

Format Differences from PSLF and PSS/E

What to know when importing a WECC
epc base case or communicating with
PSS/E and PSLF users

- Multi-section dummy buses numbers are invented when importing epc case
 - Invented number is an unused number near adjacent buses
 - No problem if NOT using previously prepared aux files, or NOT developing aux files for other cases, or WILL NOT be compared with other cases
 - Suggestion: renumber these to standardized bus numbers

	NumberTo	NumberFrom	NameFrom	NumberTo	NameTo	C
1	10051	10048	BROADWAY	10014	ARNO	1
2	10109, 10110, 10146, 10148	10099	EL-PE	10098	EL-92	1
3	10175	10107	FT_MARCY	10057	CAPITOL	1
4	10176	10103	EMBUDO	10152	JUANTABO	1
5	10189, 10190	10159	KAISER_T	10073	COCHITI	1
6	10219	10218	NEWELL_T	10217	NEWELL	1
7	10226	10225	NOE_TAP	10223	NOE	1
8	10247	10227	NORTHNM	10212	MPLAZA_T	1
9	10251	10230	NORTON_1	10201	MEJIA_T	1
10	10267	10244	PERSON	10123	HAZEL_T	1
11	10270, 10287	10030	BALLP_T	10254	PRAGER	1
12	10290	10259	PY-EL-KL	10160	KELEHER	1
13	10312, 10335, 10336	10254	PRAGER	10259	PY-EL-KL	1
14	10359, 10374	10292	SAN_JUAN	10025	B-A	1
15	10378	10295	SANDIA_1	10170	LENKURT	1
16	10379	10004	ALCAZAR	10296	SANDIA_2	1
17	10389	10310	SEWER_PL	10282	S_COORS	1
18	10392	10024	B-A	10315	SIGNET_T	1
19	10397	10382	YAHTAHEY	10009	ALLISONT	1
20	10398	10382	YAHTAHEY	10072	WNDWROCK	1
21	10399	10382	YAHTAHEY	10249	PITT-MID	1
22	10403	10385	ZAMORA_T	10280	S_ANTON	1
23	10404	10292	SAN_JUAN	10390	RIOPUERC	1
24	10473	10387	ZIA_1	10467	MGLLUJAN	1
25	12018, 12026	12008	BERNARDO	12007	BELEN_PG	1
26	12039	10322	SLUCAS_T	12036	GULF_PGT	1
27	12040	10231	NORTON_2	12038	HERNANDZ	1
28	14008	14001	FOURCORN	14002	MOENKOPI	1
29	14010	14003	NAVAJO	14002	MOENKOPI	1
30	14011	14004	SAGUARO	14004	SAGUARO	1

Easy trick to renumber dummy buses

- Save the multi-section line fields “NumberFrom”, “NumberTo”, and “Circuit” to an aux file
- In this example, we are starting from the WECC case PSS/E raw format to renumber the WECC case after importing the epc format

The screenshot shows the Model Explorer software interface. The main window displays a table of multi-section lines with columns for NumberFrom, NumberTo, Circuit, NameFrom, and NameTo. A context menu is open over the table, showing options to save auxiliary files. The table data is as follows:

	NumberFrom	NumberTo	Circuit	NameFrom	NameTo
1	10004	10296	&1	ALCAZAR	SAN...
2	10009	10382	&1	ALLISONT	YAHT...
3	10014	10048	&1	ARNO	BRO...
4	10024	10315	&1	B-A	SIGN...
5	10025	10292	&1	B-A	SAN...
6	10030	10254	&1	BALLP_T	PRA...
7	10057	10107	&1	CAPITOL	FT_MARCY
8	10072	10382	&1	WNDWROCK	YAHTAHEY
9	10073	10159	&1	COCHITI	KAISER_T
10	10098	10099	&1	EL-92	EL-PE
11	10103	10152	&1	EMBUDO	JUANTABO

- In an editor, globally replace the ampersand in the ID with a space
 - The ID in the PSS/E raw file is an ampersand
 - The ID in the epc file doesn't have an ampersand
 - Example: "&1" will become " 1"
- Then globally replace <SUBDATA Bus> to become <SUBDATA *BusRenumber*>

```
DATA (MULTISECTIONLINE,
[BusNum,BusNum:1,LineCircuit])
{
10004 10296 "&1"
  <SUBDATA Bus>
    999881
  </SUBDATA>
10009 10382 "&1"
  <SUBDATA Bus>
    999849
  </SUBDATA>
10014 10048 "&1"
  <SUBDATA Bus>
    999877
  </SUBDATA>
10024 10315 "&1"
  <SUBDATA Bus>
    999880
  </SUBDATA>
```



```
DATA (MULTISECTIONLINE,
[BusNum,BusNum:1,LineCircuit])
{
10004 10296 " 1"
  <SUBDATA BusRenumber>
    999881
  </SUBDATA>
10009 10382 " 1"
  <SUBDATA BusRenumber>
    999849
  </SUBDATA>
10014 10048 " 1"
  <SUBDATA BusRenumber>
    999877
  </SUBDATA>
10024 10315 " 1"
  <SUBDATA BusRenumber>
    999880
  </SUBDATA>
```

- Save this aux file
- Load this aux file into the epc imported case
 - Must be in edit mode
- Renumbering is done

	NumberTo	NumberFrom	NameFrom	NumberTo	NameTo	Circuit
1	10051	10048	BROADWAY	10014	ARNO	1
2	10109, 10110, 10146, 10148	10099	EL-PE	10098	EL-92	1
3	10175	10107	FT_MARCY	10057	CAPITOL	1
4	10176	10103	EMBUDO	10152	JUANTABO	1
5	10189, 10190	10159	KAISER_T	10073	COCHITI	1
6	10219	10218	NEWELL_T	10217	NEWELL	1
7	10226	10225	NOE_TAP	10223	NOE	1
8	10247	10227	NORTHPNM	10212	MPLAZA_T	1
9	10251	10230	NORTON_1	10201	MEJIA_T	1
10	10267	10244	PERSON	10123	HAZEL_T	1
11	10270, 10287	10030	BALLP_T	10254	PRAGER	1
12	10290	10259	PY-EL-KL	10160	KELEHER	1
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16	10379	10004	ALCAZAR	10296	SANDIA_2	1
17	10389	10310	SEWER_PL	10282	S_COORS	1
18	10392	10024	B-A	10315	SIGNET_T	1
19	10393	10323	VALENTIN	10308	MOUNTAIN	1



	NumberTo	NumberFrom	NameFrom	NumberTo	NameTo	Circuit
1	999877	10048	BROADWAY	10014	ARNO	1
2	999873, 999874, 999875, 999876	10099	EL-PE	10098	EL-92	1
3	999870	10107	FT_MARCY	10057	CAPITOL	1
4	999871	10103	EMBUDO	10152	JUANTABO	1
5	999868, 999869	10159	KAISER_T	10073	COCHITI	1
6	999867	10218	NEWELL_T	10217	NEWELL	1
7	999866	10225	NOE_TAP	10223	NOE	1
8	999865	10227	NORTHPNM	10212	MPLAZA_T	1
9	999864	10230	NORTON_1	10201	MEJIA_T	1
10	999862	10244	PERSON	10123	HAZEL_T	1
11	999879, 999878	10030	BALLP_T	10254	PRAGER	1
12	999858	10259	PY-EL-KL	10160	KELEHER	1
13	999861, 999860, 999859	10254	PRAGER	10259	PY-EL-KL	1
14	999854, 999855	10292	SAN_JUAN	10025	B-A	1
15	999852	10295	SANDIA_1	10170	LENKURT	1
16	999881	10004	ALCAZAR	10296	SANDIA_2	1

Potential Switched Shunt ID issue

- PSLF treats controlled shunt data (SVD's) as separate device type from shunts (not switchable)
- PWS treats SVD's and bus shunts as the same device type
 - Mode for bus shunts is "bus shunt"
 - Mode for SVD is "discrete", "fixed", "continuous", or "SVC", depending on PSLF type (types 0 through 7)
- *Question: What happens if the same ID is used in PSLF for an SVD and bus shunt on the same bus?*
- *Answer: PWS changes the bus shunt ID to "SA", with subsequent conflicts assigned ID SB, SC, etc.*
- Fortunately, no ID conflicts have occurred in WECC cases, yet

Communicating with WECC PSS/E users

- Switched Shunts in PSS/E are limited to one per bus with no ID
 - The WECC Siemens converter changes multiple switched shunts from the epc format to a single switched shunts with no ID connected to dummy buses with low impedance branch to original bus
- Series Capacitor data is not retained in PSS/E if it is bypassed in the epc
 - PSS/E doesn't have a "bypass" feature
 - It changes the branch to a low impedance tie
- No Star Bus (dummy bus) in three winding transformers
 - Uses the delta model rather than star model for three winding transformers
 - User won't see the same bus numbers for overload
- Transaction Table for area interchange is ignored
 - Total area export is specified by the user, PSS/E does not sum up individual area to area schedules