UNITED STATES OF AMERICA

FEDERAL ENERGY REGULATORY COMMISSION

CALIFORNIA INDEPENDENT SYSTEM
OPERATOR CORPORATION

Docket No. ER15-861-000
EL15-53-000

NOTICE OF TECHNICAL CONFERENCE

APRIL 9, 2015

FEDERAL ENERGY REGULATORY COMMISSION

888 First Street Northeast

Washington, DC 20426

Hearing room 2D-1

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P R O C E E D I N G S

MS. SHIPLEY: Good morning, my name is Steve Rodgers and I would like to welcome you to this staff-led Technical Conference that was convened by the Commission in its March 16 order in the ER 15-861 proceedings.

In that order the Commission rejected CAISO's proposed tariff revisions to provide a 12-month transition period for each new energy imbalance market entrant and instituted a Section 206 Investigation into the justness and reasonableness of the EIM provisions in CAISO's existing tariff related to the EIM price anomalies that occurred in PacifiCorp's two balancing authority areas when it joined the EIM last November.

In that order the Commission also directed Staff to convene this Technical Conference to help identify the underlying causes of the pricing problems associated with PacifiCorp's implementation into the EIM, and then to help facilitate the development of a just and reasonable solution to these problems.

In addition, in its order the Commission noted the discrepancies between CAISO's and commentators' assessments of the nature and significance of the issues giving rise to the price anomalies.

Thus, the Commission also directed CAISO to refine the information in the reports it was filing to assist the Commission in determining the extent to which the price spikes continue to be caused by transitional issues and the extent to which they may be triggered by the lack of adequate supply in the EIM.

Among to her things, our discussions today will explore the content of those expanded reports regarding the causes of the pricing anomalies in PacifiCorp's balancing authority areas.

While today's conference has been designed for Staff to only receive presentations on these issues from CAISO and PacifiCorp, there may be an opportunity for to hers with an interest in this proceeding to ask questions or make comments later today.

You will be given instructions on how to proceed if that opportunity arises.

Finally, I want to highlight that today's conference will be transcribed and also that the Commission has just announced that parties may file written comments in this proceeding through April 23.

I will now turn things over to Jennifer Shipley who will be moderating today's conference.

Ms. Shipley: Thanks, Steve. There is just one more opening statement to be delivered by Michael Haddad from the Commission's Office of General Counsel.

MR. HADDAD: Good morning, I am Mike Haddad from he Commission's Office of General Counsel.

Before we get underway, I just wanted to briefly mention the Commissions's ex parte rules so that we are all keeping them in mind as the day progresses.

The Commission's ex parte rules apply pt on-the-record contested proceedings and that means we cannot discuss matters that are currently pending before the Commission.

As you know, there are several open matters related to the energy imbalance market including CAISO's request to waive pricing parameters for the initial two weeks of EIM operation in Docket No. ER 15-817 and requests for a rehearing involving the same issue in Docket No. ER 15-402, and consequently, we cannot discuss the merits of those proceedings.

In addition, although this conference is not about future EIM entrants, I do want to note that the ex parte restrictions also apply to NV Energy's recent filing in Docket No. ER 15-1196 to join the EIM.

Should it appear to staff that the discussion begins to get into the merits of a contested issue or a pending matter we will interject.

If during the course of the conference you are concerned that a response that you are providing, or a question you are asking may run afoul of the ex parte restrictions please let us know.

If we are unable to provide an answer immediately to confirm whether a response would be covered by the ex parte rules we will table the discussion and loop back to it once we have had an opportunity to more fully consider the issue.

As a final note, and as indicated in the notice issued for this conference, Staff will ask questions about the information included in the informational reports filed by CAISO and the Department of Market Monitoring that were directed by the Commission.

Those reports were filed for informational purposes and are not the subject of a contested on this record proceeding.

Thank you for being mindful of the ex parte restrictions as we move forward today.

MS. SHIPLEY: We are going to focus on those reports. Our focus will be to expand Staff's understanding of what was filed in those reports and

to provide the opportunity to have dialogue with CAISO and PacifiCorp's representatives and bring back what we learned to the Commission for their consideration.

As Steve announced, we will be accepting post-conference comments filed by April 23.

As Mike mentioned the matter of our focus today we hope these conversations will inform future entrants.

Today our focus will be to understand the conditions that triggered parameter pricing in PacifiCorp balancing authority areas.

I would like to go over some ground rules. Please take a moment to silence your cell phones. This conference is being transcribed, so please observe the following.

The gentleman from Ace-Federal Court Reporters is an independent party. They are not part of FERC and it is his job to make sure we get an accurate record of what happens here today.

For CAISO, PacifiCorp, and to hers, this may sound like rules from kindergarten, but please speak one at a time and refrain from rustling papers on the table especially near to those bracketed devices as they are actually microphones.

Please do not cover them because we will get feedback and also by doing that it will impede those who are listening on the phone.

For those who are on the phone, they are on "listen only mode" and we do have somebody from our office who will be calling in and will let us know if something goes wrong, so for those of you who are on the phone line, if you have any problems that is not being fixed please text Sayed.

Each time you speak, and this goes for the folks who are at the table and for anybody who are asking questions from the audience, please give your name and your entity.

All you need to say is just CAISO or PacifiCorp and the same thing for Staff, we will just say Staff.

For those of you in this room, in case there is an emergency we will be exiting the building heading down to the American Psychological Building which is up First Street and we can convene there and Security will come to take an inventory of those folks who checked in this morning to make sure that everybody got out. That's it for ground rules.

At this time we will have you folks who are at the opposite table to introduce themselves for the

court reporter if there's anything that you would like to have in the record about your title.

MR. ANDERS: John Anders, lead counsel with California ISO.

MR. HILDEBRANDT: Eric Hildebrandt, director of market monitoring California ISO.

MS. McKENNA: Anna McKenna, assistant General Counsel Regulatory ISO.

MR. RISTANOVIC: Petar Ristanovic, vice president of technology, California ISO.

MR. ROTHLEDER: Mark Rothleder, vice president of Market Quality and Renewable Integration, California ISO.

MS. EDMONDS: Sara Edmonds, Director of Transmission Policy for PacifiCorp.

MR. KELLY: Stuart Kelly, managing director, Team D Operations, PacifiCorp.

MR. SCHAFFROTH: John Schaffroth, PacifiCorp Grid Operations, supervisor.

MS. SHIPLEY: Let's begin Session 1. This session is to cover information reported by CAISO in resource data alignment, resource outages, manual dispatches, and imports/exports.

We can start with Question 1. I will not repeat the questions because I assume you all have the

agenda.

MR. ROTHLEDER: Thank you. Before we get into the question, I would like to thank the Commission for convening this technical conference as it is an important Technical Conference in light of what we have experienced in the energy imbalance market to this point.

The energy imbalance market is an important development in the West. It is important that we get things right and with respect to the energy imbalance market let me point to a couple of unique things about it.

It is voluntary participation, or in to her words, one, it is the EIM entity, the balancing area that is making EIM available. It is voluntary for them to actually make that available as a service in their area.

The balancing authority area maintains reliability and responsibility under the NERC performance standards.

This is different from, by contrast, to the California ISO where the balancing authority and the market operator are under one umbrella effectively.

In the case of the energy imbalance market, the EIM entity, the balancing area responsibility is

separate from the market operator aligned with the EIM entity itself.

While the energy imbalance market is operating the real-time imbalance market for the combined area in the case of right now California ISO and the energy imbalance market in the PacifiCorp area as a balancing authority area they maintain responsibilities for managing their contingency operating reserves maintaining all the control performance standards under NERC and so forth.

That is different from the California ISO.

In terms of how it integrates and interplays with the market, it is an important piece that we will get into as we get into the discussion today in that the EIM, the energy imbalance market, itself is not acquiring and managing the reserves, the contingency operating reserves or regulation is the PacifiCorp area.

Whereas, the realtime market and the California ISO is co-optimizing ancillary services and energy deployment in a co-op manner.

In the EIM area and PacifiCorp area, the reserve management is still performed by the balancing area through their pre-existing processes.

There is an information flow in terms of

information about how and where those reserves are being managed so that the intent is that the energy imbalance market is informed about the reserves and how they are managing those reserves, but the energy imbalance market is not managing those reserves.

I point that out because while that may seem to be unique to the energy imbalance market in conjunction with discussions including members of our market surveillance committee with which Scott Harvey is here today, and that we will get into in Session 3 when we talk about solutions, Scott will articulate some of the experiences of New York ISO, and Midwest ISO, because there are some similarities along the way with regards to how the interplay between reserve management and the energy imbalance market operated there although there is some learning that we can apply.

As we go through the discussion, I am going to refer to a presentation and right now I would like to point basically to Slides 2 and 4 in order to orient you.

What are we talking about here in terms of infeasibilities. Infeasibility in the market itself is when effectively the imbalance needs or the calculated imbalance needs of the area exceed what is

available in terms of bid availability and capability.

That bid and availability is limited by ramp constraints, physically limited of ramp constraints. It can be limited by outages.

It can be limited, the resources providing reserves under the balance of authority areas reserve management.

It can also be limited by to her things such as internal constraints, transmission constraints, whether that be a transmission constraint or in the case of the PacifiCorp West area there are cases of the constraints related to rate of change constraints across the Bonneville Power system that we have implemented.

All of those create effectively the lowest constraint or the lowest availability is basically a limiting factor of a resource's ability to provide energy on a 15 minute or 5-minute basis.

In the vast majority of the intervals we have feasible solutions, feasible solutions meaning that the imbalance energy needs can be met by the available bid-in available capability.

In a small set of circumstances effectively now running about 5% of the intervals or less there are

these situations where we have infeasibilities and those infeasibilities are as a result of the calculated imbalancing energy needs exceeding the available physical or constrained limited availability of the resources that are bid into the market.

When that happens, at least prior to what I will refer to as the price discovery feature that is under the waiver, I will call it price discovery feature, prior to that effectively when you get to infeasibility, how you price the system effectively goes to an administrative parameter that reflects not the cost of energy at that point.

It is really reflecting how the solution, the software solution solves the problem and basically effectively says, "For $1,000, I can find a slack variable that makes up any of those differences."

But that $1,000 slack variable does not reflect what the balancing authority area is actually doing beyond the imbalance energy market and the bids that are available, what the balancing authority area is doing to manage any imbalances or reliability issues.

Yet, the $1,000 parameter, it does create a solution and up until the price discovery feature was in effect it created the price.

Under the price discovery feature, the price is now set, not based on that parameter, but based on effectively the highest marginal bid utilized just prior to going infeasible.

The causes of these infeasibilities we have attempted to categorize them and there are effectively seven categories.

We can go through them today and as we do that I can get into more detail about the description, but they are resource data alignment, resource outages, manual dispatches, imports and exports, related data, renewable deviations, load changes, and then also transmission constraints and that can be related to those.

MS. SHIPLEY: Before you get into the seven categories, the parameters that the Commission approved many years ago at this point, when you approve those parameters you propose those parameters because you needed them.

Is there any thought to propose a change to that that might accommodate the fact that you do not see or is the focus really on getting the visibility from what is happening in the to her the to her BAA?

MR. ROTHLEDER: Those parameters were designed for the California ISO system, and as I mentioned in

the California ISO system, we have a co-optimization of reserves and energy and through that co-optimization we can tune and reallocate every 15 minutes how much energy is being used and how much is being reallocated for the reserves for reserve purposes.

In the EIM area because of the separation between the balancing authority area is the responsibility to manually manage those reserves in the EIM and only effectuating the energy.

At least from the perspective of the EIM application of that parameter, at this point it may not be the right parameter to use, at least at the point where you just go infeasible and you have exhausted economic bids.

There's something that happened at the balancing authority area, and we will get into similar detail as we go through the discussion today. There is something that the balancing authority area is doing as they are managing reserves and managing to her capability that they have access to beyond what may be bid involuntarily and that has to be recognized by the market solution both from a pricing perspective and a solution perspective before going to this $1,000 parameter where the $1,000 parameter is

intended to be where you have exhausted not only your bidding capability, but you have exhausted your capability to manage that reserve versus the energy co-optimization, and now, you are to the point where it is intended to be reflective of true physical scarcity and it is intended to be an incentive for having some physical scarcity, we need more bids, it is intended to be that incentive to do that.

In the case of the EIM being the only optimization energy, and not co-optimization of the reserves, I do not think the parameter "as is" and applied in the same way as it is applied in the ISO, is a correct application of the parameter.

Something has to recognize the additional capability and the additional tools that the balancing authority has at their disposal before going to that level of pricing.

I am not suggesting that you would never go to that level of pricing based on the parameter, but there is something that needs to be recognized before you go there.

I went straight to Session 3 a little bit about solutions, but let me now back up a little bit to the fact that some of the observations --

MR. SOTO ARRIAGADA: Before you continue, allow

me to ask you a clarifying question.

Basically, what you're saying is that the market is not reflecting the additional actions that the BAA is taking to resolve the problem.

Is that a problem of communication or is this a problem of timing where maybe there needs to be a delay for when the penalties apply or is this communication?

MR. ROTHLEDER: There are three categories to the issues separate from the root drivers, the root causes, there are things that are related to system coordinated data issues.

Relay systems do not work right or data is not communicated correctly. Those issues are decreasing. Those issues are actually correctable under our existing authority.

There is a separate category dealing with what I will call transitional learning issues, and for those transitional learning issues, I will hand it off to Sara Edmonds from PacifiCorp to articulate more about those types of issues, but frankly are issues related to where this is a different paradigm of operation than their traditional balancing authority operations.

How you integrate the market now with

traditional operations, balancing operations is new and it is a learning process and we can get into more detail about that.

The third level category is what I was kind of talking about and that is beyond the learning. What I think we have now determined is that there needs to be a recognition, the market recognition of the to her tools that the balancing authority is naturally using and managing in their natural progression of managing the reserves and so forth.

For example, when an outage occurs on a resource that sets off a set of events that is important.

First, if it was a 300 MW unit, the balancing authority is likely going to set in motion their reserve deployment. They are going to deploy the reserves, and what I mean by that is they are converting their contingency reserve to energy.

When they do that there is an expectation that the balancing authority area informs the EIM market operator of what resources specifically and how much they are moving those resources in response to that contingency event.

If they do not do that on a timely basis and on an accurate basis, the energy imbalance market will try to resolve that issue, but that is not an issue

that the energy imbalance market was designed to solve.

Delay, process delay, procedure delay, and accuracy, that is a learning issue and PacifiCorp has been working very diligently in adding procedures and implementing the procedures to make that process as accurate and timely as possible.

The fact of the matter is, it is still a manual process. Beyond the learning piece of this, the third element is we need to automate the recognition of those reserves so that it is no longer manual.

When that resource trips, the EIM should actually be aware and be cognizant of the available reserves, and know that those reserves are actually now able to be deployed and priced in such a way recognizing that that energy is coming in regardless of the energy imbalance market and the available bids.

That's kind of the next evolution beyond the learning and transitional issues and I have characterized that as that's the firm and the ultimate solution that we're really now trying to strive up for, how do we close that gap, reduce the "manualties" of the information flow, automate the information flow, and frankly use that information so

that we price accordingly to recognize those balancing authority area capabilities and not go straight to the $1,000 price which is not representative of the tools that the balancing authority has.

MS. SHIPLEY: That is really helpful but I pulled you into Session 3 already, however it's nice to have sort of a preview of what it is you are thinking and that's really helpful.

At this point, I will ask you to back up and allow you to go through the questions of our first session, but we do appreciate the preview.

MR. ROTHLEDER: If I could, let me now hand it off to Sara Edmonds just to give us some preview of how she is going to go through the discussion, but she will be discussing as well.

MS. EDMONDS: Thank you, Mark. Before I get into some of these examples of the different categories of learning or system improvements, I did want to start by noting that overall we are very pleased at the overall downward trend in the infeasibilities and the flex brand test failures that we are seeing both in terms of the frequency of those infeasibilities and their magnitude.

There are many notable improvements for

PacifiCorp's West balancing authority area which we sometimes refer to as PAC West. It has been a relative downward trend for PacifiCorp's East balancing authority area which we sometimes refer to as PACE and so you will hear us use those terms today.

This is the result in price terms and the West price is very competitive and close to the pricing we used to use before the EIM for imbalance which was really our pricing proxy.

For the East, we have not seen significant enough improvement yet to move away from the price discovery provisions that are currently in place so that is what we are working towards.

Absolutely, the improved results that we are seeing are the result of the close daily coordination between PacifiCorp and the ISO operators to address and find root cause analysis for each of these infeasibilities.

What we are presenting today, and what Mark has previewed in terms of Session 3 is the result of a long road of root cause analysis.

This solution was not immediately apparent. It's where we've gotten over the trial and error process, so I am just making that clear.

This is something where we're coming to the full realization that automation is needed at the same time as this Technical Conference developed.

I would like to also importantly stress that the efforts that we are working on together to reduce infeasibilities are primarily geared at calibrating PacifiCorp's balancing authority operations to market operations.

Mark talked earlier about the unique feature of the EIM relative to the to her ISO markets where PacifiCorp retains its a balancing authority responsibilities.

It needs to have the ability to take those actions, but importantly those actions need to be understood by the market models and the nuance that Mark is teasing out is a notification process that moves away from manual which introduces both time lag and human input error or opportunity to an automated solution which we are very confident will significantly decrease infeasibilities.

What we're trying to get to ultimately is where BAA operations and the market operations are operating in tandem with one another not producing anomalous market results and getting to a place where the market is fully aware of, it is fully visible to

the market, PacifiCorp's capacity including capacity associated with the way PacifiCorp manages reserves on its system.

To be clear at all times PacifiCorp has been resource sufficient. We were resource efficient prior to EIM and we have continued to operate that way after the energy imbalance market.

We have maintained our required level of contingency reserves and we have had no reliability-based control violations since we went live and that is the measure applicable to PacifiCorp in the West which is a measure of area control error impact on interconnection frequency. It is an important measure of our reliability performance.

As a "first mover" in the EIM, together with ISO, we have identified different categories of learning curve items.

We talked about this a little earlier. The most obvious is the learning curve associated with balancing authority operators learning to use new market tools and systems.

It would be an understatement to say that there were many new tools and systems put in place to make the energy imbalance market work.

It's a lot of new complex technical inputs that

produce new outputs that our operators are becoming familiar with.

This process is somewhat explored during market simulation in parallel production, but those test environments are somewhat limited and it is not until you have everything on all settlement processes in place, those are the outlets that you can fully understand how the inputs affect the market processes.

There is that sort of human element error of the learning curve and we can talk more about it later on today, but there has been a significant amount of training conducted entirely on the PacifiCorp side, a lot of training and coordination with ISO, to write new procedures, modify existing procedures, and really just sit down and go through like I said kind of a root cause analysis process to understand how market operator, balancing authority inputs affect market outputs.

There is that second category, and Mark mentioned this as well, of understanding that cause and effect relationship in the market. This has to do with the impact of base schedules and outages going into the market, how those relate one to the to her, and how they work together, and then produce

market outputs.

Later today we will also talk about the work that we have done on bid configurations and that is a good example.

Finally, we get to these system improvements that we are targeting. We will also talk today about the ones we have completed, the ones in progress, and the ones we are planning, notably the automation around the market's ability to understand how PacifiCorp manages its reserves.

Let me also add, and this is my last point, and return it back to Mark, we are very optimistic and confident about the automation and how it will help infeasibilities, but I also want to speak from PacifiCorp's own experience as a first mover in this energy imbalance market and that is to say that we have accomplished many improvements which produce benefits that will inure to EMI amenities.

So it's very possible that as new entrants come on they will not have to deal with exactly the same set of issues that PacifiCorp has.

We have taken that on and made a lot of what will be permanent components of the energy imbalance market and I think we had to do that as a first mover and we were willing to do that.

There are these to her learning curves issues, though, that are going to be different for every EIM entity.

Every EMI entity is going to have its own unique set of characteristics of how its resources work, its topology issues, its own set of balancing authority operators, the processes they use, the procedures they use, those that differ from EMI entity to EMI entity.

There will be a Lorraine curve associated with that, and for that reason, I am also here to support the transitional period, some period of price of discovery procedures in place as EMI entities become accustomed to these new processes. They are learning how the systems work together.

Ultimately they get that most efficient and effective balance of tools which help them to put inputs to get the right outputs, but there is a learning curve, there is time associated with that process.

MS. SHIPLEY: I know we had also invited representatives from DMM. I don't know if they want to make any comments now or you can wait until later?

MR. HILDEBRANDT: Just a short statement. As is reflected in our reports, we largely concur with the

statements made concerning the proof of performance of the market as well as some of those things that will make permanent fixes which will improve performance going forward and I will get into those later on in Session 3.

Thank you.

MS. SHIPLEY: Thank you. We can now move to the Questions in Session 1.

MR. ROTHLEDER: Question 1 was really to describe the factors that drive each category with frequency with which they compute the price of parameters.

I will point you to Slides 2, 3, 4 and 5 and quickly go through those that are responsive to the question.

These really quantify the frequency of the percentage of the total intervals that are associated with each one of the root drivers of the infeasibilities.

On Slide 2 when we show the period from November 2014 through February 2015, and for that period effectively, this is a 15-minute market just under 4% of the intervals are infeasible intervals. I will say that this is for the total of the PacifiCorp East and West area.

PacifiCorp East is the more frequent area that has infeasibilities as does PacifiCorp West.

West is actually operating fairly well and the action frequency of infeasibilities with PacifiCorp West is actually well below 1% at this point of the intervals.

To give us some comparison in the ISO's market, the realtime market itself, we can't get into similar type of infeasibilities, even with our co-optimization, we are running under 1%, I think well under 1% at this point in terms of the rate of these types of events in the ISO system.

They are usually a very transitory short-term ramping constraints especially during warning ramps or evening ramps and those types of things are going to have happen at times.

I mean there is just going to be short-term transitory events that do exercise the available bid capability.

You can expect those to be infrequent and we do expect them to be based around physical related issues.

It is when they persist or they are frequent that you start having some further questions.

Slide 3 is just showing March so you can quickly

compare, if you look at both of those together, we see significant improvement in the infeasibility frequency in March, and it is down to about 1.65%.

Then you can see the breakdown by each category, and again, that percentage is just a total number of intervals.

This is on the 15-minute level. I will then direct you to the next set, Slides 4 and 5 which provide you with the frequency at the five-minute level.

It is not surprising that the 5-minute level infeasibilities are more frequent than the 15-minute.

One, is you're now in real time. Your five-minute ramping availability is less. It is much more sensitive to changes in the system, so the fact that the 5-minute is more sensitive to these is to be expected.

With that said, having 5.6% of the 5-minute intervals is, again, too high, and it does not match even in the ISO's existing performance around similar types of events in its five-minute market.

Once again, PacifiCorp West is performing better at the 5-minute level than PacifiCorp East and so far PacifiCorp East is -- well, perhaps I should point

out right now that PacifiCorp East is so unique in the sense that in terms of import capability that's an import transport capability that is available through the EIM it is limited.

It really does not have any ambient transfer capability into the area, so that the imbalances have to be met by the available bidding capability, the firm resources within the Pacific Corp East area.

To contrast that to PacifiCorp West area, there is transfer capability that comes from East to West 200 MW of transfer capability and then there is also transfer capability from ISO to PacifiCorp West that can be exercised and that provides additional flexibility if you want to say between the areas where PacifiCorp East, the flexibility effectively, has to be met for resources internal for PacifiCorp East.

Lastly, in contrast, we have seen improvement between the November period of 2014 to February 2015 to the March period, we have seen significant improvement even at the 5-minute level where the frequency of these infeasibilities is down to just under 2.6%.

We're happy to see the progress, but I to emphasize the progress is not always consistent.

There is a period of time where it degrades again and we have to go back to figure out what is the new types of issues?

Are they recurring issues? Are they new issues? We basically have to retune what the learning has got to be to keep the frequency driving down.

It comes back to the fact that until you automate some recognition of the additional capability reserve, we will continue to have at least a higher frequency of these infeasibilities than we would expect for life.

MR. BARAZESH: I have just a clarification. With all of these infeasibilities, where they occur with T-40 sufficiency tests?

MR. ROTHLEDER: There is a variety. Some of these are cases where the sufficiency tests and the balancing tests were passed, but conditions changed, or there was a change in condition or there was a lack of timing information that occurred intrahour that basically utilized all of the available EIM bid capability.

But, again, and I will get into this later, there were still to her physical capability that the balancing authority had in terms of tools.

At no time was there a depletion of physical

capability. There was a depletion of the bid in available capability.

There were to her cases that the sufficiency test did not pass and we went into the hour basically in a situation where the balancing authority area cannot then lean on the transfers, and that looked like by design.

So that when the balancing authority area is not passing that sufficiency test, they cannot lean on the to her systems doing the transfers and they are expected to be sufficient to themselves.

There are cases where they did not pass the sufficiency test and we did not have any infeasibilities, and then, there are cases where they did not pass the sufficiency test.

Basically you had a depletion of available bids in the hour that occurred that did result in infeasibilities, but again, it has nothing in those times as there was still to her physical capability that was available to the balancing authority.

MR. BARAZESH: Approximately you say what percentage can it pass?

MR. ROTHLEDER: I should have that information, but I do not have that percentage breakdown. If you like, we can get that breakdown and report back to

you.

MR. BARAZESH: Thank you.

MS. McKENNA: I just want to make sure, if we have questions we would like to take back, just for the record, if we could repeat them so we get it clear for that question, if that's okay?

MS. SHIPLEY: Please.

MS. McKENNA: The question I believe was, what percentage of the infeasibilities occurred when the entity failed the flexible sufficiency tests, is that correct?

MR. BARAZESH: Almost!

MS. McKENNA: Please clarify. I just want to make sure we get the right question.

MR. BARAZESH: The question is the intervals, the job intervals that had the infeasibility issue, what percentage of those intervals followed the successful sufficiency tests, for any reason, a place for ramp or capacity.

MS. McKENNA: Thank you.

MR. RODGERS: Mark, I have a clarifying question. What is the difference between the import / export changes in the transverse congestion constraints?

MR. ROTHLEDER: The import / export changes is a

situation where let's say at T-75, I should say all the way to T-40 there is an expectation of a base schedule.

Some of those base schedules are imports from a neighboring balancing area. The import / export changes are really after the T-40 mark there were changes to the ultimate tag imports that created a difference between what was scheduled in the BAAs and what was actually being delivered intrahour and that created a difference in the BAAs.

The transfer congestion constraint is more related to the interplay between the transfer capability and the constraints and also transmission constraints or what I will call "rate of change constraints" across the BPA system and how those bound and limited the 5-minute.

It's only in the 5-minute capability of resources so it tightened the supply up because it limited the amount of supply they could move.

And that bucket is also the area where on a 15-minute basis we cross the California intertie we can utilize the 15-minute level up to the capability, the rights that PacifiCorp has across COY, but in the 5-minute, you are limited by the dynamic transfer capability the 5-minute movement around that based on

Bonneville's dynamic transfer limitation around that.

So the transfer congestion constraint relates to those types of constraints, whereas, the import / export changes are really changes that are to the schedules from between T-40 and what was intrahour.

MR. RODGERS: Another question. The sudden vector that you have identified that gave rise to the infeasibility, which of those are associated with transitional learning curve issues as opposed to actual supply issues?

MR. ROTHLEDER: Unfortunately, it does not break out cleanly that way because within each category, and I think as we do go through the categories I will articulate more about whether, such as, is there a learning issue here or is there something that is more related to automation recognition of the to her capability that the balancing authority has?

I would say the one that is probably more learning related is resource data alignment and that is probably the next one on the list that we are going to discuss anyway.

But the resource data alignment, one of the categories within the resource data alignment is management of the multistate generator resources and the multistate generator resources is a very detailed

model of how to transition resources from one configuration to another configuration.

It does create some complexities. It creates a significant amount of learning how to use that model and how to inform that model with the proper parameters that reflect the resources.

That is one that is probably more learning-driven related than maybe some of the to hers.

MR. THOMAS: Mark, it is probably fair to say that as you go through the list more questions will come up as well as probably some clarification.

Something that stuck out to me when you did your presentation was perhaps beneficially how current CAISO works as among to her things what we call co-optimization.

I was wondering as you go through each one of these topics, can you help us understand perhaps the difference as to how co-optimization works within CAISO, where it differs with what EIM, and the neighboring BAA, is doing as perhaps that can help us to inform us when we get to Session 3 today.

MR. ROTHLEDER: Yes, I will try to do that.

MS. SCHAUB: One of the questions for this section was getting into the interrelationship

between manual dispatched and California ISO's markets and recognizing what you have already said about the need to balance the two sides.

Could you explain a bit more about how that works because one of the issues can be how the prices are formed within the market versus how the service is actually provided.

Maybe you can describe how the interrelationship between manual dispatch and California ISO's market is working and the extent to which that happens. Is it a lot or is it little in terms of serving imbalance load?

MR. ROTHLEDER: What is a manual dispatch and what is the EIM entity area.

The manual dispatch is really a dispatch that the balancing authority is making that is really unrelated to the optimized dispatch that the energy imbalance market -- there can be many reasons why the manual dispatch is occurring.

I will probably hand this off to Sara to describe more about maybe those reasons, but some of those reasons are voltages.

Some of those are to address where we talked about reserve deployment.

When a unit trips, and they have to deploy their

reserves, they need to inform and it could be non-participating resource and they are moving to respond to that event, so that is the manual dispatch.

It is not exactly parallel, but I think the closest you get in the California ISO is what we call exceptional dispatches.

In the case of in the ISO an exceptional dispatch is one that really the system operator has to exercise because there are certain constraints beyond which the market can really see or offer to.

One is a parallel, the voltage issue, where there is a voltage issue on the ISO system that is not converted to a flow constraint, the operator is going to have to take some action potentially to relieve that voltage issue.

One that is not parallel is kind of the reserve deployment. We do not have that same issue in the California ISO because we are effectively deploying our reserves through the market.

I will be very specific here because it is important.

When we have a unit trip in the California ISO, a 300 MW unit trip, we have a set of reserves that we co-optimize and procure and we can deploy those

reserves by effectively taking the energy bids associated with that capacity that was procured for that purpose and we inject it into the market so being effectively held out of the market up until that point.

But when the contingency happens, or after the contingency happens, the operator basically deploys those reserves and they do it through the market and basically injects those bids in the market and it is optimized at that point.

That is very different in the EIM area where, again, that same unit trips, the 300 MW unit trips, the deployment of the reserves and conversion of the energy does not happen automatically via the market.

Rather you have the balancing authority operators deploying the reserves manually and you have this manual process of informing the market of what resources are providing the energy to make up for that event and there you can quickly see the potential for a time lag, human error, and data issues that are related to the deployment of the reserves.

It's a very good one to contrast the difference between the ISO in that case that does not parallel, but to where the EIM entity is using manual dispatch

to inform the market systems that does not happen in the ISO.

MS. EDMONDS: Let me provide some additional context. I would rephrase the question just a little bit.

The manual dispatches are not explicitly for serving load. They are reliability actions to address a system condition.

It is the same responsibilities and obligations that we have pre-EIM and because those do not change when an entrant enters the EIM we retain those responsibilities and we need the authority under the EIM market construct to continue to take those actions because, ultimately, it is PacifiCorp as the balancing authority that is responsible for maintaining reliability and our balancing authority areas.

Manual dispatch is a term that we created for the EIM to represent these reliability actions that will take for various reasons.

Because this is an action outside the market it is critical that the market be informed accurately and timely because the market can then incorporate that information to find the optimal solution given that actual changing system condition at PacifiCorp.

Without that information the market would be operating in opposite to maybe even conflating the issue that is going on and so we want these things, as I said earlier, to operate in tandem and that involves this information exchange.

But as we have also previously discussed light outage notifications, manual dispatch, it's a manual process, it is that human-being process where a notification must be provided to the market and whenever we have those, we have the introduction of time lag issues and also operator input issues, so again, coming back to that same place that we will hit many times today that need for additional automation wherever possible, explicitly connecting it to what Mark said which is we are often using the manual dispatch to inform the market of a reserve deployment, a reserve pickup or another action related to reserve management in our balancing authority areas.

These are actions that are occurring after the base schedules. The base schedule doesn't have this information.

We are providing this information based on realtime changing system conditions.

Another example would be a drop or a raise in

variable energy resources.

We are seeing that on our system. We know that is different than the base model assumptions. We're going to those changes to a tool like manual dispatch to the market.

We would also use it to address voltage issues on the system. This is exactly what we did before the energy imbalance market.

We are just creating an explicit tool and a notification procedure so that the market perform, again importantly, so it can achieve the optimal solution in light of that realtime system information.

MR. ROTHLEDER: As we go through these underlying issues, the drivers, these are not mutually exclusive from each to her.

We cannot just say that a particular infeasibility was caused by one thing, one driver. You will see through the discussion that there is interplay between some of these things.

For example, a variable resource deviation that is not keeping up with the forecast may result in a manual dispatch and the timeliness of the manual dispatch then creates the timing issue and potentially the infeasibility, but the two drivers

are in play which ones are the root cause is subjected as to how we define that and so it is not a clean cut one for one event.

I just want to make sure that we are aware of that as we discuss these. Did I not fully answer the question?

MS. SHIPLEY: Feel free to go to the next question.

MR. ROTHLEDER: I believe the next Question is, "To what extent are these factors reflective of physical conditions? To what extent are they reflective of communication forecasting and to her non-physical conditions?"

This question is a little bit difficult to really put in context, but what we tried to do was to answer the question here in regards to, and I totally get it, the important piece of this is when we say, "Was there a physical condition?"

I am equating that to was there a physical shortage of capability that created a reliability issue?

I will point you to Slides 8, 9, 10, and 11, so what we attempted to do here was quantify how much physical capability the balancing authorities have under their control?

Some of this may basically be providing contingency reserves or meeting the minimum contingency reserve requirement of the balancing authority area.

In some cases they had path capability that was in excess of their MINIMUM contingency reserve, and in fact, oftentimes the amount of things that could be counted as contingency reserves was in excess of the minimum requirement, but that difference between what contingency reserves they are carrying and the minimum requirement, not all of that capability is necessarily bid in.

Sara will get into some of the discussions about why some of that capability is not capable to be a bid in and how some efforts are underway to make more of that capability bid in so the market is aware of it through the bid itself.

But nonetheless what these graphs are attempting to indicate was when compared to the magnitude of the infeasibility, the magnitude above which we exhausted the bids, what was left over and on average the magnitude of those infeasibilities is something in the range of about 80 megawatts in PacifiCorp East.

Oftentimes they are very small, I mean, 4 megawatts, but there are times when they are bigger,

they are larger than the 80 MWs.

Nonetheless, what we tried to do was, say of the quantity of the infeasibility, to the extent the quantity, the magnitude of the infeasibility is less than the difference between their contingency reserve that they were holding, and the minimum contingency reserve required, if that's the case, then what we say here is, and that has quantified the graph is above zero, that indicates there was not a physical shortage of what you consider all the capability available to the balancing authority area.

Obviously, I don't mean there wasn't infeasibility, yes, we exhausted the available bids, to herwise there wouldn't have been infeasibility, but if you take the quantity of the infeasibility, the quantity of that infeasibility did not exceed what was the difference between their minimum contingency reserve and how much they were effectively carrying in contingency reserve at the time.

The way I portray that is that it wasn't a physical issue in those cases, and there wasn't a dipping into their minimum contingency reserve requirement.

I can't say there wasn't a reliability concern

at that point, but it does highlight that there was a lack of recognition of the market of that additional capability again.

Wherever you see the graph above zero, in almost every case, every interval at least in March you have the line above zero indicating that the size of the infeasibility was not in excess of their additional available infeasibility indicates that there was physical issue with the balancing authority area even when you have these infeasibilities.

MR. BARAZESH: I have a clarification of this graph. This represents the amount of excess contingency reserve, meaning, contingency reserve that was held minus the minimum required contingency reserve?

MR. ROTHLEDER: It is a contingency reserve being held minus the minimum contingency reserves required minus the magnitude of the infeasibility.

If that is positive then that indicates that the magnitude of infeasibility did not exceed the excess contingency reserves being held.

I was going to point to where on Slide 11 there was a particular event, some of these are just at zero, but particularly on March 23, and this was actually hour ending 10, there was at least one data

point that indicated that the infeasibility was in excess of the difference between the contingency reserve required and the contingency reserve minimum.

This is a case where I will put this in the category of import changes. This is an example of an import change where the import effectively at T-40 that was expected to be scheduled and delivered was roughly 600 megawatts less than the intrahour actual tag delivery and that created a higher than normal infeasibility condition that was kind of the higher end of infeasibilities, and in that case, at least from this perspective, it did appear to dip into the minimum reserve requirements.

What this doesn't show are the things that the balancing authority area may have been doing to maintain the reserve, but have not been manually reported yet.

We can certainly dig into this particular event in more detail, but in essence, clearly, the balancing authority was managing the reserves.

I don't think there was actually a reserve issue in this case, but it does at least graphically show at least that measurement that I tried to describe indicates that at least an infeasibility level was at least in excess of the difference at the time, but

they were likely managing the reserves at the time.

There are a lot of things that are behind the scenes here that you have to be aware of.

This is the reserves, this is relative to the reserves, the physical reserves being held on resources in the balancing authority area themselves.

This does not include the reserves that are being held through the reserve sharing groups which I think I have to hand off to Sara and to hers to describe more.

MR. KELLY: Yes, as Mark described, this graph does not affect the 200 MWs of reserve shared capability that we have in addition to this buffer that protects our CRO.

MR. ROTHLEDER: That was my answer to Question 2 about: Was there a physical condition or not?

To what extent are these reflective of communication, forecasting, and to her non-physical conditions, I guess I would rather hold that detail as we go into the more detailed questions about particularly what makes up a particular type because there are examples in every one of them that are kind of one of those or both of those, it is hard to do that at this point.

Do I keep going?

MS. SHIPLEY: I am just watching the time. We are at 11:20. It's not that I want to rush you. I just want you to keep moving on to the next one.

MR. ROTHLEDER: I will go on to Question 3, "To what extent do these categories contribute to under supplied conditions and why?

"Why are there instances of small undersupplied capability when there is generally excessive amount of capacity bid into the EIM?

"Is there an inconsistency on this issue in DMM and ISO observations and their respective reports?"

I will hand this off to Eric Hildebrandt from the Department of Market Monitoring, but before I do so, I do want to make sure that we get our nomenclature right as you consider this.

There is what is bid in at the time and the bids come in at T-75 minutes. That is the opportunity to bid the range.

Between T-75 and T-40 there are still things going on at the base schedule level to get balanced, but there is not another opportunity to put the bid range in.

When we do the sufficiency test we check the bid range and we reconcile the bid range against any reported outages on those resources and I am being

very specific here.

There are outages that report it through the outage management system. They are not checked against manual dispatches.

It is important to understand why that is. The manual dispatches, as Sara described, are intended to deal with reliability issues that are not managed by the market.

Generally we expect those things to happen intrahour, and if they are things that are more sustained, we would expect that that would be reflected in the next hour's base schedules if it is a sustained event and not necessarily rely on the manual dispatch.

An outage though could be a physical outage on the resource a limitation on outage and those usually are scheduled over a period of time and so we have to consider the outage record as submitted by the outage management system when we are considering balancing the sufficiency test.

At T-40 we do our last round of balancing and sufficiency test. After that point, there are two things that can happen.

There still could be manual dispatches, but there could be still new outages that are put in and

changes from the T-40 period which do change the conditions intrahour.

Lastly, when we were talking about "available capability" and what is "bid in" you then have to reconcile that against what is the ramping capability?

Is there a ramping constraint on that resource or is there something that is limiting the resources such as the rate of change constraints.

Some of those can be reflected in the data that Eric will present and some of them are not.

When we say there was insufficient bid capability, at least from ISO's perspective, we are really talking about acquisition, that we are in realtime, and what is available, what is bid in, and considering all the constraints on that resource, that's when we basically get into the infeasibility.

At this point, I will hand it off to Eric Hildebrandt to can explain his picture and their observations as it relates to this question.

MR. HILDEBRANDT: It's out of one of our recent reports and this one is from April 2nd. It does illustrate some of the things that Mark has already mentioned, it kind of helps, so I will go through that framework of some of things that he is

mentioning as to where they fit in relative to this graphic.

The main point I want to make is, no, there is not a discrepancy between the ISO report and hearing from where it starts form the DMM Report and the ISO reports.

During most hours or the great majority of hours there's more than a sufficient amount of capacity, both overall capacity as well as ramping capacity to meet the demand for imbalance in EIM.

It is a very small percent of hours and those percent of hours are getting even smaller during which due to an usually big event, maybe a problem scheduling an MSG unit, could cause at least the model to see the loss of hundreds of megawatts from a base schedule or something.

Mark has mentioned some to hers, an interval type schedule issue again could create a sudden loss of several hundred megawatts that was in the market.

So why all the overall margin is sufficient during these small number of intervals, the system will go through the ramp and have usually what is a pretty small infeasibility as well. I will note that point.

These feasibilities often are in the 10 MWs, 20

MWs, a very small amount relative to the total system certainly.

Just starting with Slide 10 in this chart I will just build it from the bottom up.

First, this is kind of a snapshot of the 15-minute market data. We take what the 15-minute market is looking at and each 15-minute interval, so it does not capture 5-minute constraints, Mark has mentioned that, that on a 5-minute basis the system is much more constrained than this.

We basically build up, and again, the to her important point is that these are averages over the whole month, so the average is always masked individual hours when this margin can be much thinner again due to a relatively significant event.

The blue area and bottom are the base schedules that are submitted, I guess I would draw your attention.

Secondly, this is a relatively thin white line, that is actually the average cleared bids that clear, and so a point that I would make there is, again, at individual intervals the EIM can be redispatching relatively large quantities.

Generally, it's a relatively small quantity and overall it is functioning as an imbalance market.

There is a relatively small amount of adjustments going on around the baseline average around the base schedule, so the base schedule, at least on a system level are meeting the imbalance needs again on average.

Then the green area, the amount is within 15 minutes, the next 15 minute interval, the amount of undispatched bids in the system, and you can see there on average, I think the average here was in the range of almost 300 MWs, this is in PacifiCorp West as well and PacifiCorp West, as you will see, the margins are generally higher than in the East and we think that that has a lot to do with the better performance in the West.

Finally, there are additional bids, but they are beyond the 15-minute horizon of the 15-minute market as well as the 5-minute market, of course.

I would draw your attention next to the black line above that, above the white count. That's the amount of available capacity after reported outages in D Rate.

This chart I have limited it to participating units, coal and gas, those are the ones that are primarily used to manage the imbalances. I left out hydro because the amount of hydro that is available

can be quite variable.

One thing I would mention is you can see here all of the available capacity to the extent it is not bid in, there are a number of reasons for that.

As in our market, there is the lone star unit, they are not started up, they are not online and on a data basis you have to her units that could be operating at a lower level during the off-peaks and have a minimum down time and that makes sense.

One thing I want to make clear is we don't think the answer is to put more capacity online, to keep more capacity online.

We think there actually is sufficient capacity as long as some of the issues that the ISO is discussing or are addressed, but to basically make that capacity both as bid into the market as well as it is not bid into market, but available, if that is visible to the market software, and available to it, we think that is going to really largely resolve the relative infeasibility.

MS. SCHAUB: Eric, when you say that, does that apply to ramping capacity as well as to overall capacity, and is that inbound?

MR. HILDEBRANDT: We focused largely on upward capacity and downward ramping has not been a big

issue. At some intervals at PacifiCorp West it has but I am not prepared to speak to that today.

We focus more on upward ramping. One of our recommendations, and probably a third recommendation, we did suggest the ISO look refining the flex ramp constraint requirement particularly in the East versus the West.

The ISO is doing that. They are looking at that. They are specifically increasing it during some hours.

The way I think of that in the East that could convert some of this yellow capacity into green, so you have a unit, it is online, it is available, but there might be a configuration that is bid into the market, but it might be in configuration or a set point where it doesn't have as much 15-minute range.

With one thing that the flexible ramp can do is kind of convert more of the yellow into the green in ramping capacity, but actually in the West you can see it is quite a high margin.

I note in the West for the last month in both the 15-minute market and the 5-minute market without any price discovery prices have been comparable about equal to the bilateral market prices that we are using as a competitive benchmark.

In the West kind of the data I am showing here is really resulting in a very good outcome.

I will highlight some of things that I have heard that ISO mentioned, and you will hear as well, where they fit in, Mark has been mentioning this concept, there's a lot of a third category that is not bid into the market, but available is capacity being not bid in, it is being held as back reserve for operating reserve, both the required operating reserve as well as beyond that requirement a significant margin that they refer to as regulation and load following and it can be several hundred megawatts that is used and available to balanced load, it is not bid into the market, the ISO and PacifiCorp are working on ways to reflect that.

We have the market software to have that reflected and recognized by the market software.

What Mark has been referring to would fall, would be additional capacity that you are not even seeing in this chart.

Some of the to her things they are talking about, some of the improvements that have been made with scheduling of MSG units, I think that would prevent, and the way I see that happening is it's going to not necessarily increase the bids, but it's

going to prevent situations where basically a scheduling issue might create a kind of a false understatement of available supply of several hundred megawatts.

That is something that is really creating the market model to misstate or misrecognize the available supply and therefore start ramping capacity that an action needs to be granted.

The final one I will mention, and Mark might get into it later, is the to her tool that we think or that the to her part of the equation is the demand.

You have a demand forecast and one of the big tools that the ISO operators have as well as PacifiCorp is to adjust that demand for to her factors going on in the system and that again can create a discrepancy between the real demand and what the model is seeing, and cause it to, for instance, go through the available ramping capability when it is not actually needed and that is something that, as ISO notes in its report, it is working to implement a similar tool, it is the same tool that we have in the ISO for preventing an adjustment by the operators of demand of the load that goes beyond the available ramp and therefore causes an infeasibility.

That's an example of something, that has both a

learning component, the operator can learn how to do adjustments, that is one part of it, but in addition this automated tool for preventing load adjustments to just drive the solution and infeasibility, that's another key part of it.

We actually did some analysis looking back where that by itself we think is another thing that will have a major impact on reducing the infeasibilities.

I don't think there is a discrepancy in the two reports. It is a question of kind of averages and what the conditions are in most hours and then what is creating a perception of a shortage in these very small percent intervals.

Finally, I would just draw on the next chart which shows PacifiCorp East, I would just draw your attention how the margins are thinner, particularly of the 15-minute rampable capacity and particularly in the ramping hours.

One thing that stood out to us, again, the performance in the East is getting better that, where in our most recent report we noted that margin of undispatched bids went up.

We saw improved performance. We also saw more of the infeasibilities in the ramping kind of the off-peak and ramping hours.

Personally, I think that is probably a good development. It suggests that it is a more targeted issue that is going on, that is going to be addressed by some of the to her mitigating actions that the ISO is going to talk about.

Are there any questions?

MR. RODGERS: Thank you for your comments. We appreciate that. My question is: In hindsight you think it was just as important for CAISO to be able to see and direct the dispatch of PacifiCorp's EIM generators as it was for PacifiCorp to have those generators in the first place?

In to her words, rephrasing the question. At the end of the day, did it matter that PacifiCorp have sufficient generation of the right type on its system to meet the EIM needs on PacifiCorp's BAAs if CAISO was not able to see or have visibility or have the ability to direct the dispatch of those generators?

MR. HILDEBRANDT: Yes, that is another way of phrasing of what this shows is that there was sufficient capacity, both total available as well as online.

But, again, it is a combination of, yes, the ISO software, seeing and having an accurate picture of

what is actually available, dispatchable. It gets both the supply and demand and as I mentioned it is also the load forecast as well.

That is why I am saying we do not think the answer is to commit more capacity.

We think the capacity appears to be there with the kind of fixes or additional steps along with learning that has already taken place along with some of the fixes which will be more permanent we think with the existing capacity is going to be sufficient to really improve the performance to a level that we will be satisfied with.

MR. RODGERS: Thank you. Would you say from your vantage point that that was a lesson learned from the PacifiCorp integration experience that it is critical that the CAISO have that visibility and ability to direct the dispatch of at least a sufficient amount of generation to meet PacifiCorp's needs?

MR. HILDEBRANDT: Yes, and our understanding is the market software does have that ability to dispatch it and there are always actions on the balancing areas side as well that go along with the ISO market software and they might collaborate on that to her piece of that.

MS. EDMONDS: I just want to provide some context about our experience since GoLive, Steve, on your question.

In the early implementation period, I had talked earlier this morning about how there are often multiple overlays of issues going on leading to infeasibilities, and Mark has also mentioned the overlapping nature of some of these have root cause categories, and so in those early days, and you will see this reflected in the operational reports over time, we were not entirely sure what was leading to the infeasibility in pursuing multiple avenues to resolve it as vigorously as we could and one of the avenues we did pursue was actually adding physical capacity.

We have some resources that were on a later schedule to be added to the energy imbalance market because of metering schedules, so outage schedules onto this generation resources we were fitting them into an outage plan that necessarily meant they could not go live precisely at that moment.

We have to her resources that we did not think were necessarily adding significant value because of their bid range capability, so there are some resources that we hadn't pursued in initial GoLive,

but when we started to see the market outputs we were making corrections, and in fact after GoLive, we added over 3,000 MWs of capacity.

I think where we are at now and what Eric is reflecting in his comments is that that wasn't necessarily the root cause issue.

The bigger issue has been market visibility, but what we have been working on, as I said, on a number of fronts is ways that we can improve that visibility.

MR. KELLY: Just touching on the visibility component. PAC has learned from its experience. In terms of making the market aware of the generation capability and capacity we are actually now bidding in all configurations for our coal fleet and our gas fleet as of yesterday after some software rework with bids in all configurations.

That will definitely help the visibility the market has to the overall capability and what we are doing as a BA, be it to meet their reliability and obligations.

That said, it still needs to be recognized that that will go a long way helping and narrowing the gap and the last thing in feasibility.

However, there is still a need for an automated

solution because there's still that manual component in terms of informing the market timely with rates or adages and that sort of thing.

MR. RODGERS: The automation that you're talking about, is that something that conceivably could have been done before PacifiCorp went Live?

MR. RISTANOVIC: It depends which part of automation. As to the earlier question, it is not necessary for California ISO to control the dispatch. It is necessary for California ISO to be -- how the BA wants to be deployed.

We do not have to have full co-optimization energy reserves to make this work. So that part can work either way. We can -- for the moment or we can put this in place what you are going to propose in Session 3.

The to her automations, yes, after the fact, you have better ideas what it means, but we have pretty exhausted all of those ideas what needs to be implemented and what kind of action that we will talk about in Session 3.

MR. ROTHLEDER: The ideal way to increase and get that visibility ideally is to have the resource capability bid in.

What we're suggesting here is, the reality is

that we have to go beyond that level of visibility.

We have to recognize obviously with everything that is bid in, but we have to also have visibility in recognition of to her capability that the balancing authority has, but for whatever reason was not able to bid it in or it is not the type of capability that is available for general EIM purposes.

That's the level of visibility and recognition that I don't think we could have necessarily anticipated before going Live with this.

That is part of the lessons learned of how this really interplays in reality with a balancing authority area still maintaining its responsibility and the EIM working in conjunction with it.

That is a learning and the product of that learning is now part of what I think is what we would be proposing and that proposal does have aspects that go beyond the existing authority potentially.

Specifically, there may be needs to recognize, although physically not operating or dispatching their reserve, but recognizing that reserve and what it is doing and when we do that it is important to recognize that that reserve is not available to be exported through the EIM transfer.

There is an important component if we are going to try to maximize the automation of this, that there are certain portions of the capacity, some of the regulation, some of the contingency reserve, is intended for balancing authority use and should not be considered as part of any EIM transfer. There needs to be some things to recognize that.

MS. SCHAUB: Would it be possible to get that document in writing?

MR. ROTHLEDER: We would like to describe that in writing after the Technical Conference. I see that she is writing away.

On a conceptual level, we will get into this in Session 3 and we will be using Slide 14 to really go into a little more detail in describing that after Scott Harvey gives us some preview of how to her ISOs have dealt with this for similar type of issues.

MS. McKENNA: Yes, of course, we will do our best today to illustrate the proposal of where we are heading with all of this, but based on your "notice of comments" where we have the opportunity in the initial comments perhaps to write that up, and if that is the case, then it would be helpful to make sure that we have that authority today to do that.

We would like to describe that all in the

initial comments as best as we can recognizing the time between now and the time in which those comments are submitted we may have to submit some additional information after that, but we will try our best to do that within the record.

MR. ROTHLEDER: Shall I proceed to the next question? Fine. I believe I am on Question 4: "To what extent do these categories contribute to flexible ramping sufficiency failure and why?"

On that question, I am referring to ramping sufficiency failure, that is the test that occurs prior to 40 minutes before the market starts based on the last set of BA schedules and submitted bid ranges that came in at T-75.

The ones that probably effectuate the flexible ramping sufficiency failure is more than to hers are the resource data alignment, and if the data is not aligned, or is not fully recognized to be aligned, and this is the second one, resource outages, then you could have a situation where you think you are passing the ramping sufficiency test, but because something has been recognized or an outage has not been put in you are actually not passing the sufficiency test or vice versa.

In the case where the sufficiency test is

failing and they actually are sufficient it does create a waterfall effect because if the sufficiency test fails then as described before it basically says, "the EIM transfers cannot occur," so that the transfers are frozen and it cuts you off from what would have been potentially some of that flexibility to mitigate some of the infeasibilities.

Because the sufficiency test may not have been fully informed, but the test has occurred, it maybe possibly caused the insufficiency.

Now, if it was insufficient and it reflected all those conditions at the time correctly, then the test was doing exactly what it was intended to do and it was protecting the neighboring balancing area from basically any leaning of insufficiency from the insufficient EIM area.

Nonetheless, and that does contribute to some of the infeasibility, but what is still missing out of that is the lack of recognition of the to her capability that the balancing authority has.

To answer the question simply is resource data alignment, resource outages, then potentially driving on impact on the transfer and constraint interplaying together causing some of the more tighter conditions in the realtime than what actual conditions exist.

Hopefully that answers that question.

MS. SHIPLEY: A quick note. We will be breaking at noon for lunch. Do not worry. Wherever it is we get to, we will start right back up there after lunch.

MR. ROTHLEDER: I do think we will get through these. Question 5, Sara has already described the manual dispatches that we had described earlier, but maybe on this point Sara will describe that a little bit more about kind of the relative frequencies of them and we can go from there.

MS. EDMONDS: I will be brief because I feel I have adequately covered this ground.

Just as a reminder, and this will be reflected on our post-Technical Conference comments, it is not so much the manual dispatches exclusively serving load in that direct way, the EIM is, it is taking reliability action that we need to take as a balancing authority and that is the tool for how we do it.

The most common reason that we do it is just as it was before EIM which is for various reliabilities conditions on the system, the most common are the most easy to understand being a local voltage issue that we are seeing developed on a system.

We have to take action in realtime. It is not an adjustment that we can accommodate change in a BA schedule, so we take care of it in realtime just as we did before EIM, just as we need to do as a BA and we do that through the notification process.

This is a communications issue and if it is not done timely, if it is not done accurately, it can create non-physical conditions leading to infeasibilities.

It is very important that that be done, but going back to what are the major themes of the day? It is still a manual process.

To the extent that we can identify system improvements with additional automation that is going to improve even in this area and you would see fewer manual dispatches to the extent the automation is taking care of communicating to the market the actions that we take as a balancing authority area.

The general category of reliability issues, voltage control would be the most common reason why we are using manual dispatch.

After that kind, even with one another, you are going to see changes that we communicate because variable energy resources are changing from what is in the BA schedule forecast and that can happen.

That's a very common event especially when there is large amounts of wind on the system, so it's very critical and important that that be communicated back to the market.

Another top issue that we have is we expect to see decreasing amounts of our actions we take using manual dispatch to accommodate the outage notification processes that fail to work as we expect them to work in the system to system communications we have with ISO around outages.

Just a quick word there.

As a balancing authority, we, PacifiCorp, are responsible for approving and managing outages on our system and that is one of our BA responsibilities.

To do this we have our own system and it is called COMPASS and that is the system for managing outages and for PacifiCorp's balancing authority areas.

For EIM implementation, we pointed that system to the ISO's relatively new Web OMS tool.

Those systems have to talk to each to her, and as systems, can sometimes do especially when one of the systems is fairly new, there are times when it does not perform the way we expect it to as we are troubleshooting and making adjustments.

We have used the manual dispatch as a replacement for the system to system outage notification process when we are seeing them not go the way we know it should be going based on our visibility to our realtime system conditions. Those are the top categories we have.

I should also add reserve sharing. We do not see that very often. We are not doing that as often as those to her manual adjustments, but if there is a reserve deployment, or reserve action, or reserve sharing we use the manual dispatch to communicate those as well.

There may be various to her small contributing factors. One might be, and we have mentioned it a couple of times, we have had some challenges around the design of bid configurations for multistage generation as we have trialed and errored that process, fine tuned, and calibrated.

It has sometimes unfortunately resulted in spurious dispatch instructions that just do not make sense based on the operational reality of that resource.

So when we see that coming along we have used manual dispatch to ensure the market has the appropriate corrective assumption about the behavior

of that resource in realtime.

With that, I feel I have covered the ground on manual dispatch, but I would be happy to take any additional questions for our last minute, and then, Jennifer, I suppose you can decide if you would like us to go to the final question for Session 1?

MS. SHIPLEY: Yes, please go ahead.

MS. EDMONDS: I will continue. The final question relates to what has been referred to as emergency e-tags.

In an effort to get us to lunch, let me take you through this as efficiently as possible by first providing a little Western context about what this is because you may not be familiar.

An emergency e-tag would be a tag that is used to facilitate the purchase of energy intrahour that falls outside of the normal tag approval time lines for 15 minute or hourly schedules.

It is used in a rare number of circumstances. They are essentially a loss of generation, a loss of transmission, a loss of a resource due to a transmission constraint, or inadequate reserves or the need to restore reserves after a system condition.

This is set forth in a business practice that

PacifiCorp has the use of these intrahour e-tags is not unique to PacifiCorp.

It is also not unique with EIM implementation. These are tools that have existed that EIM balancing authority sometimes use them to address sudden changes on the system for the conditions I just went through.

In the initial days of the EIM implementation, we saw significant up tick in the number of those tags.

I would describe that initial month as a period of great complexity. We have talked about the operators learning all of the new systems and when I say that there were several systems, potentially a dozen different systems, tools all interplaying at once, and that learning curve that we have talked about today, again and again, also involves the operators learning which tools achieve the objectives thereafter most efficiently.

Sometimes because there may have been multiple contributing conditions leading to infeasibilities it was not clear to the balancing authority operator what action they needed to take which market tool would address the problem.

Our primary concern is, was, and always will be

maintaining reliability on our system.

A tool they are familiar with, a tool they had used in the past were these intrahourly e-tags, and so there was a reliance and possibly too much of a reliance in that initial month on utilizing them, but we were also root cause analyzing what those real contributing causes were and what was the appropriate remedy.

The significant fact here is that we have seen an extreme downtrend in use of those intrahour tags, so from November to December they dropped by 50% and from December to present they dropped another 50%.

Currently, based on our analysis of our tag data coming into this conference we are seeing February, March intra-hourly e-tags of this nature in the three to four per month range, and prior to EIM we were at about a three per month range for those tags.

We feel we have addressed the issues. We are back to where we were before EIM, and as I have explained before this is a tool that we have had and we have had it in place before to her Western transmission providers use the same tools.

We are feeling confident that the direction that we are headed, all of these different improvements that we are talking about today, significantly the

proposal that we are making about automation around reserve management will effectively address these issues.

This is a temporary condition and is not representative of our ongoing EIM operations.

With that, I have 30 seconds to take a question to get us to lunch timely.

MR. BARAZESH: Actually, my question goes to the previous question which is the outage management.

Could you please clarify whether your system, the system that you are currently using, does it actually go down to the individual resource level, to the individual resources themselves participating or not participating in EIM, do they individually report outages through the system or do they report to you manually and you put it into your system manually?

MR. KELLY: Even with EIM, PacifiCorp retains the approval of all outage tags, so that requires those outages to be through our EIM entity or grid operations.

For third parties, currently they report those outages to Grid Operations that then approves those outage tickets and passes them to the California ISO.

We are looking at a web service that would allow them to put it into a web service. Currently it is

through a phone call as it were prior to EIM.

With PacifiCorp itself there is manual action taken to input those outages into our system of record because we retain the approval of those tags into our OMS system which is then passed to California ISO's outage management system, Web OMS.

That is the way the process works.

It is currently manual. There is no automation necessarily from the generating unit itself to maybe a pie-tag and then into the outage management system. It is manually input into our outage management system.

MS. SHIPLEY: We will break at this point for lunch and will come back here at one o'clock. Thank you.

AFTERNOON SESSION

MS. SHIPLEY: We will go right into Session 2 and I will turn it right over to you.

MR. ROTHLEDER: Thank you very much. I think Session 2 is intended to describe a couple of the to her drivers, load changes, renewable deviation, and transfer constraints and congestion.

Although I talked about them a little bit earlier, I will tie it up a little bit to those so there is a clear understanding.

On the load changes, the main factor there is that the forecast is updated basically every minute to five minutes.

There are things that the balancing area is aware of that at times they have to inform and make adjustments to the load forecast and that is what we call a load adjustment or load bias adjustment.

To answer the question earlier, this is similar to activity that happens in the ISO. Our operators at times have to make load adjustments to refine the imbalance conditions especially because they see some change looking ahead.

In the case of PacifiCorp, one of the reasons for these changes is that they could be aware of something like they have industrial load that they can curtail and so we have had situations where the load curtailment occurs and the load forecast actually follows the load curtailment down.

It actually shouldn't because you should make a distinction between non-conforming load which is load that is following -- I am sorry, a conforming load is basically load that is following weather conditions, temperature, time of day.

Non-conforming load, and I think of the industrial load is a good example, the non-conforming

load, it doesn't follow those rules, so you really should pull the industrial load or the non-conforming loads out of the forecast.

We have actually recently done that and that is one of the improvements and things that we have learned.

But the fact is that prior to pulling that out, the activation of the industrial load was, at least an example, a precipitating event that caused the need for the operators to make load adjustments in the load forecast.

These load adjustments tend to be course adjustments. They do not put in an adjustment of 26.24. They put in 25, 50, 100.

That is problematic and we had the same problem in the ISO because of that course adjustment, any quick adjustments to those forecasts, can cause you to artificially deplete your ramping capability because the jump was too quick relative to what you have available and it really wasn't reflective of the actual conditions, but it was more reflective of the operator making these course adjustments.

There is a feature that we already have in the ISO that we will deploy for the EIM and that is what is called a limiter or adjustment limiter feature and

that adjustment limiter feature basically would identify when the operating adjustments were basically beyond what the capability was and that it basically readjusts to limit the adjustments to be what the capability is, and so we do view the application of that enhancement especially when the prices feature will be off, that would probably address maybe 25 percent to 35 percent of the infeasibilities that were overdriven by operator adjustments, those course adjustments.

That is something that we intend to do. It is just one of those refinements of synching up what we learned from the ISO's operation with the EIM operation and the operator interaction.

That's the load changes themselves and I don't think there is any question on that.

MR. BARAZESH: Maybe this should be a question to DMM because the DMM Report of April 2nd, it talks about this feature and then there is a comment that effectively with this feature you have the same impact as the current price discovery mechanism.

Could you discuss your comment in the DMM Report?

MR. HILDEBRANDT: The way it works would be, and the reason we said that is, I think we give the

example in a footnote perhaps that an operating adjustment of 100 MWs is made and that goes into the scheduling run and then in the scheduling run let's say that resulted in a 25 MW relaxation of paramount constraint so then between the scheduling run and the pricing run the feature recognizes, the additional 25 MW adjusted it was beyond the available ramp in the system, so then it would limit the adjustment in the pricing run.

So 75 MWs and then therefore instead of being the price being set by the penalty parameter, then the highest cost resource dispatch would be setting the price in the pricing run.

That's why we said had this been in effect simultaneous with the pricing run that with price discovery the result would have been equivalent as it is in the ISO market.

Under those conditions it is the marginal resource setting price rather than the penalty parameter.

MR. RISTANOVIC: It is actually not working that way because once we eliminate that bias it is not infeasible anymore, so it is not reacting.

This feature is not unique just for biasing. We did this some years ago. We introduce something to

record, constraints, and the purpose of that constraint is that an operator wants to -- some transmission constraints, and let's say they are doing it in a way to say, "I want this constraint to have 200 MWs."

We used to have keeping a system 200 MWs without seeing what is the fastest that the system can produce.

So to the extent of just imposing that on the system and creating artificial instability we know that CAISO wants to do it as fast as possible.

We are disrupting capability when we maximize speed that that constraint can be managed to 100 MWs down and this feature works in a very similar way.

If the error of bias is not big enough to cover the infeasibility we still will not price it with a partner and in that sense it works differently than discovery because if the error is smaller than infeasibility, infeasibility will be there about that and it will react once we remove this waiver.

At the moment that feature is releasing the system, but it is not active because it is not sufficiently effective because it is acting before that and getting in the way.

MR. ROTHLEDER: An important part of the

distinction is that that feature only kicks in when there is an operator adjustment and then an adjustment that is greater than the available capability, whereas, the price discovery feature is basically always on.

MS. SCHAUB: To be clear, the change you were talking about, Mark, is the same thing that was in the DMM recommendation in the report, is that the same?

MR. ROTHLEDER: Yes.

MR. RISTANOVIC: The DMM we had in our was not activated, as I said, it is in the system, it is active in the moment, but it is not that effective because price discovery is acting before that.

MR. BARAZESH: This feature is actually implemented in ISO balancing area footprint and is active, is that correct?

MR. ROTHLEDER: It is active in the ISO at the entire EIM footprint level in realtime effectively, so the global power balanced constraint and the refinement is in applying it to the area power balanced constraint would be the refinement and the application of it to the EIM.

MR. BARAZESH: What is the experience with this implementation so far in the ISO zone balancing?

MR. ROTHLEDER: We find it to be effective when the operators are making those course level adjustments and it has helped address what DMM had identified a large portion of the ISO's infeasibilities back two or three years ago were identified as caused by operator adjustment and not physical-related issues, but rather operator adjustments making these course larger adjustments than what really was available.

The next one is renewable deviations and the renewable deviation is really a situation where the renewable resources or variable resources, and more specifically, are really changing from forecasted levels and the forecast is not keeping up with those changes effectively.

That causes at times the balancing area operator to have to make either manual adjustments to the specific resources that are deviating from forecast to inform the market or take action such as adjustment to load to compensate for those deviations, and I mean, ideally, a forecast will be accurate and early on.

I am just giving you some progression here, early on we did experience an issue with the renewable deviations, or renewable forecast - by the

way - so the renewable forecast, the DMM entity can choose to use their own independent entity for the forecasting of the variable resources and in the PacifiCorp case they are using an independent entity to come up with that forecast.

They could have used the ISO's independent entity, but they chose to use their own forecasting entity for the renewable resources.

Some of the renewable resources are actually participating in the energy imbalance market and they are actually putting in bids for dispatch.

Early on what that created was an issue with the forecast because oftentimes on a short term variable resource forecast are largely driven by persistence.

In to her words, wherever you are operating at is effectively the forecast for the near term horizon.

If the PM market is dispatching the resource based on the bids, then what ends up happening in that case is the forecast ends up following the dispatch down to the dispatch level and not to the realizable forecast level based on the underlying conditions.

A long story short. ISO did have a similar issue when it went and did implementation of FERC

Order 764 in May 2014, we had similar issues and we addressed those issues shortly after and is something that maybe we could have learned from, but ultimately we did correlate that that was a similar situation and PacifiCorp working with their independent entity for forecasting address that issue.

Once that issue was addressed a large portion of the renewable deviation issue was really addressed, so we're really talking about more smaller deviations now and the need to make these adjustments is much less.

With that said, let me give the mic to Sara to add anything at this point before I go further.

MS. EDMONDS: I just want to add on to that an additional learning improvement that we made over time.

Because we use an independent entity to create that forecast and a number of the variable energy resources on our system are relying on that forecast, that introduces a third actor into the equation of market inputs that need to get to the market timely and what we realized is that although that process happens relatively very quickly for the EIM it needed to occur even more quickly.

We really drilled down on the different data

transfers, the different handoffs between the PacifiCorp providing data to the vendor, and the vendor's production of that forecast back to us and then our handing that forecast over to the ISO.

There was some latency, but we could improve upon, upon closer examination, to really reduce that time lag and that has also helped reduce the way that VRS might be contributing to infeasibilities.

MR. RISTANOVIC: One additional point. This was one of the most important learning areas for all of us because initially we were envisioning energy balanced market where we are talking about -- that we want to cover where some of these deviations can be hundreds of megawatts and it is not good to expect imbalance market to have that much flexibility to cover for all of that and so we really have to decide how much you want to cover for energy plus what is going to be the opinion how much you want to cover by to her means and it comes back to our earlier discussion how those to her means get informed to the market on time and accurately because we have seen some deviations.

MR. KELLY: Despite all of the improvements around the latency and the actual forecast itself, that is now a mix with persistence and data, and

given the point there are at times significant drop off or for pickup in wind which takes a little bit of time to get fed into the market and that is to be expected and those deviations can be several hundreds of megawatts.

I just wanted to make that point which in turn we rely on manual dispatch to inform the market, but again, you have to see when the winds change then take the manual action and then ultimately it gets fed into the market on the next run.

MR. ROTHLEDER: Varied resources are not new to the ISO. In fact, variability is one of the reasons why we introduced the flexible ramping constraint and applying that constraint to EIM area was important, but I want to make sure that it is clear that in a climate of flexible ramping constraints and coming up with a flexible quantity we try to achieve 95 percent confidence in a rule of what the ban of flexibility needs are.

That does result in that there is a 5 percent ban that could be outside of that confidence interval where we could still see net ramps in excess of that by design potentially 5 percent of the time.

That doesn't mean that every one of those times that you would exhaust if actual bid availability,

but it does create a potential and these are some of the situations where the balancing authority will use some of the to her tools in place if you get beyond that confidence interval.

Where we are finding the terms of our flexibility, we are tuning based on actual experience, so larger variability ramps will inform future flexibility requirements, but that more of a learning process to be gathering more and more data.

MS. SCHAUB: Eric, I think DMM also commented on the flexible ramp and how that gets implemented, a recommendation until later?

MR. HILDEBRANDT: I can briefly note that historically looking at the requirement we just look at it and possibly increasing it as Mark has noted, refining it, as he has noted that falls into a number of things.

One is how much variability are you going to try to cover with flex constraint versus the to her options, the load following and regulation out of the market that is held by the balancing authority area.

We are suggesting that they revisit that and as we note they have been doing that, they have been refining it and that has resulted in higher levels than what we saw in our reports going through

February starting into March, late February, it has been increasing.

As they noted, there is also that trade off between if they failed the requirement, then they get isolated, and if he said it, it exacerbates the problem because then they cannot import more from the ISO, so that is really balancing the different factors that are going on.

MR. ROTHLEDER: The flexibility, since we're on the topic, we did have some issues related to flexibility and one is defining itself, but we also had some issues related to the amount of credit that was intended to be credited, to the meeting the flexible ramping requirement based on the exports from one area to the next.

And there were some implementation issues there early on and they lasted until January and February before they were addressed.

After that, they were addressed, we started to see the flexible ramping actually work more effectively the way it was intended and now we are kind of more in the refinement period of refining the requirements itself.

This is an ongoing effort and you can expect that to improve over time.

The next one is transfer constraints and congestion. Sorry, let me back up for the flexibility.

I should note that the year one enhancements that are one of the year happens is also related to flexibility and recognition that the interchange, we talked about interchange changes taking a better look at the statistical levels of those changes that can happen and factoring that into the going forward flexibility requirements as well.

That is something that will be in the year one enhancements. That is just a note back to the flexibility.

The transfer constraints and congestion, this is related to, as I noted earlier, probably two things.

One is EIM transfer constraints themselves and the level of those transfers at the 15-minute level and the five-minute level.

I was going to kind of go around the map, in the case of PacifiCorp East to West, the 15-minute and the 5-minute transfer capability are the same.

It is 200 megawatts from PacifiCorp East, PacifiCorp West. It's zero from PacifiCorp West to East.

Both 15-minute level and the 5-minute level.

COY, in terms of rights at the 15-minute level, I don't know the exact number, but it is about 400 megawatts of transfer capability North-South and South-North at the 15-minute level.

At the 5-minute level that gets further constrained around wherever the 15-minute transfer capability basically is optimized to and on-peak it is basically about 11 megawatts of movement around the 15-minute level and off key as high as 100 megawatts.

I have seen it as high as 200 megawatts. This dynamic transfer capability is a quantity that is allocated out through a BPA process for allocating a limited amount of dynamic capability.

The total dynamic capability is 200 on-peak and 500 to 550 off-peak. So there is an allocation process under their business practices for allocating the dynamic capability to requesters what is ultimately allocated to PacifiCorp is 11 on-peak and about 110 off-peak.

The point though is that you have situations where you would have, the conditions may have changed between the 15 minute and the 5 minute that you would have wanted to move more than you are limited to in the 5-minute.

And the example is that in the 15-minute level there could have been an nexus in an EIM transfer export out of PacifiCorp area, but at the 5-minute level you could only get back 11 MWs of that at the 5-minute level even though the conditions in the PacifiCorp system would warrant that you would have wanted to go further but you are limited around the 5-minute dynamic training for capability.

Initially when we started we had zero transfer capability at the dynamic level, the 5-minute level and we evolved that to get to the 11 MWs and we saw improvements when that happened.

We saw physically the system respond better when we had that dynamic movement capability, but nonetheless we still do get constrained at times on that 5-minute movement capability.

That's kind of the EIM transfer piece of the story. The underlying transmission constraints, and I will go to the rate of change constraints first.

The rate of change constraints is a constraint on the BPA system, not on the interties, but rather on the internal flow gates of the BPA system and the purpose of those are to limit the physical effects of large transfers, changes in flow across those flow gates and they are going into the energy balanced

market working closely with BPA and PacifiCorp to come up with the right limitations are around those range change constraints, but nonetheless at a 5-minute level across the flow gates we monitor what the flow effects are of EIM dispatches on those flow gates and we limit the dispatches at times limiting the change in the flow effects on those flow gates to comply with BPA's requirements.

BPA shares what those limitations are and we enforce those limitations. There's a data exchange process with BPA to ensure that that is working properly taking into consideration the shift factor effects of resources and the effect of those effectiveness on the flows of those flow gates.

Those constraints do not constrain the 15 minute. Those flow gate limitations do not exist in the 15 minute, but they do exit in the 5-minute, so does create the situational difference between the 15 and the 5 and again makes the 5 minute more constraining in terms of the movement capability you have.

MS. SCHAUB: The 5-minute flow changes on the interties and the rate of change on the BPA flow gates sound like the same thing to me.

Is there a difference?

MR. ROTHLEDER: They sound the same, but they are different in the sense that - the transfer - the COY minute is the underlying physical reasons for that may be different than the underlying reasons for the flow gate limits.

I guess they are similar in the sense that they are both limiting the 5-minute transfer if you want to say it. Maybe.

MR. RISTANOVIC: The main difference is that COY is 5 minutes limit, the absolute limit, and the difference for rate of change constraint of the previous dispatch.

So they are tying movement on specific interface in BPA's system around the envelope that we had moving in 15 minute -- You will want to talk about in Session 3 some improvements that we are making that, initially limitation was not the best one that we could think about.

MR. ROTHLEDER: One thing we can elaborate is that prior to EIM were these in effect and I think the answer is on the COY, yes, there was dynamic transfer limitation in effect, but except for dynamic schedules there was a limitation around the hourly schedule so it was not playing a role in terms of hourly transfers under FERC Order 764, it would not

have had a limitation on 15-minute transfers, but it does have an effect on now the EIM transfers along with to her dynamically scheduled resources across COY.

In terms of the underlying flow gate limitations, those limitations have always existed as well and BPA has managed that.

The new piece of this is that EIM doing explicit dispatches is one of accommodation is that we would limit those changes in dispatches to respect the underlying physical limitations across the BPA system.

I guess they always existed, but do they ever really effectuate any type of limitations in terms of dispatch, perhaps not, it is in the EIM that they are effectuating a limitation on dispatch.

MR. KELLY: Just to build on that point. That means to respect the flow gates or how it is they should operate, the effect on the market of a dispatching unit more quickly because as a physical capability because of that flow gate constraint in BPA with CAISO on that plan is actually limited with the whole idea behind the flow gate limit was to represent the historical dispatch part of those resources.

MR. ROTHLEDER: Actually, it was a very good discussion between PacifiCorp and BPA in collaboration in regards to managing those flow gate constraints, and I think it was discussions that actually identified EIM that actually one of the benefits was that the EIM could manage those limitations in a more effective way than maybe perhaps the existing processes without the EIM.

I am not trying to sell it as that. I am just saying that that is one of byproducts of the collaboration and one of the reasons why we thought it was important that we respect those limits.

Nonetheless, we also identified that we would like to see if there are ways to increase those limits.

I know that BPA is working on looking at the COY dynamic limitation and they have done studies in collaboration with Columbia Grid and we are monitoring those.

Again we are also PAC operator in the South so we have an interest in making sure that the use of the interties is efficient and robust.

That is a good progression in terms of underlying flow gates, and the continuing effort by BPA to see what the underlying issue, the physical

conditions are, and see if there are ways to remove or release some of those constraints, but they will do that based on reliability and based on their studies and we will monitor them and respect whatever those limits are.

On my last point on the congestion is that we also enforce when the EIM entity identifies constraints that should be enforced underlying transmission constraints in the EIM area.

To this point based on the seasonal condition there has been a fair limit set of constraints that have been identified for enforcement.

We expect that that may change over time especially as seasonal conditions change, but there have been at least some situations where the transfer or the internal transmission constraints have been in force and they have been binding, but have not been a dominant limitation or a cause for the underlying system infeasibilities.

There is not a strong correlation between those constraints underlying transmission constraints and the infeasibilities.

MS. SHIPLEY: Can you talk a little bit more about those things that you are suggesting that you haven't seen that you might see in future seasonal

changes?

MR. ROTHLEDER: More generally on the enforcement of transmission constraints and what I will do is hand this off to Sara so she can elaborate more about the system conditions in their area that are seasonally based and I will be back.

MS. EDMONDS: We have a process underway. Prior to going into the energy and balance market we need a determination based on where we would be relative to our seasonal peak which was not the shoulder season, but we would institute a plan and a procedure for activating internal constraints on our system.

This will allow us to gradually implement those constraints during a period when they would not be expected to bind, in a systematic and methodical process because what we realized about the tools available to us from the ISO that enables these internal constraints is that you really need to carefully validate the model is interpreting the constraint the same way that you understand that constraint.

In many cases the process we have gone through there is actually quite a bit of work in validating inputs and some calibrations that are needed, so that before we activate an internal constraint we are very

confident that it is behaving in a way that we would expect it to.

This process has been underway. We have enabled a handful of internal constraints and there is a plan to continue to do so as we move towards our summer peak because that is when we see the highest loads on our systems, but by the time we get to summer peak we will have everything in place that we need to, but the seasonal nature of that exercise is that we will be dealing with a new element, a new operational element and new activated tools which will be binding in deep periods that we will have to get accustomed to and that will be a new layer for us in terms of the coordination of our balancing authority operations relative to market operations which I put on a couple times today.

MS. SHIPLEY: Let me try and understand. This started before EIM?

MR. KELLY: In terms of, yes, looking at some of those constraints and putting them in the market, absolutely.

The biggest challenge that comes with the summer configuration of our system and particularly in the case of the East Side where it is summer picking, we did not have the data flows obviously because we are

doing a parallel operation through the month of November to mimic those conditions and test them.

This is why we are taking a very methodical approach to introduce those constraints as the data starts to hit the systems.

MS. EDMONDS: There are to her seasonal considerations not necessarily relative to transmission constraints, and I can address those now if you like or can wait for those to come up? We will wait? That seems right.

MR. RISTANOVIC: There are many to hers and I can give you just one example. About five or six weeks ago we had PacifiCorp -- saw before. It was very difficult for us to manage and learn and train operator and that caused the forecast error to go from below 1 percent to 3 percent and that is a big impact.

So those things of seasonal forecast has to do with topology, composition resources, flexibility, shoulder months, distributional flexibilities, altogether transmission constraints, hydro situations, how much hydro do you have?

So have events -- that affects flexibility -- there are many many seasonal things that are happening, that are expected and there are a few that

we cannot expect.

MS. SHIPLEY: But these are things that happen every year with seasonal changes, right, so these are not unusual seasonal changes just because EIM is coming in.

EIM coming in, I'm not saying it is not complex. It is very complex. What I am saying is that introducing EIM is not adding new seasonal challenges.

MR. ROTHLEDER: It is not adding new seasonal challengers, but until you have gone through a complete set of seasonal conditions, the EIM has not fully experienced all those type of situations in the new area and every balancing area is different.

They have kind of unique seasonal conditions and maybe they were certainly going to go talk about seasonal conditions.

Hydro conditions in the Northwest, if you have high hydro in California, but if you have high hydro you actually lose flexibility because the resources are full output and they are not able to provide upper flexibility.

That is a conditional change that is unique to the spring runoff season.

Low levels in different balancing areas are

going to be different and they are going to keep differently.

PacifiCorp will peak differently from the ISO, I mean, that is a diversity benefit, but it will peak differently from the PacifiCorp West and it will peak differently from those areas.

Those are all benefits in terms of diversity, but going through and experiencing, having the EIM experience those conditions and unique setups of riding through those peaks, if you do not have that going into the market you cannot fully simulate that.

This is something that you have to experience through at least a year's worth of operation.

MS. SHIPLEY: With to her markets that started up, they would have experienced these same seasonal challenges with implementing a new realtime market.

It's hard for me personally to understand how this one is much more different than those.

One thing to keep in mind is the Commission in their order, a year sort of seems like too much time, but I understand what you're saying. Just keep that in mind.

MR. RISTANOVIC: Let me try to respond on some of that. We have MRQ going Live similar transition, and if you will remember, we had gradual price for an

extended period of time.

In some sense for operators EIM is more difficult because they are not day ahead marketing, they have to balanced every hour, every hour they have to balanced flexibility and capacity.

You are dealing with that transformation people who used to run the system one way and expect the system to respond another way.

This takes time to get confidence in what the market has done, and this response to market is with different seasons, so that EIM transition they are going to be there always.

There will always be surprises, there is going to be a lot of seasonal stuff you have ride through and trusting the market and behaving the way the market does and not always trying to fit what markets and what you are used to.

There are a lot of factors in this that we saw before and in to her markets and deal with differently, but what we see here is additional complexity because they have manage the reserves, they have to form the market, there are organization issues, so there are quite a few things that are not there.

MR. ROTHLEDER: I understand the concern about,

"Is a year too long?" I guess I would only ask if a year is too long, then I guess to understand the nature of the seasonal conditions and try to understand that there is at least a minimum amount of seasons that are important to really understand and experience, if it is not a year, didn't think about the unique situations in an area in those seasonal boundary conditions and outliers that may exist in that particular balancing area, so I understand a year is a lot to ask for.

MS. SHIPLEY: If you come in with additional information, the Commission may consider things like that. Just highlighting it.

MR. ROTHLEDER: Thank you.

MS. SCHAUB: What is also important here are the lessons learned going forward. In terms of the constraint validation, Sara, that you were talking about, could some of that be moved into the period before market operations so that when the market starts more of those constraints are actually ready to go?

MR. KELLY: Would you restate the question as I am not sure if I followed?

MS. SCHAUB: The question is in terms of validating transmission constraints before you turn

them over to the market operator to enforce.

This is just for lessons learned because even though we are where we are, would it be possible to move that into a prestart process so that when you do a parallel operation you then are testing the lines and making sure that California ISO has got the right numbers and that things are showing up appropriately?

MR. KELLY: Absolutely, as I said, in parallel operation we can and did test some of those constraints.

The point that I failed to communicate more eloquently, the data we are using in parallel operation is the data for that particular period.

It is not the summer data that is important because we do not have all the systems in place to exchange the data to actually go through that experience.

It's a case of actually having the real data to make sure there is no unintended consequences that Jennifer rightly said.

This is not something that PacifiCorp hasn't experienced before.

The constraints are not necessarily any different. We absolutely will not be short of supply, but until you actually go through it there

may be some calibration of the model that is required because the market is not representative of the real world conditions as well as to her points in terms of communicating to the market some of the difference or changes that are occurring.

MR. ROTHLEDER: I went through Questions 1, 2, and 3, as I tried to describe the three additional categories.

The point about what I summarize on is that some of the things that we experienced are already implied in terms of addressing some of those issues.

I talked about flexible ramping, the load, the adjustment limiter, those things are already in flight and we will see the benefits of that.

But as we transition and before we transition when we get to these events, still the underlying question is, let's set the price and what does the balancing area authority in any of these conditions, no matter how you got into the situation in terms of exhausting the bids, what should you be recognizing and how you make that a robust process as possible to recognize all the capability that the balancing authority has.

With that, unless there are further questions, maybe we could start to just transition and talk

about solutions.

MS. SHIPLEY: What we will do now is to pause for some questions from folks in the audience.

I request of the audience to remember to speak very closely to the mic, think American Idol, and please preface your questions on clarifications of what has been said so far.

If it pertains to solutions, please hold it to the third session.

State your name and your entity. The natural tendency is to say the introduction quickly, but not everybody in the room knows you, and most likely the court reporter does not know you, so please slow down.

What we will do is bring you a mic I am not sure if that one works very well, but you can try it out.

MS. KING: Diana King from Bracewell & Giuliani on behalf of PowerX Corp. First, a question directed to CAISO.

In fact, if I could just preface with one comment for the Staff's consideration before I launch into my questions.

It appeared that the CAISO's solution is going to be one that they hand off to us in comments that you all hopefully are going to file on the 23rd of

April.

Is that what I understood?

MS. McKENNA: We have been talking a little bit here today as you have heard, and we will be in the third session discussing that a little bit further, and we also will be documenting that in the April 23 comments.

MS. KING: A comment for the Staff's consideration. I know that there was a notice yesterday about those comments being filed on the 23rd, but it would be useful to stakeholders and to interested parties to perhaps do a staged set of comments so that we would have the opportunity to respond to the CAISO's very much more specific statements or to provide a two-staged set of comments to be filed, so let me just request for your consideration on that having heard of the CAISO's response.

Moving to the questions. I would like to ask the question about Slides 8 through 11 that you all went through in the first session today.

Returning to Slide 8. The slides describe what you identify or term as available capability.

The question is whether or not this available capability that you are measuring on these slides

includes supply, in a sense, if this includes supply that the PacifiCorp perhaps bought bilaterally from its neighbors in response to resource insufficiencies at T-40?

In to her words, is this supply that was available only because of PacifiCorp's own actions?

MR. KELLY: No, it doesn't represent a lack. What it does represent is the capacity that was available to PacifiCorp that was not necessarily bid into the market.

MS. KING: If I understand that correctly, what I am trying to ask is at a certain point after T-40, if there is a resource insufficiency problem and PacifiCorp takes action to procure bilaterally from one of its neighbors, does this chart reflect that PacifiCorp purchased as available capability?

MR. KELLY: Actually, you should ask CAISO for the timing of when the data was pulled. Was that prior to prior T-40?

MS. EDMONDS: We can certainly confirm and supplement in any written comments, Diana, but my understanding of the original source of the data is from our PIE Data System, and that is a database system that we have which provides information about how we are managing our PacifiCorp resources on our

system.

I believe that is the source that populates the data, but we will confirm and provide that in written comments. Do you have anything?

MR. ROTHLEDER: No, the source data is exactly what Sara described. The only overlay that we did on this was the actual infeasibilities for the same time periods that we experienced from the markets solution.

MS. KING: As a follow up, Sara, to your comment back to us. Is it possible to provide in this docket the data in each hour of two central items for us?

One is the maximum imbalance need in each hour for each of the two BAAs, PAC East and PAC West and then for each of those hours what the flexible ramping requirement was in that same hour.

MS. EDMONDS: I believe so, but I prefer not to answer now and instead follow up with written comments.

MS. KING: Sara, would that mean that we would not see an answer on that until the 23rd of April or might that be something that you would be able to respond to and provide the market with?

MS. McKENNA: I just want to make sure. When you're asking for additional information, what Sara

is trying to point to is that we are in a process, so I want to make sure I have understood your question for the request of the information.

When you're asking for it saying, "Can you provide it?" can you be clear as to what you mean by that? How? And where? And what process?

Because we are running into a time line here that is very quickly approaching, and I want to make sure that I have understood the question, and with those details, it will be helpful for us to understand how we can return that. Does that make sense?

MS. KING: I think so. Our request would be, and I don't know how you would make it available, or if you prefer to make available by posting it simply at a certain link?

I do believe this data is probably Excel spreadsheet data, so it needs to be made available electronically, but the question is for each hour and separately for each of the two PacifiCorp BAs, PAC West and PAC East two metrics.

First of all, the maximum imbalance need that I believe Mr. Rothleder described earlier in Session 1.

And second, the flexible ramp flexible sufficiency requirement that was set in that same

hour.

MS. McKENNA: I don't believe there was a discovery process through this proceeding.

I don't want to be too ridged. I want to make sure and we will be happy to provide information regarding what the Commission's questions were.

If there is additional work that has to happen to produce that information, then it may not be feasible within the time frame.

MS. SHIPLEY: Let me suggest this. What I am hearing is, I was trying to talk with my higher ups on the high bar, is perhaps to have everybody come at the same time, if we're looking at a potential for CAISO to come in with some proposals for solutions, if we actually have gotten that far, which is great, then perhaps it might be something.

We cannot make a decision here because it is the Secretary of the Commission that makes the decision so I wanted to float the idea and see what the response is.

If we were to have CAISO make the filing first of what their proposals are and get some time before people respond at that point you can comment on both the Technical Conference and their proposal.

I am seeing some heads nodding.

Does anybody feel opposed to that?

We cannot make the decision. We can float that.

CAISO, we are interested in moving quickly because to her matters are moving quickly. Is the two weeks too tight for you to come in with these proposals? No promises. Just checking.

MS. McKENNA: Of course, if you give us more time we will take more time!

We are eager to have our issues resolved and move forward as we have indicated we have already taken some steps to move this along.

If I could just have one moment, I will confer with my client. I do believe that two weeks is enough time for us to incorporate that, but right here from this discussion is that we would be provided additional details, more details as much as possible, on the fixes that we are looking to implement.

Let me take one side bar and do a little bit of math and I will get back to you. Is that fair?

MS. SHIPLEY: Absolutely and we will pause.

MS. McKENNA: We have an answer. It will just take a moment. We can do it in two weeks. We think we can provide the information we need to flush out the details and support our proposal.

MS. SHIPLEY: Great, so we will see what we can do as to how much time we can have folks to get their response and comments on that.

As I said before, you do not need to file comments on the 23rd on the Tech Conference. Please wait to file everything afterwards.

MS. KING: If I can just respond to your concern about data and data requests.

It is not our intent to create a flood of data requests in sort of a month-long dragged out process that requires considerable back-and-forth.

We do understand that the issues here can be resolved and understood more easily with data.

I appreciate very much in these graphs on Slides 8, 9, 10, and 11, and some of the information that seems to be trying to head towards questions about the flexible ramping requirements about what it is that is being met or not met in PacifiCorp's balancing authority area as in each hour.

The request that I am handing off to you today was intended to be as narrow as possible to ask for two metrics according to each of those hours that we thought would be not fertile in terms of supplying the data that would help parties understand better some of the issues that are going on and have gone on

and better understand some of these data that you have put forward for us.

MS. SHIPLEY: For our purposes this conference is meant to inform staff so that we can inform the Commission what we have learned for their consideration to the extent the Commission feels that it needs additional information that will be their decision to make.

I'm not opposed to CAISO providing you additional information. I just want to make sure we keep this moving.

MS. KING: Jennifer, I do not intend to require you to have CAISO respond. My question is very much a question right now for CAISO and PacifiCorp as to whether or not those data can be provided to stakeholders and interested parties?

MS. McKENNA: It is important and we will provide all the information necessary to support and to demonstrate what our proposal is and how it works and why it is necessary and we have already done that actually through this discussion today and this record in support of why it is necessary.

What I am trying to caution against is the two-week timeframe as the additional information would be a little bit onerous on us.

I also want to note the way the proposal has been put forth or the details of the fixes that we are putting forth are it will become part of the whole solution and the issues we are discussing.

I do not think there needs to be a lengthy back-and-forth. We have done a lot and we have been very transparent through all of our reports about what the issues are and the quantification of those.

What you are asking for from what I understand is two additional sets of data that may or may not be feasible in that two week timeframe.

All I am suggesting is when you make that big of a request, then that information may not be necessary in order to explain our proposal or to demonstrate its validity.

MR. RISTANOVIC: Just delay that to explain our proposal and you will see towards flexibility and once you have a better understanding of what it is you are doing, then you will see that flexibility is not that real solution that we are talking about. What I'm saying is we delay that discussion until then.

MS. KING: Certainly, we can delay that until then.

MR. KELLY: The purpose of these graphs was not

to demonstrate flex capability to any stretch of the imagination.

It is solely to demonstrate that PacifiCorp is well resourced on its load and it is not deficient on supply.

MS. SHIPLEY: Are there any to her questions from the audience on the first two sessions?

We are ahead of schedule. Do you feel you need a break or take a break? Then we will take a break and let's get back in 15 minutes.

AFTER A BREAK, ON RESUMING

MS. SHIPLEY: FERC Staff has conversations at the break. We will definitely be going up the chain of command to see about getting that notice issued and thinking about timing. I believe I got a notice from you that you wanted to chat about some timing as well.

MS. McKENNA: Yes, thank you, Jennifer. Before we launch into the next discussion since we are on the topic of procedure and also that there will be provided any additional conversations that need to happen before the end of the day, if necessary.

I would like to lay out a potential time line that is a little lengthier than what we discussed before recognizing that there are so many

implementation requirements that we have to go through.

What I calculated based on my math, please correct me if I am wrong, April 23rd is the date that is currently set for post-technical conference comments and that will be the date that the ISO could file comments, as I said earlier, and then two weeks after that would be approximately May 7 where to her parties could respond or file comments.

Two weeks after that would be early June that we would like to have an opportunity once those parties have filed their comments, if we had any unfinished business to respond.

Sorry, this would be towards the end of May. It will be a good two-week cycle taking into consideration that some of those dates might fall on a Saturday or a Sunday so have to consider that.

MS. SHIPLEY: If we were to analogize to a 205-type approach, you would be making your initial proposal on the 23rd, a two-week comment period, and you are suggesting an answer would come in two weeks later from CAISO?

MS. McKENNA: That is exactly right or approximately right. Then, I wanted to note that some of the fixes we are looking to implement are

more readily implementable. Others are not.

Our current time frame on implementing some of the solutions that we have been talking about is August 18.

I do note that the refund effective date is June 22. The proposals that we are looking at for the most part are changes that would require us to operate our market systems differently, and therefore, they are not the kind of changes you can go back and implement on the refund effective date.

From June 22nd, until August 18, for example, we wouldn't be able to actually do what we are talking about here today.

We also wanted to note that by my calculations under the 206 requirements you may extend up to August 22nd, yes, the 22nd of August, to act under 206 a refund effective date which would help us in accomplishing a smooth transition to this new requirement and ensure that the market is not exposed to the types of errors and issues and the challenges we have been having with implementing the recognition of the reserves manually.

MS. SHIPLEY: Just to clarify, Anna. When you are talking about extending the refund effective date you are not talking about extending the waiver, just

the refund effective date?

MS. McKENNA: I think in combination would extend the refund date we would need to have the waiver extended because we would argue that the same challenges, the same risks associated with transferring the information to the market manually will exist during that time frame and our best options to minimize that exposure to the market is to have the automated feature in place.

If there is no waiver pricing, there is no automated feature. The risks are significantly high enough that there will be many instances in which we might have what we are referring to as not real infeasibilities due to the transfer of information being not done in a timely or in a correct manner.

So that would require that bridge, if you wish.

MR. HADDAD: In terms of moving or requesting to move the refund effective date, my impression here just thinking about it, it might make more sense to file something with us.

The order has already set the refund effective date, so I am not sure of our authority to just move it on our own, so it might make sense to have that paper in front of us.

MS. McKENNA: I suspected that that might be

necessary and so we can file.

It is my expectation, if I can articulate what I would expect to file is really not necessarily to move the refunded effective date but to recognize that the waiver extends beyond that date so we can have the pricing mechanism in place.

Not being able to apply this on an automated basis from June 22nd does not have any material impact on the market.

Let me note that the feature that we will be discussing is not automation but a lot of things have already been accomplished, in to her words, already PacifiCorp is taking action to ensure that the reserves and its actions are appropriately reflected in the market and that is when we see the improvements that we have.

Therefore, technically, this is no different than what they are doing already because it does eliminate the instances of infeasibilities through their actions that we are hopeful that that will continue to trend up so that is what our expectation is.

But in order to ensure that the rates at that time are not unjust and unreasonable as you have suggested it would be our recommendation that the

waiver extends to August 22nd so we waiver pricing is in effect during that time and then we would implement this on automated feature on August 18.

Does that make sense?

MR. HADDAD: Yes.

MS. McKENNA: Thank you.

MR. THOMAS: Let me elaborate because I understand that. This is one reason why Mike mentioned that where one is called a motion or a supplemental or whatever under the 206.

My concern is if we do not think through that clearly to make sure that happens, we are still in that arena of what if the Commission, where somebody wants to do something beyond automation which is not necessarily a tariff modification, but what they may do with the tariff modification, that is part of the conference today is to understand that what those fixes may be, so absent that, we would be concerned as to a standardized type of process that it gets missed.

MS. McKENNA: Yes, that is exactly right. We are both trying to address the same issue.

I am not quite sure what the appropriate label on the pleading is whether it be a motion, I will have to think about that and consult with my to her

attorneys and we will put forth a pleading that explains that procedural request if you wish so that it is clear and how that moves along.

I do recognize that based on how we are proceeding once established the Commission may act on or before June 22nd with additional requirements or different requirements, but we are hopeful that this proposal that we will shortly be discussing, as soon as I stop talking, will address maybe issues that we have been discussing that we think is a good solution.

That is our hope.

MS. SHIPLEY: Something to explain here also is that the Commission has approved extensions of the waiver a number of times and there is a little bit fatigue on the Commission for that and so you and Staff would have to make a really good case. I think there is a potential for that, but there is some fatigue there.

MR. ROTHLEDER: Moving into Session 3, we were starting to talk about solutions, but before I do that, this is just a follow up to PowerX that triggered in my mind the question about the requests for imbalance quantities.

I don't think I have done a very good job of

making sure that it was understood that in some of these cases these data issues or the information flow will have an impact on artificially inflating the imbalance needs relative to what EIM was intended to do or what the imbalance energy needs would have been had it been fully informed.

I wanted to mention that because it is not just about recognizing all the capability, but we would be continuing the efforts of making sure that imbalance needs themselves correctly reflect the actual conditions.

There are times when those can be inflated because of the data issues. Does that make sense.

MS. SHIPLEY: I missed the beginning. Could you bottom line what you just said.

MR. ROTHLEDER: It was really in response to PowerX's request that triggered in my mind, and the request was, "Can you provide the imbalance needs for every interval?"

All I'm suggesting is that the needs of every interval that were calculated determined, and they do not exist as to a number, they really exist as a product of the overall dispatch.

All I am suggesting is that those needs could have been artificially inflated and do not reflect

actual conditions, but they reflect the underlying information flow issues and they may not reflect the actual conditions that the EIM was intended to cover.

MS. SHIPLEY: I got you and thank you for that. Actually the comment has set off Session 3, so let's get started.

MR. ROTHLEDER: Before going into more details of the concept that we are considering, and the to her solutions, I thought it would be good to have Scott Harvey. Scott is a member of our markets surveillance committee at California ISO.

He has a great deal of experience with to her ISOs and it will be worthwhile to have him share the experience and some of the parallel things that are happening in New York ISO and MISO as we kind of discuss conceptual solutions.

MR. HARVEY: I am an individual member of the market surveillance committee and to her members are here as well.

My views and my statements reflect my own individual opinions, they are not a collective opinion of the market surveillance committee.

Also through my to her affiliations, I do FDI consulting, I consult for the MISO, and the New York ISO, and these comments, again, are my individual

opinions that do not necessarily reflect the opinions of those organizations.

Most of my comments are pretty factual though. They will go historically to those organizations that have seen the same kind of ramp constraint, even the California ISO fixes the kind of information flow problems that they have had, the phantom infeasibilities, the experience shows when you run a five-minute dispatch they are going to continue to see those infeasibilities.

I will talk about the kind of steps that MISO and NYISO have taken and where they are now and then briefly talk about how they got there because that also is relevant.

Going back to the infeasibilities, it is not uncommon for system operators that balance the system on a five-minute dispatch you find that they cannot balance in every five-minute dispatch interval with their on dispatch resources.

Both the MISO and NYISO have that characteristic. They send out five-minute dispatch instructions.

If you send out 15-minute dispatch instructions, you may not have infeasibilities in your dispatch, but you're still in the same problem balancing load

on a 5-minute basis, but it doesn't show up.

But like the CAISO, the Midwest ISO, and the NYISO, send them under 5-minute dispatch instruction and over the years they have had this same problem of being unable to balanced on a 5-minute basis.

There are places and papers that you can go to to see where this is talked about.

The New York ISO and the Market Issues Working Group, on June 21, 2010, Sean Johnson had a presentation leading up to a discussion of changes in the penalty factors which went through and portrayed the infeasibilities over the last 40 years in the MISO which ranged 1.4 percent to 1.0 percent in terms of shortages of regulation at the 5-minute intervals.

To get that information, everybody can pull it up, and we can always put it in written form in the comments so no one loses it.

There is a MISO filing letter in Docket ER 12-1185 which was the filing letter for the spending reserve shadow price, and in the filing letter, and in Van Nys testimony, they had some statistics on spinning reserve shortages and relaxation on the spin constraint in the Midwest ISO for the previous year.

There's another analysis relating to the ramp capability product where we are looking at shortage

events in connection with developing that in the MISO and it is the fifth MISO Stakeholder Fifth Technical Workshop Ramp Capability pleading on April 14, 2012, and there is some data on pages 45 to 47.

These are publicly available and there are to her things where they have done disconnect calculations and that is out there for everyone to look at.

This is a good starting point to recognize that there is nothing really unusual in terms of ending up when you are doing a 5-minute dispatch having infeasibilities around 1 percent to half of a percent of the intervals.

Given that you have that kind of problem, and that is at issue, what is the approach the MISO and NYISO have taken?

The basic philosophy is we want to relate the prices in those intervals rationally to the steps we take to deal with that imbalance.

We need to recognize as those ISOs recognize as in PacifiCorp and the CAISO have been talking today is that there are to her resources, there are regulation capability, the right of spinning reserves, there are to her resources that are used to balanced that.

Neither the MISO or NYISO at any time has saved a $1,000 penalty price for when they run out of ramp capability.

Rather they have had a system of penalty prices. The current penalty prices that the New York ISO uses when they have these short term ramp capabilities the first thing they do is release regulation up to 25 megawatts of regulating capacity at the penalty price of $80.

It is not $1,000, it is $80, because Operations feels that that is just not that big a deal.

We want to maintain that and we set an $80 ramp capability penalty so we retain all of that regulation if it is cheap, but it is not worth more than $80 of ratepayer money to keep that rate and that is what we're talking about.

We are talking about how much ratepayer money do we spend for the extra regulation capability and over the years they have evolved at $80 for the first 25 megawatts and then they relax up to 80 megawatts for the penalty price of $180, and more than 80 megawatts relaxation goes to $300.

It appears for relaxation, and this is all in the tariff, of how you make more capability and it flows automatically into the dispatch those resources

are dispatched on a least-cost basis, and in the end what would have happened if you did not release it, you still would have in the end used your regulation capability to balance load through AGC.

But by putting in the dispatch we send out a rational signal that tells the market and people who incent the generation of resources to have that rate ramp capability and the pricing, we try, we think rationally related to the importance of having that additional ramp capability.

The NYISO has additional penalties and at $450 they relax Eastern spin, a 10-minute spin, and they relax regular spin at $500, those are more serious, that's when you're getting into a more tighter situation, but in the end we are going to balance load and generation.

What we are doing is we're saying, "We will balance load and generation and we're going to send out a series of price signals depending on how far we dip into those to her resources and do it."

MS. SHIPLEY: I am sorry, but ...

MR. HARVEY: Let me go on for 10 seconds. There is one last, unloaded prices, and it is only $25 and that is just for Eastern spin and there is also the ISO and NYISO is a targeted carrying a certain amount

of spin on the East versus the West, but it is not a big deal.

If we can solve ramp and straighten the East just by carrying the same amount of spin in the West, we do that for a $25 penalty because Operations feels that that is just not a big deal.

We spend a little bit of ratepayer money to keep that spin in East but not more than $25.

MS. SHIPLEY: I appreciate your passion on this issue. A lot of FERC share your passion on these issues and I am sure that you folks do as well.

Have you been professor before?

MR. HARVEY: No.

MS. SHIPLEY: It sounds like what you're suggesting is a graduated response rather than this sort of cliff response?

MR. HARVEY: Right and we rationally relate the price. It is not perfect. You can go back and look at the filings and maybe justify these things, so we are reaching up for justifications and how to come up with those numbers and it is not pretty.

It's a lot like making sausage. You try to talk things over and then arrive at a consensus of what seems like to be a reasonable value for the real reliability value of that because the ratepayers in

the end pay for it. That was the New York ISO and where we are now.

Where MISO is now is as a result of that spin filing I mentioned, they release 10 percent of their spin at a shadow price of $65.

Again, it is not anything like $1,000. It is $65. And then they release more spin at $98 and they have higher penalty prices for releasing regulation. That is their operating philosophy.

Of course, each set of operators have their own views on how they want to do it, but that is the same idea. They wanted those and that filing, that docket I gave you about the spinning relaxation there is a lot of talk about why they wanted to do this to better reflect the cost of the spin.

Now, how did we get here? The values I read for the MISO are the ones that have been in place since 2011.

When we started in 2005 we put in a constraint relaxation when New York made a major change in software, they went from the old Power Pool software to the new ISO software in 2005, and learning on their experiences in operating the old software we put, and FERC approved these kinds of shadow prices, they were higher at that time what we did for

regulations is we released 25 megawatts at a penalty price at $250 and then more than 25 megawatts was at $300.

That was a lot higher so you can see that the tendency in what we decided between 2005 and 2011, is we should relax more of that regulation at a lower price to keep the upper end.

The to her changes back then, we only get a shadow price of $150 on Eastern 10-minute spin but we increase that to $450 in 2011 because Operations wanted to go the to her way.

They wanted to make sure we kept the 10-minute spin and we incurred higher costs to start units to have it available. That's the second.

But there was an earlier part to this because when we started operating in November 1999, the software was the old SED software that had a hard constraint. What we built into it was a feature that tracked the shadow price of the load balance constraint and a transmission constraint so that whenever they spiked for one interval, the number is more than 100 hours in the shift change in shadow price in one interval we release some of the regulation.

Then we took it back to the next interval so

that if there was a one interval price, we said, "We are not going to take some extremely expensive action because it is not worth it for one interval," and that was less sophisticated software.

It did not do intertemporal optimization like the California ISO software does now or the New York software does now, so they can take that into account as the Operators had to do that on their own.

But we knew that it wasn't cost effective to spend a lot of ratepayer money for something that is probably just a one interval.

You can see this evolution of thinking from something crude in November 1999 that we implement in the software that we had and the New York ISO had guys that actually changed the code, we didn't even have to go through the vendor, and then we thought about it, and in 2005, we came to you with a more elaborate design, it was more thought out, but again, learning from our experience we do not want it to be $1,000. We want to have it rationally related.

MS. SHIPLEY: Yes, I think we got the point.

MR. HARVEY: Yes! Okay! And there is MISO. I will do this more quickly but there is one proceeding that I do want to get out in front of you.

The MISO, they made the spin finally, but before

that they didn't have any pricing, they just relaxed spin and that was true from 2009, and that is when they implemented the spin, so there wasn't pricing.

Before 2009, MISO was like EIM, and remember, MISO had independent balancing authority areas, and the independent balancing authority areas were balancing their own generation on AGC, and they were still in their own reserve activation groups, and they were doing the same thing that PacifiCorp does, they had capacity that the MISO dispatch didn't see.

If you go back to ER O6-1099, that was filed on June 5, 2006, you will see that MISO went to you, and you approved it, to let them go into that range between the E-CON Max that the balancing authorities gave them on their unit to the emergency upper limit to say, "We really don't want to really run out of ramp capability, don't get really high, we want to be able to go into that range."

Especially what they were looking at is, "We don't want the operators to commit an expensive unit to solve a ramp problem that we can solve by going into the emergency range for a couple intervals."

That's my statement.

MS. SHIPLEY: I assumed, and I assume CAISO and PacifiCorp have as well and that will be reflected in

their proposal.

MS. McKENNA: I took as many comments as possible, but yes, I can talk to Scott at any time, that is right. I will pass the microphone now over to Mark who will start speaking about our proposal.

MR. ROTHLEDER: Thank you, Scott, and thank you for the discussion of the proposal that I will be using in Slide 14 as the guiding visual to explain it as it will make a lot of sense as a result of Scott's explanation at this point.

What you are showing here is an illustration of a stack and the stack that I want to point out, first off, is the upper participating capability.

This is the EIM participating resources. This is the ramp limited, outage limited constraints of the voluntary offer bids.

In most cases we have already talked about earlier in the 95 percent plus of the cases the imbalance needs, what is represented by the imbalance needs is that green arrow, that quantity, that megawatt quantity of imbalance needs does not exceed the upper limit of the bids as constrained by all of those things I have described.

That is a feasible result, and a majority of results are feasible and prices are rational and

everything.

It is the Case 2 that we are talking about. Case 2 is basically where the market has exhausted those voluntarily offered bids, but yet the balancing area still has all of those things in the pool that are represented above the line of what was called the upper limit of bids.

There is to her capability that may not be able to bid in for whatever reason.

There is regulation and some of that regulation may be also doing load following and then you get to the upper end of contingency reserve which is really their reserve for contingency events.

Nonetheless, as you go up that stack, these are the tools that the balancing area has available up to the physical limits of all the resource capability.

The concept of the proposal is when you get to that red arrow, rather than setting the price based on this administrative penalty value of $1,000, it is recognizing the value and the physical quantities of availability of those additional capabilities the balancing area has.

Some of these are pretty straightforward. Actually, you do not need any changes. It is a matter of how do the balancing areas or the

participating resources find ways to maximize the to her capability that could be bid in and should be bid in, how do you move that from the to her capability to basically being in the upward participating capability thus increasing the stack that is basically the economic bid stack that is available.

That is part of the learning process and I think PacifiCorp is in the middle in continuing in that learning process and they can elaborate some of the more recent things they have been doing to try to move some of the to her capability to the upper participating capability.

You go beyond that point and there starts to be some operational restrictions around the capability that limit the ability for the resources to actually participate as a participating resource, but that capability should still be recognized by the market solution.

That is where the solution needs to develop ways of recognizing either the events or the conditions in which we should be recognizing that additional capability and pricing accordingly.

At the same time we want to make sure, and while we're not dispatching necessarily specific capacity capability, that remains under the balancing area's

control.

We are informing the balancing area of the quantities that are necessary, but they are taking the action to actually dispatch it.

We are pricing accordingly, but we are also doing this in a way that ensures that we are not relying on that capability to export out of the system.

That is part of the management of the restrictions around that capability.

We can leverage some of the things that we have got designed into the system. Specifically, for example, we talk about the greenhouse gas mechanism to limit a resource that cannot be exported and support transfers.

There are ways to leverage that capability so that we recognize that some of this capability cannot support transfers out of the area.

If we do that we can basically only utilize this capability in the economic order that it should be used relative to the value of that capability, but also based on whatever the operational restrictions are that you should be using it for.

For example, a contingency reserve you should not be using that unless you have a contingency

event, a DCS, disturbance contingency event.

If we can detect automatically that that event happened, we can then make the market systems recognize, "We will just account for that, the balancing area is going to use that, but we are now leveraging the market system to recognize that while the balancing area is in parallel deploying those reserves."

By doing that you close this informational gap. You no longer rely on the operators to manually inform the operator of what resources they are manually deploying the reserve at, but you are rather doing it automatically at the time right after the event has occurred and as long as we can detect the event and we can recognize that capability.

All I am suggesting is that there are some details that have to be worked out. How do you do this to verify the quantities are right and they are representative of the physical conditions?

You don't want phantom capability here to be accounted for. You want actual capability.

That's one.

What is the price that we should be getting when we go into the different levels of recognition of these capabilities?

We believe there are multiple ways of doing that and we have not gotten to that level of detail which is the best way, but perhaps it could be bid in by the EIM entity itself or perhaps it is an administrative value.

Whatever it is, there needs to be a mechanism that establishes that price, just as Scott Harvey suggested that the New York ISO and MISO had established the penalties at which they relax the constraint in price.

There is quantity, there is the price, and the third component is what are the limitations and what are the events around which we can start dipping into those capabilities and what are the criterias around that?

That is the third piece and that is where you get to where you cannot export this capability. You can only get to this export when you have had a power balance constraint relaxation in the first place.

Those are the criterias of use.

If you can work out those details which we are very motivated to do, then that is a rational workable solution to automating the recognition.

At the same time all of these to her learning and to her things that we have talked about earlier

are implemented to their maximum ability, this kind of closes that last gap out of how do you automate the recognition of this additional capability that the balancing area has available.

MR. RISTANOVIC: Just a couple of things that Mark described. We are thinking about this change as actually not requiring major market redesign.

So these additional capability that we are talking about would be about flexibility requirement that we have today.

So you have the same way of calculating all four of the requirements to meet the specific requirement that have to be bid and satisfied with the EIM bids and then this should be above and beyond that we did not count against that infeasibility.

There should be in addition, but deployed in special circumstances.

As I said earlier today, we are thinking to leave this up to BA to decide how much of that additional capacity they have.

They want to protect from not being economically expert to to her BAs, so there is the option there to have a piece of that to be available for export and how they want to do deal with this additional capacity.

As Mark said, we have additional automatic way to recognize circumstances in which we are deploying this so we can decide to deploy additional operator reserves, DCS.

By doing all of this it is quite different from what New York and MISO do because this is part of their co-optimization and managing reserves.

This can maintain circulation of reserve functions for BA. This was originally asked automatically deploying those additional capacities and if they wish they can be bid this at zero price because we have mechanisms to guarantee that we are not going to displace anything else that was dispatched before with infeasibility.

In to her words, this capacity will be deployed only for the portion of the visibility that is left when all economic business in the EIM market are deployed.

There is a lot of flexibility as Mark said and we can deal with this in different ways in still the kind of concept of plus plus, but we are quite confident that we can work out some sort of solution and maintain all the principles for the EIM market design impact.

MR. ROTHLEDER: I can take some questions, but I

do want to hand it off to Stuart because I want have him explain a little bit about the to her capability and what they are doing to move some of that to the dispatch capability.

MR. SOTO ARRIAGADA: How do you ensure that this extra capability that you are going to have available coming into the market displacing of the reserve that is coming in at lower price?

MR. ROTHLEDER: There is an important distinction here and I want to be very clear.

These are tools that the balancing area has. If these tools are tools that they can use and the costs of those tools are at a lower cost in a submitted bid they should legitimately displace the submitted bid.

That is a tool the balancing area has. This is somewhat unique to the fact that the EIM is an operation of a balancing area first and EIM overlaying on that.

We have to recognize that the balancing area has that ability. We should not remove those capabilities from the balancing area because you have implemented an energy and balance market.

I distinguish that from the California ISO where those two operations are happening in unison through the co-optimization process as I described earlier.

To remove all of their tools from their toolbox at the value at which they and the cost of those tools would be incorrect and probably inappropriate.

MR. RISTANOVIC: Let me address the question specifically. In our interpretation we have something called scheduling run and pricing run.

In the scheduling run we are going to deploy all the dispatch business we have and as a result of that optimization we may end up with what we call infeasibility balancing question, let's say, the 50 megawatts.

Everything else is stack bids, they are at economic prices and as we have today discovery economic bid and scheduled for that bid.

Only that portion of 50 megawatts will be subject to deployment for this so we cannot substitute anything else that is already deployed to cover bonds.

We cannot physically substitute. We are limiting how much you get in pricing run from these additional capacities.

So from that point of view the normally displaced capacity is already scheduled based on economic order.

Now price wise depends on how you bid that

section. If you bid it at zero price then that segment that you are bidding is going to the lower end of the stack and you will keep the same price you had with the last economic bid.

If you want to protect that regulation you can bid that high price that is called the stack you can bid it at $80 or $100, and if the BA wants to value that segment, and then it can be higher or lower than the last economic bid because nobody is going to bid.

There is enough flexibility there, and then again, if you don't have enough, if you do not have 50, if you have 40, and we need additional 10, then the third part will kick in and that is its true capacity because we exhausted all the economic ability of what BA produced to cover for that.

MR. SOTO ARRIAGADA: Just to clarify. If you have 60, you still only have 15 to the market.

MR. RISTANOVIC: We don't know how much we are going to have. They have to assume whatever they have but if you have 60 deficiency in the scheduling run from this start we will get only up to 60.

MR. ROTHLEDER: But you use the scheduling run to discover the quantity of the infeasibility.

Once you discover the quantity of the infeasibility then you go the pricing run and bring

only that quantity of that additional capability at whatever these prices that we determined are the right prices to use and then it is reoptimized through the pricing run and the dispatch will reflect that.

MR. SOTO ARRIAGADA: I understand that. Thank you.

MR. ROTHLEDER: There are details there that we could discuss here, but we are confident that those interactions can be dealt with to only get into this capability when there is a feasibility, but after such for the right economic order relative to the to her side.

MR. RISTANOVIC: And we are confident that we can do it because we already did it for GAG for this improvement for year one enhancement and we can declare fortunately our capacity to export to California and a similar concept we can implement to limit movement of that piece of capacity to be only for a physical portion of the scheduling run and what we are looking for is to find a way to expend functionality to make sure that the BA does not export that.

MR. SOTO ARRIAGADA: Yes, the two portions together make sense.

MR. ROTHLEDER: I would like to, unless there are any questions, hand this off to Stuart to give a little bit more explanation on the piece that I call learning and that is what they are doing, and what kind of resource capability they are trying to move in from the to her capability and move it into the participating capability.

MR. KELLY: Before I talk about the capability. Given the improvements that we have seen to date, it is important to note that the normal size of the infeasibility is typically less than 50 megawatts.

It is not infrequent that we see maybe eight or nine megawatt type deviations and that is worth bearing in mind with the system that peaks around 12,500 megawatts and a deviation can easily be covered, but plants are already probably deviating more to control ACE because the market doesn't have the ability.

With that said, in terms given the market visibility, that definitely it will help as explained, but will not completely eradicate infeasibilities and that message was well delivered by Scott. PacifiCorp is currently working on making bids available for all configurations.

It is gas and coal plants, as I mentioned

earlier, and currently the market, well, up until yesterday actually, the market only had bids in all configurations for coal.

As of yesterday we actually went into production with bids in all configurations for gas plants.

We are also bringing in additional resources. We are looking at Swift to resource what we have tested extensively because it was a relatively complicated hydro plant that was downstream of the mean hydro plant, that we wanted to bid into the market and there was some latency there that we had to model, so that would be an additional 100 megawatts in the West and we are currently looking at bringing in the Gadsby Units 1 and 2 that is currently on outage and bringing them in as participating resources and then an additional 120 megawatts.

On top of that, PACE, we have the demand response capability as explained earlier in the conference, we had already broken that in my response or non-confirming load out from the conforming loads and improved load forecast, so we provide that information to the market.

On top of that, we will actually be providing to the market bids associated with that demand response

of 445 megawatts.

But I will go back to the point that it is very important that we are not using a sledge hammer to crack a nut here and not tripping a demand response when we have already covered that 8 megawatt deviation through when the plants are falling for ACE.

MR. RISTANOVIC: Flexibility is a very important point to follow up. As you see our approach is to maintain flexibility requirement on generators and this is up for dispute and is described, we are going to have probably in this market that Mark is talking about at least 400 MWs of industrial load demands a response that we are not going to count against flexibility because you only use that very rarely.

Because if you count it against flexibility it has to be available all the time and you do not want to be moving this emergency response all the time.

We are letting this short gas unit, which is also very expensive, they also may be the infeasibility stack or above infeasibility stack, but the bottom line is that we feel that we have enough capacity.

We have evidence that we have enough capacity. We just need to learn how to organize that capacity

within operating practice with PacifiCorp and how to inform the market to use it appropriately, the appropriate frequency at appropriate prices.

We think this is a big step in the that direction because we see in the PAC typically 300 to 500 megawatts of available capacity that we don't have access to and there are various reasons why PAC does not want to keep that in the market all the time because you do not want to be moving these things too frequently.

MR. ROTHLEDER: Are there any questions?

MR. BARAZESH: Both the ISO and DMM reports talk about some modeling changes that were done to represent the change, the representation of the regulation in the PacifiCorp units and these changes were implemented in March.

How did those changes relate to this discussion that you just had? Is it the same discussion or was it a different exercise?

MR. ROTHLEDER: It is different because that goes to how PacifiCorp is managing and informing the market of their reserves.

I will give this to Stuart and Petar, but effectively, prior to that they would have to limit the amount of bids at the T-75 minute level based on

the expectation that what was providing reserves.

The reality is that their management reserves is much more dynamic than that. They move reserves around intrahour from resource to resource as necessary and the mechanism they are using now leverages the outage information system to do that more dynamically. Now I will give it to Stuart to explain that more.

MR. KELLY: Effectively the T75, we have the set up for the hour and that set up is based on best information at that time, but obviously there is forecast error that comes and in hour they have to deal with.

Irrespective of placing all tests at T40 for sufficiency, or flexed, those things will happen in terms of varied deviation, or whatever, we have to deal with, what PacifiCorp figured out is obviously we are tied at T75.

However in order to make intrahour changes as long as we made the bids available on all configurations as well as and restricting what the plan can do further based on the set up we had going into the hour using the outage system we can actually move as we move reserves around make more available to market to cope with that deviation and overall

forecast error within the hour.

So that's how we are handling it because previously we were out of the market the way we had it set up from T75.

MS. EDMONDS: Stuart is articulating an additional learning curve issue.

We did not realize that it was an unintended consequence that defining our setup of a T75 was going to result in essentially us being locked into that position for 135 minutes, 75 minutes before operating hour and then the 60 throughout the real time hour.

What we have come to as a workable interim solution is a manual process using the outage cards to better inform the market about how we actually manage reserves dynamically through the hour and we came to a manual solution what we are thriving to is more automation in the market that provides the market that same information about how we are managing reserves.

MR. BARAZESH: This solution has been implemented and has been in operation since March. Is that true?

MR. KELLY: Part one of the solution was implemented on March 9 and as I said yesterday, the

mean beneficial component comes when you actually enter bids in all configurations which was all internal as of yesterday.

From yesterday, I would expect continued improvement in the frequency of the infeasibilities.

MS. EDMONDS: But inherently it's still a manual process and a theme that we have certainly hit on several times is any time it is a manual notification to the market you are introducing time lag and human input error opportunities.

MR. RISTANOVIC: Bid solution is not implemented, not even a part of first stack. Yes, PAC has been in more of that without protection and we are not doing this automatic deployment only with infeasibilities.

That is something that we are proposing to do by August, but at the moment that whole process is only deploying that part is not in the system and we don't have protection against that of the BAs.

But we see impact of them bidding the capacity you can see a significant reduction in infeasibilities especially in 15 market.

MR. BARAZESH: That was my question. To the extent it has implemented so far, what is your experience with that?

Do the figures, the capacity you presented in these slides, that come form Slides 10 and 11, is that capacity there. To what extent have you actually been eating into the contingency reserve regulation requirements?

What is your experience with that?

MR. RISTANOVIC: Whenever we have non-infeasibilities, they play the role to calculate those numbers, but we have to remember the main purpose of the U.S. market and the purpose of the U.S. Market is not to tremendously increase flexibility required beyond any BA.

We have to resolve flexibility that will reflect the needs of all following and agree to that.

So if you put 1,000 MWs of flexibility and 6,000 MWs that the system will never have price spikes, but then the crossover in the system, you cannot -- you are looking to find the right balance and to put two in control of BA to decide we are to deploy these to her things and that is the main goal and that is why we need a solution.

MR. BARAZESH: That I understand is a discussion, the preamble to this discussion.

What my question is: It is just some experience with this in particular to the extent that you have

actually use your reserve capacity for this purpose. How frequently and to what extent is that?

MR. RISTANOVIC: If that operational experience is available.

MR. KELLY: I will let Mark quantify on the reserve component, but to the point, the graphs on Slide Numbers 10 and 11, are of February 2015, so it doesn't represent the increased capacity that will be getting bid into the market, but what you will see and the respective BAs effectively the price will diminish.

MR. ROTHLEDER: There's a little bit of confusion. Their management is basically telling us what capacity we cannot dispatch into.

They are doing that dynamically through the use of the outage management that they are maintaining their contingency reserve and that is demonstrated by the 8, 9, 10, and 11, is they are maintaining that, but if there is anything additional that is beyond their minimum contingency reserve requirement this has the ability to more dynamically make that available, but they are not releasing at this point their minimum contingency reserve requirement.

MR. RISTANOVIC: The to her change that is since March before that they were not bidding the whole

range.

If you do not bid the whole range after T-75, you have the time to move things around because you are limited by bid limit.

What they are doing since March in many units they are bidding the whole range and restricting us.

There is more flexibility now to use that range that is restricted, but there is still a bid for it because there is no bid after T-75 mark, you cannot use it so that is a big change and a big help.

MS. McKENNA: I would like to note that Mr. Barazesh's question with regard to the crypted slides that we represented, where we represented reserves, we will have another opportunity as we go forward reporting to the Commission and those slides will be part of the reports that we will provide, so the changes over time will be reflected in the next coming reports.

I will just remind everybody that that we did suggest in our last report that we filed in April that we will be filing one that covers all of March, that one will not have any changes that this these practices might have, but as you go forward in the months we will be providing the additional data for the annual seat transitions over time so that will be

reflected in our data.

MR. RISTANOVIC: That is pretty much a high-level conceptual description of the proposal.

There are a few to her things that we can talk about improvements that are in the pipeline, so if you have more questions about this one.

MR. THOMAS: To follow up. I would like to step back to the first proposal and make sure I understand it.

You talked about that there's going to be a learning curve for the ability to deploy additional resources on the system and upper limit of the bids is over, that is, the individual solution.

What I would like to know is, if either party at this juncture knows whose responsibility at whatever levels, there is the learning level, I heard a lot today about how much PacifiCorp is going to take on with automation, how much does CAISO have to do based upon your proposal at each step.

The learning curve might be one thing, but as we go farther, because it sounds an awful lot like as Mr. Harvey was reflecting, what is proposed is a lower bound rather than a $1,000 limit, you already have a flexible limit, so do you maybe want to lower it or am I missing something?

MR. ROTHLEDER: Are you talking about the flexible ramping string?

MR. THOMAS: We can take it in two parts.

MR. ROTHLEDER: In terms of implementation of the proposal and when I talk about the proposal it is really this automation recognition of the available capability.

There's some work on both sides, but the majority of the work would be on the ISO side of doing the proper recognition and accounting for that capability.

The balancing area role is making sure that they inform us about the quantities and the criteria when it can be used in terms of when you got to feasibility when that particular type of capability can be used.

And thirdly, and this depends on the ultimate solution of how are its practices, but I expect the balancing area would have some role in determining that price as well.

The second question, though, is in terms of, "Can you just do this by using the flexibility constraint?"

I don't think you can because flexibility constraint, when you just do that, you just use the

parameter of flexibility constraint and set the price there, it does not do the job of recognizing what the physical limits are about the capability that you are relying on.

There are legitimate reasons why there will be graduated prices depending on which capability you are giving into to solve that infeasibility and I think the flexibility requirement doesn't do sufficient job recognizing that.

MR. THOMAS: Thank you. I appreciate that. Do you have a sense, this is for Petar or Mark, what type of work that CAISO is going to have to do? Software? Physical?

MR. RISTANOVIC: I was almost sure before, but now I am changing my mind, a change like a GAG extension, just to put this protection against export outside of BA.

You have to do software change on our side which is relatively deep in the system so align PAC to a big extent and then work on the PAC side to educate about how to bid this and how to manage the operation, so there will be training, there will be procedural change and training of PAC and for that we have shared responsibility.

California ISO is doing a lot of training and

that is probably the biggest lesson learned, we have a lot more training to bid their operation and BA.

There we will be able to work in that area, testing, you want to see how it works, tuning, so we are expecting that by mid August we can wrap this up altogether.

MR. ROTHLEDER: The important thing is that in large part we have the building blocks and the software capability.

It is a matter of putting the building blocks together to do what we are trying to achieve.

It is not a major software effort. It is more putting the building blocks together that exist in different places.

MS. McKENNA: On the tariff change issue, one of the reasons why we are discussing this in such detail here today is that we believe this goes directly to the scope of this current Technical Conference which is the just and reasonableness of the pricing, and this of course, we believe goes to that.

From a tariff perspective, it is our hope that we can get this through the process and we would take this as a compliance filing in response to when a Commission action happens.

If that were the case, obviously, filing that is

within the scope of time and I believe I can type that up as quickly as possible, so we hope that we can get it to you in time.

MS. SHIPLEY: Let's talk about process for a moment and then we will open this up for some questions.

I have checked with my folks. It sounds like we're not able to run up the flagpole to make this decision and respond to you, so if you all could file a motion asking us to change the time lines, and perhaps proposing the time lines that you would like, then the Commission can address that and you do not have to wait until the 23rd to make that filing, so you do that quickly.

Something else, yes, you did have more you wanted to talk about before we open it up for questions.

MS. McKENNA: Yes, we do.

MS. SHIPLEY: Sorry.

MR. ROTHLEDER: Not a lot more. It was really more summarizing some of the things that we talk about in the proposal.

I want us to summarize and review things that we can do now that are kind of in flight and just go through those one more time to make sure that

everybody is aware.

The first one is, obviously, continuing to train in the process of improvements and you have heard a lot of those on the PacifiCorp side and to the extent the ISO can help to facilitate those things we are always available to do that and we are committed to doing that.

The next one is refinement of the existing reserves and how those are managed and that goes to what Stuart already described about more dynamically, but still manually making the market aware of the capability that is being held reserve and you cannot dispatch into, but the to her portion that is bid in and is available in forming that more dynamically in realtime rather than T-75.

That is a refinement that is in process and that will continue to develop especially for some of the resources that have duct firing ranges and stuff like that.

In terms of --

MS. SHIPLEY: Sorry? Can you? "Resources that have," what?

MR. ROTHLEDER: I went too far, didn't I! It wasn't the duck. This is D U C T. It's an upper range of a gas fired plant that you really only get

to when you position the resource to do it and there are some limitations right now, Stuart, that you can get into, some limitations right now making that duct firing available, but those are being removed.

MS. SHIPLEY: I am happy to wait to hear about that in your final.

MR. ROTHLEDER: Good! We also have improvements to the flexibility requirement.

We made several improvements already, but we believe there are still continued refinements in terms of the quantity, about the flexibility requirements and we are pursuing those.

We talked about the load adjustment limiter. We had extensive discussions around that.

Really, that is ready to go now, but it really will not actually kick in until really the pricing discovery feature is really turned off because with the pricing discovery feature on it masks the effectiveness of have tool.

It only comes into play at least in the EIM area when the pricing discovery feature is turned off.

The to her area as we talked about the transmission constraints, there is a continuing effort working with BPA, but also on our side of when you move form the 15 minute to the 5-minute rate of

change constraint we believe there are some refinements there how you represent the changes that occur from the 15 minute to 5 minute and a more gradual ramping change rather than a sudden change would allow for a more precise implementation of that constraint.

Lastly, just the recognition that we are monitoring these things closely. We are looking for seasonal changes and things that crop up as result of changes ns the seasonal conditions that we have to respond to and adjust our way of thinking and practices.

We are continuing to watch for that and then really the last one is what we have been talking about is really the further automation of the whole exchange of information.

Really, I should be careful here, the automation which really is what we talked about in the proposal and that is that automation is really an automated recognition of the to her capability that balancing area is already utilizing in conjunction with the EIM, but the automated recognition of that that allows for decreasing the manual intervention or manual information flow, but also removes the need and gets rid of those time lags. That we think is

important piece of it.

MR. RISTANOVIC: This is what is in flight, but I would like to emphasize something how to increase because if you look at that map, PAC East is sitting as an island. We cannot go back over there.

PAC West is most of the time on a strong diet for 15 megawatts import so that managing that forever is very small so we cannot really benefit from this energy between our system where we have a 50,000 megawatt system that we can move 15 megawatts to PAC literally and that is going to change.

That is going to change for multiple reasons and I am looking forward for that change coming because when you get a few hundred megawatts that we push through PAC East and push from PAC East to PAC West and knowing what is the magnitude of infeasibility that we see today which is range of less than 50 megawatts, it is going to be a much easier life for my organization and for my team and I am looking forward to that. That is a big change that is coming our way.

MR. ROTHLEDER: Yes, that is important, I have to be careful here, as the EIM expands you start to create additional pathways to transfer that then address some of the underlying lack of ability to

rely on those transfers.

That is an important aspect, but we have to make this work as is. We cannot rely on that future. It has to work as is and support of that we make it work as is and not rely on those future things.

We skipped over a question a little bit and that is Question 3 and I would like to hand that off to Sara because short of the additional transfer capability that may be coming with expansion of the EIM there are some additional thoughts about how do you make additional capability available especially third-party supply capability available, so there may be some thoughts on that, Sara.

MS. EDMONDS: From the transmission provider perspective which is where I am hailing from we are very excited and optimistic about the potential for third-party, meaning, nonspecific core generation participation in the energy and balance market within our balancing authority areas.

A lot of environment that opens access to that market has already been created in the tariff market design that was part of PacifiCorp's EIM implementation filing and we have the Commission to thank by and large for many of removals of possible limitations that would create possible road blocks or

challenges to participation.

Those include transmission requirements which from initial proposal to the tariff that we have on file today are substantially different and essentially remove that as a possible impediment.

We also had another development that evidenced itself through the ISO tariff which was the development of the greenhouse gas lag.

So some resources outside of the ISO have expressed reluctance to be involved in the market if it would subject them to greenhouse gas compliance in California.

The development of the flag is another example of where the existing tariff climate is already quite hospitable to additional participation.

PacifiCorp continues to work with its transmission customers who are interested in participating with resources they have internal to our balancing authority areas.

I would observe, and this is my personal opinion, that there some wait and see approach going on from the nonspecific core participants on our system.

We have one customer who has filed a construction agreement and filed an application. Now

that doesn't mean that they will be certified to be an EIM participating resource, but it is the closest we have come and it would add about 300 MWs to the PACE balancing authority area, and for us, for the transmission side, that would be a big success in terms of ensuring that what we are really trying to create is an open and hospitable market environment that is diverse and deep, so we continue to work with customers and we are always willing to work with anyone who is interested and who has questions and that is part of our outreach in our lessons learned process.

There is also the matter of 15-minute intertie bidding on PacifiCorp's interties. This has been discussed in the initial market design implementation for EIM and is also a part of year one enhancements discussion.

It has been moved to the Phase II portion of that discussion. Essentially the concept is once a balancing authority area enters the EIM an option, currently it is not an option, the balancing authority area might determine to open its own interties to essentially expand the ISO's footprint for purposes of 15-minute Order 764 economic participation to those further interties.

Our initial decision not to pursue that which is by the way an approach that will be taking in its filing and I believe Puget is going to take a similar initial conservative approach is not to open that additional expansion.

Part of this for us at least was we had a lot to do with a very little amount of time and we were unclear about the additional implementation details that would be required around that.

The to her point I make here today is not to say that we are not looking at it as we continue to look at it.

What we are more interested in currently in terms of priority setting is to pursue the solutions that we have been discussing all throughout today, so perfecting on the learning curve issues, working on the system's improvements and the automation that we have talked about today, that is the clearer pathway to having the market have visibility to the capacity that we need to resolve the infeasibilities, and as Eric has stated from the DMM from a couple of times today supporting us in that additional physical megawatts is not necessarily the solution.

That being said, I would say that we are not done with consideration of 15-minute economic bidding

at the interties.

We have a unique system and lots of interconnected balancing authority areas particularly in the West and we would need to be careful about how we implemented that because there are a lot of complicated transmission issues because of the interconnected interwoven nature of our systems in the West, so that we would have some seams issues to deal with.

That is an issue in the forefront of our minds and we would need a solution to those kinds of issues to really open that expansion up, but we are not done considering it.

MR. RISTANOVIC: Those are the kind of things that we already have solid plans for what we want to do thinking beyond that.

We see feedback how this works, and how this fits with different open practicing in the West, so we are definitely looking for a time line.

We are looking at T-75, and T-55 scheduling, and we are looking to 15 minute balancing instead of hourly balancing to smooth the edges of this system and the spikes.

We are looking at a time line with T-40, T-20, so all of that is a very detailed consideration.

We understand the deficiency there and we are making some progress.

MS. SCHAUB: Sara, you mentioned earlier that you guys are working on automating your outage management system and that is not a subject of this per se, but just out of curiosity, is there anything more you can shed light on about what or how or when something like that might happen?

MS. EDMONDS: I will share that and then I will promptly hand over the mic to Stuart.

There are no plans that I am aware of currently that would send an automatic signal from a generator to an outage system, so that level of automation, to my knowledge, is not currently being contemplated.

But what we are currently working on is a way for nonparticipating resources to have a web interface to put outage information instead of emails, phone calls and the way we have traditionally done it, that is traditionally how that notification has been provided so we are looking for something a little bit more sophisticated on that front.

MR. KELLY: We have done quite a lot of work on our outage management system.

Basically we designed it in many respect to ensure that that manual input from the operator is as

simple as possible to ensure that it gets to the market with the correct data.

Also we have worked extensively with CAISO to streamline the data we share with the market.

Previously we had to restate all availability and historical points and all that good stuff and would mean significant improvements on that front as well.

Seriously, there are to her things that we have looked at in terms of potential automating with the generator and I would be really leery of it going there right now.

It is incredibly important that we do a couple of things. We keep the environment relatively stable. We have put in changes that truly will add volume and we closely monitor on a daily basis each and every feasibility that we have to drive the course.

Putting too much change into the environment at this time would probably have the wrong consequence.

MS. SHIPLEY: Seeing that there are no more questions from Staff, I invite folks from the audience if you have questions to step up to the standing mic and just to reiterate, these are clarification questions on what we have been

discussing.

MR. SILVERSTEIN: I am Craig Silverstein and I am here today on behalf of Deseret Power.

Deseret is a transmission customer and also owns resources in the PACE balancing authority just as a little bit of background.

First question I had and maybe I will ask more. We heard a little bit from the EIM and from PacifiCorp on their position on dynamic scheduling using the interties.

My question would be a follow up to CAISO and the question is: Can the CAISO accommodate this type of resource participating through the EIM entities what changes would need to be made to the tariff to the market to your software to accommodate those types of changes.

MR. ROTHLEDER: You said dynamic. I think you meant 15 minute.

MR. SILVERSTEIN: Sorry, yes.

MR. ROTHLEDER: We can support 15 bids schedules and optimization of scheduled interties and we do that currently at our interties.

When you have that capability to support that out at the EIM interties. There are mechanics that have to be coordinated however between the EIM entity

who is still ultimately the approver of the tags and therein lies some of the trickling part of the timing because no longer does a 150 minute, you just do a scheduled change, you just do that based on the tag change and I think the EIM entity already would approve that.

Now interjecting the market into that process, you have to wait for the optimization to come up with a solution and then the market is updating the tag and that goes back out to the EIM or the balancing area for final approval.

It is that sequence that is the one that has to be coordinated to work out and it has to be solid between the EIM, or the market operator and the EIM entity.

MS. EDMONDS: If I can add? I have taken a look at this briefly in terms of to go on the regulatory front, I think some small tariff modifications by PacifiCorp to clarify.

This type of participant, right now, it is fairly limited to physical internal resources or external resources to a pseudo tie, so I think that is probably what we would do, but that would not be probably the least complicated stuff in that process.

MR. SILVERSTEIN: If I could ask one more? This

goes back to Slide 14 to kind of the core solution.

I am not disparaging the solution itself using contingency reserve load following regulation load following as part of the solution. I am just thinking about the discussion of pricing where you price it and put it in the stack and I started thinking, "Does this create a revenue stream? Is there going to be, if it sets the price, or if there are dollars that are exchanged that is creating a revenue stream, and is that duplicative of the revenue stream that in this case, PacifiCorp gets through its cost base rate as an ancillary service in its tariff?

MR. ROTHLEDER: I will give that to Sara. I don't think it is duplicative because in the sense that it is no different from what is happening today when we deploy reserves, they are basically moving the resource, and that resource movement is away from BAA schedule.

That movement away from BAA schedule will be settled at the locational marginal price whatever it is. This doesn't change that and so it doesn't change it to create a new revenue stream.

It just leverages the revenue stream that would already be occurring for any changes from BAA

schedule.

In terms of the interplay between that and the revenue recovery for ancillary services.

MS. EDMONDS: Craig, I am going to have to think about that. I would like a little time to think about that and so that might be an item that we address in our post-Technical Conference.

I suppose it is possible. It depends on the design and what the pricing ultimately is. We don't know that, but that is a detail to be flushed out when ISO provides the proposal, so I continue to consider it. Thank you for the question.

MR. SILVERSTEIN: Thank you, it is a different question than having the resources there. So I appreciate it. Thank you.

MR. MACARTHUR: Clay MacCarthur with Deseret Power. One of the questions I had for PacifiCorp is the discussion that is on Slide 14, the to her capability.

Deseret is a partial owner in one unit that is a nonparticipating resource in the PacifiCorp East balancing authority and is a majority shareholder in another unit and is also nonparticipating.

This to her capability, would jointly owned units, or nonparticipating units, be able to bid into

that or to effectively offer capability into that as well and how do they go about doing that?

MR. ROTHLEDER: This is a detail that has to be worked out. The idea here is that we are not trying to make a nonparticipating resource participate.

But we are trying to recognize to the extent that that nonparticipating resource is a tool to the balancing authority area we should recognize it as the tool that they have available, but it doesn't make it a participating resource.

It is a jointly owned unit, and by the way, a jointly owned unit does create some complication because right now it only the participating portion of jointly owned unit is bidding in you will have to navigate where a portion of it may be bid in as participating and a portion may not be, but only be recognized through this to her capability and gets tooled to the balancing authority area.

MR. MACARTHUR: Thank you.

MS. SHIPLEY: No more questions? Getting shy? I'm shocked! This is a really great chance to ask some questions about this. Come on down!

MR. MACARTHUR: If I may ask a question from the Session 1, if that is all right?

This talks about the Monamirror, and the

Monamirror is a little bit complicated issue, so I may have to take a couple tries at this.

The Monamirror is a modeling technique that is used to allow transfers between the PacifiCorp Eastern balancing authority and the California ISO up until the hour ahead market.

After the hour ahead market that transmission is no longer available and it is, I believe, a simplified explanation would be the state that the end of the PacifiCorp eastern balancing authority, that transfer or any transfer that occurred in the hour ahead market would look like a load to PACE and the to her side looks would like a resource in the California ISO.

My question is: If during the hour ahead market a transfer of what we will say 100 megawatts occurred, and in the subsequent energy and balance market the resource had been supplying that transfer went away and is no longer available and infeasibility was going on to support the eastern balancing authority, how would a price propagation occur from the CAISO back to PacifiCorp work?

MR. ROTHLEDER: I will have to get additional resources in here and fortunately we brought some.

MR. ANGELIS: First of all, I want to make a

correction. It is not really a transfer. The Monamirror is not used for transfers. It is used for matching the ISO that clears the market at that location that happens to be a location within the PacifiCorp East which is also used as a scheduling point for imports and exports into the ISO also in the day ahead markets, so it is existing scheduling point.

The mirror resource, we call it mirror, because it is mirroring the transactions that clear through the ISO market at that location.

It is used as a mechanism to mirror the transaction that we see on the ISO side and we see them on the PacifiCorp side at that location so that we match them in megawatts because the actual energy is not generated at that location.

There is no resource at that location. The actual energy is actually coming from somewhere else either from resources within PacifiCorp East or energy imported into PacifiCorp East from PacifiCorp interties.

By doing this matching we actually have a correct solution for our power flow that models the energy coming all the way through into the ISO.

You are now referring to the situation here

where the energy that is the source that is providing this input into the ISO at that location suffers an outage and the consequence of that is that the tag for that import into the ISO will have to be cut to present the fact that the energy is no longer available.

Also it will be cut on the mirror side because that is also a tag from PacifiCorp, so that is how we have the correct solution that says that the energy is no longer flowing.

Obviously the energy also is going to be cut at the source, either a tag at the import on PacifiCorp or the generator that went out in PacifiCorp East. So that is the mechanics.

MR. MACARTHUR: So it is not treated as firm transfer for a fixed transfer that is held constant through EIM?

MR. ANGELIS: It is held constant in the sense that the mirror does not have a bid, it is a BAA schedule, so a BAA schedule that matches the ISO transaction there and then it is an intertie that is scheduled changing to match BAA to clear the market and in that sense it is first because it is using new transmission used in the ISO.

But you can always cut a tag if the energy is

not going to flow because it is an outage with what you are referring to.

To understand a little bit your question that comes after this you are getting to also some situation in PacifiCorp East and you were asking about pricing indications.

Like every situation where you have a schedule that is cut, particularly for interties, this translates to an operating adjustment.

The operating adjustment is settled at the 5-minute locational market price, so when you have now a shortage you will see the effect of that shortage of the price.

With the current price discovery feature, if PacifiCorp East goes short in balancing, then the price discovery feature will show you the last economic price, the last data that was taken to balance the system after the waiver expires with the solution that is proposed what you will see is the price that will be used for this extra capacity that the proposal was showing here which is used for balancing the control linear of PacifiCorp East out of load following and regulation resources.

That price is the price that they will bid into the market or some administrative price will still

need to work out the details of that solution, so it will be part of, is it the volume?

MS. EDMONDS: Yes.

MR. MACARTHUR: If the waiver was not in effect, and this were to occur today, the price gap would be hit in place of $1,000, even though it may be that local resource bids a lower price next to whoever the load may be in the CAISO could have been dispatched.

My concern is that the Monamirror provides a local optimization rather than a global optimization and it may result in local optimizations.

MR. ANGELIS: There is no data on mirror resource. Is not optimized. It is merely matching whatever clears the market on the to her side of the ISO side.

If the resource that was actually supplying the energy has an outage, that is also a deviation from a schedule, that resource will also see the price whatever that price is because you have an imbalance because of the outage.

MR. MACARTHUR: So they would be paying you the $1,000.

MR. ANGELIS: Yes, because that energy is scheduled and then if you do not produce it you have an imbalance.

But the effect of the mirror of what it does is that you only pay that imbalance once because what happens is you have loss of generation, so you pay for the charge of the energy that you don't produce.

The mirror resource is a load, so you are getting paid for not consuming, and then the ISO transaction shows import that is getting charged, so a charge you see a single charge for the loss of energy.

MR. MACARTHUR: Thank you.

MR. ROTHLEDER: This is a detail that is not really conducive to the type of conference but we are willing further discussions with you offline to make sure that it is well understood.

You bring up the Monamirror. Is it one of the late, but it was one of the more complicated features because the Mona and Gragview are both an ISO scheduling point as well as an EIM -- well, inside of the EIM it is an EIM location but these locations are not for EIM transfers at this point.

So that there is more to grid how to manage this under the ISO settlement as an ISO transaction and not as an EIM transfer.

MR. MACARTHUR: I bring it up because it is a trend. There is a transmission infeasibility, the

pricing implications can be substantial for PACE.

MR. ROTHLEDER: We will commit to having follow up discussions to make sure that both in context of the proposal but just in the context of it now everything is well understood in terms how that settled out.

MS. KING: This is Diana King again with Bracewell & Giuliani on behalf of PowerX Corp with a follow up question on the reference of a little bit earlier this afternoon to the load bias limiter.

I think what I understand to be perhaps some changes in how that affects penalty pricing as part of the going forward process.

I understand, if I am right, that the load bias limiter will prevent penalty pricing from applying, in to her words, if the bias would to herwise cause a penalty price to be imposed that you are going to withhold the penalty price if you find that it was a load bias cause, you are going to change your load bias adjustment to avoid a penalty price result, is that correct?

MR. ROTHLEDER: The way I would characterize it is that it limits the operator adjustment to a level that is reflective of the available movement capability.

The result of that is, yes, that will in and of itself not cause an infeasibility, but if there are to her things that are happening that could cause an infeasibility that could still happen.

MS. KING: What if the opposite is true, if the load bias the operator action would alleviate, would be taken to alleviate a penalty, would you also pull back from that load bias adjustment?

MR. ROTHLEDER: I don't understand the question.

MS. KING: My sense was that if the load adjustment moves you incrementally into a place where you end up to herwise triggering a parameter you will pull back on that load adjustment, do you also take the opposite, will you take the opposite step?

MR. ROTHLEDER: No, and it has to be clear that the adjustment would have to be in the same direction as the infeasibility, so if the direction of the adjustment, let's say, they are adjusting load down and that creates an infeasibility in the upward direction you could still have that infeasibility occur because it is the opposite direction of the adjustment itself.

MR. RISTANOVIC: We are not doing this to control the prices as has been described in these different scenarios where you are having

infeasibility and they are biasing down they are guessing in the right direction, the system is short or the whole forecast is wrong, so we are not correcting for that.

If they are biasing up and the system is a physical scenario where it kicks in, again, only up to the amount they are biasing, that correction is $1,000.

The goal is not to control the prices to avoid price spikes. The goal is to correct errors from the operator guessing that error in the forecast in the system.

MS. KING: Do you propose making those changes through tariff amendments, business practices, or are you still in a load make those decisions.

MR. ROTHLEDER: We think that that is an existing practice and it has already been performed. Years ago roughly that we instituted this, and this is a result of prior observations in the ISO where we were seeing infeasibilities and the result was that, and DMM pointed this out, that those are being driven artificially by operator adjustments that may not be consistent with conditions, but they are just course adjustments and that is when we instituted that approach which basically recognizes that had the

operator been able to be informed about what was available in the system they would not have made that course adjustment to the system to the load.

MS. McKENNA: I just wanted to note in line with what Mark just stated, a lot of this load limit, the load bias limiter, load adjustment limiter, it has got different names, so I think we will come up with a really good acronym on this one too, but that adjustment is an adjustment to the ISO load forecast which ISO uses for purposes of dispatching the system, and as you all know, that is a method that we use in our system constantly and it has been in the our box of tools for a long time.

There is some language already in the BPM that describes the operators will bias the load forecast in order to adjust it based on your understanding of the system conditions are, the load forecast is produced sometimes not the minute you need to use it.

So there are adjustments that you can make this tool that corrects the erroneous adjustments to ensure that it does not unnecessarily spike the price is what we are talking about and it has been in place.

There is language in the BPM that has preexisted this whole process. I would be from that.

We might have to enhance that BPM language to make it more explicit perhaps given the extreme interest there has been on this issue.

But it is not something that requires a tariff amendment and we will be stating that in our comments because it is a load forecast tool. So we do not think we need the tariff amended.

MS. KING: Thank you. This is slightly moving into a different direction, but in DMM's report they talk about, it looks like that the minus 150 offer floor penalty parameter now zero, and I think you do that through the BPM as well, did I read that right? Am I reading this right?

MR. ROTHLEDER: That does not sound right.

MS. SCHAUB: Maybe I should ask you that because on page 5 of the DMM, of the last DMM report, it noted that the minus 150 price floor had been moved to zero and the question is the issues that have been addressed today, address that issue as well. The measures that you are taking will also resolve that issue or do you want to get back on that?

MS. McKENNA: I would just like to clarify this on behalf of the California ISO. I think, Pat, you are referring to the pricing parameter associated with the flexible ranking constraint – –

MR. ROTHLEDER: No. She's talking about oversupply.

MS. McKENNA: Oh, it is different? No, I think she's talking about – –

MR. ROTHLEDER: We will get back to you on that, but I think what it is you are describing – –

MS. McKENNA: Please, if you could give us a moment.

MR. ROTHLEDER: Let me be clear. There are two parameters. There is one that has to do with oversupply condition and the power balance constraint being basically relaxed in the oversupply condition.

In that case similar going to $1,000 you go to a negative $150.

This was not a parameter that was in the tariff, I do not believe, it was more of in the BPM, and as a result of that when we did the pricing discovery we also did price discovery on the oversupply condition as well.

That is why you were placed at zero to discover what the last economic bid is in the oversupply condition.

It could go as low as a negative $150, if there are bids that go at $150, and we have seen that, but it does not go there automatically just because you

relax a constraint.

MS. SCHAUB: I was just wondering if the things that we addressed today would also resolve whatever issue that was meant to address.

MR. ROTHLEDER: We will consider that question. I think we had been mainly talking about upward, but we will think about the question in the context of, "What does the balancing authority have in terms of their toolbox in the oversupply condition that creates a symmetric or parallel solution for that?"

We will take that question back.

Since someone has said it, and we have discussed it, there is the parameter of dealing with a flexible ramp constraint, relaxation, and when we went and implemented the price discovery feature we also had to adjust the parameter used in the pricing run for the flexibility constraint itself because when you have a power balance constraint in feasibility, if you are really trying to discover what the last economic bid price is and you don't want to set it based on a parameter, then we felt it was inappropriate to set in that condition based on the flexible ramping constraint parameters as well.

That is an issue that has been brought up and we have to answer more about that so we can discuss that

more, but that is the way it is implemented.

In implementing that we have identified, that parameter being zero in the pricing run, I would say unintentionally is also being applied even when there is not a power balance constraint relaxation thus trying to discover the last economic.

We are in the process of remedying that in the sense that that parameter should only be zero in the pricing run as it is associated with the power balance constraint relaxation.

If there is not a power balance relaxation in the EIM area, we would agree that the flexible ramping constraint parameter should not be set to zero in that case.

MS. SHIPLEY: Barring anybody diving for the mic, we are done. Let me thank all of you for coming to participate in an extremely helpful back-and-forth dialogue.

It is really appreciated.

We appreciate those of you who have traveled to be here and thanks to those of you who have attended by phone and we hope that you are able to hear everything.

MR. ROTHLEDER: Could we make a closing comment?

MS. SHIPLEY: Absolutely.

MR. ROTHLEDER: We talked the whole day that was largely about this pricing parameter. Let me just reemphasize.

We are talking about a less than 5% of the condition situation. I do not want to lose sight of the fact that the rest of the time that the EIM is working as we expected it to and it is working well.

It is providing value to the EIM and participating entities and the ISO.

I do not want to lose that idea as we kind of continue to resolve these types of issues and evolve the market and ultimately make this really a beneficial tool ultimately for PacifiCorp and any to her future entity.

Thank you for this opportunity to have this discussion.

MS. SHIPLEY: Thank you and that was well said. I can also state on behalf of Staff to say that we do appreciate PacifiCorp being the first mover and taking the brunt of this. We do appreciate your hard work to try to fix this as much as we can.

With that we are concluded.