UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

California Independent System Operator Corporation	**Docket No. ER12-1630**

MOTION OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION FOR EXTENSION OF TIME

I. Introduction

Pursuant to Rules 212 and 2008(a) of the Commission's Rules of Practice and Procedure,[1] the California Independent System Operator Corporation (the ISO)[2] files this motion for an extension of time until May 1, 2013 to implement tariff provisions revising its compensation practices for resources providing regulation pursuant to Order 755.[3] In an order issued on September 20, 2012, the Commission directed that the ISO make its tariff revisions effective on January 1, 2013.[4] The ISO requests an order addressing this motion within 60 days.

As part of its tariff revisions to comply with Order 755, the ISO proposed an effective date of April 9, 2013 to coincide with its spring 2013 market release. The ISO proposed this effective date based on the facts it understood at the time. Since the ISO submitted its tariff revisions, the ISO has rescheduled its market release for spring 2013

[1] 18 C.F.R. §§ 385.212 and 385.2008(a)

[2] The ISO is also sometimes referred to as the CAISO. Capitalized terms not otherwise defined herein have the meanings set forth in Appendix A to the ISO tariff.

[3] *Frequency Regulation Compensation in the Organized Wholesale Power Markets*, 137 FERC ¶ 61,064 (October 2011) (Order 755); rehearing denied 138 FERC ¶ 61,123 (February 2012) (Order 755-A).

[4] *California Independent System Operator Corporation*, 140 FERC ¶ 61,206 (September 2012) (Order on Compliance). Separately, the ISO is filing a request for rehearing of the Order on Compliance. If the Commission grants this motion, the ISO's request for rehearing will be moot.

to May 1, 2013, in part to align the release with the first day of a month for settlement purposes.

The Commission should grant this motion because good cause exists to do so.[5] Based on current internal development efforts and the scheduled delivery of software code from the ISO's external vendors, implementation of Order 755 on January 1, 2013 is not possible. Once this software is delivered, the ISO must conduct testing to ensure the proposed enhancement functions properly. The ISO must also provide market participants with an opportunity to test and validate that their business and market systems are functioning. The ISO's planned market simulation also creates value for and prospective market participants that have the option to participate in the market simulation using a pseudo resource. Finally, once testing and market simulation efforts are complete, the ISO must deploy the Order 755 market design into production. As part of this effort, the ISO must ensure deployment does not create system problems that may otherwise delay its implementation until an even later date. The ISO has submitted a supporting declaration of Dr. Khaled Abdul-Rahman (Abdul-Rahman Declaration) as Attachment A to this motion.

II. Background

A. Order 755

The Commission issued Order 755 in October 2011. Order 755 required all Independent System Operators (ISOs) and Regional Transmission Organizations (RTOs) to compensate resources providing regulation service through (1) a capacity payment that reflects the marginal unit's opportunity costs and (2) a performance payment that reflects the quantity of regulation service actually provided by a resource

[5] 18 C.F.R. § 385.2008(a).

when the resource accurately follows a control signal. In addition, Order 755 required the use of a market-based price rather than an administrative price on which to base performance payments for regulation service. Order 755 did not require a specific methodology for how to determine that market-based price, but instead deferred to ISOs and RTOs to develop the bidding parameters to meet the directives set forth in Order 755.[6] Order 755 directed ISOs and RTOs to file the tariff revisions needed to implement this compensation approach within 120 days of the effective date of Order 755 (*i.e.*, by April 30, 2012) and to implement the compensation approach within 180 days after that (*i.e.*, by October 27, 2012).[7]

B. The ISO's Order 755 Compliance Filing

On April 27, 2012, the ISO timely submitted its Order 755 compliance filing in this proceeding. The ISO requested that the Commission make the tariff revisions contained in the compliance filing effective in the spring of 2013.[8] As discussed in the Order 755 compliance filing, the ISO requested this effective date in order to have sufficient time to complete the design, testing, and market simulation efforts necessary to implement a performance payment for regulation services as required by Order 755. The ISO explained that failure to complete all of these necessary steps would be inconsistent with good utility practice.

The ISO's market design to comply with Order 755 uses a two-part bid structure that requires significant changes to the ISO's market systems. The ISO will establish

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6 Order 755 at P 130.

7 Order 755 at P 201; Order on Compliance at PP 51, 77.

8 Transmittal letter for April 27, 2012 compliance filing at 17 (Order 755 compliance filing).

two separate market clearing prices for regulation capacity and mileage. Under the ISO's proposal, resources that receive regulation capacity awards must also receive a mileage award and vice versa. The ISO must, therefore, consider both capacity and mileage bids in determining the marginal clearing price for both attributes of regulation service. In addition, since a performance payment based on the mileage market clearing price reflects resources' actual movement in response to a control signal, ISO will measure resources actual performance in response to a control signal and deliver this information to its settlement systems. This will require enhancements to the ISO's energy management system.[9] The Order 755 market design also touches multiple internal and external applications.[10]

The ISO stated that when it undertakes an enhancement that affects its market and settlement systems – such as the market enhancement to implement a performance payment for regulation services – sufficient time is required to design, test, and conduct the market simulation for the enhancement.[11] The ISO described the steps it must take as well as its work plan to implement this market enhancement to comply with Order 755 in the spring of 2013.[12] The ISO explained that performing each of these steps in the work schedule was necessary to enable the ISO to implement a

[9] Transmittal letter for Order 755 compliance filing at 18-19.

[10] *Id.*

[11] *Id*. at 19.

[12] *Id*. *See also* Attachment D to transmittal letter for ISO Order 755 compliance filing, Declaration of Janet Morris.

performance payment for regulation services to comply with Order 755 and that "[f]ailure to undertake these steps would not be consistent with good utility practice."[13]

The ISO also explained that it would perform the earlier portion of this work schedule while concurrently preparing nine other market enhancements that it planned to undertake in the fall of 2012. The ISO stated that many of those other market enhancements would require the time and attention of the same ISO and market participant resources dedicated to implement Order 755's directives.[14] The ISO further explained that implementing the Order 755 directives in the spring of 2013 would not prejudice new entrants into the ISO markets and would provide certainty for such new entrants to make necessary resource investments to participate in the ISO's regulation market.[15]

C. The Order on Compliance

On September 20, 2012, the Commission issued its Order on Compliance conditionally accepting the ISO's tariff revisions to comply with Order 755.[16] The Order on Compliance "recogni[zed] that CAISO must implement a number of changes to its business processes and software, among other things, to implement its compliance

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[13] Attachment D to transmittal letter for ISO Order 755 compliance filing, Declaration of Janet Morris at 5-6.

[14] Transmittal letter for Order 755 compliance filing at 20-21.

[15] Transmittal letter for Order 755 compliance filing at 22.

[16] The ISO has submitted the compliance filing required by the Order on Compliance and requested that its Order 755 tariff revisions take effect on May 1, 2013.

filing."[17] Nevertheless, the Order on Compliance granted the ISO only until January 1, 2013 to implement its tariff revisions.[18]

D. The ISO continues to prioritize the implementation of its Order 755 market design

Since making its compliance filing with Order 755, the ISO has continued its work to develop software and system enhancements for this project. And, as stated in the Declaration of Dr. Abdul-Rahman, implementing the Order 755 market design has resulted in the ISO delaying other work.[19]

The ISO is currently in the design and development phases of this project.[20] The ISO expects to receive delivery of software code from its external vendors and complete development efforts for its internal applications in December 2012.[21] The ISO's vendors have informed the ISO that they cannot deliver the software code to implement Order 755 by an earlier date.[22] Upon receipt of the software code, the ISO plans to conduct testing and undertake a market simulation before moving its Order 755 market design into the final deployment implementation phase.[23] Once the ISO has completed this final phase, it plans to promote its software enhancement into production on the 1st day of the following month, or May 1, 2013.[24]

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17 Order on Compliance at PP 51-52, 77.

18 Order on Compliance at P 77.

19 Abdul-Rahman Declaration at 4.

20 *Id*. at 5.

21 *Id.* at 9-10.

22 *Id*. at 9-10.

23 *Id.* at 12-15.

24 *Id*. at 15-16.

III. Argument

A. The ISO cannot implement its Order 755 market design on January 1, 2013.

Based on the schedule for delivery of software code for the ISO's day-ahead and real-time market systems, market quality system, scheduling and infrastructure business rules, and energy management systems, the ISO cannot implement its Order 755 market design on January 1, 2013 in manner consistent with good utility practice. The ISO will not receive this software code or complete its own software development efforts with respect to internal applications until December 2012.[25] As described the Declaration of Dr. Abdul-Rahman, this delivery schedule cannot be accelerated.[26] Once the ISO receives software code from its vendors and completes its enhancements for internally-developed applications, it is imperative that the ISO undertake testing well as other implementation steps prior to promoting this code into production.[27] This is standard practice in connection with deploying new software or changing software in the ISO's market systems.[28]

The ISO tariff requires the ISO to perform its tariff obligations, which include the implementation of market enhancements pursuant to tariff provisions, in accordance with good utility practice.[29] This standard makes implementing Order 755 by January 1,

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[25] Abdul-Rahman Declaration at 5-10.

[26] *Id.* at 8-10.

[27] *Id*. at 4-5 and 10-14.

[28] *Id*. at 12.

[29] *See, e.g.*, ISO tariff section 7.4 ("When the CAISO is exercising Operational Control of the CAISO Controlled Grid, the CAISO and Market Participants shall comply with Good Utility Practice."); ISO tariff section 22.6 ("The CAISO shall engage sufficient staff to perform its obligations under this CAISO Tariff in a satisfactory manner consistent with Good Utility Practice.").

2013 infeasible.[30] To attempt otherwise would require the ISO and market participants to forego all software testing, market simulation or deployment work. Absent that work, the project may face disruption and delays far beyond the effective date the ISO is requesting in this motion.[31] The Commission has provided relief from regulatory directives when compliance is not possible, and the ISO respectfully requests similar relief in this case.[32]

B. All Interested Parties Benefit From a Market Simulation.

Additional good cause exists to grant the ISO's motion for an extension of time because an extension will permit the ISO to conduct a minimum level of testing, including factory acceptance testing, to ensure the designed software meets the requirements of the ISO's Order 755 market design.[33] Once the ISO has completed a minimum level of testing, it plans to initiate a market simulation.[34] Market simulation is a critical part of a release plan. It will allow the ISO, market participants and new entrants to observe the ISO's Order 755 market design function in both structured and unstructured environments.[35]

The ISO's market simulation will allow the market participants to see end-to-end functionality of the ISO's Order 755 market design from bid-to-bill.[36] Market participants

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30 Abdul-Rahman Declaration at 10-11.

31 *Id.*

32 *New York Independent System Operator, Inc.*, 132 FERC ¶ 61,030, at PP 1-14 (2010); *California Independent System Operator Corp.*, 110 FERC ¶ 61,333, at PP 12-15 (2005).

33 Abdul-Rahman Declaration at 11-12.

34 *Id*. at 12-14.

35 *Id*. at 15-16.

36 *Id*.

will be able receive settlements for each trade date in order to validate their internal settlement business process and systems. New entrants will have the ability to use pseudo resources to participate in this market simulation in the same manner as actual resources. Market participants will be able to submit bids for regulation capacity and mileage, review the optimization results of ISO's day-ahead and real-time markets, review the dispatches of energy management system and automatic generation control to these resources, and validate settlement outcomes. Apart from the training opportunities the market simulation provides for both ISO and market participants with existing resources, some market participants also use market simulation as an opportunity to collect data and understand performance and behavior of their proposed projects to help advance the implementation plans for these projects.[37]

Similar to its testing phase, the ISO views completing the market simulation phase as a necessary condition to promoting a complex software enhancement into production.[38] The ISO, therefore, urges the Commission to grant the ISO an extension of time to implement its Order 755 market design.

C. An effective date of May 1, 2013 for the ISO's Order 755 market design will allow the ISO to complete its the phased deployment of software enhancements consistent with good utility practice.

The ISO has two scheduled market releases a year - one in the fall and one in the spring.[39] By scheduling two predictable and staged releases, the ISO can support a larger volume of enhancements while minimizing both technical and financial impacts to

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[37] Abdul-Rahman Declaration at 15-16.

[38] *Id*. at 4-5.

[39] *Id*. at 14.

the ISO and its market participants.[40] Conducting a single market simulation for multiple initiatives brings economies of scale to the testing process itself for both the ISO and its market participants. For example, regression testing covers multiple initiatives that would otherwise need to be repeated for each.[41]

As part of this release plan for software enhancements such as the ISO's Order 755 market design, the ISO implementation process consists of six phases: requirements, design, development, testing, market simulation, and deployment. Although these phases commonly overlap, each is necessary to ensure successful implementation of the market design enhancement.[42]

The ISO will need to complete its deployment implementation phase before moving its Order 755 market design into production. This final phase follows a market simulation that the ISO cannot begin before mid-February.[43] The quality assurance process involved in the deployment implementation phase takes no less than three weeks in the ISO's test and staging environments.[44] It is necessary to minimize the risk of a problem when the ISO moves the new functionality into production.[45] Furthermore, some business process cycles, such as the ISO settlement systems, now require that the ISO implement any new functionality on the 1st day of a given month.[46] For this reason, the ISO is planning a May 1, 2013 release date for its Order 755 design. This is

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40 Abdul-Rahman Declaration at 14-15.

41 *Id*.

42 *Id.* at 4-5.

43 *Id.* at 16-17.

44 *Id*.

45 *Id.*

46 *Id*.

the first day of the month following the date on which the ISO can complete the six phases for implementing its software enhancements in connection with its Order 755 market design.

IV. Conclusion

The ISO respectfully requests that the Commission grant this motion for an extension of time to implement tariff revisions to comply with Order 755 until May 1, 2013. This timeline will permit the ISO to complete the steps necessary to promote this market feature into production consistent with good utility practice.

Respectfully submitted,

By: *<u>/s/ Andrew Ulmer</u>*

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ATTACHMENT A

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

California Independent System Operator Corporation	**)**	**Docket No. ER12-1630**

DECLARATION OF KHALED ABDUL-RAHMAN ON BEHALF OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

I. Introduction

Q. Please state your name and business address.

A. My name is Khaled Abdul-Rahman. My business address is 250 Outcropping Way, Folsom, California 95630.

Q. By whom and in what capacity are you employed?

A. I am employed as Director, Power Systems Technology Development for the California Independent System Operator Corporation (ISO).

Q. Please describe your professional and educational background.

A. I received my Ph.D. in Power Systems in 1993 from the Illinois Institute of Technology (IIT), Chicago, IL. Since then, I have worked in the electric power system industry in the U.S. focusing primarily on large scale optimization software development, and deployment to production systems. My career includes working for different Energy Management System, electricity market, and information technology software vendors, and various consulting companies. Between March 2006 and July 2009, I was employed as the Independent

Principal Consultant for Electricity Markets at Siemens Transmission and Distribution, where my responsibilities included testing and supporting Energy Market Management software and deploying into production the Security Constrained Unit Commitment and Security Constrained Economic Dispatch software used in the new ISO market. In July 2009, I began work as the Principal for Power Systems Technology Architecture and Development for the ISO and, in July 2010, I became the Director of the Power Systems Technology Development group at the ISO. My current responsibilities include design, implementation, testing, deployment, and analyzing results of all market applications for the ISO's day-ahead and real-time markets. I have worked on many projects requiring deep optimization knowledge and full understanding of market design rules.

Q. What is the purpose of your declaration in this proceeding?

A. In my declaration, I explain the current status of the ISO's implementation efforts to comply with Federal Energy Regulatory Commission Order 755, why the delivery schedule for software code from outside vendors makes implementation infeasible on January 1, 2013, the scope and purpose of the ISO's planned market simulation and testing as well as the rationale for why the ISO is requesting to deploy the market enhancements associated with Order 755 on May 1, 2013 as opposed to an earlier date.

II. The ISO is currently devoting significant resources to implement Order 755.

Q. Please provide a brief overview of the ISO's market design to comply with Order 755.

A. In October 2011, the Commission issued Order 755, adopting a final rule for compensation of frequency regulation in organized wholesale power markets. The Commission's final rule requires organized markets to compensate regulation resources based on the actual service provided, including a capacity payment that reflects the marginal unit's opportunity costs and a performance payment that reflects the quantity of regulation service actually provided by a resource when the resource accurately follows a dispatch signal. Order 755 also requires the use of a market-based rather than an administrative price on which to base performance payments.

In the fourth quarter of 2011, the ISO proposed a market design to comply with Order 755. Through a stakeholder process, the ISO refined this design during the first quarter of 2012. This effort culminated with the ISO obtaining approval from its Board of Governors in March 2012 to file tariff revisions to implement the proposed design. The ISO made its tariff filing in April 2012.

The ISO's proposal uses a two-part bid structure. The ISO will establish two separate market clearing prices for regulation capacity and mileage. Under the

ISO's proposal, resources that receive regulation capacity awards must also receive a mileage award and vice versa. The ISO must, therefore, consider both capacity and mileage bids in determining the marginal clearing price for both attributes of regulation service. In addition, since a performance payment based on the mileage market clearing price reflects resources' actual movement in response to a control signal, the ISO must establish a level of expected performance in selecting which resources are awarded regulation capacity and/or regulation mileage. The market-based marginal clearing price for mileage takes into consideration expected performance even though the ISO will only compensate resources for actual performance. The ISO will measure resources actual performance in response to a control signal and deliver this information to its settlement systems. This requires enhancements to the ISO's energy management system. The Order 755 market design also touches multiple internal and external applications. Implementing this design is a significant undertaking and has resulted in the ISO delaying other projects.

Q. Broadly, what steps are necessary to implement the ISO's Order 755 market design?

A. For market design changes requiring software enhancements such as the ISO's Order 755 market design, the ISO implementation process consists of six phases: requirements, design, development, testing, market simulation, and deployment. Each phase is necessary to ensure successful implementation of

the market design enhancement. These phases commonly overlap, but the sequence of necessary steps defines the timeline for completion.

Q. Please describe the current status of the ISO efforts to implement its Order 755 market design.

A. Referring to the six phases identified in my answer to the prior question, the ISO is currently in the design and development phases.

During the second quarter of 2012, the ISO prepared business requirements for its Order 755 market design to explain necessary changes to business practices. The ISO published these requirements for market participant review in June 2012. The ISO has since worked with market participants to answer questions regarding these requirements, which affect both the ISO's and market participants' business practices. During the third quarter, the ISO also completed system requirements specifications for its Order 755 market design to explain necessary changes to market systems.

In addition, the ISO has been working to complete the design phase of this project. The design phase translates the business and system requirements into detailed software design specifications for all impacted applications. During the third quarter of 2012, the ISO completed its development design specification to enhance its market and energy management systems. The ISO also engaged in discussions with its market applications software vendor – Siemens – to assess

design enhancements necessary to the ISO's day-ahead and real-time market systems, market quality system, as well as scheduling infrastructure business rules. Based on the statement of work from the vendor, the ISO contracted for these changes to be delivered in December 2012 for the start of onsite functional testing. This is the earliest possible delivery date provided by the vendor based on the level of effort involved in the development of such requirements.

The ISO engaged in discussions with another software vendor – Ventyx/ABB – to assess design changes to the ISO's energy management system (EMS) that are necessary to record telemetry data from resources providing regulation and deliver that information to the ISO's downstream settlement systems. The ISO also contracted for delivery of these changes in December 2012 based on the vendors' statement of work. Again, this is the earliest possible delivery date based on level of effort identified by the vendors and their available resources to devote the project.

Coincident with these efforts, the ISO has worked on various internal design and development efforts in connection with its Order 755 market design. During the third quarter of 2012, the ISO completed use cases for internally-developed applications and web service schema designs for all integration requirements. Changes to internally-developed applications require over 900 hours of design and development work, which is being conducted in parallel with the vendors'

development activities and include changes to the following internally-developed applications:

- Common Market Results Interface (CMRI) Reports
- Enterprise Data Repository (EDR)
- Integration Services: 13 internal and 10 external services are changing
- Market Validation Tool (MVT) Functionality
- Open Access Same-Time Information System (OASIS) Reports
- Outage Management System (OMS/SLIC) Functionality
- Settlements Functionality
- Application Programming Interfaces (APIs) for CMRI, OASIS, OMS/SLIC, and Settlement systems

The ISO is on-track to complete its development phase for the internally-developed applications in December 2012, in conjunction with the Siemens (market applications) and Ventyx (EMS) deliverables.

To help expedite the change process for the external market participants systems and interfaces that will be affected by the implementation of Order 755, the ISO is also developing an implementation guide, which will be published on or about November 16, 2012, to assist market participants to clearly identify and prepare for these changes in the ISO systems. The implementation guide provides additional details to market participants and interested parties about various aspects of the project. It serves as a reference document containing

timelines and instructions for market participants as well as providing a repository for references to business and technical documentation.

Q. Are there additional steps the ISO can take to accelerate the schedule for these activities?

A. In my opinion, there are no additional means to expedite this project beyond what the ISO has already done. The ISO's release plan is based on two releases per year; one in the fall and one in the spring. The ISO's vendors can only efficiently maintain two code bases, the production-code version and one release in development. Therefore, the coding of software changes for the next release will not begin until the prior release is deployed into production. However, due to the urgent request for the development of the ISO's Order 755 market design, the vendor has built another development-code branch off of the spring 2012 code and started development of the Order 755 market design in parallel with the ISO's fall 2012 planned market release. The fall 2012 release is in its final phases of implementation and will be deployed in December 2012. Once deployed, the Order 755 code branch will be uplifted with the latest software changes from the fall 2012 release to serve as the basis for the next release in the spring of 2013. The ISO's scheduled release plans to promote software into production is a constraining factor in the delivery of the software for the Order 755 market design changes.

Q. When will the ISO commence its testing, simulation and implementation phases?

A. The ISO plans to commence these phases during the fourth quarter of 2012. A necessary step to initiate these phases is the delivery of software code from Siemens, Ventyx, and internal development teams.

III. The delivery schedule for software code precludes implementation of the ISO's Order 755 market design on January 1, 2013.

Q. What is the delivery schedule for software code from Siemens and Ventyx?

A. Siemens has committed to deliver software code in December 2012. Siemens is scheduled to deliver software code for the ISO's day-ahead and real-time market applications on December 17, 2012; for the ISO's market quality system on December 18, 2012; and for the ISO's scheduling and infrastructure business rules system on December 20, 2012. Ventyx has committed to deliver software code for the ISO's EMS on December 14, 2012. From the vendors' perspective, these are the earliest delivery dates to which the vendors can commit. The vendors consider this time line as aggressive for the development of required software changes.

Q. What efforts, if any, has the ISO made to accelerate these delivery dates.

A. I have asked Siemens and Ventyx whether they can accelerate the delivery of software code necessary to enhance the ISO's market system to implement Order 755. Both vendors have explained that the delivery dates in mid-December are the earliest that they can commit to deliver software code under their existing vendor agreements. Both vendors advised the ISO that any attempt to accelerate the dates earlier will have adverse impacts on the solution quality and may ultimately translate into an overall project schedule delay.

Q. Are there additional steps the ISO could take to create incentives for these vendors to accelerate their delivery dates?

A. In my opinion, no. The projects on which Siemens and Ventyx are working on require highly specialized resources that are devoted to this type of work. Siemens and Ventyx have informed me that they have already deployed experienced resources to develop this complex software code change and have committed these resources to the current schedule based on design specifications and their understanding of the complexity to meet the design requirements.

Q. What impact, if any, does this schedule have on implementing the ISO's Order 755 market design on January 1, 2013?

A. Under the ISO's approach to implementing software enhancements, the delivery schedule for software code from Siemens and Ventyx makes implementing the Order 755 on January 1, 2013 infeasible. Once the ISO receives the software code from its vendors, it is imperative that the ISO test the code. Indeed, in light of the scope of changes under this initiative, Siemens has recommended that the ISO undertake at least six weeks of functional and end-to-end testing prior to commencing any market simulation with external market participants. Implementing this software on January 1, 2013 would preclude any such testing, eliminate any simulation for market participants to assess how the ISO's Order 755 market design will function and interact with their own business processes and systems, and preclude any implementation activities to promote this functionality into production. Financial risks to market participants and overall market solution quality caused by insufficient testing of the software is not an acceptable outcome from a software deployment perspective. In my opinion, implementing this software on January 1, 2013 would violate good utility practice.

IV. The ISO proposes to implement its Order 755 market design as part of its spring 2013 release on May 1, 2013.

Q. Please briefly describe the scope of testing that the ISO intends to undertake before conducting a market simulation?

A. The ISO's testing phase will evaluate the completeness and quality of the delivered software solution. The ISO is planning a testing effort which will begin in December and run until April 2013 with functional unit testing, end-to-end and integration testing, regression testing, and performance testing with the combined set of software codes for the spring 2013 release scheduled for May 1, 2013. This testing applies to both enhancements to the ISO's internal applications (such as ISO's master file, enterprise data repository, open access same-time information system, settlements, and market clearing interface) as well as software under development by the ISO's external vendors to enhance market optimization, scheduling infrastructure and business rules as well as the ISO's energy management system. The testing will include factory acceptance testing of software to determine if the software product meets the business and system requirements identified by the ISO during the requirements and design phases as well as how the software performs with the integration of downstream applications, including the ISO's settlement system. This level of testing is standard practice when deploying new software code or changes in any software code.

Q. Does the ISO need to complete all testing before it commences a market simulation?

A. No. The testing phase and market simulation phase can overlap, but the ISO needs to complete a minimum level of functional and integration testing before it commences a market simulation for multiple reasons. The ISO must perform security testing at a minimum and some functional and integration testing. Failure to perform these tests thoroughly prior to market simulation creates unacceptable risks to the project and may result in a market simulation of little value to market participants. We currently expect to initiate a market simulation in February 2013, after the ISO completes a minimum level of functional and integration testing.

Q. What does the ISO plan to achieve through a market simulation?

A. The market simulation phase allows the ISO to demonstrate to market participants the functionality which has been developed as well as allow market participants to test their own required software changes and interfaces with the ISO's systems. The ISO will allow entities that do not have physical resources installed within the ISO's balancing authority area to participate in the market simulation by allowing them to use pseudo resources. This will provide valuable data on how the ISO's Order 755 design functions for entities considering

investments in new resources that may wish to participate in regulation services. Participants in the market simulation will be able to submit bids for regulation capacity and mileage, review the results of the ISO's optimization and dispatch of resources by both the market and EMS systems, and validate settlement outcomes.

The ISO currently plans to hold a market simulation which will begin in early to mid-February 2013 and run through early-mid March 2013 to demonstrate the readiness of the spring 2013 planned release.

Q. What advantages, if any, exist for the ISO to administer a market simulation for its Order 755 market design in concert with other initiatives scheduled for the spring 2013 release?

A. The ISO has two major releases per year for new market functionality. This allows us to manage numerous changes to our processes and the software code in a streamlined and controlled manner. By scheduling two predictable and staged releases, the ISO can support a larger volume of enhancements while minimizing both technical and financial impacts to the ISO and its market participants. Conducting a single market simulation for multiple initiatives brings economies of scale to the testing process itself for both the ISO and its market participants. For example, regression testing covers multiple initiatives that would otherwise need to be repeated for each. The coordination and communication functions required for a market simulation are also streamlined

for the ISO and market participants under this consolidated release model. In any event, the requirement to perform functional and integration testing for the software code would not allow the ISO to initiate a market simulation for Order 755 before early to mid-February 2013.

Q. Please provide a brief overview of the steps involved in the ISO's proposed market simulation?

A. For the first week of the market simulation, the ISO will run structured scenarios, which will allow the market participants to see end-to-end functionality of the ISO's Order 755 market design from bid-to-bill. The ISO will use the second week for un-structured scenarios. Under these scenarios, market participants will receive settlements for each trade date in order to validate their internal settlement business process and systems. During the third week, the ISO will continue to run structured scenarios and hold daily conference calls with market participants to answer questions and discuss issues. The fourth week will allow market participants to participate in unstructured scenarios and again test their business processes and systems. Pseudo resources will have the ability to participate in this market simulation in the same manner as actual resources. Market participants will be able to submit bids for regulation capacity and mileage, review the optimization results of ISO's day-ahead and real-time markets, review the dispatches of energy management system and automatic generation control for their resources, and validate settlement outcomes. Apart from the training opportunities the market simulation provides for both ISO and

market participants on the new market enhancements, some market participants use market simulation as an opportunity to collect data and understand performance and behavior of their proposed projects (pseudo resources) to help advance the implementation plans for these projects.

Q. Once testing and market simulation is done, why can't the ISO implement its Order 755 design?

A. The ISO needs to complete its final step in the implementation phase, which is referred to as the deployment implementation phase. This phase consists of planning to bring the market enhancement from testing and simulation into production. The ISO maintains separate environments for managing software changes: (1) the Live-Track for production emergencies and variances and (2) the Markets and Performance (MAP) Track for long-running initiatives. When MAP Track initiatives are introduced into production, the ISO requests a final code merge between MAP-Track code and the Live-Track code to capture any production changes from break-fixes or normal variance fixes requested on the Live-Track during the testing and market simulation timeframe. The ISO also conducts regression tests against the Live-Track changes. This quality assurance process, which follows functional testing and market simulation, takes no less than three weeks in the ISO's test and staging environments. This due diligence is necessary to minimize the risk of a problem when the ISO moves the new functionality into production. Furthermore, some business process cycles, such as the ISO settlement systems, now require that the ISO implement any

new functionality on the 1st day of a given month. For this reason, the ISO is planning a May 1, 2013 release date for its Order 755 design. This is the first day of the month following the date on which the ISO can complete the six phases for implementing its software enhancements in connection with this initiative.

Q. Does this conclude your declaration?

A. Yes.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct to the best of my knowledge.

Executed on October 19, 2012

/s/ Khaled Abdul-Rahman
Khaled Abdul-Rahman

CERTIFICATE OF SERVICE

I hereby certify that I have served the foregoing document upon all of the parties listed on the official service lists for the above referenced proceedings, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2011).

Dated at Folsom, California this 19th day of October, 2012.

/s/ Jane Ostapovich

Jane Ostapovich