WECC Modeling and Validation Work Group
Load Long ID (LID) Instructions

October 4, 2011
Updated April 10, 2012

1. Introduction

Western Electricity Coordinating Council (WECC) is moving forward with the implementation of the composite load model. Figure 1 below illustrates a process by which the CMPLDW dynamic models will be created.

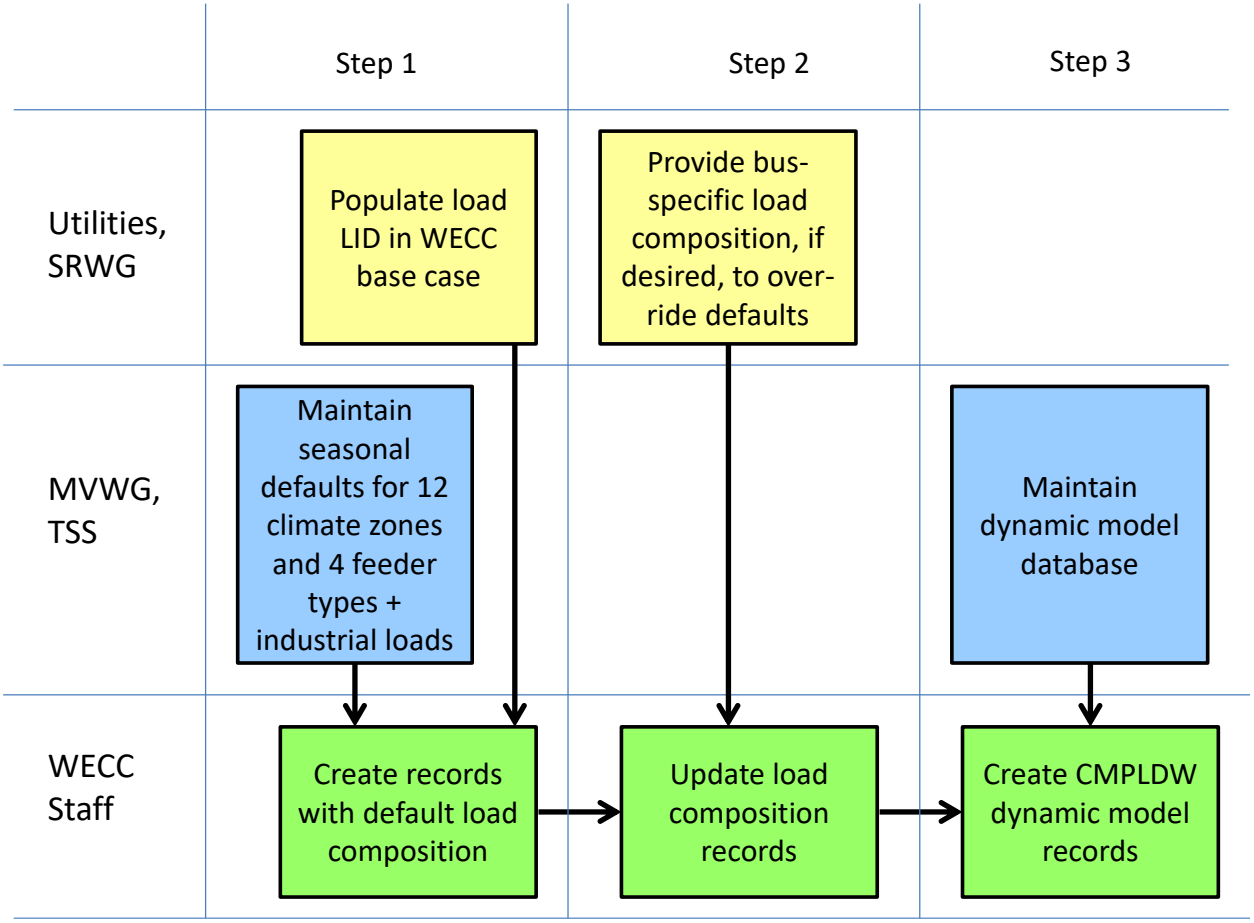

Figure 1: A flow chart of the process of creating CMPLDW dynamic model records

In Step 1, WECC utilities provide the Long IDs (LID) for all loads in WECC powerflow case. The same LID can be used for all basecases. WECC Modeling and Validation Work Group (MVWG) maintains load composition defaults for 12 climate zones and 4 feeder types in each climate zone. The load composition defaults are developed for normal summer, hot summer, cool

summer, normal winter and shoulder seasons. MVWG also developed load composition data for several types of industrial loads. Industrial loads stay the same across all climate zones and all seasons. WECC staff creates load composition records for each load by matching its LIDs with the records in the MVWG default data set.

In Step 2, WECC utilities can over-ride the default load composition data by providing bus-specific load composition information. WECC staff updates load composition records with this information.

In Step 3, WECC staff creates CMPLDW dynamic records by combining the load model composition data with the dynamic models for load model components (such as motors, electronic loads and ZIP).

For GE PSLF users, the Load Model Data Tool (LMDT) is available to assist in creating the composite load model data records.

For Siemens PTI PSS®E users, the dynamic load files are created in a conversion process from PSLF models.

The same LID can be used for all base cases prepared by WECC. The composite load model records will be created for each base case and the load will reflect the case year, season and time of day. Each powerflow base case will have a corresponding dynamics file with the composite load model records.

2. Long ID (LID) Format

The LID consists of 7 characters.

For commercial, residential, and rural loads, the LID code is a combination of the Climate Zone and Feeder Type.
The LID format is as follows: <3-character climate zone>_<3-character load class>
For example:

- A load in downtown Phoenix with high concentration of commercial loads would be identified as "DSW_COM"
- Rural agricultural load in Moses Lake, WA would be identified as "NWI_RAG"

For industrial, irrigation, and power plant auxiliary loads, the LID code will be one of the IDs in the provided tables below, which starts with “IND_”, “AGR_”, and “PPA_”, respectively.
The LID format is as follows: <7-character load ID>

2.1. Climate Zone

For commercial, residential, and agricultural loads, determine the climate zone based on the geographic location of the load, and use the corresponding 3 letter ID as part of your LID.

Representative cities within each of the climate zones are provided in the following table.

ID	Climate Zone	Representative City
NWC	Northwest Coast	Seattle, Vancouver BC
NWV	Northwest Valley	Portland OR, west of Cascades
NWI	Northwest Inland	Boise, Tri-Cities, Spokane
RMN	Rocky Mountain North	Calgary, Montana, Wyoming
NCC	Northern California Coast	Bay Area
NCV	Northern California Valley	Sacramento
NCI	Northern California Inland	Fresno
SCC	Southern California Coast	LA, San Diego
SCV	Southern California Valley	LA, San Diego
SCI	Southern California Inland	LA, San Diego
DSW	Desert Southwest	Phoenix, Riverside, Las Vegas,
HID	High Desert	Salt Lake City, Albuquerque, Denver, Reno

A map of the general geographic areas for the climate zones are shown in the following figure.

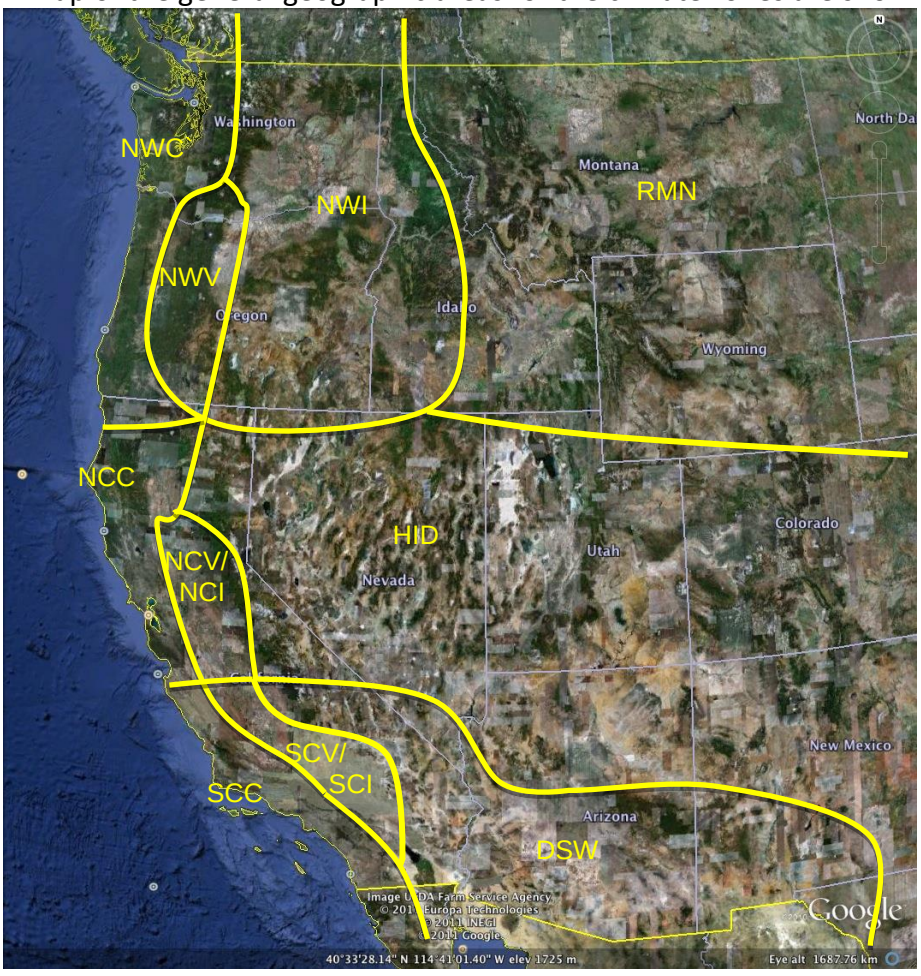

Figure 2: Map depicting the general geographic region for each of the climate zones

2.2. Substation / Feeder Type

For each substation or feeder, determine the type of loads that compose the load. The general categories are residential, commercial, mixed residential and commercial, and rural/agricultural. The breakdown of what types of loads are in each general category is shown in the table below. The percentages are based on energy.
Caution: Do not confuse this with customer count.

ID	Feeder Type	Residential	Commercial	Industrial	Agricultural
RES	Residential	70 to 85%	15 to 30%	0%	0%
COM	Commercial	10 to 20%	80 to 90%	0%	0%
MIX	Mixed	40 to 60%	40 to 60%	0 to 20%	0%
RAG	Rural	40%	30%	10%	20%

The actual load composition may vary from the provided composition. Although you can customize this option and be precise for each load, be careful that the added effort to be precise provides the desired benefits. The substation / feeder types provided are used to develop the composite load model using typical data.

A general description of the substation / feeder types can also be described as follows:

- Residential – representative of suburban residential feeders
- Commercial – representative of feeders in metro areas, such as those that serve the downtown area
- Mixed – mix of commercial and residential loads, for example areas that are residential with a mall or shopping center or small office park
- Rural – rural / agricultural feeders

Sources to determine the load composition of each substation or feeder will vary depending on your company. Typically your distribution planner will be able to classify the types of load on each feeder. Other sources could include end-use surveys, SCADA data, load forecasts, etc. The analysis should be based on the energy consumption of the various types of loads. It is suggested to use MIX (Mixed) identification when no information is available.

Based on your choice of the best load composition to model each load, use the corresponding 3 letter ID as part of the LID.

2.3. Industrial Loads

The options for industrial loads where typical data will be provided are as described in the following table. Use the corresponding 7 character ID as the LID.

ID	Feeder Type
IND_PCH	Petro-Chemical Plant
IND_PMK	Paper Mill – Kraft process
IND_PMT	Paper Mill – Thermo-mechanical process
IND_ASM	Aluminum Smelter
IND_SML	Steel Mill
IND_MIN	Mining operation
IND_SCD	Semiconductor Plant
IND_SRF	Server Farm
IND_OTH	Industrial – Other

If you have a better representation of a particular industrial load, you can submit the composite load model parameters directly. Still, please provide the most appropriate LID for the industrial load.

Large industrial sites may include embedded generation. It is necessary to have correct representation of industrial load and generation in the powerflow base case. Practices like load-netting or modeling embedded generation at the high voltage bus should be avoided. Industrial generation and load need to be represented at a low voltage bus behind a plant transformer. Figure 3 illustrates the correct modeling approach.

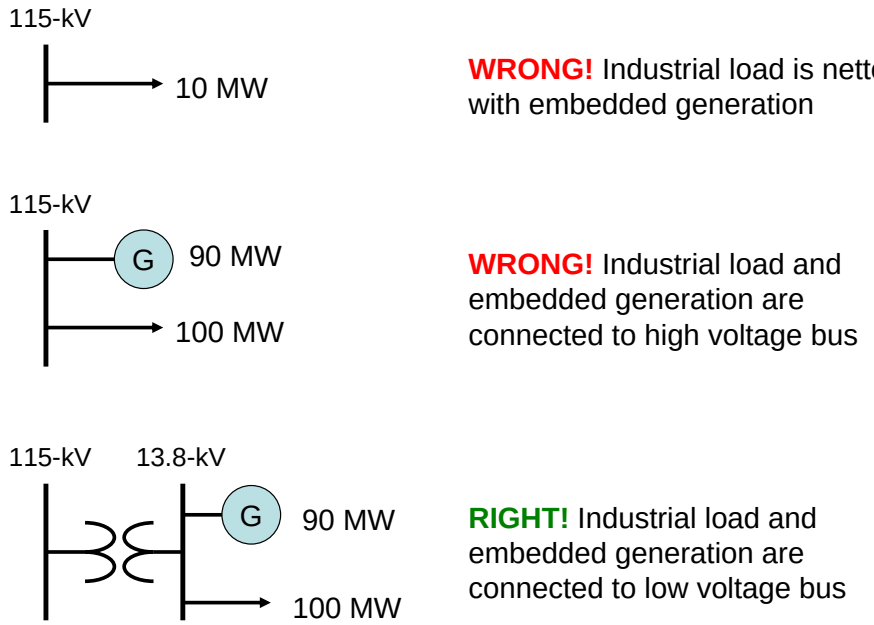

Figure 3: Powerflow basecase representation of an industrial site with embedded generation. The industrial site in this example includes 100 MW load and 90 MW of embedded generation. Although the net shows up as 10 MW at the high side, the correct approach is to represent the generation and load at lower voltage level.

2.4. Irrigation Loads

For agricultural irrigation loads (induction motor pumps), use the LID code AGR_IRR.
Large pumping stations, that have large synchronous motors, use the LID code AGR_PMP.

ID	Feeder Type
AGR_IRR	Agricultural irrigation loads
AGR_PMP	Large pumping stations with synchronous motors

If you have a better representation, you can submit composite load model parameters to represent this load. Still, please provide the LID for the base case.

2.5. Power Plant Auxiliary Loads

For power plant auxiliary loads, use the LID code "PPA_AUX".

ID	Feeder Type
PPA_AUX	Power Plant Auxiliary

If you have a better representation, you can submit composite load model parameters to represent this load. Still, please provide the LID for the base case.

3. References

The following references are to other available documentation related to the composite load model. These are available on the WECC website.

WECC Load Model Report
Latest version: "WECC Load Model - DRAFT Report 2011-08-10.doc"

Load Composition Model (LCM)
Latest version: "WECC Load Composition Model - ver1x.xlsx" and
"WECC_LCM_Instructions.doc" dated October 2011

Load Model Data Tool (LMDT)
Latest version: LMDT 3A with "LMDT_3A_Instructions.doc" dated May 2011

4. Contacts

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