

3.3.2 Available Short Circuit Current

The Utility provides the main source of short circuit currents available throughout the circuit. Refer to Table 3-1 for a summary of the available short circuit current. These values are used as the basis for the short circuit study.

Table 3-1
Utility Main Substation Short Circuit Current

Utility	Short Circuit Type	Voltage Reference	Fault Current
AEP Texas Alpha 69kV Line	Three Phase	69 kV	982.1 MVA
	Single line to ground	69 kV	727.1 MVA
AEP Texas Bravo 69kV Line	Three Phase	69 kV	973.7 MVA
	Single line to ground	69 kV	757.9 MVA
AEP Texas Charlie 69kV Line	Three Phase	69 kV	808.9 MVA
	Single line to ground	69 kV	574.6 MVA

3.3.3 Overcurrent Protection

Overcurrent protection is provided by a main breaker/relay on each feeder and/or distribution equipment. (Refer to Table 3-2, Table 3-3, and Table 3-4). For additional Neutral / Ground Overcurrent Protection settings, refer to Appendix R – Compiled OCPD Information Table.

Table 3-2
Dyess AFB Alpha Switchgear Overcurrent Protection Data

Relay	FDR A1	FDR A2
Model	GE SR 760	GE SR 760
CT ratio	1200/5	1200/5
Phase Settings		
Tap (pickup)	0.3 (360A)	0.3 (360A)

Time dial setting	1.2	1.2
Curve shape	U4 Extremely Inverse	U4 Extremely Inverse
Instantaneous	None	None
Neutral Settings		
CT ratio	1000/5	1000/5
Tap (pickup)	0.15 (150A)	0.15 (150A)
Time dial setting	1.2	1.2
Curve shape	U4 Extremely Inverse	U4 Extremely Inverse
Instantaneous	None	None

Table 3-3
Dyess AFB Bravo Switchgear Overcurrent Protection Data

Relay	FDR B1	FDR B2	FDR B3	FDR B4
Model	SEL-751	SEL-751	SEL-751	SEL-751
CT ratio	240/1	240/1	240/1	240/1
Phase Settings				
Tap (pickup)	1.25 (173.205A)	1.25 (173.205A)	1.25 (173.205A)	1.25 (173.205A)
Time dial setting	2.85	2.85	2.85	2.85
Curve shape	U3 Very Inverse	U3 Very Inverse	U3 Very Inverse	U3 Very Inverse
Instantaneous	12 (1662.77A)	15 (2078.46A)	15 (2078.46A)	10 (1385.64A)
Neutral Settings				
Tap (pickup)	0.5 (69.282A)	0.5 (69.282A)	0.5 (69.282A)	0.5 (69.282A)
Time dial setting	2	2	2	2

Curve shape	U3 Very Inverse	U3 Very Inverse	U3 Very Inverse	U3 Very Inverse
Instantaneous	None	None	None	None

Relay	RLY-S-G1-1	RLY-S-G1-2	RLY-SW-EG1-UTILBKR
Model	SEL-751	SEL-751	GE SR 750
CT ratio	240/1	240/1	1200/5
Phase Settings			
Tap (pickup)	2 (277.128A)	2 (277.128A)	0.68 (816A)
Time dial setting	2.5	2.5	6
Curve shape	U3 Very Inverse	U3 Very Inverse	IAC Short Inverse
Instantaneous	None	None	None
Neutral Settings			
Tap (pickup)	0.5 (69.282A)	0.5 (69.282A)	0.11 (132A)
Time dial setting	3.25	3.25	10.9
Curve shape	U3 Very Inverse	U3 Very Inverse	U4 Extremely Inverse
Instantaneous	None	None	None

Table 3-4
Dyess AFB Charlie Switchgear Overcurrent Protection Data

Relay	FDR C1	FDR C2	FDR C3	FDR C4
Model	SEL-751	SEL-751	SEL-751	SEL-751
CT ratio	120/1	120/1	120/1	120/1
Phase Settings				
Tap (pickup)	2.5 (300A)	2.5 (300A)	2.5 (300A)	2.5 (300A)

Time dial setting	2.85	3.23	3.1	3
Curve shape	U3 Very Inverse	U3 Very Inverse	U3 Very Inverse	U3 Very Inverse
Instantaneous	29.17 (3500.4A)	29.17 (3500.4A)	29.17 (3500.4A)	29.17 (3500.4A)
Neutral Settings				
Tap (pickup)	1 (120A)	1 (120A)	1 (120A)	1 (120A)
Time dial setting	4.8	4.8	4.8	4.8
Curve shape	U3 Very Inverse	U3 Very Inverse	U3 Very Inverse	U3 Very Inverse
Instantaneous	8.33 (999.6A) 0.2 sec Delay	8.33 (999.6A) 0.2 sec Delay	8.33 (999.6A) 0.2 sec Delay	8.33 (999.6A) 0.2 sec Delay

Relay	FDR C5	FDR GPR-C-G1	FDR GPR-C-G2	FDR IPR-C-C7
Model	SEL-751	SEL-751	SEL-751	SEL-751
CT ratio	120/1	1200/5	1200/5	1200/5
Phase Settings				
Tap (pickup)	2.5 (300A)	2.5 (600A)	2.5 (600A)	2.5 (600A)
Time dial setting	3	2.85	2.85	2.85
Curve shape	U3 Very Inverse	U3 Very Inverse	U3 Very Inverse	U3 Very Inverse
Instantaneous	29.17 (3500.4A)	29.17 (7000.8A)	29.17 (7000.8A)	29.17 (7000.8A)
Neutral Settings				
Tap (pickup)	1 (120A)	1 (120A)	1 (120A)	1 (120A)
Time dial setting	4.8	4.8	4.8	4.8

Curve shape	U3 Very Inverse	U3 Very Inverse	U3 Very Inverse	U3 Very Inverse
Instantaneous	8.33 (999.6A) 0.2 sec Delay	8.33 (1999.2A) 0.2 sec Delay	8.33 (1999.2A) 0.2 sec Delay	8.33 (1999.2A) 0.2 sec Delay

3.3.4 Utility Source (Substations)

Dyess Air Force Base (AFB) operates and maintains three on-site switching stations, designated Alpha, Bravo, and Charlie. These stations are powered by adjacent substations managed by American Electric Power Texas (AEP Texas). The base also features an on-site diesel generator (DG) standby plant, which is connected to the Bravo switching station. The DG plant serves as a standby power source for the main base, ensuring power supply to Bravo and Charlie in the event of a commercial power outage.

3.3.5 Switchgear Protection

At the Substation, SEL and GE relays are used for protection at the medium voltage level. Throughout the rest of the distribution system, there is a combination of relays and fuses used for protection at the medium voltage level.

At the low voltage level, there are a combination of SSTs used. These include Sentron, Digi-Trip, Seltronic, Micrologic and Spectra RMS. Figure 3-4 shows an example of one of these relays. Some of these relays contain a ground element.

These relays fall into the Solid-State Trip (SST) category unlike an Intelligent Electronic Device (IED) category. SST provides no analytical assistance, historical databasing, or event recording.