BOPTEST Reference Test Case Peer Review Document

This document serves a peer review template for an emulation model that is to be a reference test case. There are four sections:

I. General Information

II. General Comments

III. Model Checks

IV. Test Case Checks

Section I is to be completed by the Model Developer. The remaining sections are to be completed by the designated Model Reviewer, and returned to the Model Developer so that they may make the appropriate edits. This process should be repeated until all concerns of the reviewer are addressed. Each review should be documented using a separate version of this document, specified by the Review # in Section 1 below.

# I. General Information

|  |  |
| --- | --- |
| **Reference Case** |  |
| **Current Location** |  |
| **Model Developer** (Name, Institution, Email) |  |
| **Model Reviewer**  (Name, Institution, Email) |  |
| **Review #** |  |

# II. General Comments List each comment in separate row with number. Additional rows may be added as needed. They should be supported by the responses in Sections III and IV.

|  |  |
| --- | --- |
| **#** | **Comment** |
| 1 |  |
| 2 |  |
| 3 |  |

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# III. Model Checks

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| **Criteria** | **Reviewer Response** |
| **Reference Case Representation** |  |
| Does the model represent overall intent of reference case?  Are the relevant thermal systems, heat loads, and control signals accounted for? |  |
| **Climate** |  |
| Complete weather data file, similar to TMY? |  |
| Sufficiently long period, e.g. one year? |  |
| **Internal Gains** |  |
| Occupancy schedule? |  |
| Occupancy gain values reasonable for building type? |  |
| Lighting schedule/control? |  |
| Lighting gain values reasonable for building type? |  |
| Equipment schedule? |  |
| Equipment gain values reasonable for building type? |  |
| **Envelope Modeling** |  |
| Are IDEAS, Buildings, or AixLib component models used for building envelope and window modeling? |  |
| If not IDEAS, Buildings, or AixLib component models, are dynamic wall heat transfer models used? |  |
| If not IDEAS, Buildings, or AixLib component models, are complex fenestration models used? |  |
| It not IDEAS, Buildings, or AixLib component models, is latitude and longitude consistent with intended region or weather file? |  |
| It not IDEAS, Buildings, or AixLib component models, are convection models for inside and outside nonlinear? |  |
| Are window surface areas reasonable? |  |
| Are insulation levels reasonable? |  |
| Are all surfaces accounted for? (e.g. the roof is not forgotten) |  |
| Which of the following is used for modeling air infiltration?  *None*  *Constant*  *Pressure-driven flow*  *Buoyancy-driven flow*  *Mixed pressure and buoyancy-driven flow* |  |
| Inter-zone airflow and common wall heat transfer properly accounted for? |  |
| Are the inside and outside radiation models appropriate? |  |
| **HVAC Modeling** |  |
| Are moisture and condensation effects properly accounted for? |  |
| Are fluid components such as ducts, pipes, actuators, pumps, fans, and heat exchangers modeled with pressure-flow relationships? Are pressure drops reasonable? |  |
| Is the heat transfer performance of other equipment such as heat exchangers and plant equipment modeled reasonably? |  |
| Are equipment capacities reasonable? |  |
| Are equipment efficiencies such as COP, heating, hydraulic, and motor reasonable? |  |
| Is a reasonable level of control provided such that the model can simulate without use of external controller? |  |
| **External control Input Signals** |  |
| Reasonable given state of the art actuation? |  |
| Units assigned? |  |
| **Measurement Output Signals** |  |
| Reasonable given state of the art sensors? |  |
| Are all equipment power/fuel consumptions computed and measured for KPI calculations? |  |
| Are all zone temperatures measured for KPI calculations? |  |
| Units assigned? |  |
| **Compilation and Simulation** |  |
| Uses official library release versions (with Modelica “Uses” statement)? |  |
| Can be compiled into FMU free of commercial licensing? |  |
| Simulates for full year? |  |
| Compatible with variable time-step solver? Otherwise, minimum timestep acceptable? |  |

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# IV. Test Case Checks

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| **Criteria** | **Response** |
| **Documentation** |  |
| Building Design and Use (including architecture, constructions, occupancy schedules and comfort, internal loads and schedules, climate) |  |
| HVAC System Design (including primary and secondary system designs, equipment specifications and performance maps, rule based and/or local loop controllers) |  |
| Additional System Design  (such as lighting, shading, onsite generation and storage) |  |
| Points List (including control inputs signals and measurement output signals with descriptions and meta-data) |  |
| Important Model Assumptions  (such as infiltration models, moist/dry air assumptions, well-mixed assumptions) |  |
| Scenario Information (including energy pricing and emission factors) |  |
| HTML template followed? |  |
| **KPI Calculations and Scenario Information** |  |
| JSON map for matching output signals to KPI calculation provided? |  |
| Reference comfort temperature(s) for each zone provided? |  |
| GHG emission factors provided? |  |
| Pricing scenario 1 (constant) provided? |  |
| Pricing scenario 2 (dynamic) provided? |  |
| Pricing scenario 3 (highly dynamic) provided? |  |