system that are primarily used for storage injections should have made the metering error more readily apparent. (Staff Ex. 4.00R, p. 45.) His argument was premised on an incorrect assumption, because there are not a small number of delivery points on the IP system that are used primarily for receipt of gas for storage injections Gas delivered to virtually any IP delivery point on the NGPL, PEPL or Mississippi River Transmission Corporation pipeline systems can be moved to the Hillsboro Field for injection. (IP Ex. 2.11, pp. 14-15.)

5. Conclusion on Mr. Lounsberry's "Overall Storage Concerns"

As the forgoing discussion in this §IV.D has shown, none of Staff witness Lounsberry's "overall storage concerns" has any merit individually. Nor do they lend any support to Mr. Lounsberry's contention that a prudence disallowance should be imposed in this 2003 PGA reconciliation with respect to the operation of the Hillsboro Storage Field. Other than the reduction of the HSF peak day capacity itself (see §IV.D.1 above), the record fails to demonstrate any causal relationship between any of the items in Mr. Lounsberry's "overall storage concerns" and the prudence or timelines of IP's efforts in investigating, identifying and remediating the Hillsboro deliverability problems.

E. Quantification Issues

Staff witness Lounsberry's proposed disallowance relating to the Hillsboro issues has two components: peak day value and seasonal value. The peak day value relates to the cost of replacement pipeline firm transportation ("FT") capacity that IP would have needed to obtain to replace 25,000 Mcf/day of Hillsboro's peak day capacity when its peak day capacity rating was reduced during the 2002-2003 winter. The seasonal value represents the cost of gas purchased

by IP during the winter season that it would not have purchased had it been able to cycle a larger working gas volume from Hillsboro during 2003.

Because IP believes the record shows its decisions and actions relating to management of the Hillsboro Storage Field were prudent, IP believes there should be no prudence disallowance. However, IP and Staff agree on the methodology for calculating the seasonal value adjustment. The parties agree that the correct calculations of the seasonal value adjustment, were one to be imposed, are shown on IP Exhibit 2.6 (assuming it were concluded that IP should have commenced reinjecting replacement working gas inventory into HSF in 2000) and Staff Exhibit 4.00R, Schedule 4.04R (assuming it were concluded that IP should have commenced reinjecting replacement working gas inventory into HSF in 2001). In addition, in Mr. Shipp's surrebuttal testimony, he presented a calculation of the seasonal value adjustment assuming it were concluded that IP should have commenced reinjecting replacement working gas inventory into HSF in 2002. (IP Ex. 2.13.) IP Exhibit 2.13 uses the same methodology that Mr. Lounsberry used to calculate the seasonal value adjustment on Staff Schedule 4.04. (IP Ex. 2.11, pp. 10-11.)

IP and Mr. Lounsberry do not, however, agree on the calculation of the peak day value adjustment, assuming that one were to be made. Mr. Lounsberry's calculation of his proposed peak day value adjustment is $825,008. IP believes that the peak day value adjustment should be no higher than $525,000.

For his calculation, Staff witness Lounsberry used the monthly unit price of FT in a contract that IP had in place during 2003 for capacity on an NGPL facility known as the "NGPL Lateral". Although this contract was in effect throughout 2003 (and beyond), he used the monthly cost under this contract for 25,000 Mcf/day of capacity for the months of January through October, 2003. (Staff Ex. 2.00R, pp. 15-16.) Although the reduction of Hillsboro's

peak day capacity only impacted the 2003 reconciliation year during the 2002-2003 winter, Mr. Lounsberry assumed that any FT that IP acquired to replace the reduction in Hillsboro's peak day capacity would have been acquired under a 12-month contract running from November 2002 through October 2003. (*Id*., p. 16.)

AmerenIP witness Shipp testified that Mr. Lounsberry's assumptions were erroneous. First, the full peak day rating of Hillsboro was restored following the 2002-2003 winter coverage period and was in effect from May through December 2003. (Rev. IP Ex. 2.1, p. 21.) More importantly, had IP purchased additional pipeline FT to replace the 25,000 Mcf/day of Hillsboro Storage Field peak capacity, IP would have purchased only a winter term FT contract covering the period November 2002 – March 2003. Only a winter term replacement FT capacity contract would have been needed because the peak day capacity is only utilized during the winter season. (*Id*., p. 20.) Winter-only FT contracts are readily available in the marketplace and were readily available on NGPL (the same pipeline company that Mr. Lounsberry used in his calculation) for the 2002-2003 winter. (*Id*.) Further, IP did not have any pipeline transportation contracts that expired in October 2003 (*id*.), so Mr. Lounsberry's assumption that to replace the Hillsboro capacity, IP must have purchased replacement pipeline capacity under a contract expiring in October 2003 is not factually supported.

Mr. Shipp calculated a peak day value adjustment of $524,987 by using the price in an actual contract with Dynegy for 33,000 MMBtu of capacity on NGPL that was terminated effective March 31, 2003, and applying it to the months of January through March 2003 (the months in 2003 that this contract was actually in effect). (Rev. IP Ex. 2.1, p. 21.) This contract actually terminated as of the end of the 2002-2003 winter coverage period, at the same time that the need for Hillsboro's full peak day capacity ended. Further, the capacity purchased under this

contract was approximately equal to the amount by which Hillsboro's peak day capacity was reduced. The contract Mr. Shipp used in his calculation therefore provides a more appropriate basis for calculating the incremental cost that IP actually incurred during 2003 due to the reduction in the peak day capacity of the Hillsboro Storage Field.[32]

In his rebuttal testimony, Mr. Lounsberry argued that the pipeline contract he used for the peak day value adjustment should be used because the Commission had accepted the use of the capacity price from this same contract in the used and useful calculation in Docket 04-0476, IP's recently-completed gas rate case. (Staff Ex. 4.00R, p. 19.) His argument is inapposite because it fails to recognize that the purpose of the imprudence disallowance calculation in this case is to quantify an amount of *actual costs* that IP incurred during the 2003 reconciliation period (and charged to customers through the PGA) that it could have avoided if the purportedly imprudent actions had not occurred. Because the impact of the 25,000 Mcf/day HSF peak day capacity reduction ended at the end of the 2002-2003 winter season, the Dynegy contract for 33,000 MMBtu of pipeline capacity that was terminated on March 31, 2003, at the end of the winter period, much more appropriately represents an actual, incremental cost that IP was incurring while the Hillsboro peak day capacity was reduced. (IP Ex. 2.11, p. 9.) The cost of the Dynegy contract is an actual incremental capacity cost that IP incurred and included in its PGA charges to customers only during the period in 2003 that the Hillsboro peak day rating was reduced and replacement pipeline capacity would have been needed. (*Id*.) In contrast, the pipeline contract that Mr. Lounsberry used does not expire until 2012. (Rev. IP Ex. 2.1, p. 11.)

[32]The contract used by Mr. Shipp actually had a higher monthly price per unit of capacity than the contact used by Mr. Lounsberry, but since Mr. Shipp only applied the contract price to three months (January-March) rather than 10 months, his total amount for the peak day value is lower than Mr. Lounsberry's total amount. (Rev. IP Ex. 2.1, p. 21.)

Mr. Lounsberry also argued in rebuttal that using the Dynegy contract was inappropriate because the Hillsboro peak day capacity rating was reduced from 125,000 Mcf/day to 100,000 Mcf/day in 1999, but IP only used a contract that was in effect for the 2002-2003 winter. (Staff Ex. 4.00R, p. 19.) However, only the impact of the HSF peak day capacity reduction on 2003 gas costs passed through the PGA is at issue in this case. Further, Mr. Lounsberry's argument does not help justify his own choice of contract, because the NGPL contract he used for the calculation was not entered into until 2002. (IP Ex. 2.11, p. 10.) Further, the contract Mr. Lounsberry used did not even expire during 2003. The NGPL contract that Mr. Lounsberry used was for 90,000 MMBtu of capacity (far in excess of the HSF peak capacity reduction), and was entered into in 2002 for a 10-year period (to 2012), based on an economic analysis that looked at the benefits of the contract (including the replacement of contracts on other pipelines and the ability to access additional sources of supply) over a 10-year period. (Rev. IP Ex. 2.1, pp. 11-12; IP Ex. 2.3.) It was not entered into as a replacement for the derated Hillsboro peak day capacity

Accordingly, should the Commission determine that a prudence disallowance is warranted relating to the Hillsboro Storage Field peak day capacity reduction (which, for the reasons discussed at length earlier in this brief, it is not), the amount of the disallowance of 2003 reconciliation year gas costs for the peak capacity reduction should not exceed $525,000.

V. Conclusion

For the reasons detailed in this brief, the Commission should adopt AmerenIP's proposed reconciliation of gas costs and revenues collected under the PGA for the 2003 reconciliation year, as presented in IP Exhibit 1.1, adjusted only for the reduction of gas costs by $40,009 for cost of gas lost due to damage by third parties for which the Company was reimbursed, as recommended by Staff witness Ms. Jones.

Respectfully submitted,

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