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TABLE 8.4-1

Sheet 1

AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

General Remarks

1. All breakers which may supply a given bus are interlocked to prevent paralleling supply sources.
2. Each bus has provision for manually transferring between normal and alternate sources. Manual transfers of all 4160-V buses are high speed except as otherwise indicated.
3. Bus transfers which are initiated automatically by undervoltage are time coordinated to avoid needless transfer of buses toward the load.
4. The term "high-speed transfer" applies to 4160-V bus transfers between stored-energy circuit breakers which are controlled for a dead time not exceeding 5 cycles.
5. The term "delayed transfer" applies to 4160-V bus transfers supervised by bus residual relays, which permit either the normal supply breaker to trip or the alternate supply breaker to close when the bus voltage decays to a value safe for connected motors. Normally the residual voltage relay will be set at 30 percent voltage. The delayed transfer for 4-V Unit Boards 1A, 1B, 2A, and 2B has been disabled.
6. Automatic bus transfer is blocked by operation of bus overcurrent or current differential relays for all 4160-V buses. Except for those minor 480-V buses normally supplied from main 480-V buses of the normal auxiliary power system, all 480-V automatic bus transfers are blocked by bus overcurrent protective devices.
7. The offsite power circuits through the CSSTs do not have the capacity to support all connected loads for electric plant alignments where there is an existing pre-load on the CSST supplied 4160-V start buses or if a CSST is out of service. This is addressed by manually disabling the automatic transfer of selected 4160-V unit boards and/or 4-kV common boards. See FSAR figures for any limitations on usage of power sources.

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Sheet 2

AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

<u>Item</u>	<u>Board and/or Main Bus</u>	<u>Power Sources</u>		<u>Remarks</u>
		<u>Normal</u>	<u>Alternate</u>	
1	4160-V Start bd 1 - Start Bus 1A	COM SS TR A, X-winding fed from Athens or Trinity 161 kV lines	COM SS TR B, X-winding fed from Athens or Trinity 161 kV lines	Automatic high speed transfer from the normal to the alternate source is initiated by operation of protective relays for the normal source common station service transformer, or for the 161-kV line feeding that transformer. The bus will be automatically returned to its normal source 40 cycles after return of voltage on the normal source. This time delay is to avoid needless switching during 161-kV line reclosing operations. If alternate source voltage is abnormally low, the normal source breaker will not trip (no transfer); if the normal source breaker trips again within 15 seconds, it will lock out with an alarm, and operator reset will be required.
2	4160-V Start bd 1 - Start Bus 1B	COM SS TR B, X-winding, fed from Athens or Trinity 161 kV lines	COM SS TR A, X-winding fed from Athens or Trinity 161 kW lines	(See Remarks under Item 1)
3	4160-V Start bd 2 - Start Bus 2A	COM SS TR A, Y-winding fed from Athens or Trinity 161 kV lines	COM SS TR B, Y-winding fed from Athens or Trinity 161 kV lines	Automatic high speed transfer from the normal to the alternate source is initiated by operation of protective relays for the normal source common station service transformer, or for the 161-kV line feeding that transformer. Automatic delayed
	transfer by			from the normal to the alternate source is initiated time delay undervoltage relays. The bus will be automatically returned to its normal source 40 cycles after return of voltage on the normal source. This delay is to avoid needless switching during 161-kV reclosing operations. If alternate source voltage is abnormally low, the normal source breaker will not (no transfer); if the normal source breaker trips again within 15 seconds, it will lock out with an alarm, and operator reset will be required.
	time line			
	trip			

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Sheet 3

AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

<u>Item</u>	<u>Board and/or Main Bus</u>	<u>Power Sources</u>		<u>Remarks</u>
		<u>Normal</u>	<u>Alternate</u>	
4	4160-V Start bd 2 - Start Bus 2B	COM SS TR B, Y-winding fed from Athens or Trinity 161 kV lines	COM SS TR A, Y-winding fed from Athens or Trinity 161 kV lines	(See Remarks under Item 3)
4a	4160-V Bus Tie Board			
5	Shutdown Bus 1 (4160-V)	4 kV unit bd 1A or 2B of preselected on-line unit	<p>Alternate 1</p> <p>4 kV unit bd 2B or 1A (that source not preselected for "normal")</p> <p>Alternate 2</p> <p>Same 4 kV unit bd of preselected unit, but with a delayed manual transfer to start bus 1A or 1B</p> <p>Alternate 3</p> <p>Two diesel generators if required for back-feeding a preselected 4 kv unit bd (1A, 2B) See also remarks for items 13, 14, 15, and 16.</p>	<p>The two independent shutdown buses normally supply 4160-V power to assigned 4160-V shutdown boards, with each bus serving as the normal source to two boards and as the alternate source to the two other boards. Of the two possible feeders to each shutdown bus from the two 4 kV unit boards, one feeder is preselected manually as the normal source to that bus. Automatic delayed transfer from the normal to an alternate 1 source is initiated by undervoltage on the normal source. Automatic high-speed transfer from the normal to an alternate 1 source is initiated when the normal source 4 kv unit board normal source breaker trips. If an alternate 1 source is not available, the transfer is prevented, and there is a delayed manual transfer to the alternate 2 source. Automatic transfer is blocked after time delay in the presence of an accident signal. Alternate 3 source may be selected manually only.</p>

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AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

<u>Item</u>	<u>Board and/or Main Bus</u>	<u>Power Sources</u>		<u>Remarks</u>
		<u>Normal</u>	<u>Alternate</u>	
			Alternate 1	
6	Shutdown Bus 2 (4160-V)	4 kV unit bd 1B or 2A, of preselected on-line unit	4 kV unit bd 2A or 1B (that source not preselected for "normal")	(See Remarks under Item 5)
			Alternate 2	
			Same 4 kV unit bd of preselected unit, but with a delayed manual transfer to start bus 1A or 1B	
			Alternate 3	
			Two diesel generators, if required for back-feeding a preselected 4 kV unit bd (1B, 2A) See also remarks for items 13, 14, 15, and 16	
7	4 kV Recirculation Pump Boards:			
(a)	Unit 1, Pump VFD 1A Board 1	Unit SS TR 1A Y-winding	Start Bus 2A	Automatic high-speed transfer from the normal to the alternate source is initiated by main generator unit trip relays. Automatic delayed transfer from the normal to the alternate source is initiated by high-speed voltage relay.

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Sheet 5

AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

<u>Item</u>	<u>Board and/or Main Bus</u>	<u>Power Sources</u>		<u>Remarks</u>
		<u>Normal</u>	<u>Alternate</u>	
(b)	Unit 1, Pump VFD 1B Board 1	Unit SS TR 1A Y-winding	Start Bus 2B	
(c)	Unit 2, Pump VFD 2A Board 2	Unit SS TR 2A Y-winding	Start Bus 2A	
(d)	Unit 2, Pump VFD 2B Board 2	Unit SS TR 2A Y-winding	Start Bus 2B	
(e)	Unit 3, Pump VFD 3A Board 3	Unit SS TR 3A Y-winding	Start Bus 2A	
(f)	Unit 3, Pump VFD 3B Board 3	Unit SS TR 3A Y-winding	Start Bus 2B	
8	4 kV Unit Boards, Unit 1		Alternate 1	
(a)	4 kV unit bd 1A	Unit SS TR 1B X-winding	Start bus 1A	Automatic high-speed transfer from the normal to alternate 1 source is initiated by generator or switchyard breaker failure relaying, USST protective relaying, main transformer protective relaying, or generator backup protection relaying (See General Remarks Numbers 5 and 7)
			Alternate 2	
			Backfeed from shut-down bus	Manual only through backfeed switches

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AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

<u>Item</u>	<u>Board and/or Main Bus</u>	<u>Power Sources</u>		<u>Remarks</u>
		<u>Normal</u>	<u>Alternate</u>	
(b)	4 kV unit bd 1B	Unit SS TR 1B Y-winding	Alternate 1	(See Remarks Item 8(a))
			Start bus 1B	
			Alternate 2	Provisions are included for backfeeding diesel-generator power from the 4-kV shutdown boards into the 4160-V unit boards for reactor plant shutdown cooling if all plant power, other than diesel generator power, is lost. The plant design includes a mode of operation for running one condenser circulating water pump to permit use of the condensers as a heat sink.
			Backfeed from shut-down bus	
(c)	4 kV unit bd 1C	Unit SS TR 1A X-winding	Alternate 1 Start bus 1B	Automatic high-speed transfer from the normal to the alternate 1 source is initiated by generator or switchyard breaker failure relaying. USST protective relaying, main transformer protective relaying or generator backup protection relaying. Automatic delayed transfer from the normal to the alternate 1 source is initiated by a time delay voltage relay. (See General Remarks Number 7).
9	4 kV Unit Boards, Unit 2		Alternate 1	
(a)	4 kV unit bd 2A	Unit SS TR 2B X-winding	Start Bus 1A	(See Remarks Item 8(a))
			Alternate 2 Backfeed from shut-down bus	

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AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

<u>Item</u>	<u>Board and/or Main Bus</u>	<u>Power Sources</u>		<u>Remarks</u>
		<u>Normal</u>	<u>Alternate</u>	
			Alternate 1	
(b)	4 kV unit bd 2B	Unit SS TR 2B Y-winding	Start Bus 1B	(See Remarks Item 8(a))
			Alternate 2	
			Backfeed from shut-down bus	
			Alternate 1	
(c)	4 kV unit bd 2C	Unit SS TR 2A X-winding	Start bus 1A	(See Remarks Item 8(c)) (See General Remarks Number 7)
10	4 kV Unit Boards, Unit 3			
			Alternate 1	
(a)	4 kV unit bd 3A	Unit SS TR 3B X-winding	Start bus 1A	Automatic high-speed transfer from the normal to the alternate 1 source is initiated by generator or switchyard breaker failure relaying, USST protective relaying, main transformer protective relaying, or generator backup protection relaying. Automatic delayed transfer from the normal to the alternate 1 source is initiated by a time delay voltage relay. (See General Remarks Number 7)

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Sheet 8

AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

<u>Item</u>	<u>Board and/or Main Bus</u>	<u>Power Sources</u>		<u>Remarks</u>
		<u>Normal</u>	<u>Alternate</u>	
			Alternate 2	
			Backfeed from shut-down boards	Manual only through backfeed switches.
			Alternate 1	
(b)	4 kV unit bd 3B	Unit SS TR 3B Y-winding	Start bus 1B	(See Remarks Item 10(a))
			Alternate 2	
			Backfeed from shut-down boards	Provisions are included for backfeeding diesel generator power from the 4-kV shutdown boards into the 4160-V unit boards for reactor plant shutdown cooling if all plant power, other than diesel generator power, is lost. The plant design includes a mode of operation for running one condenser circulating water pump to permit use of the condensers as a heat sink.
			Alternate 1	
(c)	4 kV unit bd 3C	Unit SS TR 3A X-winding	Start bus 1A	(See Remarks Item 10(a))
11	4 kV Common Board A	Unit SS TR 1A X-winding	Start Bus 1A	Automatic delayed transfer from the normal to the alternate source is initiated by undervoltage on the normal source, subject to voltage check on the alternate source. Automatic delayed transfer back to the normal source is initiated by return of normal voltage on the normal source. Manual transfers in either direction are the fast transfer type. (See General Remarks Number 7)
12	4 kV Common Board B	Unit SS TR 2A X-winding	Start Bus 1B	(See General Remarks Number 7)
			Alternate 2	
13	4 kV Shutdown Board A	Shutdown Bus 1	Shutdown Bus 2	(See also remarks for items 5 and 6.)

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AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

<u>Item</u>	<u>Board and/or Main Bus</u>	<u>Power Sources</u>		<u>Remarks</u>
		<u>Normal</u>	<u>Alternate</u>	
			<p>Alternate 1</p> <p>Diesel generator A</p> <p>Alternate 3</p> <p>Manual, access connection to diesel generator 3A via 4-kv shutdown board 3EA</p>	<p>Manual delayed transfer from Diesel Generator to Shutdown Bus when electrical loads permit operators manually transfer the boards to the alternate 4.16-kV Shutdown bus. Alternate 2 source is tripped in the presence of a common accidental signal.</p> <p>All diesel generators are automatically started by an accident signal, or by loss of voltage on its shutdown board for 1.5 seconds, or degraded voltage for 4 seconds. After 5 seconds without voltage on the shutdown board, all its supply breakers and all its loads except 4160-480-V transformers are all automatically tripped. Alternate 1 source is then automatically connected. Manual return to the normal auxiliary power system is permitted if normal auxiliary power system voltage returns.</p> <p>Provision is made to manually select alternate 3 source.</p>
14	4 kV Shutdown Board B	Shutdown Bus 1	<p>Alternate 2</p> <p>Shutdown Bus 2</p> <p>Alternate 1</p> <p>Diesel generator B</p> <p>Alternate 3</p> <p>Manual, access connection to diesel generator 3B via 4-kV shutdown board 3EB</p>	

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AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

<u>Item</u>	<u>Board and/or Main Bus</u>	<u>Power Sources</u>		<u>Remarks</u>
		<u>Normal</u>	<u>Alternate</u>	
15	4 kV Shutdown Board C	Shutdown Bus 2	Alternate 2 Shutdown Bus 1 Alternate 1 Diesel generator C Alternate 3 Manual, access to diesel generator 3C via 4-kv shutdown board 3EC	
16	4 kv Shutdown Board D	Shutdown Bus 2	Alternate 2 Shutdown Bus 1 Alternate 1 Diesel generator D Alternate 3 Manual, access to diesel generator 3D via 4-kV shutdown board 3ED	
16a	4 kV Shutdown Board 3EA	4 kV Unit Board 3A	Alternate 1 Diesel generator 3A	Provisions are included for backfeeding diesel generator power from the shutdown boards into the 4160-V unit boards for reactor plant shutdown cooling if all plant power, other than diesel generator power, is lost. For this purpose, means are provided to manually synchronize 4-kV shutdown boards.

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AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

<u>Item</u>	<u>Board and/or Main Bus</u>	<u>Power Sources</u>		<u>Remarks</u>
		<u>Normal</u>	<u>Alternate</u>	
			Alternate 1	
16b	4 kV Shutdown Board 3EB	4 kV Unit Board 3A	Diesel generator 3B	
			Alternate 1	
16c	4 kV Shutdown Board 3EC	4 kV Unit Board 3B	Diesel generator 3C	
			Alternate 1	
16d	4 kV Shutdown Board 3ED	4 kV Unit Board 3B	Diesel generator 3D	

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AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

<u>Item</u>	<u>Board and/or Main Bus</u>	<u>Power Sources</u>		<u>Remarks</u>
		<u>Normal</u>	<u>Alternate</u>	
17	480-V Water Supply Board			
			Alternate 1	
(a)	Bus 1	4 kV unit bd 1B via TR TW1	Bus 2 (Item 17b)	Automatic transfer from the normal to the alternate source is initiated by time-undervoltage on the normal source. Return to the normal source is automatic upon return of voltage to the normal source.
			Alternate 2	
			Bus 3 (Item 17c)	
			Alternate 1	
(b)	Bus 2	4 kV unit bd 2B via TR TW2	Bus 1 (Item 17a)	
			Alternate 2	
			Bus 3 (Item 17c)	
			Alternate 1	
(c)	Bus 3	4 kV unit bd 3B via TR TW3	Bus 2 (Item 17b)	
			Alternate 2	
			Bus 1 (Item 17a)	
18	480-V Unit Boards			
(a)	Unit 1, 480-V Unit Bd 1A	4 kV unit bd 1A via TR TU1A	4 kV com bd B (via TR TEB)	Automatic transfer from the normal to the alternate source is initiated by time-undervoltage on the normal source. Return to the normal source is automatic upon return of voltage to the normal source.
(b)	Unit 1, 480-V Unit Bd 1B	4 kV unit bd 1B via TR TU1B	4 kV com bd B (via TR TEB)	

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AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

<u>Item</u>	<u>Board and/or Main Bus</u>	<u>Power Sources</u>		<u>Remarks</u>
		<u>Normal</u>	<u>Alternate</u>	
(b)	Unit 1, 480-V Unit Bd 1B	4 kV unit bd 1B via TR TU1B	4 kV com bd B (via TR TEB)	
(c)	Unit 2, 480-V Unit Bd 2A	4 kV unit bd 2A via TR TU2A	4 kV com bd B (via TR TEB)	
(d)	Unit 2, 480-V Unit Bd 2B	4 kV unit bd 2B via TR TU2B	4 kV com bd A (via TR TEA)	
(e)	Unit 3, 480-V Unit Bd 3A	4 kV unit bd 3A via TR TU3A	4 kV com bd A (via TR TEA)	
(f)	Unit 3, 480-V Unit Bd 3B	4 kV unit bd 3B via TR TU3B	4 kV com bd A (via TR TEA)	
19	480-V Lighting Boards			
(a)	480-V Lighting Bd 1	4 kV com bd A via TR TL1	4 kV com bd B (via TR TEB)	Transfer between sources is manual only. Each 480-V lighting board serves as the power source, via single phase voltage regulators (Unit 2 only) and 480-V to 240/120-V stepdown transformers, for three 240/120-V lighting boards per unit. These unit lighting boards serve various distribution cabinets in the plant.
(b)	480-V Lighting Bd 2	4 kV com bd A via TR TL2	4 kV com bd B (via TR TEB)	
(c)	480-V Lighting Bd 3	4 kV com bd B via TR TL3	4 kV com bd A (via TR TEA)	
20	480-V Common Boards			

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AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

Item	Board and/or Main Bus	Power Sources		Remarks
		Normal	Alternate	
(a)	480-V Common Bd 1 Bus A	4 kV com bd A via TR TC1A	Bus B of Item 20a	Automatic transfer from the normal to the alternate source is initiated by time-undervoltage on the normal via TR TC1B source. Return to the normal source is automatic upon return of voltage to the normal source.
	Bus B	4 kV com bd B via TR TC1B	Bus A of Item 20A	
(b)	480-V Common Bd 2 Bus A	4 kV com bd A via TR TC2A	Bus B of Item 20b	
	Bus B	4kV com bd B via TR TC2B	Bus A of Item 20b	
(c)	480-V Common Bd 3 Bus A	4 kV com bd A via TR TC3A	Bus B of Item 20c	
	Bus B	4 kV com bd B via TR TC3B	Bus A of Item 20c	
21	480-V Service Building Main Board			Same as remarks for Item 20.
	Bus A	4 kV com bd A via TR TSBA	Bus B of Item 21	
	Bus B	4 kV com bd B via TR TSBB	Bus A of Item 21	
22	480-V Radwaste Boards			If the normal feed should fail, a manually actuated transfer to the alternate source may be made.
	Board 1	480-V Serv Bldg Bd (item 21) Bus A	1) 480-V com bd 1 2) 480-V Diesel Aux Bd-A	
	Board 2	480-V com bd 1 Item 20 Bus B	1) 480-V Serv Bldg Bd (item 21) 2) 480-V Diesel Aux Bd-B	
	Board 3	480-V Service Building board (Item 21) Bus B	480-V Common board 1 Bus A	

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Sheet 15

AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

Item	Board and/or Main Bus	Power Sources		Remarks
		Normal	Alternate	
23	480-V Auxiliary Boiler Bd			Both buses are normally fed from source shown, and with the manually operated bus tie breaker closed. Automatic transfer of both buses from the normal to the alternate source is initiated by time-undervoltage on the normal source. Return to the normal source is automatic upon return of voltage to the normal source.
	Bus A	480-V com bd 3, Bus A	480-V com bd 1, Bus B	
Bus B	480-V com bd 3, Bus	480-V com bd 1, Bus B		
24	480-V Control Bay Vent Boards			
	Board A	480-V Shutdown Bd 1A	480-V com Bd 1	
	Board B	480-V HVAC Bd B	480-V com Bd 3	
25	480-V Turbine MOV Boards			
(a)	Unit 1, Board 1A	480-V unit bd 1A	480-V com bd 1, Bus A	
(b)	Unit 1, Board 1B	480-V unit bd 1B	480-V com bd 2-Bus B	
(c)	Unit 1, Board 1C	480-V unit bd 1B	480-V com bd 2-Bus B	
(d)	Unit 2, Board 2A	480-V unit bd 2A	480-V com bd 3-Bus B	
(e)	Unit 2, Board 2B	480-V unit bd 2B	480-V com bd 2-Bus B	
(f)	Unit 2, Board 2C	480-V unit bd 2B	480-V com bd 2-Bus A	
(g)	Unit 3, Board 3A	480-V unit bd 3A	480-V com bd 3-Bus A	
(h)	Unit 3, Board 3B	480-V unit bd 3B	480-V com bd 3-Bus B	
(i)	Unit 3, Board 3C	480-V unit bd 3B	480-V com bd 2-Bus A	

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TABLE 8.4-1

Sheet 16

AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

Item	Board and/or Main Bus	Power Sources		Remarks
		Normal	Alternate	
26	480-V Condensate Demineralizer Boards			
(a)	Unit 1	480-V unit bd 1A	480-V shdn bd 1B	In case of failure of the normal source, automatic transfer is made to an energized alternate source. Upon restoration of the normal source, automatic return to normal is effected.
(b)	Unit 2	480-V unit bd 2A	480-V shdn bd 2B	
(c)	Unit 3	480-V unit bd 3A	480-V shdn bd 3B	
27	480-V Reactor Building Vent Boards			
(a)	Unit 1, Board 1A	480-V unit bd 1A	480-V com bd 1-Bus B	See remarks of Item 23.
(b)	Unit 1, Board 1B	480-V unit bd 1A	480-V com bd 1-Bus B	
(c)	Unit 2, Board 2A	480-V unit bd 2A	480-V com bd 3-Bus A	
(d)	Unit 2, Board 2B	480-V unit bd 2A	480-V com bd 3-Bus A	
(e)	Unit 3, Board 3A	480-V unit bd 3A	480-V com bd 3-Bus B	
(f)	Unit 3, Board 3B	480-V unit bd 3A	480-V com bd 3-Bus B	
28	480-V Turbine Building Vent Boards			
(a)	Unit 1, Board 1A	480-V unit bd 1A	480-V com bd 1-Bus A	See remarks on Item 23.
(b)	Unit 1, Board 1B	480-V unit bd 1B	480-V com bd 2-Bus B	
(c)	Unit 2, Board 2A	480-V unit bd 2A	480-V com bd 3-Bus B	
(d)	Unit 2, Board 2B	480-V unit bd 2B	480-V com bd 2-Bus A	
(e)	Unit 3, Board 3A	480-V unit bd 3A	480-V com bd 3-Bus A	
(f)	Unit 3, Board 3B	480-V unit bd 3B	480-V com bd 2-Bus A	

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Sheet 17

AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

<u>Item</u>	<u>Board and/or Main Bus</u>	<u>Power Sources</u>		<u>Remarks</u>
		<u>Normal</u>	<u>Alternate</u>	
29	480-V Shutdown Boards			
(a)	Unit 1, 480-V Shutdown Bd 1A	4 kV shutdown bd A via TR TS1A	4 kV shutdown bd B via TR TS1E	Transfer from the normal to the alternate source is manual. Interlocking is provided to prevent manually transferring to a faulted board and to prevent paralleling two sources.
(b)	Unit 1, 480-V Shutdown Bd 1B	4 kV shutdown bd C via TR TS1B	4 kV shutdown bd B via TR TS1E (c)	Remark (a)
(c)	Unit 2, 480-V shutdown Bd 2A	4 kV shutdown bd B via TS2A	4 kV shutdown bd C via TR TS2E	
(d)	Unit 2, 480-V shutdown Bd 2B	4 kV shutdown bd D via TR TS2B	4 kV shutdown bd C via TR TS2E	Remark (a)
(e)	Unit 3, 480-V Shutdown Bd 3A	4kV shutdown bd 3EA via TR TS3A	4 kV shutdown bd 3EB via TR TS3E	Remark (a)
(f)	Unit 3, 480-V Shutdown Bd 3B	4 kV shutdown bd 3EC via TR TS3B	4 kV shutdown bd 3EB via TR TS3E	Remark (a)
30	480-V Reactor MOV Boards			Remark 29(a)
(a)	Unit 1, 480-V Reac MOV Bd 1A	480-V Shutdown Bd 1A	480-V Shutdown Bd 1B	Remark 29(a)
(b)	Unit 1, 480-V Reac MOV bd 1B	480-V Shutdown Bd 1B	480-V Shutdown Bd 1A	Remark 29(a)
(c)	Unit 1, 480-V Reac MOV Bd 1C	480-V Shutdown Bd 1B	480-V Shutdown Bd 1A	Remark 29(a)

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AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

<u>Item</u>	<u>Board and/or Main Bus</u>	<u>Power Sources</u>		<u>Remarks</u>
		<u>Normal</u>	<u>Alternate</u>	
(f)	Unit 2, 480-V Reac MOV Bd 2A	480-V Shutdown Bd 2A	480-V Shutdown Bd 2B	Transfer from the normal to the alternate source alternate source is manual. Interlocks prevent transferring a fault from one source to another and paralleling sources.
(g)	Unit 2, 480-V Reac MOV Bd 2B	480-V Shutdown Bd 2B	480-V Shutdown Bd 2A	Transfer from the normal to the alternate source is manual. Interlocks prevent transferring a fault from one source to another and paralleling sources.
(h)	Unit 2, 480-V Reac MOV Bd 2C	480-V Shutdown Bd 2B	480-V Shutdown Bd 2A	Transfer from the normal to the alternate source manual. Interlocks prevent transferring a fault from one source to another and paralleling sources.
(i)	Unit 2, 480-V Reac MOV Bd 2D	480-V Shutdown Bd 2A	480-V Shutdown Bd 2B	Transfer from the normal to the alternate source is initiated by manual actions at the 480V Shutdown Boards. These manual actions open the normal feeder breaker and close the alternate feeder breaker, which is sensed by time-undervoltage on the normal source. Interlocks prevent transferring a fault from one source to another and paralleling sources. Return to the normal source is manual upon return of voltage to the normal source.
(j)	Unit 2, 480-V Reac MOV Bd 2E	480-V Shutdown Bd 2B	480-V Shutdown Bd 2A	Transfer from the normal to the alternate source is initiated by manual actions at the 480V Shutdown Boards. These manual actions open the normal feeder breaker and close the alternate feeder breaker, which is sensed by time-undervoltage on the normal source. Interlocks prevent transferring a fault from one source to another and paralleling sources. Return to the normal source is manual upon return of voltage to the normal source.
(k)	Unit 3, 480-V Reac MOV Bd 3A	480-V Shutdown Bd 3A	480-V Shutdown Bd 3B	Transfer from the normal to the alternate source is manual. Interlocks prevent transferring a fault from one source to another and paralleling sources.

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TABLE 8.4-1

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AUXILIARY POWER SUPPLIES AND BUS TRANSFER SCHEMES

Item	Board and/or Main Bus	Power Sources		Remarks
		Normal	Alternate	
(l)	Unit 3, 480-V Reac MOV Bd 3B	480-V Shutdown Bd 3B	480-V Shutdown Bd 3A	Transfer from the normal to the alternate source is manual. Interlocks prevent transferring a fault from one source to another and paralleling sources.
(m)	Unit 3, 480-V Reac MOV Bd 3C	480-V Shutdown Bd 3B	480-V Shutdown Bd 3A	Transfer from the normal to the alternate source is manual. Interlocks prevent transferring a fault from source to another and paralleling sources.
(n)	Unit 3, 480-V Reac MOV Bd 3D	480-V Shutdown Bd 3A	480-V Shutdown Bd 3B	Automatic transfer from the normal to the alternate source is initiated by manual actions at the 480V Shutdown Boards. These manual actions open the normal feeder breaker and close the alternate feeder breaker, which is sensed by time-undervoltage on the normal source. Interlocks prevent transferring a fault from one source to another and paralleling sources. Return to the normal source is manual upon return of voltage to the normal source.
(o)	Unit 3, 480-V Reac MOV Bd 3E	480-V Shutdown Bd 3B	480-V Shutdown Bd 3A	Automatic transfer from the normal to the alternate source is initiated by manual actions at the 480V Shutdown Boards. These manual actions open the normal feeder breaker and close the alternate feeder breaker, which is sensed by time-undervoltage on the normal source. Interlocks prevent transferring a fault from one source to another and paralleling sources. Return to the normal source is manual upon return of voltage to the normal source.
31	480-V Diesel Auxiliary Boards			
(a)	480-V Diesel Aux Bd A	4 kV Shutdown Bd A via TR TDA	4 kV Shutdown Bd B via TR TDE	Transfer from the normal to the alternate source is manual. Interlocks prevent transferring a fault from one source to another and paralleling sources.
(b)	480-V Diesel Aux Bd B	4 kV Shutdown Bd D via TR TDB	4 kV Shutdown Bd B via TR TDE	Remark (a)
(c)	480-V Diesel Aux Bd 3EA	480-V Shutdown Bd 3A	480-V Shutdown Bd 3B	Remark (a)
(d)	480-V Diesel Aux Bd 3EB	480-V Shutdown Bd 3B	480-V Shutdown Bd 3A	Remark (a)
32	480-V HVAC Boards			
(b)	480V HVAC Board B	4-kV Shutdown Bd 3ED	480-V Shutdown Bd 3B	Transfer from the normal to the alternate source is manual. Interlocking is provided to prevent manually transferring to a faulted board and to prevent paralleling two sources.

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Table 8.4-2

(Deleted by Amendment 11)

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Table 8.4-3

(Deleted by Amendment 11)

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Table 8.4-4

(Deleted by Amendment 10)

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Table 8.4-5

(Deleted by Amendment 10)

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Table 8.4-6

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Table 8.4-7

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Table 8.4-8

(Deleted by Amendment 10)

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Table 8.4-9

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Table 8.4-10

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Table 8.4-11

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Table 8.4-12

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Table 8.4-13

(Deleted by Amendment 10)

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Table 8.4-14

(Deleted by Amendment 13)