**Introduction**

“Solar train” and “Energy consumption” are components of a C++ project called “generators” (GridLAB-D’s module) developed in order to simulate the movement of a full electric train depended only on batteries due to its movement. Especially one can determine where and if the train must stop to change its batteries. Moreover it determines when the batteries that are charged by the use of PV panels must shift from being charged by PV panels to being charged by power plants in order to meet time requirements.

**Logical Design**

“Solar train” class, our primary focus, is a part of a whole called “generators” module and depends strongly on “energy consumption” and “solar” classes included in this module as well. It also depends on “house” and “lights” classes included in “residential” module. These dependencies are necessary in order to acquire important for our simulation parameters already implemented and tested by experts and especially, the U.S. Department of Energy (DOE) at Pacific Northwest National Laboratory (PNNL).

**Physical Design**

The first directory (core) contains the necessary libraries that the module needs. We have modified the “complex.h” library and especially we have transformed the private values into public ones in order to use complex numbers more efficiently. This directory also includes the “gridlabd.h” library that the module needs in order to run.

The directory “generators” contains our classes. Especially the “solar train” class that implements the needed functionality and the “energy consumption” class that is used for initialization purposes.

Finally, the directory “powerflow” contains important for our implementation libraries such as “power\_electronics.h” and “node.h” in order to implement the necessary connections between our objects in the .glm file.