California ISO
Shaping a Renewed Future

Transmission Competitive Solicitation Questions Log
Question / Answer Matrix
2023/2024 TPP – Phase 3

No.	Comment Submitted	ISO Response	Assigned To:
1	115kV Breaker Configuration Clarification: Per I.1.2, Functional Specification for New Humboldt 500 kV Substation, with 500/115 kV transformer, and a 500 kV line to Collinsville [HVDC operated as AC] Project of Appendix I requires three (3) 115kV Circuit Breakers initially, however the Figure I.1-2: Schematic Diagram of the Humboldt 500/115 kV Substation shows one (1) 115kV circuit breaker. Please clarify the 115kV circuit breaker requirement.	One 115 kV circuit breaker is required in the initial configuration.	Planning
2	The one-line diagrams of the New Humboldt 500 kV Substation Initial and Ultimate Configuration on pages I-6 and I-7 currently shows switches at the POCO locations. Will line switches be required at the POCO locations? If so, can the line switches be located within the substation?	Line switches will be required at the POCO locations. Line switch locations can be located within the substation upon mutual agreement between interconnecting parties	Transmission Assets
3	The functional specifications do not identify the specific required 500kV protection schemes or protective relaying design criteria to be used on the 500kV system. Please provide additional details.	500KV protective relaying standards shall comply with TPL-001-8 single point of failure design requirements including, but not limited to, separate communication paths and DC systems. The designs shall meet the recommendations of the WECC Relay Work Group "EHV Transmission Line Protection White Paper" published December 9, 2021 . White Paper on EHV Transmission Line Protection 2020 format XC DS R1 (wecc.org)	Transmission Assets
4	To enhance the resiliency of the Humboldt 115 kV system and allow for the retirement of gas generation in the long term, in all alternatives the ISO is proposing to provide another supply to the area from the Humboldt 500 kV substation. The interconnection includes a 500/115 kV transformer at Humboldt 500 kV substation, a 115 kV line from Humboldt 500 kV to existing Humboldt 115 kV substation, and a 115kV/115 kV phase shifting transformer (PST) at Humboldt 115 kV substation. The PST will help to control the flow	The latest models for these facilities are included in the power flow cases on CAISO's market participants' portal. CAISO will use updated models in future studies as they become available by the project sponsors.	Planning

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	and prevent overload as the amount of offshore wind generation varies in real time operation. The schematic diagram of the interconnection is provided in Figure F.16-7. The model provided by CAISO lumps both the Transformer, PST and all impedances into an equivalent transformer. Since the PST and other impedances are out of the scope, can CAISO provide an explicit model for PST and impedance to facilitate the assessment of the facility?		
5	How much detail should be provided by the applicant regarding the work required for the future conversion to DC operation including the design, construction, testing and cutover of the transmission line from AC to DC for the New Humboldt to Collinsville line?	The application should include the following: a) An overall design of the equipment needed to convert and operate the transmission line from New Humboldt to Collinsville at 525kV DC. This shall include a single line diagram, breaker arrangements, etc.; b) General layout drawings identifying the DC convertor and associated equipment that will be required to operate the line as a HVDC tie between Humboldt and Collinsville. c) A schedule showing the steps necessary for the construction, testing and cutover of the line to DC operation.	Transmission Assets
6	Where should the DC information be located in the Application?	The information shall be included at the end of the response to Question S-1 and noted as “Future Conversion to 525kV DC Operation”	Transmission Assets
7	Should the New Humboldt to Collinsville transmission line be designed and constructed to operate at both 525 kV AC and 525kV DC and not require changes to the line in the future when operation is converted to DC	Yes, the New Humboldt to Collinsville transmission line should be designed to operate at 525kV AC and 525kV DC without the need to redesign, revise or upgrade the line when converting to DC operation.	Transmission Assets
8	Can bids be revised after the bidding window is closed?	No, the CAISO does not accept revised bids after the bid window is closed.	Transmission Assets

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9	Regarding the shield wire requirement included in Appendix I for the Humboldt to Collinsville and Humboldt to Fern Road projects, does CAISO consider a 48-count fiber the equivalent of 24 pairs of fibers?	Yes	Transmission Assets
10	Will the ultimate configuration of the New Humboldt Substation be required to exactly match the one-line diagram presented on page I-7 of Appendix I from the ISO's 2023-2024 Transmission Plan? The initial and ultimate configuration one-lines appear to indicate the '500/115kV XMFR' would need to move bays in order to accommodate the ultimate station one line. The initial configuration presented on page I-6 shows the '500/115kV XMFR' sharing the same bay with 'Offshore Wind 2' position. The ultimate configuration presented on I-7 shows the '500/115kV XMFR' sharing the same bay with 'Fern Road' position.	No, the station single line diagram is representative of the locations for the needed connections. The final connection locations will be determined after project award during the substation design process.	Transmission Assets
11	Approximate Line Impedance Clarification: Per I.1.2 and I2.1 of Appendix I, projects require an Approximate Line Impedance of 0.00000728 + j0.000264 pu/mile (500 kV, 100 MVA base), ±20%. Please clarify if the approximate line impedance in p.u./mile include the series compensation. If yes, please also clarify if the series compensation can be adjusted to meet p.u./mile line impedance values.	The Approximate Line Impedance is just for the line itself and does not include the series compensation.	Planning
12	Appendix I New Humboldt Substation schematics and description indicate no reactive power required. However, both New Humboldt to Collinsville 500 kV Line and New Humboldt to Fern Road 500 kV Line require at least 100 Mvar line reactors and 75% series compensation (37.5% at each end of the line).	As reflected in the functional specification, no reactive power support systems, such as shunt capacitors, shunt reactors, SVCs, STATCOMs, or synchronous condensers, are required either initially or in the long-term ultimate planning for this project. Although the line reactors and series capacitors specified in the functional specification will absorb or generate reactive power, their	Planning

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	1. Please confirm that the line reactors and half of the series compensation for each line may be located within the New Humboldt Substation 2. Please confirm that the series compensation at the Fern Road and Collinsville ends of the respective new 500 kV lines are included in the scope of these projects and are the responsibility of the approved project sponsor, and not the responsibility of the owner of the Fern Road and Collinsville substations 3. Please confirm whether the series compensation is to be 75%, or if the objective is to keep the line impedance with +/-20% of the specified line impedance, which will require series compensation that is likely to be around 75%.	primary purpose is not to manage reactive power but to fulfill other operational needs. 1. Confirmed. Line reactors and the series capacitors may be located within the New Humboldt Substation. 2. Confirmed. While the line reactors and series capacitors are in the scope of the projects and the responsibility of the approved project sponsor, it is acceptable if the project sponsor makes arrangements with the owners of the Fern Road, Collinsville, and New Humboldt substations and have the line reactors and series capacitors installed in Fern Road, Collinsville, and New Humboldt substations instead of creating new substation for those components. 3. Series compensation is to be 75% of the final line impedance. The specified impedance in the project specification does not reflect the impact of the series compensation.	
13	Can a proposer provide a contingent bids for Collinsville and Fern Rd? For example, if portions of both projects share the same ROW, can the proposer submit an optimized ROW to minimize ROW widths and associated costs.	The applicant can provide additional information for consideration as an additional advantage or strength in its proposal. Contingent information included in the second sequence project proposal may be evaluated if the first sequence project is awarded to the same applicant.	Transmission Assets
14	Does the Humboldt – Collinsville project scope include the acquiring the necessary land and ROW for the ultimate configuration design which includes the HVDC station and two 500kV lines interconnecting to the Collinsville 500kV substation?	Yes	Transmission Assets
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