**Comments on the Latest Draft 2013 Nonresidential ACM Reference Manual
Docket Number 12-BSTD-06**

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Although I have not had the time to decide exactly how and where the following comments would best be integrated into the Nonresidential ACM Reference Manual, I would like CEC to consider a few recommendations.

Terminology. To support Gary Farber's previous comments, the ACM Manuals need to be scrupulous in ensuring that compliance software always uses the same terminology as in the Standards and Compliance Manuals. This takes a lot of editing time, but is really crucial for correct use of the performance method and correctly applying compliance modeling rules.

Compliance Reports. In advance of the 2015 data registry requirement, it's important that compliance reports coming out of the software allow ACM vendors to add (merge) additional documentation, proprietary reports and other information in PDF format to the standard report pages. The same is true for the Residential ACM Manual.

A minor point: for plan check and field inspection, it would be better if compliance forms are more explicit in clearly stating the installed conditions based on proposed building inputs for which default assumptions are made. For example, if there is no cooling system, the MECH-1C and other related forms should not list the Cooling Capacity as " 0 Btuh" or "n/a" but as "No Cooling Installed".

Certification Tests. As I expressed at the public workshop, the certification tests should allow DOE-2 based compliance software to be approved under the 2013 Standards as a transition to 2016 Standards when it will be reasonable to require that all ACMs use Energy Plus.

Gabel Associates is working with EnergySoft to determine by early January if there are problems with the DOE-2 simulation meeting the Nonresidential ACM certification tests based on Energy Plus (E+). We look forward to reporting back to CEC Staff on that work, and discussing results. However, even before the results are in, it's important for the Commission to understand the serious implications of not allowing DOE-2 based compliance software to pass the ACM certification tests.

(1) At this late date, there is insufficient time for current Nonresidential ACM vendors (which collectively represent 100% of the market) to rework their DOE-2 based software to use E+ in time for the January 2014 Standards effective date without the use of the new Nonresidential Compliance Software Manager.

(2) The Nonresidential Compliance Software Manager will have to be completed and ready for distribution by this coming February 1st to give ACM vendors at least 6 months to rework their programs around it. Vendors could then submit compliance software for approval, optimistically, by August 1st; and it would take the CEC at least 3 months for ACM approval by

around October 1st. This would be just three months before 2014. Having participated in and observed compliance software development over the past 30 years, and notwithstanding claims to the contrary by CEC Staff, <u>it is my contention that the 2013 Nonresidential Compliance Software Manager will not be completed, tested and debugged by February 1st</u>.

(3) If only the public domain compliance software is ready by the fall of 2013, then all energy analysts, mechanical engineers and others (e.g., approximately 2,500 current compliance software users) who run the performance approach will have to learn an entirely new public domain program in a very short space of time – a recipe for an implementation train wreck.

(4) The public domain software will by necessity be untested in the real world as compared with current ACMs, with the 2013 Nonresidential Standards completely riding on an unknown with uncertain user support.

(5) The new CABEC Certified Energy Analyst (CEA) Nonresidential exam, which includes a modeling test, will almost certainly be delayed until Subject Matter Experts (SMEs) have enough time to master the new public domain program and devise a new test based on it; and until prospective CEAs can reasonably be expected to know how to use the new software.

(6) For large buildings: the run time for a 100+ Zone building for compliance in E+ will be on the order of several hours. This will become a major issue for modeling these types of projects where many runs are needed to properly evaluate energy design choices.

Given all the major changes in the Standards -- scope, measures covered, stringency, new compliance forms, new modeling rules, the required use of the Residential Compliance Software Manager in Residential ACMs, new training programs, and an entirely new Certified Energy Analyst exam -- <u>implementing the 2013 standards will be extraordinarily challenging under the very best of circumstances</u>. Add to this the effective elimination of all current Nonresidential compliance software programs which are all based on the DOE-2 simulation, and we're looking at major CEC-inflicted chaos in both compliance and enforcement of the Nonresidential Standards.