2008 DEER Update – Summary of Database Contents

October 2008

I. Introduction

The results of the 2008 DEER analysis are stored in a MySQL database. A custom application called MISer (Measure Inspection and Summary) is provided to access the database in a logical and useful way. This tool also allows a user to extract the data from the database for their own use.

The DEER2008 database is built using the free and open source database "MySQL Community Server", version 5.1. While users are encouraged to utilize the tools provided to access the data, they can also get full and open access to the entire database by using this program or other MySQL aware database programs.

The database tables and table fields are described below in order to provide the user with some background on what is available in the database and how to access it. **Version 2b of the database format added separate fields within the annual results tables for whole-building and end-use results. The whole-building results for electricity use, electricity demand and gas use are the same as the "DEER Values" of previous versions of the database. The end-use results for electricity use, electricity demand and gas use are new and can be used to represent "non-interactive" measure results. Significant changes are highlighted in blue.**

II. Annual Impacts Tables

The ANNUAL_SIM and ANNUAL_WTD tables contain the annual results for all measure impacts. For this project an *impact* is defined as the comparison of a set of base case simulation results with a set of measure case simulation results. These tables contain one record for each calculated impact. With hundreds of measures, dozens of building types, sixteen climate zones, multiple building vintages and multiple base case scenarios (customer average, code, and market average), this table will hold millions of impact records.

The annual results are divided into two tables. The ANNUAL_SIM table contains building vintage-specific results; the second table, ANNUAL_WTD, contains results that have been weighted up into an overall "existing" vintage and also weighted up to represent an entire IOU territory.

Each annual record contains more than 340 fields that describe the impact results and provide both base case values and "delta" values (the difference between the base case and the measures case). The fields are fully defined in the accompanying spreadsheet "DEER2008 Database Field Descriptions (Version 2b).xls".

The first section of the annual results table consists of the main descriptor fields and the main measure results (energy impacts) as well as values that are useful in maintaining the

database, such as a unique impact ID, a time stamp that indicates when the record was loaded, and other status values; these fields are included within the first 39 columns of the annual table.

The second major section of the annual results table lists 153 base case values. These values include general information from the base case simulation, such as monthly electricity use and demand, end-use values for electricity and gas, monthly TDV values, etc... A number of measure specific values, such as total supply fan kW or total chilled water pump kW are also included.

The last major section of the annual results table lists the change in each of the 153 base case values due to the energy efficiency measure. These impacts are defined as the base case value minus the measure case value (i.e. "savings" are positive).

The most generally useful fields are described below. Those impact fields in bold are key to identifying the impact, those followed by an asterisk are needed to identify the basic energy and demand savings.

Table 1. Annual_Sim and Annual_Wtd tables – selected fields

Impact Field Name	Description
ImpactID	Unique string the identifies the impact
BaseCase *	Either Customer Average, Code/Standard or Market average
BldgType *	Building Type
CZ *	Climate Zone
Vint *	Vintage
HVAC *	HVAC System (if applicable)
Sched *	Schedule or Number of Shifts (if applicable)
TechID *	Technology ID, used to look up the Technology description
BaseTechDesc	Base case Technology Description
Unit1Desc	description of the Common Units (no. 1)
Unit2Desc	description of the Common Units (no. 2)
Unit1Val	Number Common Units (no. 1)
Unit2Val	Number Common Units (no. 2)
TotArea	Total building area (ft^2)
MeasArea	Total building area affected by the measure (ft^2)
LoadShapeID	Identifies the record in the Hourly_Sim or Hourly_Wtd table that contains the normalized load shape for the whole-building impact
LoadShapeID_EU	Identifies the record in the Hourly_Sim or Hourly_Wtd table that contains the normalized load shape for the end-use impact
ElecDem_D08	Demand: Whole Bldg Demand 2008 period (kW)
ElecDemD08_EU	Demand: Direct End Use Demand 2008 period (kW)
Imp_AnnualkWh	Impact: Annual electricity (kWh)
Imp_AnnualkWh_EU	Impact: Annual electricity – direct end use (kWh)
Imp_Annualtherm	Impact: Annual gas use (therm)
Imp_Annualtherm_EU	Impact: Annual gas use – direct end use (therm)

Each impact record has a unique "ImpactID" field. This text field identifies the exact simulations runs used to determine the impact. The process of determining impacts using eQUEST and a number of custom tools utilizes this ImpactID to track results. Once the data are in the database, however, it is more efficient to use the fields shown above that are marked with an asterisk to identify the impact results.

The "LoadShapeID" field links the whole-building annual impact to a normalized hourly loadshape that can be found in the HOURLY_SIM or HOURLY_WTD tables. Similarly, the "LoadShapeID_EU" field links the end-use annual impact to a normalized hourly loadshape

The impact values in the database are not normalized by any common unit, they are absolute values. Appropriate normalizing units, such as "per ton of chiller capacity" or "per lamp" are listed as Unit1Desc and Units2Desc. Their corresponding values are listed as EnergyUnits1 and EnergyUnits2. The standard DEER energy savings values for whole-building impacts are calculated as:

- Electricity Savings = Imp_AnnualkWh / Unit1Val (kWh/unit)
- Gas Savings = Imp_Annualtherm / Unit1Val (therm/unit)
- Demand Savings = ElecDem_D08 / Unit1Val (kW/unit).

The savings values for end-use impacts are calculated as:

- Electricity Savings = Imp_AnnualkWh_EU / Unit1Val (kWh/unit)
- Gas Savings = Imp_Annualtherm_EU / Unit1Val (therm/unit)
- Demand Savings = ElecDemD08_EU / Unit1Val (kW/unit).

Note that for measures that have no assigned direct impact end-use, the whole-building and the end-use impacts are set to be the same. If a user wants to review results that do not include interactions with other end-uses, the user can look at the end-use results exclusively. Currently, only indoor lighting and residential appliances are assigned a direct impact end-use.

III. Loadshapes Tables

The HOURLY_SIM and HOURLY_WTD tables contain normalized load shapes that are associated with specific annual impacts. The data in the HOURLY_SIM table is associated with annual results in the ANNUAL_SIM table. Likewise, the data in the HOURLY_WTD table is associated with annual results in the ANNUAL_WTD table. The annual and hourly tables are linked via the LoadShapeID and the LoadShapeID_EU fields in the annual tables and the LoadShapeID field in hourly table.

The binary field in each record contains a "zipped" file of hourly values. The hourly values are normalized such that the sum of all 8,760 values equals 1.0. These values can be multiplied by the annual electricity savings to get an impact load shape.

The binary field, technically called a "BLOB", or Binary Large Object, is a comma separated text file that has been compressed to reduce storage requirements. Then extracted, the contents of the zipped file contain the following fields:

Table 2. LOADSHAPE hourly data file contents

DEER2008 Update, version 2 DEER Impact ID, OfS-w03-vN5-bCD-eMS-mNE-HVAC-airAC-Pkg-lt65kBtuh3phs-12p0seer Loadshape Type, Normalized Normalized Demand Savings (W/annual-kWh-savings) DEER2005 and DEER2008, 0.5366771941, 0.5366771941 Calculation Type, NoSmoothing DOE2 Base File, OfS-w03-vN5-cCD-mNE-HVAC-airAC-Pkg-lt65kBtuh3phs.csv, DOE2 Measure File, OfS-w03-vN5-cMS-mNE-HVAC-airAC-Pkg-lt65kBtuh3phs-12p0seer.csv Day Definition File, na, Report Configuration File, Clg-Htg-Tot.Dat Reference Impact ID, na, Year Basis, 1991 Scale Basis, 0
0 0 0 0.056667566 0.196162701 0.333442688 0.360494971 0.22197485 0.055427432 *(8760 hourly kW impacts)*

The first ten lines describe the impact and how the hourly values were derived. These lines are followed by 8,760 hourly impact values.

IV. Technologies Table

The TECHNOLOGIES table contains a brief description of each technology along with other summary information, such as a measure category and a sub-category. This information is used by the MISer program to group the technologies when needed.

Table 3. TECHNOLOGIES table – selected fields

Technologies Field Name	Description
techID	Unique ID that links the IMPACTS records to the associated TECHNOLOGIES record.
TechDesc	brief description of the energy-savings technology
DEER05ID	ID from the DEER05 Database (if applicable)
ImplementPhase	2008 phase the measures is targted for
Status	measure status information
Category	Measure category, for grouping technologies
SubCat	Measure sub-category, for grouping technologies
Measure	measure name, informs the MAS tool how to process measure
PrimEU	Primary End-Use
NormUnit1	Primary Normalizing Unit description
NormUnit2	Secondary Normalizing Unit description (optional)
NormUnit3	Third possible Normalizing Unit description (optional)

The DEER05ID can be used to map previous DEER impact estimates to the new estimates contained in this database.