Development of the Compliance Software Tool Assistance Manual for the 2014 Florida Building Energy Code

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Background:

Florida Energy code compliance is essentially done through compliance software approved by the Florida Building commission. As a result, the compliance software plays a critical role at "improving the implementation and enforcement" of Florida's energy code. The Technical Assistance Manual (TAM) is part of the software approval process. The current TAM, for most part, only deals with the following aspects of software verification:

1. Validation & consistency checks, missing inputs
2. Minimum capabilities, including building heat and moisture flows
3. Simulation criteria
4. Minimum outputs and end use reporting
5. Required equipment modeling capabilities
6. Certain test and standard that verifies accuracy of the underlying simulation engines

Rational & Need for Proposed Work:

The proposed 2014 residential and commercial energy codes are principally based on IECC 2012 with the commercial code, in addition, having the option of using ASHRAE 90.1 2010. In general, both residential and commercial codes specify complex rules and procedures to determine compliance of a building. Implementation of these rules are the key to ensuring that the inputs from a user are being correctly translated per established rules and compliance determined accurately. A major verification aspect that has been completely overlooked and ignored by the current TAM are test cases that verify if the rules of compliance are being accurately applied by the software to produce correct results.

For example, the 2014 code allows commercial buildings to comply one of five compliance options – two from IECC and three from ASHRAE 90.1-2010: While the current TAM specifies test suites that are intended to verify the underlying simulation engine, it does not have any provision whatsoever to verify whether the software tool correctly applies the rules and criteria for each of the method outlined above. Clearly, tests, protocols, baseline prototypes are needed to demonstrate what kind of results will be expected of the compliance software tool submitted for approval. The methodology and requirements that software tools must meet at a minimum need development. No such tests are known to exist in the literature at this time.

The proposed 2014 Florida Building Code includes four methods of residential compliance. The original manual is written for just the performance method yet for the 2010 code the Commission found themselves also reviewing software for the prescriptive trade-off method. The manual needs to be updated to handle test cases for the developer to run to

verify compliance using this method as well as reports to be submitted to show compliance. It also should be updated with test cases for generating the 2014 Florida code baseline home.

Needless to say, the compliance software plays a critical role at "improving the implementation and enforcement" of Florida's energy code and the need for the proposed work is important. First, it ensures that different software that seek approval go through a common series of tests to give some confidence in the software and approval process. Second, and more importantly, it will avoid users gravitating to software that seem to provide "easier" compliance, since now there will be a level playing field.

SCOPE OF WORK

1. Review existing Technical Assistance Annual

2. Update general software requirements

3. Update Residential Energy Compliance Procedure

The proposed 2014 Florida Building Code includes four methods of compliance. The original manual is written for just the performance method yet for the 2010 code the Commission found themselves also reviewing software for the prescriptive trade-off method. The manual will be updated to handle test cases for the developer to run to verify compliance using this method as well as reports to be submitted to show compliance.

4. Update Commercial Energy Compliance Procedure

The tasks in this section are designed to develop limited verification suite of tests to verify whether the rules for all the five compliance options are being applied correctly. We will develop several protocols, baseline test cases, results to be compared with to demonstrate what kind of results will be expected of the compliance software tool submitted for approval. The manual will contain detailed description about these methodologies and the requirements that need to be met by compliance software tool for each case.

5. Write Compliance Software Tool Approval Manual (CSTAM) for 2014 Florida Building Energy Code

BUDGET & SCHEDULE: Approximately $ 70,000 and 6 to 9 month.

OUTCOMES & BENEFITS:

FSEC will deliver a technical assistance manual and supplementary data that will provide guidance to approve compliance software tools with the 2014 Florida Building Energy Code for both residential and commercial buildings. First, it ensures that different software that seek approval go through a common series of tests to give some confidence in the software and approval process. Second, and more importantly, it will avoid users gravitating to software that seem to provide "easier" compliance. This will result in "improving the implementation and enforcement" of Florida's energy code