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April 5, 2005

The Honorable Magalie Roman Salas
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Re: California Independent System Operator Corporation,
Docket Nos. ER04-445-005, ER04-445-006, ER04-435-007, ER04-435-
008, ER04-441-004, ER04-441-005, ER04-443-004, and ER04-443-005.
ISO Response to February 25, 2005 Request for Information.**

Dear Secretary Salas:

The California Independent System Operator Corporation ("ISO") respectfully submits an original and six copies of the enclosed letter in response to a letter received on February 25, 2005, from Jamie L. Simler, Director, Division of Tariffs and Market Development - West. Two additional copies of this letter are enclosed to be date-stamped and returned to our messenger. If there are any questions concerning this filing please contact the undersigned.

Sincerely,



Michael Kunselman

Counsel for the California Independent
System Operator Corporation

Enclosures

cc: Edward Ristway, Division of Tariffs and Rates - West

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008, ER04-441-004, ER04-441-005, ER04-443-004, and ER04-443-005.
ISO Response to February 25, 2005 Request for Information.**

Dear Secretary Salas:

On January 5, 2005, in Docket No. ER04-445-006, the California Independent System Operator Corporation ("ISO") submitted for filing its proposed Large Generator Interconnection Procedures ("LGIP"), interconnection study agreements, and related ISO Open Access Transmission Tariff ("OATT") amendments, pursuant to Order Nos. 2003 and 2003-A.¹ Also, on January 5, 2005, in Docket Nos. ER04-445-005, ER04-435-008, ER04-441-004, and ER04-443-004, the ISO, Southern California Edison Company, San Diego Gas & Electric Company, and Pacific Gas and Electric Company ("Filing Parties") jointly filed their proposed Large Generator Interconnection Agreement ("LGIA"). On February 25, 2005, the Federal Energy Regulatory Commission ("Commission" or "FERC") propounded certain questions to the ISO and the Filing Parties with respect to the January 5, 2005 filings. This letter contains the answers of the ISO² and the Filing Parties to the questions posed by the Commission in that letter with respect to the earlier filings. These responses should be considered as an amendment to the explanations provided by the ISO and the Filing Parties concerning the proposed terms of their LGIP and LGIA in their previous filings.

¹ Standardization of Generator Interconnection Agreements and Procedures, Order No. 2003, 68 Fed. Reg. 49,845 (Aug. 19, 2003), FERC Stats. & Regs., Regulations Preambles ¶¶ 31,146 (2003) (Order No. 2003), *order on reh'g*, Order No. 2003-A, 69 Fed. Reg. 15,932 (2004) (Order No. 2003-A), *reh'g pending*; See also Notice Clarifying Compliance Procedures, 106 FERC ¶ 61,009 (2004).

² Capitalized terms not otherwise defined herein shall have the meanings set forth in the Master Definitions Supplement, Appendix A to the ISO Tariff.

However, this filing does not propose any modification to the terms of the LGIP and LGIA themselves. The ISO coordinated with the other Filing Parties in preparing these answers, and the ISO has been authorized to state that the Filing Parties concur that this additional filing answers the questions posed by Commission staff and properly supports the January 5, 2005 compliance filings. A form of notice suitable for publication in the Federal Register, together with a copy of the same notice in electronic format, is provided as Attachment 2 to this letter.

LGIP Section 3.3.3 – Proposed Deliverability Assessment Test

Commission Request

To facilitate the identification of transmission facilities needed to ensure that the full output of a new Generating Facility may be transmitted to load under peak system conditions, ISO proposes that a *Deliverability Assessment Test* be included in the system studies process. The ISO states that the *Deliverability Assessment Test* is similar to the *Interconnection Study* that is prescribed for Order No. 2003 Network Resources.³ According to ISO, the *Deliverability Assessment Test* would *objectively identify the incremental impacts on the grid of a new Interconnection Customer's proposed Generating Facility*. To initiate this new assessment, ISO would conduct a baseline study to establish the deliverability of existing generation facilities. The baseline assessment methodology is expected to take six months to complete.

Under the ISO's current procedures for providing transmission service, an Interconnection Customer may commence commercial operation after fulfilling Reliability Network Upgrade requirements, but is not required to procure transmission capacity to support delivery of its output. In addition, Load Serving Entities do not designate Network Resources to serve their load. Generators can schedule over congested lines and ISO is responsible for relieving this congestion in the real-time market. Under these operating conditions, it is unclear what the starting point would be in the determination of a baseline.

Accordingly, please provide a descriptive account of the steps, resources, and assumptions that the ISO will use in developing a baseline to determine deliverability. In addition, please explain whether the ISO intends to undertake continuous updates or a static approach to the baseline.

ISO Response

In anticipation of FERC approval of the ISO's and the Filing Parties' Order No. 2003 compliance filings, and in response to the California Public Utilities

³ See Order No. 2003 *pro forma* LGIP Section 3.2.2.2, The Network Resource Interconnection Service Study.

Commission (“CPUC”) Resource Adequacy Proceeding,⁴ the ISO is currently performing a comprehensive baseline deliverability study to determine the deliverability of power from existing Generating Units in the ISO Control Area. The ISO requested data at the end of 2004 and began the study at the beginning of 2005. Preliminary results are expected to be available for stakeholder review in May 2005, with the study completed in mid-2005. However, the preliminary results from the study, and resolution of policy issues such as the allocation of deliverability problems within a Generation pocket, could impact this schedule.

Once the CPUC’s Resource Adequacy Proceeding is completed, the ISO will perform an annual baseline deliverability study. A comparable deliverability study will be performed, on an incremental basis, for each proposed new Generating Facility interconnection.

Attachment 1 provides a description of the baseline deliverability study. It describes the steps, resources, and assumptions that the ISO will use in the study.

In summary, the ISO baseline deliverability study is a comprehensive test of every Generating Unit to ensure that there is enough transmission capacity for the power from each Generating Unit to be delivered to the aggregate of load. The deliverability assessment in and of itself, however, will not convey any right to deliver electricity to any specific customer or point of delivery. If a deliverability deficiency is identified, then the deliverability of power from some Generating Units will be reduced. Generating Units that have a “DFAX” (this is a defined term in the enclosed document) of greater than 5% on a facility basis, that is associated with an identified deliverability problem, are considered to be in the same Generation pocket and could be subject to a reduced level of deliverability. A capacity value of a Generating Unit for resource adequacy counting purposes will be discounted based on its level of deliverability. A methodology for allocating limited deliverability capability among existing Generating Units in a Generation pocket has not yet been approved by the CPUC. The ISO has proposed that deliverability limitations on existing Generation can be allocated among multiple Generating Units contributing to the same problem by first giving a lower priority to Generators that elected to not finance transmission upgrades identified in their interconnection studies for deliverability purposes. Then, for Generating Units with the same priority, allocation of deliverability limitations would be based on the incremental flow impact that each Generating Unit would contribute to the problem. The deliverability of power from both existing and new Generating Units that are certified as deliverable would be maintained by the annual baseline analysis to be performed by the ISO and the transmission expansion planning process.

⁴ See California Public Utilities Commission, Order Instituting Rulemaking to Promote Policy and Program Coordination and Integration in Electric Utility Resource Planning, Docket No. R. 04-04-003 (2004).

LGIP Section 3.4.2 and LGIA Article 11.4.1: Economic Test

Commission Request

Currently, Network Upgrade projects which cost more than \$20 million must be approved by the ISO Board. Under its proposed LGIP section 3.4.2, the ISO would review the economic viability of any Network Upgrade project that exceeds the lesser of \$20 million or \$200,000 per MW of installed capacity, to determine whether the overall benefits of the Network Upgrade meet or exceed their costs. The amount of those benefits would be used as a de facto cap on the level of refund credits offered to the Interconnection Customer for funding Network Upgrades. The portion of the Network Upgrades funded by the Interconnection Customer that exceeds the benefits cap would be refunded with FTRs or CRRs, if available. The ISO claims the threshold generally represents an amount likely to have measurable impact on ratepayer costs, from a system-wide perspective.

Please provide an explanation of the criteria and parameters that will be used in the evaluation of benefits in determining whether a network upgrade or an interconnection location is economically justifiable. The ISO should indicate whether it intends to make these criteria and parameters available to all market participants in advance. Also, please explain how the ISO will factor in future changes that could impact the static determination of whether a Network Upgrade is economically justifiable. Furthermore, please explain how CAISO's decision to limit refunds for certain economic upgrades is reasonable, objective, and whether it will encourage infrastructure development.

ISO Response

The ISO's LGIP compliance filing for FERC Order No. 2003 – originally filed over a year ago, in January 2004, and subsequently re-filed twice in response to FERC Order No. 2003-A – outlines in general terms the nature of an economic test for large transmission projects that are necessary for the interconnection of new Generating Facilities at the location determined by the project developer. The test is characterized as a temporary, necessary element of the ISO's transition toward a meaningful Network Resource Interconnection Service. During this interim period before meaningful Network Resource Interconnection Service is in place, an economic test is needed to provide an important check against egregiously expensive projects that would be, under the proposed crediting policy, automatically refunded within five years, making the project developer indifferent to the cost of transmission upgrades. This "cost-benefit check" is particularly necessary now because Generating Unit developers do not now have locational price signals that would help minimize the cost for transmission related to their interconnecting power plant. Without such a test, California ratepayers are at risk for paying excessive costs of Network Upgrades that are not economically justified. The filing also suggests the need for some

flexibility in implementing the economic test due to the evolving development of a specific methodology for the assessment of economic need. The ISO, with the support of the CPUC,⁵ proposes this economic test as a reasonable way to protect consumers while avoiding any delay or imposing unnecessary burdens on new Generating Facility developers.

As discussed below, we believe the economic test is reasonable, necessary, and based on empirically objective criteria, that it will encourage sound transmission infrastructure development in California, and that the Commission accordingly should have no hesitation in approving it.

Since the initial filings in January 2004, the following two significant policy developments have matured, as anticipated: establishment of resource adequacy requirements, and development of an economic methodology for evaluating transmission expansion. First, the state of California, under the auspices of a CPUC rulemaking, the Resource Adequacy Proceeding, has moved closer to implementing by 2006 resource adequacy requirements for load-serving entities. There now exists a near-term timeframe within which a Network Resource Interconnection Service could be created that would include locational price signals for the siting of new Generating Facilities. In addition, transmission upgrade costs associated with new Generating Facility interconnections would be a factor used in determining the cost effectiveness of a load-serving entity contracting with a given Generating Unit to satisfy a resource adequacy requirement.

As stated in the ISO filings, the ISO has always planned to revisit its interconnection policies when a market design is approved and implemented that allows for market-based interactions between forward contracting requirements, locational marginal pricing, and the allocation of financial rights (i.e. Firm Transmission Rights/Congestion Revenue Rights) to influence plant location. Such a reassessment certainly would include examining whether this economic test continues to be necessary.

Second, the ISO has developed and refined an economic methodology for transmission expansion evaluation, called the Transmission Economic Assessment Methodology ("TEAM"), and gained widespread consensus on the methodology among stakeholders and the CPUC. Thus, the ISO is now in a better position to describe the criteria and parameters of cost-benefit analysis of large transmission upgrades.

The TEAM methodology was developed through an extensive two-year public stakeholder process that included public workshops, technical groups,

⁵ See Notice of Intervention and Comments of the Public Utilities Commission of the State of California, Docket Nos. ER04-445-000, *et al.* (Feb. 23, 2004) at 8 ("The CPUC Supports an Economic Test for New Interconnections.")

conference calls, and various meetings. During this public stakeholder process, the ISO expressly provided detailed description of the TEAM and actively solicited stakeholder input, advice and feedback. The goal was to establish a standard approach for rationalizing transmission projects on economic grounds, instead of solely for reliability reasons.

The ISO also utilized the stakeholder process to provide interested parties with exposure to the analytical tools utilized by the ISO to perform the TEAM methodology. These tools include a full-network production cost and market price simulation model that considers proposed projects within a west-wide Western Electricity Coordinating Council ("WECC") approved base case, with consideration of alternative resources such as other comparable competing generation resources, energy efficiency, and demand-side management. Advanced probabilistic models are also developed in TEAM for incorporating risk and uncertainties in future fuel costs, load forecasts, alternative resource development, hydro scenarios, and market competitiveness, and for assessing the impact of these key variables on transmission expansion evaluation.

In summary, the TEAM methodology integrates five key components for defining quantifiable benefits into a single comprehensive analysis to support decisions for transmission upgrades. These five key components are as follows:

1. A benefit framework that consistently measures the benefits of a transmission expansion project to various participants. It provides policy makers with several options or perspectives on the distributional economic impacts of an expansion on consumers, producers, transmission owners or other entities. The benefit framework clearly sets criteria for transmission expansion determination under various perspectives.
2. A network model that captures the actual physical constraints of the transmission grid, as well as the economic impacts of a project.
3. A credible and comprehensive approach for forecasting market prices that incorporate the impact of strategic bidding of suppliers. This allows the benefits of transmission expansion to be not limited solely to reducing the production cost of electricity but also to include consumer benefits from reduced supplier market power.
4. A scientific method for addressing the risk and uncertainty of future market conditions and the impact on transmission expansion benefit. This component factors in future changes that could impact the static determination of whether a project is economically justifiable.
5. A credible approach for capturing the interaction between Generating Facility addition, demand-side management, and transmission investment decisions.

The TEAM methodology was filed with the CPUC on June 2, 2004, and has been available to the public and all market participants since that time. The TEAM criteria and parameters will be updated and refined over time and will be

available to market participants in advance of consideration of proposed projects. Further details on the ISO's TEAM methodology and the stakeholder process that facilitated its development are available at:
<http://www1. caiso.com/docs/2003/03/18/2003031815303519270.html>

TEAM has already been used by the ISO to evaluate one major project presented to the CPUC and is expected to be the standard economic methodology that will be used in justifying future economic transmission projects before the CPUC. By achieving this level of acceptance for the economic justification of projects, especially by the key state regulatory body responsible for the siting of transmission projects, the ISO firmly believes that many improvements to California's electricity infrastructure, including the transmission upgrades needed for new Generating Facilities, will find easier regulatory approval and more streamlined construction schedules.

The parameters for TEAM allow for some flexibility in the identification of benefits. For example, different types of economic analysis that could reasonably demonstrate the benefits of a Generation project and its transmission upgrades, within the parameters described above, or analysis focused upon only one of these parameters, would be acceptable for the economic test. In fact, for most network upgrades attributable to Generation projects being studied within the ISO's interconnection queue, the ISO may utilize a scaled down version of the TEAM analysis (e.g., production cost analysis) to determine if the benefits are substantial enough to offset the transmission costs. This would help expedite application of the economic test, which, under the ISO's LGIP, would be conducted concurrently with other ISO technical reviews and, in most cases, should add no additional time to the interconnection study process. A scaled-down version of the TEAM analysis may be used, as appropriate, to confirm a sufficient level of benefits for a full refund— if the benefits are estimated to be insufficient for a full refund, a complete TEAM analysis would be performed.

The point is that the economic test is to be used only to screen the highest-cost transmission upgrade projects that have been proposed, under the current situation, with no consideration for the cost to ratepayers. The economic test is not intended to block or hinder worthy Generation projects, nor will it have any such effect.

In light of the potential for large consumer impacts under California's current market structure, the ISO believes that it is reasonable and necessary to allow the ISO flexibility to check for benefits that would justify a project, or for project developers to propose analyses that confirm economic benefits, as long as those benefits are within the five parameters described above.

ISO OATT Section 5.7.5.1: Maintenance of Encumbrances

Commission Request

Currently, section 5.7.5.1 of the ISO's OATT provides for the identification and mitigation of a new interconnection's adverse effect on the ability of the Interconnecting PTO to honor its Encumbrances existing when the interconnection is requested.⁶

In its transmittal letter, ISO states that it has deleted much of its OATT Section 5.7, which addresses Generator Interconnections, and is replaced by the LGIP. While the LGIP, as proposed by the ISO, requires coordination with Affected System Operators to determine the potential impact of a new interconnection project,⁷ nothing in the LGIP appears to specifically require the PTO or the Interconnection Customer to mitigate any adverse effect on its Encumbrances. The ISO should explain why it has removed this provision from its OATT, and how the maintenance of Encumbrances would be provided, or why the commitment is no longer necessary, under the proposed revisions.

ISO Response

When the Commission accepted Amendment No. 39 to the ISO Tariff, which added Section 5.7, including ISO Tariff Section 5.7.5.1, it did so only conditionally, pending the issuance of the Commission's final rule and *pro forma* LGIP. The ISO understood the Commission's intention in its conditional acceptance to be that the *pro forma* LGIP, adopted by the Commission in Order No. 2003, would displace the operative provisions of Amendment No. 39, including Section 5.7.5.1, in their entirety. Thus, the ISO in its January 5, 2005 compliance filing proposed the deletion of Section 5.7.5.1 along with all the other operative provisions of Section 5.7 on the understanding that these provisions are to be replaced by the LGIP.

Based on the fact that the Commission did not incorporate a provision similar to Section 5.7.5.1 in its *pro forma* LGIP, the ISO presumed the Commission did not

⁶ The ISO's OATT definition of Encumbrance: A legal restriction or covenant binding on a Participating TO that affects the operation of any transmission lines or associated facilities and which the ISO needs to take into account in exercising Operational Control over such transmission lines or associated facilities if the Participating TO is not to risk incurring significant liability. Encumbrances shall include Existing Contracts and may include (1) other legal restrictions or covenants meeting the definition of Encumbrance and arising under other arrangements entered into before the ISO Operations Date, if any; and (2) legal restrictions or covenants meeting the definition of Encumbrance and arising under a contract or other arrangement entered into after the ISO Operations Date. See Master Definition Supplement, Appendix A to the ISO Tariff.

⁷ See ISO proposed LGIP Section 3.

consider such a provision to be appropriate; thus the ISO did not propose to add such a provision to the ISO's filed version of the LGIP, and proposed to delete the conditionally approved language of Section 5.7 of the ISO Tariff. However, the ISO has no objection to adding a provision similar to ISO Tariff Section 5.7.5.1 to the ISO's version of the LGIP if ordered by the Commission as part of a further compliance filing. In fact, the ISO would consider the addition of a provision requiring Interconnection Customers to mitigate adverse effects on existing Encumbrances to be a very useful clarification with respect to the ISO's administration of the relationship between these different aspects of the operation of the electric system. If the Commission believes that this is the most appropriate solution, then the ISO would propose that the substance of the provisions of Section 5.7.5.1 be added to the LGIP as an additional provision (Section 2.5) regarding the "Scope and Application" of the LGIP. Of course, a number of editorial revisions would need to be made to the existing provisions in order to conform them to the terminology used by the Commission in the *pro forma* LGIP.

Proposed LGIA Article 11.6: Compensation for Service Pursuant to Reactive Power and during Emergency Conditions

Commission Request

The Filing Parties propose that if the ISO requests or directs the Interconnection Customer to provide a service pursuant to reactive power or Emergency Conditions, the Interconnection Customer will be compensated in accordance with the ISO Tariff. However, the Filing Parties have failed to cite to the appropriate sections of the OATT which outline the parameters for compensation. The ISO should coordinate with the Filing Parties to cite the specific sections of the ISO OATT that provide compensation for these services, and explain how the relevant OATT sections are consistent with Order Nos. 2003 and 2003-A, for compensating the Interconnection Customer.

ISO Response

The FERC Order Nos. 2003 and 2003-A *pro forma* LGIA requires that an Interconnection Customer design its Generating Facility to maintain a composite power delivery at continuous rated power output at a certain power factor range (power factor design criteria). Once the Interconnection Customer has synchronized the facility to the system, the Interconnection Customer is required to operate the facility to produce or absorb reactive power within the design limitations of the specified power factor design criteria. The "Transmission Provider" is required to pay the Interconnection Customer for reactive power that the Interconnection Customer provides or absorbs from the facility when the Transmission Provider requests the Interconnection Customer to operate its facility outside the power factor design criteria range, provided that if the Transmission Provider pays its own or affiliated generators for reactive power

service within the specified range, it must also pay the Interconnection Customer. Payments are to be made pursuant to Article 11.6 (Interconnection Customer Compensation), or such other agreement to which the Parties have otherwise agreed. Article 11.6 provides that, if the Transmission Provider requests or directs the Interconnection Customer to provide a service (i.e., operate outside the specified power factor design criteria range) during a non-Emergency Condition or an Emergency Condition, the Transmission Provider will compensate the Interconnection Customer in accordance with the Interconnection Customer's applicable rate schedule then in effect unless the provision of such service(s) is subject to an RTO or ISO FERC-approved rate schedule [emphasis added].

In their January 5, 2005 compliance filing, the Filing Parties have made certain revisions to the FERC Order Nos. 2003 and 2003-A *pro forma* LGIA language. In particular, Article 11.6 has been revised to provide that, "...the ISO shall compensate the Interconnection Customer in accordance with the ISO Tariff." (The language in the compliance filing is not specific as to the applicable sections of the ISO Tariff.) FERC has asked the Filing Parties to "cite the specific sections of the ISO OATT that provide compensation for these services, and explain how the relevant OATT sections are consistent with Order Nos. 2003 and 2003-A, for compensating the Interconnection Customer."

The terms of the ISO OATT concerning reactive power are consistent with the provisions of FERC Order Nos. 2003 and 2003-A concerning payment to Interconnection Customers for the provision of reactive power. Provided below is a discussion of the applicable sections of the ISO OATT, and how these sections are consistent with FERC Order Nos. 2003 and 2003-A. This answer also describes the specific sections of the OATT that provide for compensation and the formula for calculating such compensation.

Under Section 2.5.3.4 of the ISO Tariff, Generating Units are required to maintain an ISO-specified schedule voltage at the point of interconnection as specified in their interconnection agreement or other applicable ISO agreements. For Generating Units that do not operate under one of these agreements, Section 2.5.3.4 of the ISO Tariff states that it is expected that the Generating Unit will maintain a power factor within a band of .90 lag (producing VARS) and .95 lead (absorbing VARS). Assuming that the Generating Unit meets these ISO Tariff requirements, no compensation would be provided for any reactive power provided to or absorbed from the ISO grid. The ISO treats all Generating Units the same: i.e., no Generating Units are compensated for the provision of reactive power service when operated within the specified power factor design criteria range. This treatment of reactive power provided from operation within the specified power factor design criteria range is consistent with the provisions of FERC Orders Nos. 2003 and 2003-A.

Regarding compensation to Generating Units for operation outside of the specified power factor design criteria range, Section 2.5.18 of the ISO Tariff states that, "...any Participating Generator who is producing Energy shall, upon the ISO's specific request, provide reactive energy output outside the Participating Generator's Voltage Support obligation defined in Section 2.5.3.4." Section 2.5.18 goes on to state, "The ISO shall pay to the Scheduling Coordinator for that Participating Generator the opportunity cost of reducing Energy output to enable reactive energy production. This opportunity cost shall be $\text{Max}\{0, \text{Zonal Settlement Interval Ex Post Price} - \text{Generating Unit bid price}\} \times \text{reduction in Energy output (MW)}$." Because Section 2.5.18 of the ISO Tariff, which constitutes a "FERC-approved rate schedule," specifically provides for compensation for reactive power derived from operation outside of the specified power factor design criteria range (during a non-Emergency Condition or an Emergency Condition), the Filing Parties' removal from Section 11.6 in their compliance filing of the reference to "Interconnection Customers' rate schedules" is fully consistent with Order Nos. 2003 and 2003-A. Thus, the Filing Parties' overall proposal for treatment of reactive power provided from operation outside the specified power factor design criteria range is consistent with the provisions of FERC Orders Nos. 2003 and 2003-A.

The Filing Parties note that an issue was raised earlier in this proceeding concerning the fact that there is no current compensation for any "fixed cost" of providing reactive power under the ISO Tariff. However, Order Nos. 2003 through 2003-B do not require such compensation. FERC Order Nos. 2003 and 2003-A do not specify a particular compensation mechanism for reactive power. In fact, the Commission explicitly refrained from doing so. See Order No. 2003-B at P 120 ("We also clarify that Order No. 2003-A does not prejudge how the Interconnection Customer is to be compensated for providing reactive power."). If the Commission completes an inquiry into the issue of reactive power compensation in another proceeding and concludes that compensation different from that currently specified in the ISO Tariff is warranted, the ISO Tariff could be amended as necessary.

Respectfully Submitted,



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**Additional Information Regarding
LGIP Section 3.3.3 – Proposed Deliverability Assessment Test**

**Generation and Import Deliverability to the Aggregate of Load
(Baseline) Study Methodology
Executive Summary**

Deliverability is an essential element of any resource adequacy requirement. Specifically, Load Serving Entities (LSEs) must be able to show that the supplies they intend to procure to meet their load requirements can be delivered to load when needed. Otherwise, such resources are of little, if any, value for the purposes of resource adequacy.

An effective deliverability assessment is essential in resource plans so that the LSEs will be able to “count” their resources to determine whether they satisfy the Commission’s planning reserve margin. Draft 1 of this paper was the focus of a six-hour meeting and a two-hour conference call involving approximately 30 participants, as well as written comments from eight participants as of April 5th, 2004. The current version of this paper is the result of much stakeholder discussion.

The complete deliverability proposal consists of three assessments: Deliverability of Generation to the Aggregate of Load, Deliverability of Imports, and Deliverability to Load Within Transmission Constrained Areas. Each of these tests would be required for the overall deliverability methodology to ensure that resources procured by LSE’s would be deliverable to load. CPUC Decision 04-10-035, requested that the CAISO serve an updated description of the proposed generation and import deliverability to the aggregate of load (Baseline) study methodology, its data requirements, and a schedule for the analysis. Therefore, this paper focuses on the Deliverability of Generation and Imports to the Aggregate of Load portions of the methodology. An implementation of only the generation and import deliverability tests would be an incomplete implementation of the deliverability methodology, and would not adequately ensure deliverability of resources to load.

A. Deliverability Of Generation To The Aggregate Of Load

As part of developing its proposal to comply with FERC's Order No. 2003 regarding the interconnection of new generating facilities, the ISO developed and proposed to FERC a “deliverability” test (but not a requirement). The purpose was to begin to assess the deliverability of new generation to serve load on the ISO’s system. Recent experience indicates that while California has added needed new generating capacity to the system over the past few years, not all of

that capacity is deliverable to load on the system because of the presence of transmission constraints. Therefore, although not requiring all new generation to be deliverable, the ISO proposed in its Order 2003 compliance filing to assess deliverability so that the sponsors of new generation projects can accurately assess their ability to deliver the output of the new plants to the aggregate of load for resource adequacy counting purposes. This first assessment reflects the deliverability test and the baseline analysis envisioned by the ISO to be conducted as part of this interconnection process.

The ISO recommends that a generating facility deliverability assessment be performed to determine the generating facility's ability to deliver its energy to load on the ISO Controlled Grid under peak load conditions. Such a deliverability assessment will provide necessary information regarding the level of deliverability of such resources with and without Network Upgrades (i.e., major transmission facilities), and thus provide information regarding the required Network Upgrades to enable the generating facility to deliver its full output to load on the ISO Controlled Grid based on specified study assumptions. That is, a generating facility's interconnection should be studied with the ISO Controlled Grid at peak load, under a variety of severely stressed conditions to determine whether, with the generating facility at full output, the aggregate of generation in the local area can be delivered to the aggregate of load on the ISO Controlled Grid, consistent with the ISO's reliability criteria and procedures. (This definition for deliverability comes from the FERC interconnection order, and this methodology for assessing deliverability has been developed from consultation with PJM officials about their already-established practices.)

In addition, the ISO recommends, based on guidance in FERC Order 2003, that the deliverability of a new resource should be assessed on the same basis as all other existing resources interconnected to the ISO Controlled Grid.

Because a deliverability assessment will focus on the deliverability of generation capacity when the need for capacity is the greatest (*i.e.* peak load conditions), it will not ensure that a particular generation facility will not experience congestion during other operating periods. Therefore, other information (*i.e.* congestion cost analysis for all hours of the year) would be required in addition to the deliverability assessment to evaluate the congestion cost risk of energy purchase agreements, such as a take-or-pay contract with a particular generation facility.

Section I, Generator Deliverability Assessment, contains the technical details of this proposed methodology.

B. Deliverability of Imports

California is now, and will likely remain, dependent on imports to satisfy its energy and resource requirements. Therefore, it is likely that as part of fulfilling their obligation to procure sufficient resources (reserves) in the forward market to

serve their respective loads, the IOUs will contract with out-of-state resources. This is appropriate and necessary.

The ability to rely on imports to satisfy reserve requirements is entirely dependent on the *deliverability* of such out-of-state resources to and from the intertie points between the ISO's system and the neighboring systems. While the existing system may be able to satisfy the procurement plans of any one LSE, it likely will not be able to transmit the sum of LSEs' needs. Each LSE may well plan to rely on the same potentially constrained transmission paths to deliver their out-of-state resources. Therefore, the transmission system should be checked to make sure that simultaneous imports can be accommodated.

When relying on imports to serve load, each LSE should be required to ensure that they have assessed the deliverability of such resources from the tie point to load on the ISO's system.

At the CPUC's April 12-13, 2004 Deliverability Workshop, an action item was assigned to the California ISO. As requested, the ISO coordinated a detailed technical discussion and development of a proposal for establishing the total import capacity, for each import path, to be allocated to Load Serving Entities (LSEs) for resource adequacy planning purposes. This proposed approach was presented at the Deliverability Workshop on May 5, 2004.

Transmission constraints can impact the simultaneous deliverability of imports and internal generation. As a result, the interaction between the deliverability of imports and the deliverability of generation needs to be examined. The proposed generation deliverability assessment includes, as an input assumption, the amount of imports and existing transmission contract related encumbrances electrically flowing over the ISO Controlled Grid.

Whatever import capacity is available to LSEs for resource adequacy planning purposes should also be the basis for the import assumptions in the internal generation deliverability analysis. Workshop participants proposed that historical import information should be the basis for determining the initial amount of import levels to be allocated to LSEs. In addition to using historical data, existing transmission contract (ETCs) information should also be utilized. It is assumed that the entities that have contracted for the transmission capacity are already relying on this import capability in their resource plans, so this transmission should not be reallocated.

The impact of these total import levels would likely affect the deliverability of some existing generation, and the interplay between the deliverability of these existing generators and imports needs to be addressed during the generation deliverability analysis. If the deliverability analysis determines that the initial import level assumption is reducing the deliverability of internal ISO grid generation, then the initial import levels would be reduced and the deliverability

analysis would be re-run. Although it is not anticipated that import levels would have to be reduced significantly from their initial level based on historical data, this issue may need to be reassessed after the analysis is completed. One of the key benefits of this proposed approach is that a clear deliverability benchmark would be established up front, it would be the starting point for future years, and LSEs would have some flexibility within this structure to adjust their resource adequacy plans to find an appropriate balance between imports and existing generation inside California.

Section II, Deliverability of Imports Assessment, contains the technical details of the deliverability of imports study methodology developed by the subgroup.

C. Summary

Several entities reviewing the “Strawperson” proposal questioned how the ISO might tie together these three suggested “buckets” of Deliverability, and when individual resources might be determined or categorized as “deliverable” based on these proposed tests.

The Generation Deliverability Assessment would be performed in the annual baseline analysis and in every new System Impact Study as part of the generation interconnection process. Resources that pass the deliverability assessment could be counted to meet reserve margin requirements and resources that don't pass could not.

Total import capacity to be allocated for resource adequacy purposes would be an input to the generation deliverability assessments. The deliverability of the total import capacity would be assessed during the initial and annual baseline analyses. LSE's could propose additional imports in their long-term resource plans beyond the amounts allocated and these additional imports would be tested using the generator deliverability methodology to ensure that the additional imports do not impact the deliverability of generation that has already passed the generation deliverability test. Once the resource plans are approved, the import assumptions for future generation deliverability assessment would be updated as needed.

The Deliverability to Load test would be performed so that the results would be available during the development of the *long term* resource plans. Solutions for resolving resource deficient load pockets could include the construction of resources needed to meet reserve margin requirements but located in the deficient load pocket to mitigate the deliverability to load deficiency. The construction of resources within the load pocket could be by any developer of generation—a procurement contract with that new generator should ensure that it is actually built.

Section I

Generator Deliverability Assessment

1.0 Introduction

A generator deliverability test is applied to ensure that capacity is not "bottled" from a resource adequacy perspective. This would require that each electrical area be able to accommodate the full output of all of its capacity resources and export, at a minimum, whatever power is not consumed by local loads during periods of peak system load.

Export capabilities at lower load levels can affect the economics of both the system and area generation, but generally they do not affect resource adequacy. Therefore, export capabilities at lower system load levels are not assessed in this deliverability test procedure.

Deliverability, from the perspective of individual generator resources, ensures that, under normal transmission system conditions, if capacity resources are available and called on, their ability to provide energy to the system at peak load will not be limited by the dispatch of other capacity resources in the vicinity. This test does not guarantee that a given resource will be chosen to produce energy at any given system load condition. Rather, its purpose is to demonstrate that the installed capacity in any electrical area can be run simultaneously, at peak load, and that the excess energy above load in that electrical area can be exported to the remainder of the control area, subject to contingency testing.

In short, the test ensures that bottled capacity conditions will not exist at peak load, limiting the availability and usefulness of capacity resources for meeting resource adequacy requirements.

In actual operating conditions energy-only resources may displace capacity resources in the economic dispatch that serves load. This test would demonstrate that the existing and proposed certified capacity in any given electrical area could simultaneously deliver full energy output to the control area.

The electrical regions, from which generation must be deliverable, range from individual buses to all of the generation in the vicinity of the generator under study. The premise of the test is that all capacity in the vicinity of the generator under study is required, hence the remainder of the system is experiencing a significant reduction in available capacity. However, since localized capacity deficiencies should be tested when evaluating deliverability from the load perspective, the dispatch pattern in the remainder of the system is appropriately distributed as proposed in Table 1.

Failure of the generator deliverability test when evaluating a new resource in the System Impact Study brings about the following possible consequences. If the addition of the resource will cause a deliverability deficiency then the resource should not be fully counted towards resource adequacy reserve requirements until transmission system upgrades are completed to correct the deficiency.

A generator that meets this deliverability test may still experience substantial congestion in the local area. To adequately analyze the potential for congestion, various stressed conditions (i.e., besides the system peak load conditions) will be studied as part of the overall System Impact Study for the new generation project. Depending on the results of these other studies, a new generator may wish to fund transmission reinforcements beyond those needed to pass the deliverability test to further mitigate potential congestion—or relocate to a less congested location.

The procedure proposed for testing generator deliverability follows.

2.0 Study Objectives

The goal of the proposed ISO Generator deliverability study methodology is to determine if the aggregate of generators in a given area can be simultaneously transferred to the remainder of ISO Control Area. Any generators requesting interconnection to the ISO Controlled Grid will be analyzed for “deliverability” in order to establish the amount of deliverable capacity to be associated with the resource.

The ISO deliverability test methodology is designed to ensure that facility enhancements and cost responsibilities can be identified in a fair and nondiscriminatory manner.

3.0 Baseline analysis

Deliverability Test Validation: This procedure was derived from the deliverability test procedure currently used by PJM. Adaptations to the PJM procedure were necessary due to the considerable physical differences between the PJM system and the ISO-Controlled Grid. During the initial implementation of this procedure, it will be tested, and evaluated on existing resources to ensure that the results are reasonable, equitable, and consistent with engineering judgment. Stakeholders will review the results of this validation process. The deliverability test procedure will be refined as needed.

In order to ensure that existing resources can pass this deliverability assessment, an annual baseline analysis, with the most up-to-date system parameters, must first be performed by applying the same methodology described below on the existing transmission system and existing resources. Identified deliverability problems associated with generation that exist prior to the implementation of this deliverability test may be mitigated by transmission expansion projects if the capacity is needed and/or the project is economically justifiable. Deliverability limitations on currently existing generation can be allocated among multiple generators contributing to the same problem by first giving a lower priority to generation that elected to not finance transmission upgrades identified in their interconnection study for deliverability purposes. Then, for units with the same priority, allocation of deliverability limitations would be based on the incremental flow impact that each generator would contribute to the problem. The deliverability of both

existing and new generators that are certified as deliverable would be maintained by the annual baseline analysis and the transmission expansion planning process.

4.0 General Procedures and Assumptions

Step 1: Build an initial powerflow base case modeling ISO resources as shown in Table 1. This base case will be used for two purposes: (1) it will be analyzed using a DC transfer capability/contingency analysis tool to screen for potential deliverability problems, (2) it will be used to verify the problems identified during the screening test, using an AC power flow analysis tool. All new generation applicants in the interconnection queue ahead of the unit under study are set at 0 MW (but available to be turned on for the screening analysis but not for the AC power flow analysis). Unused Existing Transmission Contracts (ETC's) crossing control area boundaries will also be modeled as zero MW injections at the tie point, but available to be turned on at remaining contract amounts for screening analysis. Then the capacity resource units in the queue electrically closest to the unit being studied are turned on at 90% of Dependable Capacity until the net ISO Control Area interchange equals the interchange target (see deliverability of imports section). Generation applicants after the queue position under study are not modeled in the analysis.

Step 2: Using the screening tool, the ISO transmission system is essentially analyzed facility by facility to determine if normal or contingency overloads can occur. For each analyzed facility, an electrical circle is drawn which includes all units (including unused ETC injections) that have 5% or greater distribution factor (DFAX) on the facility being analyzed. Then load flow simulations are performed, which study the worst-case combination of generator output within each 5% DFAX circle. The 5% DFAX circle can also be referred to as the Study Area for the particular facility being analyzed.

Step 3: Using an AC power flow analysis tool and post processing software, verify and refine the analysis of the overload scenarios identified in the screening analysis.

The outputs of capacity units in the 5% circle are increased starting with units with the largest impact on the transmission facility. No more than twenty¹ units are increased to their maximum output. In addition, no more than 1500 MW of generation is increased. All remaining generation within the Control Area is proportionally displaced, to maintain a load and resource balance. The number of units to be increased within a local area is limited because the likelihood of all of the units within a local area being available at the same time becomes smaller as the number of units in the local area increases. The amount of generation increased also needs to be limited because decreasing the remaining generation can cause problems that are more closely related to a deficiency in local generation rather than a generation deliverability problem.

¹ The cumulative availability of twenty units with a 7.5% forced outage rate would be 21%--the ISO proposes that this is a reasonable cutoff that should be consistently applied in the analysis of large study areas with more than 20 units. Hydro units that are operated on a coordinated basis because of the hydrological dependencies should be moved together, even if some of the units are outside the study area, and could result in moving more than 20 units.

For Study Areas where the 20 units with the highest impact on the facility can be increased more than 1500 MW, the impact of the remaining amount of generation to be increased will be considered using a Facility Loading Adder. The Facility Loading Adder is calculated by taking the remaining MW amount available from the 20 units with the highest impact times the DFAX for each unit. An equivalent MW amount of generation with negative DFAXs will also be included in the Facility Loading Adder, up to 20 units. Negative Facility Loading Adders should be set to zero.

Step 4: Verified overloaded facilities with a DFAX from the new unit greater than 5% would need to be mitigated for the new unit to pass the deliverability test.

Table 1: Resource Dispatch Assumptions

Resource Type	Base Case Dispatch	Available to Selectively Increase Output for Worst-Case Dispatch?	Available to Scale Down Output Proportionally with all Control Area Capacity Resources?
Certified Capacity Resources*	Lesser of 90% of Summer Peak Dependable Capacity or Summer Peak Qualified Capacity	Y	Y
Energy Resources*	Minimum commitment and dispatch to balance load and maintain expected imports	N	Y
Imports	As determined in deliverability of imports section		
Load			
<ul style="list-style-type: none"> • Non-pump load 	90% to 100% of maximum load.	N	N
<ul style="list-style-type: none"> • Pump load 	Within expected range for Summer peak load hours**.	N	N

* The initial baseline analysis would identify the initial set of Certified Capacity Resources and Energy Resources. See section 3.0 Baseline analysis.

** Summer peak load hours are the 50 to 100 hours in the months of August and September when Control Area load is between 90% and 100% of maximum annual load.

Distribution Factor (DFAX)

Percentage of a particular generation unit's incremental increase in output that flows on a particular transmission line or transformer when the displaced generation is spread proportionally, across all dispatched resources "available to scale down output proportionally with all control area capacity resources in the Control Area", shown in Table 1. *Generation units are scaled down in proportion to the dispatch level of the unit.*

G-1 Sensitivity

A single generator may be modeled off-line entirely to represent a forced outage of that unit. This is consistent with the ISO Grid Planning Standards that analyze a single transmission circuit outage with one generator already out of service and system adjusted as a NERC level B contingency. System adjustments could include increasing generation outside the study area. The number of generators increased outside the study area should not exceed the number of generators increased inside the study area.

Municipal Units

Treat like all other Capacity Resources unless existing system analysis identifies problems.

Energy Resources

If it is necessary to dispatch Energy Resources to balance load and maintain expected import levels, these units should not contribute to any facility overloads with a DFAX of greater than 5%. Energy Resource units should also not mitigate any overloads with a DFAX of greater than 5%.

WECC Path Ratings

All WECC Path ratings (e.g. Path 15 and Path 26) must be observed during the deliverability test.

P_{max}* DFAX Impact

Generators that have a $(DFAX * \text{Generation Capacity}) > 5\%$ of applicable facility rating or OTC will also be included in the Study Area.

Section II

Deliverability of Imports Assessment

Background

At the CPUC's April 12-13, 2004 Deliverability Workshop, an action item was assigned to the California ISO. As requested, the ISO coordinated a detailed technical discussion and development of a proposal for establishing the total import capacity, for each import path, to be allocated to Load Serving Entities (LSEs) for resource adequacy planning purposes. This proposed approach was presented at the Deliverability Workshop on May 5, 2004.

Transmission constraints can impact the simultaneous deliverability of imports and internal generation. As a result, the interaction between the deliverability of imports and the deliverability of generation needs to be examined. The proposed generation deliverability assessment includes, as an input assumption, the amount of imports and existing transmission contract related encumbrances electrically flowing over the ISO Controlled Grid.

One of the observations from the Workshop was that LSEs needed to have results of the deliverability assessments in advance of submitting their resource plans to the CPUC for the year-ahead review. The generation deliverability assessment would provide results in advance. However, the deliverability of imports assessment initially described was an after-the-fact review of all of the LSE resource plans combined.

Because of the need for up-front information the ALJ assigned the ISO to lead a smaller group of Workshop participants to develop a methodology for determining the total amount of import capacity, by import path, which could be available to LSEs.¹ This document describes a proposal for a methodology developed by the subgroup.

Discussion of Proposed Approach

Whatever import capacity is available to LSEs for resource adequacy planning purposes should also be the basis for the import assumptions in the internal generation deliverability analysis. Because of the interaction between the deliverability of imports and the deliverability of internal generation, one should not simply determine the maximum import capability under favorable conditions and make that import capability available to LSEs for developing their resource plans. This approach assumes that all the import capability is needed and will be used for resource adequacy planning purposes, an assumption that could result

¹ Determining a methodology for allocating import capability to LSEs was not an assignment of this working group.

in impairment of deliverability of internal generation. (This would be inconsistent with the consensus from previous workshops that the deliverability of generation internal to the ISO grid should be preserved.) Furthermore, it is likely that, compared to a more reasonable import allocation, more of the allocated import capability might remain unused by an LSE to meet its resource adequacy requirement at the expense of more internal generation being available to meet an LSE's resource adequacy requirement.

Workshop participants proposed that historical import information should be the basis for determining the initial amount of import levels to be allocated to LSEs. Following this suggestion, the ISO reviewed actual import flows and schedules during peak load hours in 2003. After initial review of the data, it appears that 2003 saw the highest import levels in the last five years during peak load periods. A subsequent review of 2004 import flows during peak load hours showed similarly high import levels.

In addition to using historical data, existing transmission contract (ETCs) information should also be utilized. It is assumed that the entities that have contracted for the transmission capacity are already relying on this import capability in their resource plans, so this transmission should not be reallocated.

The impact of these total import levels would likely affect the deliverability of some existing generation, and the interplay between the deliverability of these existing generators and imports needs to be addressed. One of the key benefits of this proposed approach is that a clear deliverability benchmark would be established up front, it would be the starting point for future years, and LSEs would have some flexibility within this structure to adjust their resource adequacy plans to find an appropriate balance between imports and existing generation inside California.

Proposed Methodology

Initial Import Level

The proposed approach for combining both historical information and contractual information is to add final transmission net import schedules (day-ahead, hour ahead, and real-time) not associated with ETCs, to ETC reservations on a path by path basis. One could then verify that this sum would not have exceeded the historical Operational Transfer Capabilities (OTCs) and make the appropriate adjustments. This methodology could be applied using several historical high load, high import hours and then taking the average total net import as the initial net import level.

Generation Deliverability Analysis

Using the initial import level as an input assumption, a baseline analysis of the deliverability of generation to the aggregate of load would be performed as

described in the Generation Deliverability Assessment Attachment. This benchmarking analysis would establish the deliverability of internal generation.

Deliverability Priority

If the baseline deliverability analysis for existing generation determines that the initial import level assumption is reducing the deliverability of internal ISO grid generation, then the initial import levels will be reduced and the baseline deliverability analysis will be re-run. Although it is not anticipated that import levels will have to be reduced significantly from their initial level, this issue may need to be reassessed after the analysis is completed, consistent with the "Review of Results" paragraph (below.)

Make Results of Deliverability Assessment Available for Use

Once the deliverability assessment is completed the results will be provided for use in developing year-ahead LSE resource procurement plans for resource adequacy purposes.² The total import capacity, by path, determined to be deliverable would need to be allocated to LSEs using some allocation methodology that has yet to be defined.

(Optional Step) Modify Results of Deliverability Assessment based on Economic Tradeoff between Import Capacity and Internal Generation Capacity

This step assumes that the deliverability of existing resources may not necessarily be preserved, and could be reduced as needed to increase the deliverability of imports, if it is determined that more economic capacity can be obtained from import levels that exceed the total import capability allocated to LSEs. Some sub-group participants had concerns regarding the logistics of implementing this step, and there is no consensus whether or not this step should be included in this general methodology.

Review of Results of Generation and Import Deliverability Assessment Methodology

As part of the initial implementation of this analysis, the test results for generation and import deliverability should be evaluated to ensure they are reasonable, equitable, and consistent with engineering judgment. Stakeholders would help review the reasonableness of these initial test results, and, if necessary, the deliverability test procedure could be refined.

² Operational requirements of the various local areas (i.e., RMR areas) would need to be addressed so LSEs have the necessary information to develop their resource procurement plans. This includes operational requirements such as the amounts and locations of generation needed to be on line and the potential generation retirements that could increase local area requirements. The deliverability to load methodology should focus on these requirements.

Attachment 2

Notice Suitable for Publication in the Federal Register

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

California Independent System Operator Corporation	Docket Nos. ER04-445-005 ER04-445-006
Pacific Gas and Electric Company	Docket Nos. ER04-435-007 ER04-435-008
San Diego Gas and Electric Company	Docket Nos. ER04-441-004 ER04-441-005
Southern California Edison Company	Docket Nos. ER04-443-004 ER04-443-005

NOTICE OF FILING

(_____)

Take notice that on April 5, 2005, the California Independent System Operator Corporation (ISO) filed with the Commission a letter pursuant to the Commission's February 25, 2005 letter requesting additional information with respect to the ISO's January 5, 2005 Large Generator Interconnection Procedures filing and the ISO, Pacific Gas & Electric Company, San Diego Gas & Electric Company, and Southern California Edison Companies' (the "Filing Parties") joint January 5, 2005 Large Generator Interconnection Agreement filing. The responses in the ISO's letter should be considered as an amendment to the explanations provided by the ISO and the Filing Parties concerning the proposed terms of their LGIP and LGIA in their previous filings. However, the ISO's letter does not propose any modification to the terms of the LGIP and LGIA themselves.

The ISO states that it has served a copy of this document upon all parties listed on the official service list compiled by the Secretary in the above-captioned proceedings, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010)

Any person desiring to intervene or to protest this filing should file with the Federal Energy Regulatory Commission, 888 First Street, N.E., Washington, D.C. 20426, in accordance with Rules 211 and 214 of the Commission's Rules of Practice and Procedure (18 CFR 385.211 and 385.214). Protests will be considered by the Commission in determining the appropriate action to be taken, but will not serve to make protestants parties to the proceeding. Any person wishing to become a party must file a

motion to intervene. All such motions or protests should be filed on or before the comment date, and, to the extent applicable, must be served on the applicant and on any other person designated on the official service list. This filing is available for review at the Commission or may be viewed on the Commission's web site at <http://www.ferc.gov>, using the **eLibrary** (FERRIS) link. Enter the docket number excluding the last three digits in the docket number field to access the document. For assistance, please contact FERC Online Support at FERCOnlineSupport@ferc.gov or toll-free at (866)208-3676, or for TTY, contact (202)502-8659. Protests and interventions may be filed electronically via the Internet in lieu of paper; see 18 CFR 385.2001(a)(1)(iii) and the instructions on the Commission's web site under the "e-Filing" link. The Commission strongly encourages electronic filings.

Comment Date: