Memorandum

To: ISO Board of Governors
From: Keith Casey, Vice President, Market & Infrastructure Development
Date: December 10, 2014
Re: **Decision on the Harry Allen-Eldorado 500 kV Transmission Project**

This memorandum requires Board action.

Executive Summary

On March 20, 2014, the ISO Board of Governors approved the ISO's 2013-2014 Transmission Plan. The economic benefit analysis of the Harry Allen-Eldorado 500 kV transmission project documented in that transmission plan indicated that the line would result in net benefits for ISO ratepayers. However, Management acknowledged that NV Energy's recent announcement of its intention to join the ISO's energy imbalance market could affect the results of that analysis and that further study was required. That analysis has since been updated to include the modeling of NV Energy's participation in the ISO energy imbalance market along with other modeling updates. The updated analysis confirmed the previous results that the Harry Allen-Eldorado 500 kV transmission project would result in net benefits for ISO ratepayers.

Through its own analysis and the input of stakeholders, the ISO performed economic transmission studies in the 2013-2014 planning cycle. The analyses compared the cost of the mitigation plans to the expected reduction in production costs, congestion costs, transmission losses, capacity or other electric supply costs resulting from improved access to cost-efficient resources. The ISO's original analysis was documented in the ISO's 2013-2014 Transmission Plan. The updated analysis discussed here is documented in a supplemental report that is being posted to the ISO website. The ISO presented the results of its updated analysis to stakeholders on November 20, 2014 and provided an opportunity for stakeholder comments. A summary of stakeholder comments along with Management's response is attached. The updated analysis demonstrates that financial benefits of the Harry Allen-Eldorado 500 kV transmission project are expected to exceed its expected costs. The benefits of this project are derived both from anticipated production cost savings and through savings in capacity costs provided by increased access to out of state generation.

Given the updated analysis along with the additional benefits described in this memorandum, Management recommends proceeding with the Harry Allen-Eldorado 500 kV transmission project.

Management proposes the following motion:

> ***Moved, that the ISO Board of Governors approves the Harry Allen-Eldorado 500 kV transmission project as part of the ISO 2013-2014 Transmission Plan, and as described in the memorandum dated December 10, 2014.***

Discussion

The objective of the ISO's economic studies is to identify transmission congestion and analyze whether network upgrades can cost effectively mitigate the congestion. Generally speaking, transmission congestion increases consumer costs because it prevents lower-priced electricity from serving load. Resolving congestion bottlenecks is cost effective when ratepayer savings are greater than the cost of the project. In such cases, the transmission upgrade is warranted as an economic project.

The study process analyzed benefits in accordance with the ISO's Transmission Economic Assessment Methodology (TEAM), estimating production simulation and capacity benefits from the perspective of ISO ratepayers. The identified benefits included energy production benefits to ISO ratepayers through more efficient overall market operation, as well as the potential for procurement of additional resource capacity from Nevada and the Desert Southwest.

The Harry Allen-Eldorado 500 kV transmission project is a comparatively modest transmission project that would complement the recently completed Robinson-Harry Allen 500 kV transmission line. The proposed project entails building an approximately 60 mile 500kV line between the Harry Allen substation (owned by NV Energy) and the Eldorado substation (jointly owned by Southern California Edison and other minority owners). The estimated capital cost of the line is $182 million.

Summary of Economic Analysis

The ISO assessed the economic benefits of the Harry Allen-Eldorado 500 kV transmission project in both the 2012-2013 and 2013-2014 planning cycles[1]. The analyses compared the cost of the mitigation plans to the expected reduction in production costs, congestion costs, transmission losses, capacity or other electric supply costs resulting from improved access to cost-efficient resources. The economic benefit analysis of the Harry Allen-Eldorado 500 kV transmission project

[1] In the 2012-2013 Transmission Plan, the Harry Allen to Eldorado 500 kV transmission project was identified as meriting additional analysis in the 2013-2014 planning cycle.

documented in the 2013-2014 Transmission Plan indicated that the line would result in net benefits for ISO ratepayers. However, Management acknowledged that NV Energy's recent announced intention to join the ISO's energy imbalance market could affect the results of that analysis and that further study was required. As noted above, that analysis has since been updated to include the modeling of NV Energy's participation in the ISO's energy imbalance market along with other modeling updates. The updated analysis confirmed the previous results that the Harry Allen-Eldorado 500 kV transmission project would result in net benefits for ISO ratepayers. The ISO presented the results of its updated analysis to stakeholders on November 20, 2014.

The annual benefits of this project are derived both from anticipated production cost savings and capacity cost savings provided by increased access to out of state generation. Specifically, the addition of the Harry Allen-Eldorado 500 kV transmission project enables a 200 MW increase of schedules from Nevada and the Desert Southwest across the West of River Path. This 200 MW increase in import deliverability can be accommodated while still accommodating approximately 1,800 MW of deliverability from the Imperial zone.[2] The levelized economic dispatch savings and capacity cost savings from this project are $8.6 million and $10.8 million per year[3].

Several sensitivity studies were performed to check the variation in economic dispatch savings under various scenarios. Production simulation models used to measure economic dispatch savings are extremely complex, so sensitivity studies are needed to estimate how the study results will change under different scenarios. For 6 percent higher load levels or 25 percent higher gas prices the benefits increased $4.5 million to $6.5 million, and conversely for 6 percent lower load levels or 25 percent lower gas prices the benefits decreased up to $5.5 million, as expected. The economic dispatch and capacity benefits of the enhancement to the transmission system begin to accrue immediately upon completion of the circuit, which is targeted for 2020. The benefits do not rely on the development of other infrastructure that is not already underway, either transmission or generation.

[2] In the 2013-2014 transmission planning process, the ISO concluded that the SONGS retirement materially shifted transmission path flows and substantially reduced the deliverability of generation from the Imperial renewable zone. Recent studies in the 2014-2015 transmission planning process have determined that bypassing series compensation in the 500 kV lines into San Diego coupled with previously approved transmission reinforcements will restore deliverability of generation from the Imperial zone to the previous 1,700 MW level.

[3] The levelized values are based on a 7% discount rate.

Extrapolating out the benefits and costs (revenue requirements) over the expected life of the project, and then deriving discounted present value of each, results in a benefit-to-cost ratio of 1.06 to 1.20 (Table 1). The upper end of the range is with a 10% return on equity and a 5% discount rate and the lower end is with an 11% return on equity and a 7% discount rate.

Table 1 – Summary of Benefit-Cost Results

	5% Real Discount Rate	7% Real Discount Rate
10% ROE	1.20	1.11
11% ROE	1.15	1.06

The updated analysis shown in Table 1 demonstrates that financial benefits of the Harry Allen-Eldorado 500 kV transmission project are expected to exceed its costs.

In addition to these economic benefits, the Harry Allen-Eldorado 500 kV transmission project would provide both reliability benefits and renewable integration benefits. In terms of specific reliability benefits, the project would mitigate contingency overloads on the Mead Substation-Bob Substation 230 kV line in the Valley Electric Association system caused by five different Category C overlapping contingencies identified in a reliability assessment model representing summer peak conditions in 2024. In terms of specific renewable integration benefits, the 200 MW of increased import capacity would provide access to flexible generation capacity needed for renewable integration.

Based on this analysis, Management recommends proceeding with the Harry Allen-Eldorado 500 kV transmission project. However, the economic justification for the project is heavily dependent on its estimated cost and, as a result, Management will plan to carefully scrutinize and asses the cost containment capabilities and commitments provided by project sponsors with respect to the estimated cost assumed in the ISO's economic analysis.

Competitive Solicitation for New Transmission Elements

The ISO's transmission planning process includes a competitive solicitation process for reliability-driven, policy-driven and economically driven transmission facilities over

200 kV. Upgrades to or additions on an existing participating transmission owner facility and the construction or ownership of facilities within an existing participating transmission owner's substation are excluded from competition.

The Harry Allen-Eldorado 500 kV transmission project is eligible for competitive solicitation. Consistent with the tariff and subject to the Board's approval of the project at this meeting, the ISO will initiate the competitive solicitation process in January 2015. This process provides a period of at least two months for project sponsors to submit specific proposals to finance, own, and construct the regional transmission facilities subject to competitive solicitation identified in the comprehensive transmission plan.

Conclusion

Based on the economic analysis discussed above, Management recommends the Board approve the Harry Allen – Eldorado transmission project. As previously noted, the economic justification for the project is dependent on its estimated cost and, as a result, Management will carefully scrutinize and asses the cost containment capabilities and commitments provided by project sponsors with respect to the estimated cost assumed in the ISO's economic analysis.