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Comments on 2019 Proposed Language by CalCERTS

Additional submitted attachment is included below.

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CalCERTS, Inc.
HERS PROVIDER

July 27, 2017

To: California Energy Resources Conservation and Development Commission

Re: CEC proposed changes to 2019 Energy Code and additional proposed changes from CalCERTS. Docket # 17-BSTD-01

CalCERTS, Inc. appreciates this opportunity to provide feedback to the California Energy Commission. For those who may not know, CalCERTS, Inc. is the largest HERS Provider in the state. We train, certify, and provide quality assurance on the majority of HERS Raters in the state. HERS Raters are the third party special inspectors that provide field verification and diagnostic testing to assist in the enforcement of the Title-24, part 6, Energy Codes. Our comments stem from our mutual goals of:

1. Improved compliance with the energy code
2. Simplified and streamlined protocols and procedures
3. Reasonable alternatives to compliance options
4. Enforceability of the requirements

We request to be involved with the development of the details of any new verification protocols. CalCERTS appreciates the hard work and dedication by CEC staff and consultants and their roles in meeting the above goals.

Comments Regarding CEC Staff and CASE Study Recommendations

Regarding the 6-1-17 Drain Water Heat Recovery Presentation by Danny Tam:

CalCERTS supports the HERS verification requirements for Drain Water Heat Recovery systems. This is an important measure for ensuring accuracy of the compliance model relative to installed performance.

Regarding the 6-1-17 Compact Hot Water Distribution Systems Presentation by Danny Tam:

CalCERTS supports the two-tiered HERS verification requirements for Compact Hot Water Distribution systems. This is an important measure for ensuring accuracy of the compliance model relative to installed performance and could help in the uptake of this measure.

Regarding the 6-6-17 Residential IAQ Presentation by Jeff Miller, P.E.:

CalCERTS supports the option of HERS verification for dwelling unit enclosure sealing (blower door test) as an alternative to a balanced ventilation system in both high rise and low rise multifamily buildings. This is an important measure to prevent IAQ problems between dwelling units with pressure differentials between units caused by unbalanced ventilation.

CalCERTS supports the requirement for HERS verification of kitchen range hoods based on the HVI certification of 100 CFM and 3 sones. However, we are concerned that installed performance is not guaranteed due to the impact of duct design not captured by this approach and suggest that measured airflow should be considered as a HERS verification option.

CalCERTS supports the requirement for HERS verification of both high rise and low rise multifamily central ventilation duct/shaft leakage, air balance, and minimum ventilation airflow. This is an important measure to prevent IAQ problems between dwelling units caused by leakage in the common central ventilation duct system and to ensure minimum ventilation rates.

CalCERTS supports the proposed implementation of ASHRAE 62.2-2016 as it relates to the calculation of Q_{fan} and Q_{inf}. We do not have an opinion on the appropriateness of the ACH50 default value of 2.0. However, we support the concept of keeping the ACH50 value used in the calculation of Q_{fan} at the default value until the proposed ACH50 for building infiltration credit goes below that default, then using the proposed ACH50 in the Q_{fan} calculation. This will streamline IAQ verification and eliminate the never used CF2R and CF3R MCH-24 and help ensure a safe ventilation fan size regardless of infiltration in most cases.

CalCERTS is concerned that the increase of filter ratings from MERV 6 to MERV 13 will cause a higher percentage of projects to fail the HERS airflow/fan-efficacy verification, unless a better job is done by installers to account for the filters in their duct sizing calculations (e.g., *ACCA Manual-D*). We suggest that the CEC consider requiring stronger enforcement of the duct design and submittal requirements of the CMC and CalGreen codes.

Regarding the 7-18-17 Small Duct High Velocity Presentation by Mark Alatorre:

CalCERTS supports, in concept, the adoption of the lower airflow and fan efficacy targets for small duct high velocity systems (SDHV). If revised targets do get adopted, we remind staff to consider and address the impacts on the duct leakage protocols (using airflow to determine target leakage) and refrigerant charge (minimum 300cfm/ton requirement). We also highly recommend that proper performance modeling guidelines be addressed in the *Residential Compliance Manual* and the *Residential Alternative Calculation Method Reference Manual*

specifically for these systems to prevent them from being modeled as typical heatpump systems. Lastly, given installers' difficulties meeting the airflow and fan efficacy targets for standard ducted systems, we are concerned that these systems will have a higher failure rate unless there is a very clear design methodology and improved enforcement with regard to submitting design drawings and calculations. *ACCA Manual D* does cover these types of systems, but some SDHV manufacturer's also provide their own design services or design guidelines. We recommend that the CEC ensure that the manufacturers' guidelines meet *ACCA Manual D* or equivalent and, as previously recommended, they require stronger enforcement of the duct design and submittal requirements.

Regarding 7-18-17 Residential HVAC, HERS Verification and Data Registry Requirements Presentation by Jeff Miller, P.E.:

CalCERTS is concerned that reducing the target fan efficacy from 0.58 watts/cfm to 0.45 watts/cfm (compounded by the increased filter MERV rating) without better enforcement of the duct design requirements will cause a higher percentage of projects to fail this test. The problem with failing this test is that, unlike failing a duct leakage or refrigerant charge test, it can sometimes require redesign and deconstruction/reconstruction of portions of the system. Tables 150.0-B and 150.0-C are an alternative; but, not widely used and questionable in their effectiveness since the tables do not address supply ducts at all. CalCERTS recommends that the CEC consider more strict requirements for submittal and review of duct design drawings and calculations and that they consider adopting a simplified design methodology that addresses both supply and return ducts that can be used as an alternative to testing like Tables 150.0-B and C.

CalCERTS supports HERS verification requirements for heat pump capacity verification. This is an important measure for ensuring accuracy of the performance model relative to installed performance. However, heat pump sizing is a complicated issue that many energy consultants do not understand. We recommend that detailed information be added to the *Residential Compliance Manual* or other support document on this topic. *ACCA Manual H* is a good resource.

CalCERTS supports the HERS verification requirements for Whole House Fan (WHF) Airflow Verification. This is an important measure for ensuring accuracy of the compliance model relative to installed performance. Verification of attic vent area will be an extremely difficult verification to execute and NOT necessary if the fan passes the airflow and fan watt draw tests. We are not familiar with the pressure matching method described in the presentation and would like to see the blower door manufacturers review and approve it before it is approved by the CEC. We support the approval of the powered flow capture hood as a test method, including using a blower door fan with a powered flow hood adapter. We recommend that passive flow hoods with adequate capacity be allowed as a test method.

CalCERTS supports the HERS verification requirements for Central Fan Ventilation Cooling System (CFVCS) verification. This is an important measure for ensuring accuracy of the performance model relative to installed performance. Verification of attic vent area will be an

extremely difficult verification to do and is NOT necessary if the fan passes the airflow and fan watt draw tests.

CalCERTS strongly supports the update *RA3.8 Field Verification and Diagnostic Testing of Building Air Leakage*, specifically the suggestion of limiting the test to a single point test. The multi-point test adds a huge amount of complexity and time to perform the test for a small amount of improved accuracy.

CalCERTS Suggested Changes to the 2019 Code Language or Other CEC Documents.

CalCERTS recommends a change to the code language in **section 10-103(b)1A** to not require that the compliance documentation be left "in the building" and to allow them to be emailed, downloaded or otherwise delivered electronically to the homeowner. Provider Registries can easily facilitate this for builders which will improve compliance with this requirement.

CalCERTS recommends a change to the code language in **section 150.0(m)1** to allow R-0 ducts to be installed when they are completely exposed and surrounded by directly conditioned space (e.g., spiral metal duct used in "loft style" dwelling units). HERS Raters have had to fail these systems, but there is no good reason for these ducts to be insulated. We suspect that this was probably just an oversight in the previous language.

CalCERTS Suggested Changes to the 2019 Compliance Document Generator Pseudo-code and Data Registry Requirements Manual (DRRM).

FORM(S) AFFECTED	ISSUE	PROPOSAL / RECOMMENDATION	REQUIRES CHANGE TO
CF1R	If VLLDCS is triggered, the CF1R should indicate DLO <= 25 CFM, not 5% as it does now.	Indicate correct duct leakage target in the distribution system section of the CF1R PDF (5% total leakage or 25 CFM DLO).	Pseudo-code
ENV-01	Enable registry forms to validate data entered for the as-built condition against proposed values on the CF1R.	Revise pseudo-code: 1. Draw number of records from the CF1R/XML file. 2. Add a 'not installed' option for any record. (e.g. if a skylight is modeled, but not installed, that would still be acceptable) 3. Validate that U-Factor, SHGC and Sq.Ft. meet or exceed modeled values.	Pseudo-code

ENV-03	Enable registry forms to validate data entered for the as-built condition against proposed values on the CF1R.	Revise pseudo-code: 1.If an un-insulated assembly, then do not report as a record on the ENV-03 (line -07). 2. Using a default value for the insulation type and the reported insulation depth, error check that reported insulation meets or exceeds R-value claimed on the CF1R.	Pseudo-code
ENV-04	Currently users must indicate “Other” for ridge vents and correctly reporting installed NFA is an exercise in creativity.	Upper Vent type list should include “Ridge Vent” with associated modification to report NFA based on installed linear feet of ridge vent.	Pseudo-code
MCH-01	Users must choose central gas furnace to represent a package unit with a gas furnace.	Add "Central Packaged Gas" or "Gas-Pack" to list of heating system types on the MCH-01.	Pseudo-code
MCH-20	When VLLDCS is claimed it is likely that the ducts will become inaccessible and a rough-in test would be best practice, one that more building departments are starting to request. However it is excluded when VLLDCS is claimed because this measure forces the DLO test.	Revise pseudo-code of the CF2R-MCH-20 to allow installer to perform rough-in duct test under any conditions.	Pseudo-code, Appendices
MCH-22 MCH-23	CalCERTS has been operating on clarification provided by CEC to exempt VRF condensers driving multiple coils. When a VRF condenser drives multiple coils there is no way to 'parse' the condenser capacity in order to determine the compliance criteria.	Provide explicit exception regarding VRF condensers driving multiple indoor coils.	Code Language, Appendices, RCM, Pseudo-code and Form Design

MCH-25	Work-scope of some projects include the replacement of the condenser and evaporator coil. MCH-01 did not indicate “Yes” for Field B-06, but did correctly indicate “All New Cooling Components” in Section C-07. As completed, the MCH-01 properly triggered the MCH-23 and -25 but did not trigger the MCH-20.	Revise pseudo-code so that it properly triggers forms.	Pseudo-code
MCH-26	Due to split in Federal minimum efficiencies based on system capacity, compliance software forces a High-EER verification for any modeled EER value >11.7. But in most cases the minimum efficiency is EER=12.2 and this flaw in the software is imposing an unnecessary verification/expense.	Modify pseudo-code of MCH-01 to provide exception based on the installed capacity.	Pseudo-code, Compliance Software
MCH-26	Extra work to look up AHRI # when performing QA verification on SEER/EER verification	Have AHRI certificate appear on CF3R to assist QA Raters	Pseudo-code, Form Layout
PLB-02	CF2R-PLB-02 doesn't allow entry of more efficient or different capacity WH then modeled on the CF1R (Implement a tolerance of +/- 10% to allow some flexibility for the installer when selecting equipment. However, we do want to prevent the user from jumping categories (i.e., spec a small instant and then install a unit with > 200,000 Btu/hr rated input) so we will enforce the category restrictions)	Revised pseudo-code to allow CF2R to accept a range of efficiency/capacity.	Pseudo-code

SRA-02	When completing the SRA-02 worksheet, the pseudo-code requires a specific combination of answers that are often not obvious to the user. Specifically, as shown in the screen-shot, the user must choose "N/A" for line D-07 or else the line D-10 will suggest the subarea does not qualify. There is no logical reason why choosing "Yes" for line D-07 should not also be a valid answer.	Update pseudo-code for this worksheet to allow "Yes" or "N/A".	Pseudo-code
MCH-27	Problem for HERS Raters locating IAQ fan in homes.	Add a field on MCH-27 that asks for a description of where the fan is located (e.g., master bath, laundry room, etc.)	Pseudo-code and Form Layout

Thank you for this opportunity to comment on the 2019 code. We look forward to the Commission's feedback on this issue.

Sincerely,

Russell King, M.E.
Senior Director of Technical Services,
CalCERTS, Inc.