GRDA

Generation Interconnection Facilities Study Report for GEN-2023-057 Pawnee Switch 138kV Project

T&D Engineering Department| Transmission Planning
2-5-2026
(Original)

1. Facilities Study Summary

Grand River Dam Authority (GRDA) Transmission Planning performed the following study at the request of the Southwest Power Pool (SPP) for SPP Generation Interconnection request DISIS-2023-001 Phase 2 Restudy results for GEN-2023-057. Per the SPP Generator Interconnection Procedures (GIP), SPP requested that GRDA perform an Interconnection Facilities Studies (IFS) for Network Upgrade(s) in accordance with Section 8.11 for the following Interconnection and/or Network Upgrade(s):

1.1. Project Description

GEN-2023-057 proposes to add a 150.0 MW battery-storage (BESS) generation facility at the 138 kV Pawnee GRDA POI (See Figure 1 & Figure 2), located in Pawnee County, OK (Section 29-T22N-R5E), geographical coordinates 36.352964, -96.793847, 0.12 miles east of the POI.

1.2. GRDA's Scope of Work to Facilitate Interconnection

- To accommodate the interconnection, work will need to be completed at the 138 kV interconnection station including but not limited to tie-line metering, CTs and PTs, circuit breakers, disconnect switches, protective relays, structures, foundations, conductors, insulators, and all other associated work and materials or terminal equipment needed to interconnect the customer's gen tie line into GRDA's new POI for GEN-2023-057.
- GRDA reserves the right to specify the final acceptable configuration considering design practices, future expansion, and compliance requirements.
- The interconnect point will be a GRDA-owned transmission structure outside the station fence, located on GRDA property. Conductor and Fiber will dead-end at the structure, where ownership will transfer.
- It is understood that the Interconnection Customer is responsible for all the connection costs associated with interconnecting GEN-2023-057 to the GRDA transmission system.

1.3. Short Circuit Evaluation

- It is standard practice for GRDA to recommend replacing a circuit breaker when the current through the breaker for a fault exceeds 100% of its nameplate interrupting rating with recloser de-rating applied, as determined by the ANSI/IEEE C37.5-1979, C37.010-1979 & C37.04-1979 breaker rating methods.
- In the GRDA system, no breakers were found to exceed their interrupting capability after the addition of the generation and related facilities. Therefore, there are no additional short circuit upgrade costs associated with the DISIS-2023-001, GEN-2023-057 interconnection.

1.4. Stability Evaluation

- Based on the results of the DISIS-2023-001 short circuit and stability report, GRDA is not aware of any instances where the system does not meet TPL-001 stability performance requirements for the planning events and generation dispatch conditions that were considered in this DISIS study.

1.5. Interconnection Cost of Facilities Included in the Facilities Study

Table 1

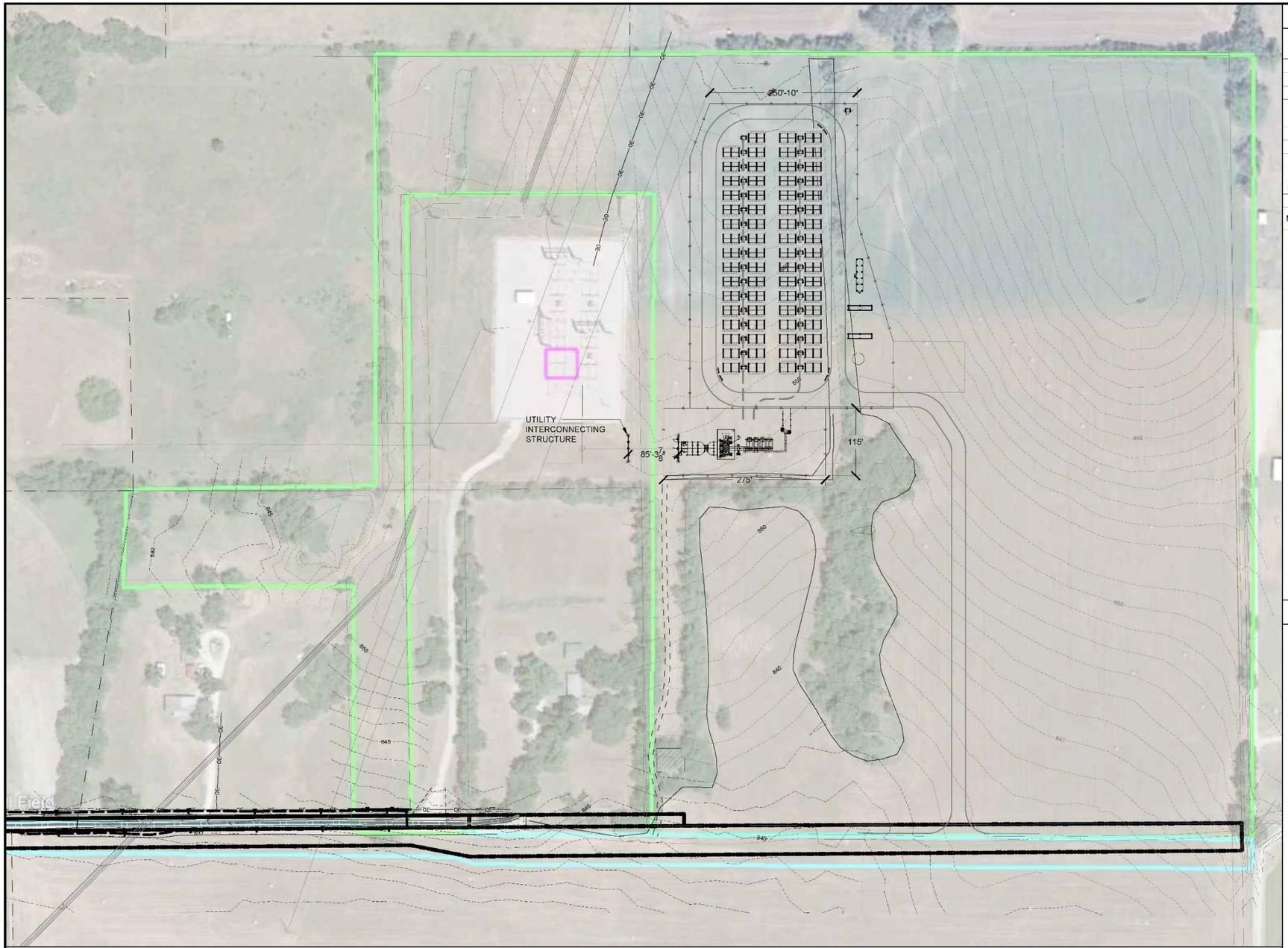
Description	Cost (USD)
Transmission Owner Interconnection Facilities (GRDA):	$0
No work projected apart from the terminal addition.	
Non-Shared Network Upgrades	$1,830,400.00
Construct one (1) new 138 kV line terminal, line switches, dead-end structure, concrete foundations, line relaying, communications/SCADA equipment, tie-line metering, line arrestor, and all associated equipment and below or above ground facilities necessary to accept transmission line from interconnection customer's generation facility.	
Total	**$1,830,400.00**

1.6. Project Lead Time

- Specific construction schedule and milestones will be determined during the Generator Interconnection Agreement negotiations.
- GRDA is estimating an engineering and construction schedule for this project as approximately 36 months after the issuance of authorization from the interconnection customer.
- Other factors associated with clearances; equipment procurement delays and work schedules could cause additional delays.
- This is applicable after all required agreements have been signed and internal approvals are granted.

2. Appendices

Figure 1: Point of Interconnection (POI Site Plan)



ELECTRICAL SITE PLAN
1" = 80'

0 40' 80' 160'

N W E S

SYSTEM SUMMARY

BATTERY ENERGY STORAGE SYSTEM (BESS)

SYSTEM TOTALS	
OUTPUT POWER @ POI	150MW @ 0.95PF
ENERGY RATING	600MWh
BATTERY	
MEGAPACK TYPE	4hr
MEGAPACK QTY	134
INVERTER	
MANUFACTURER	TESLA
OUTPUT RATING	1,400kVA
OUTPUT VOLTAGE (AC)	480V
MV TRANSFORMERS	
MV TRANSFORMER QTY	34
MV TRANSFORMER CAPACITY	6,360kVA

GENERAL NOTES

1. PRELIMINARY INDICATIVE LAYOUT. FINAL DESIGN TO BE DETERMINED AFTER SITE SURVEY AND REVIEW OF EXISTING CONDITIONS.
2. SYSTEM TO BE DESIGNED AND INSTALLED TO LOCAL JURISDICTION AND UTILITY REQUIREMENTS.
3. THE INDICATIVE EQUIPMENT LAYOUTS SHOW THE MINIMUM FOOTPRINT RECOMMENDED BY TESLA. ADDITIONAL AREA WILL BE REQUIRED FOR CONSTRUCTION OF THE PROJECT.

TESLA
3500 DEER CREEK RD.
PALO ALTO, CA 94304
(650) 681-5000

ORIGINAL SIZE 24"X36"
SHEET SIZE ARCH "D"

PRELIMINARY - NOT FOR CONSTRUCTION

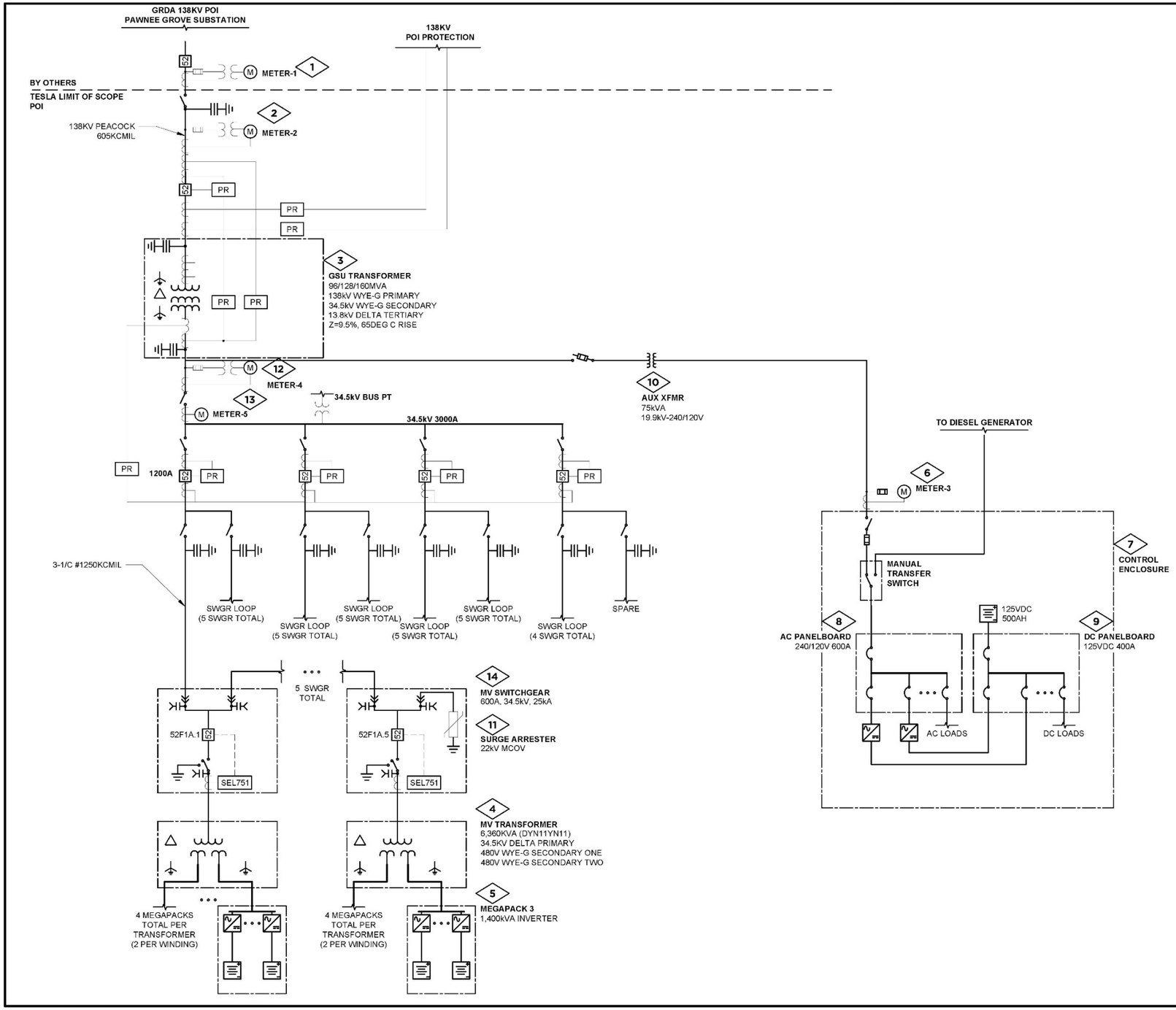
TESLA - BATTERY ENERGY STORAGE SYSTEM
SWANSON - MEGAPACK 3 DESIGN
TESLA
36°21'10.67"N, 96°47'37.85"W
PAWNEE, OK

NO	REVISION	DATE
1	ISSUED FOR REVIEW	05/24
2	NEW OVERHEAD LINE EASEMENT	12/24
3	POSITION UPDATE	12/24
4	ISSUED FOR REVIEW	12/25

ELECTRICAL SITE PLAN
E-101
JB-######
REV: 3 | PDE

PLOT DATE: 12/17/2025 1:35 AM CDRAG

Figure 2: Point of Interconnection Single Line Diagram



SYSTEM SUMMARY:
- 134 MEGAPACK 2XL
- MEGAPACK TOTAL OPERATING POWER: 150 MW
- MEGAPACK TOTAL SYSTEM ENERGY: 600 MWh
- INTERCONNECTION VOLTAGE: 138kV
- (34) 6,360kVA TRANSFORMERS

#	
1	METER-1 (BY OTHERS) - UTILITY HV METER
2	METER-2 - TESLA SITE METER
3	GSU TRANSFORMER -96/128/160MVA, 138kV-34.5kV, Z=9.5%, 65DEG C RISE, MINERAL OIL, OUTDOOR
4	MV TRANSFORMER 6,360kVA, 34.5kV(DELTA)-480V(WYE-G), Z=8%, PAD MOUNTED, 75DEG C RISE, LOOP-FEED, DEAD FRONT, FR3 OIL, OUTDOOR
5	MEGAPACK 3 1,400kVA, 1206kW, 480V
6	METER-3 - AUXILIARY LOAD METER
7	CONTROL ENCLOSURE
8	AC PANELBOARD -600A, 120/240V 1PH, NEMA 1
9	DC PANELBOARD -400A, 125VDC
10	AUX TRANSFORMER -75kVA, 19.9kV - 240/120V
11	SURGE ARRESTER
12	METER-4 - UTILITY WSL METER
13	METER-5 - TESLA QSE METER
14	MV SWITCHGEAR 34.5kV, 600A, 25kA

LINE TYPES
- CONDUCTORS
- BUSSING
- EQPT. ENCLOSURES

DRAWING ELEMENTS
- LINE OF DEMARCATION
- CONTINUATION
- MATCHLINE
- AC-01 — CIRCUIT SCHEDULE TAG
- (N) EQUIPMENT TITLE / RESPONSIBLE PARTY / SPECIFICATIONS — EQUIPMENT NOTE

EQUIPMENT
- TRANSFORMER
- INVERTER

SYMBOLS
- CIRCUIT BREAKER
- MV LOAD BREAK
- FUSIBLE SWITCH
- SURGE ARRESTOR
- GROUNDING ELECTRODE
- DELTA WINDING
- GROUNDED WYE WINDING

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