

Transmission Register Component Linking Manual August 13, 2021

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California Independent System Operator

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1. Introduction

The Transmission Register (TR) is a secure Web-enabled database environment for CAISO internal users and specific Participating Transmission Owners (PTO) to access TR data.

The TR discloses for each transmission line and associated facility the:

- Identity of the PTO responsible for operation and maintenance, and its owners.
- Dates which the CAISO assumed or relinquished Operational Control.
- Date of any change in the identity of the PTO responsible for its operation and maintenance, or in the identity of its owner.
- Transmission equipment's applicable ratings and history.

The TR also provides ISO, PTO Administrators, and/or linking designees the ability to link group able components.

Note: Refer to the <u>Transmission Register CAISO & PTO General User Manual</u> for the basic steps to navigate within TR, the <u>Transmission Register Autoloader User</u> <u>Manual</u> to perform bulk Change Requests, and the <u>Transmission Register PTO</u> <u>Admin User Manual</u> for PTO Admin to perform maintenance and management of Component information for their individual Organizations.

1.1. Purpose

The TR maintains the official listing of transmission lines, associated facilities, and Entitlements that are subject to the CAISO's Operational Control, as required by the Transmission Control Agreement, Section 4.2.

This manual describes the method for linking components to accurately represent transmission facilities under CAISO Operational Control.

1.2. Scope

A Component Link is a relationship between two Components of which one is considered a Parent Component and the other a Child Component. The user of this manual must be a TR Admin authorized representative set with Linking permissions.

1.3. Definitions

The following table gives the definitions of the different components used in linking, and differentiates between parent and child, and group able components:

Object	Definition	Parent or Child				
		designation				
BUS	Bus	Both				
BSCB	Bus Sectionalizing Circuit Breaker	Both				
CABLE	Cable	Both				
CAP	Shunt Capacitor	Both				
СВ	Circuit Breaker	Both				
COND	Overhead Conductor	Both				
CSW	Circuit Switch	Both				
СТ	Current Transformer	Both				
DISC	Disconnect Switch	Both				
FUSE	Fuse	Both				
	Typically consists of a CB, DISCs,	Both & can represent group				
LEG	and COND at a CB position inside a	of components				
	Station.					
MOD	Motor Operated Disconnect Switch	Both				
RCT	Shunt Reactor	Both				
REG	Regulator	Both				
RLY	Relay	Both				
SCAP	Series Capacitor	Both				
SCND	Synchronous Condenser	Both				
SRCT	Series Reactor	Both				
SVC	Static VAR Compensator	Both				
	Represents one terminus of a	Both & can represent group				
TERM	transmission line typically consisting	of components				
	of a LEG(s) and line drop CONDs.					
ті	Transmission Line	Parent, & can represent				
		group of components				
TLS	Transmission Line Section	Both				
TR	Transmission Register	Both				
TRCT	Tertiary Reactor	Both				
WTRP	Wave Trap	Both				
XFMR	Transformer	Both				
XEMR BANK	Transformer Bank	Both, & can represent group				
		of components				
XEMR BAY	Transformer Bay	Parent, & can represent				
		group of components				

2. Linking Examples

A variety of components can be entered into the TR. Some components are individual pieces of equipment, such as circuit breakers or disconnect switches. Other components such as legs, transmission lines, and transformer banks are considered a grouping of individual pieces of equipment or sub-groups of equipment. For instance, legs generally consist of a group of station equipment (circuit breakers, disconnect switches, jumpers, etc.) that reside between a line drop and a station bus, or another line drop. Another example is a transmission line, which consists of line segments, conductor types, legs, and additional pieces or sub-groups of equipment that in a group make up a transmission line.

The types of components that are individual pieces of equipment that can either be a parent or child, or can represent a group of components, are defined in section **Error! Reference source not found.**. The types of components, ordinarily used to represent a group or sub-group of individual equipment components, or sub-groups of components, are reiterated as follows:

Group able Component Type	Description
LEG	Leg
TERM	Terminal
TL	Transmission Line
TLS	Transmission Line Segment
XFMR BANK	Transformer Bank
XFMR BAY	Transformer Bay

The diagrams in the ensuing subsections represent the method to group components to analyze grid configurations using current TR terminology:



2.1. Example 1 – Two Terminal Transmission Line



2.2. Example 2 – Three Terminal Transmission Line





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3. Linking Steps

The linking function is viewable on the TR Main Page for those individuals with linking permission. Once the linking criterion is understood, performing the steps is fairly simple.

Take the following actions to link components:

	Transmission Register Preferences Help 💻 Walcome TRR ISCO Admin Linker: Liner — 15 May 2007
	CALIFORNIA ISO
	Transmission Register Components Requests Admin Reporting Component Quick Find: Component ID 60
	Find Components By selecting one of two search types, Static or Dynamic, a user may search for transmission equipment ratings and information utilizing different criteria, e.g., station name, equipment type, organization, and/or voltage.
-	Link Components Allows a user to create parent/child relationships between two or more components of an electric transmission system.
	Add New Components Permits an ISO or PTO Admin to create a Change Request to add new components to the Transmission Register.
	Participating Transmission Owner (PTO) Entitlements Click here for access to the Transmission Control Agreement which includes each PTO's Entitlements that have been turned over to the CAISO for Operational Control.
١	Figure 1. Components Home Page

- **Click** on the Components tab shown in Figure 1.
- Click on the Link Components hyperlink and the screen in Figure 2 loads.

	California I	SO										View Me
	Transmission	Register _c	omponents	Requests	Admin	Reportir	ng			Componen	t Quick Find: 🖸	omponent ID
Link Co	mponents							Organiz	ation:			
arents					(Children						
Station	Voltage (kV)	Equipment	Туре	Run Search		Station	•	Voltage (kV)	•	Equipment	Type	Run Search
Station	Туре	Component Des	cription			Station		Туре	Comp	onent Des	cription	
					Link							
ink View						Componen	t Details					
Id	Description	Station	Eq. Ty	/pe		Desc	cription:					
_							ID:			Hig	ıh (k¥):	
							Org: Ownors:			Lo	₩ (k¥): (Lv):	
						Effe	ct Date:			rerda	ISO:	
						Last Mo	od Date:			Star	t Date:	
						Station:			End Date:			
						Equip Type:			Additional Info:			
						Pendina R	equest: A	IA			Line #:	
						Ratings						
						Rating Type	AMP Rating	MVA Rating	M¥Ar High	MVAr Low	Duration	Notes

Figure 2. Link Components Screen

- Select the organization from the dropdown menu. ---
- **Select** the station from the dropdown menu on the Parents side.
- Select the Voltage (kV) from the dropdown menu and, if needed, select the Equipment Type.
- **Press** the Run Search button and the window below Parents populates.
- **Select** the organization from the dropdown menu on the Children side.
- Select the station from the dropdown menu.
- Select the Voltage (kV) from the dropdown menu and, if needed, select the Equipment Type.
- Press the Run Search button and a window below Children populates.

	Link Compone	ents								Organiza	ation: PL	JD		
Parents Children														
	Station	Voltage (kV)		Equipment Ty	pe			Station		Voltage (kV)		Equipment	t Туре	
	CLIPPER GAP	230.0	-			un Search		CLIPPER GAP	-	230.0	-		•	Run Search
	Station	Туре	Com	ponent Descri	ption			Station		Туре	Compo	onent Des	cription	
1	CLIPPER GAP TL. 102 CLIPPER GAP TLS 120 CLIPPER GAP LS 120 CLIPPER GAP CB 66 CLIPPER GAP CB 66 CLIPPER GAP XFMR 78 CLIPPER GAP XFMR BAN CLIPPER GAP XFMR BAN CLIPPER GAP XFMR BAN CLIPPER GAP XFMR BAN	K 80 K 82A K 82B K 82C				▲ ▼	Link	CLIPPER GAP T CLIPPER GAP T CLIPPER GAP T CLIPPER GAP C CLIPPER GAP X CLIPPER GAP X CLIPPER GAP X CLIPPER GAP X CLIPPER GAP X CLIPPER GAP X	L 102 LS 120 ERM 150 EG 150A B 66 FMR 78 FMR 78 FMR 84 FMR 84 FMR 84 FMR 84 FMR 84 FMR 84	K 80 K 82A K 82B K 82C				
	Link View							Component	Details					
	Id			Description	Station	Eq. Type		Descr	iption:	102				
	□ 150059			102	CLIPPER GAP	TL		-	ID:	150059		Hiç	gh (k¥): 230	
	⊟ 150060		Unlink	120	CLIPPER GAP	TLS			Org:	PLUD		La	w (kV): 115	
	□ 150061		Unlink	150	CLIPPER GAP	TERM		0	wners:	PLUD		Tertia	ry (k¥):	
	= 150062		Unlink	150A	CLIPPER GAP	LEG		Effect	Date:	05/11/2007		Ch	ISU: T	20007
	15001	L3	Unlink	66	CLIPPER GAP	CB		Last Mot	i Date:	CLIDDED CAD		Stal	d Date: 05/01	1/2007
								Equip	Type:	TL		Addition	al Info:	
								L	ength:				Line #:	
								Pending Re	quest:	N/A				
								Ratings						
								Rating	AMP	MVA	MVAr	MVAr	Duration	Notes

Figure 3. Link Components Screen Loaded

- **Highlight** the desired component from the Parents side.
- **Highlight** the desired component from the Children side and the Link button activates.
- **Press** the Link button and the screen refreshes with the Link View populating.

To unlink parent and children components:

• **Press** the <u>Unlink</u> hyperlink.

4. Revision History

Version	Activity	Ву	Date
1.0	Draft	Steve Rutty	7/1/02
2.0	TR rebuild initiated manual rewrite.	Marilyn Lien	5/17/07
3.0	Corrected Components in Examples 1 & 3, Updated ISO Logo	Duke Luu	5/12/2014
4.0	Updated ISO Logo and format	Chris Hillman	8/13/2021