Meeting Notes

Posted April 2023

Notes from 2025 Title 24, Part 6 Code Cycle Utility-Sponsored Stakeholder Meeting for:

Nonresidential HVAC Controls and Space Heating

Meeting Information

Meeting Date: 2/27/2023
Meeting Time: 9:30 am – 1:00 pm
Meeting Host: California Statewide Utility Codes and Standards Team

Meeting Agenda

Time	Topic	Presenter
9:30 AM	Welcome and Introduction	Cosimina Panetti Javier Perez Kelly Cunningham
9:50 AM	HVAC Controls Presentation and Discussion	Hwakong Cheng, Taylor Engineers and Rupam Singla, TRC
11:10 AM	BREAK	
11:25 AM	HVAC Space Heating Presentation and Discussion	Bryan Boyce, Shaojie Wang, Energy Solutions and Jeff Stein, Taylor Engineers
1:00 PM	Adjourn	Cosimina Panetti

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Meeting Participants (available upon request by emailing info@title24stakeholders.com)

Action Items from Meeting

- The Statewide CASE TEAM followed up on all questions or comments that required a response and were not discussed during the meeting.

Key Points from Meeting

This proposal for nonresidential HVAC controls and HVAC space heating in nonresidential buildings is important because:

HVAC Controls: Title 24 includes aggressive HVAC control requirements, but they have not been realized often enough in practice. Rather than placing the burden on designers and installers, ASHRAE Guideline 36 moves the process ‘upstream’ to the manufacturer level

where the controls are programmed into equipment and savings are automatically realized. This measure will streamline the design and installation process, and also achieve more efficient outcomes for buildings.

HVAC Space Heating: The fraction of newly constructed nonresidential buildings that rely on all-electric space heating is expected to increase rapidly in the coming years in California. This proposal addresses the segment of nonresidential buildings that have historically relied on gas boilers providing hydronic heating but must now select an all-electric space heating design.

MEETING NOTES

During the meeting, questions and comments were submitted in three distinct formats which are provided in these meeting notes in these [hyperlinked for quick access] sections:

1. **In-Meeting Questions / Comments:** Questions and comments submitted verbally during the meeting via the 'raise hand' function in GoTo Webinar, where participants were unmuted to speak, or in some cases, comments submitted in writing were discussed verbally during the meeting (in which case the person that commented may not be identified in these notes).
2. **Questions / Comments Submitted Via GoTo Webinar:** See this section for questions and comments submitted in written format via the GoTo Webinar question pane.
3. **Public Input Submitted Via Mentimeter:** This section includes public comments and questions, including screen shots of the polls that were conducted during the meeting, and responses to those polls.

Due to time limitations, not all written questions and comments were discussed during the meeting but all have responses available in these meeting notes.

In-Meeting Questions / Comments

Controls/ASHRAE Guideline 36

1. **Question asked verbally by Skip Ertz, Daikin: The discussion so far has been aimed at field installers rather than packaged air conditioners and factory installed controls. On the packaged equipment, it's more difficult to implement changes this quickly. Any thoughts?**
    a. CASE Team Response (Rupam Singla): Our measure covers the field installed controls and does not cover the factory installed controls.
    b. CASE Team Response (Hwakong): In section 140.4 our language refers to programming in Direct Digital Control (DDC) systems, so the intent is that this would apply to field programmable controls that are in the DDC systems. It's not always black and white, there are some grey areas, but the intent is not to cover factory installed controls.

2. **Comment given verbally by Wayne Stoppelmoor, Snyder Electric: We support this code change requiring the Guideline 36 Library. We found that once a contractor starts using them, they find it to be very effective and reduces programming time and cost, which makes the whole process simpler for them.**
    a. CASE Team Response (Rupam Singla): Thank you, Wayne.
3. **Question from GoTo Webinar Question pane from Spencer Lipp: What are the proposed trigger(s) for inclusion of G36 as the control sequences?**
    a. CASE Team Response (Hwakong Cheng): It would have to be equipment that is covered in the scope of G36. In 2021 of G36 covers both air-side and water-side equipment. This proposal would only cover air-side equipment. The controllers would have to be DDC with programmable controls. That is the high-level summary of what would drive applicability.
4. **Question from GoTo Webinar Question pane from Gina Rodda: What happens in alterations in which the existing equipment cannot meet the Guideline 36 requirements?**
    a. CASE Team Response (Hwakong Cheng): Additions and alterations are always a bit complicated. This proposal would only apply to alterations where there is a new space conditioning system. If it's altering an existing system that doesn't have the compatibility with G36, it wouldn't apply. It only applies if it is a new HVAC system.
5. **Comment from Mentimeter submitted anonymously: The base case doesn't meet 2022 Title 24 requirements.**
    a. CASE Team Response (Rupam Singla): That is what we are assuming. We have seen that compliance with controls requirements is not perfect. There are a lot of buildings that don't comply with the current Title 24 controls requirements. So that is what we are assuming in the base case.
6. **Comment from Mentimeter submitted anonymously: We have a few comments about control contractors developing their own libraries that meet the requirements.**
    a. CASE Team Response (Rupam Singla): Intention is manufacturer will develop libraries that controls contractor could use. Controls contractors could develop their own libraries, but the other option would be to use the manufacturer certified libraries.
7. **Question from GoTo Webinar Question pane from Neil Bulger: Has the certification process and maintenance of a library by the CEC been recognized as a potential market-adoption barrier? Have other lists of certified elements by the CEC or outside parties been reviewed for ways to minimize costs and time to the CEC?**
    a. CASE Team Response (Hwakong Cheng): Great question. This is something we've been thinking about a lot and we have been doing a lot of outreach with manufacturers. The initial certification as we envisioned it would primarily be

following a checklist of elements. You would have A B C D, etc. We don't explicitly include testing procedures in the Joint Appendix as currently drafted. The expectation now would be that manufacturers would be doing a lot of testing on their own. They already are doing testing on their own, knowing that this is a code requirement requires not only the creation of the library but also that installers and contractors are using the library; and that there is a closed feedback loop on the availability of the library. Some of the manufacturers are coming together to form some sort of consortium, developing some sort of standardized testing procedure/testing rules to streamline that process, the hope is that this would develop into an ASHRAE standard and would be a more rigorous process to ensure consistency across manufacturers and G36 will grow over time to expand to more equipment. Library certification, as currently defined, would be by attestation so the burden on the CEC would only be to maintain the list of organizations that have submitted the required declaration. The CEC would not be responsible for testing, verifying, or maintaining the libraries themselves.

8. **Comment from Mentimeter anonymously: Keep in mind that HVAC System designs are different across the country...so libraries may need to be localized.**
    a. CASE Team Response (Hwakong Cheng): This is something that came up in the ASHRAE G36 project committee as well. The ASHRAE committee SGPC 36 includes membership across a wide range of stakeholder types, designers, commissioning agents, manufacturers, contractors, and individuals representing all over the country. Different climate factors. This is addressed in the guideline. One thing that may not be clear is that it is not just one sequence of operation, it's a collection of different sequence sections that you can pick and choose that apply. So, different system types, or different climatic features, etc. For example, freeze protection is applicable in some climate zones and not others. It's covered in the Guideline but you may not be applying it to your particular project.

9. **Question from Mentimeter asked anonymously: What equipment covered by Section 120.2(j) - DDC to zone, that would not be covered by the Guideline 36 requirements?**
    a. CASE Team Response (Rupam Singla): So G36 does only cover specific HVAC system types, primarily VAV reheat systems, dual duct systems, single zone VAV systems. Aside from these, other systems would not be covered by the G36 requirement, even if they have DDC to the zone.

10. **Question from Mentimeter asked anonymously: Do the base case assumptions assume deviation from T24-2022 prescriptive requirements?**
    a. CASE Team Response (Rupam Singla): We have seen that compliance with controls requirements is not perfect, there are a lot of buildings that don't comply with the current T24 controls requirements (see Question #5 above).

11. **Question from Mentimeter asked anonymously: Title 24 2022 requirements have only been in effect for a couple of months.**
    a. CASE Team Response (Rupam Singla): Most of the control requirements, particularly those we talked about with Guideline 36, are also in the 2019 code, so they aren't new to 2022. Most of the control requirements considered in the energy analysis have been in Title 24 for many code cycles now.
12. **Question from Mentimeter asked anonymously: What is the basis for the assumption that they don't meet the requirement? Studies? Anecdotal? (Response to Question #5 and #10)**
    a. CASE Team Response (Rupam Singla): There aren't a lot of studies done on this, but from our own professional experience we've seen that compliance with the current code requirements are poor and this is what we are basing our assumptions on. We are interested in finding more studies or hearing from other folks their thoughts on current controls requirements.
    b. CASE Team Response (Hwakong Cheng): We did a literature review and the strongest study that's been published that supports this view point was done a few years ago by PNNL where they looked at new construction, and did a third-party review of designs, and a few stepping points beyond that with permitting, design, construction, commissioning, etc. to confirm the penetration of many of these controls-related code requirements. They found there were relatively low adoption rates, particularly at permitting, design, and commissioning, and that viewpoint is supported by observation of other stakeholders' experience with commissioning. More feedback on other experiences, and what we've assumed for the modeling base case, would be appreciated.
13. **Question from GoTo Webinar question pane from Jim Coogan: The Certification text says: "Programming library shall include complete control programming for each of the logic sections from G36 listed…" Don't we want to certify one logic section at a time? We might fully support the VAV terminals, but not have gotten around to the Snap-Acting Dual-Duct. We would want to certify what we have.**
    a. CASE Team Response (Hwakong Cheng): That is great feedback. In the draft markup language, we have the equipment that are covered in G36 listed out in that table. So, if the sentiment is that some of these sections are not as far along, or that some of these are less common equipment compared to say a reheat and cooling-only VAV terminal. If the sentiment is that some of these other ones are not as established, and manufacturers have not done as much programming there and are not as comfortable with requiring these in the library, that's certainly something we can consider changing for the draft language as we proceed this spring. But for simplicity and clarity, our intent is to certify an entire library together, rather than piecemeal for individual sections.

14. **Question from Mentimeter asked anonymously: If G36 specifies functional tests in the future, the Acceptance Tests should be aligned so we aren't asking folks to do two separate and slightly different functional tests for the same thing.**
    a. Once the functional tests do exist, then that might be something that leads to a potential change in the acceptance test forms. There could certainly be some synergies there to avoid duplicative efforts.

15. **Verbal follow-up question from Gwelen Paliaga: Is there a plan to edit/change the acceptance test forms as part of this proposal?**
    a. CASE Team Response (Hwakong Cheng): Yes, there would be some minor changes to the acceptance test forms. It could be as simple as additional verification of the use of the G36 Programming Library, in addition to the individual control requirements. We haven't fully fleshed this out, but we do anticipate there will be some changes.

16. **Question from Mentimeter asked anonymously: Can you clarify if the use of Guideline 36 would be a mandatory or prescriptive requirement?**
    a. CASE Team Response (Hwakong Cheng): This would mainly be a prescriptive requirement, not mandatory. The change to Section 120.2 in the standard in the mark up language today is not correct, the changes would be in prescriptive section 140.4. Eventually there will be changes in the performance path as well.

17. **Question from Mentimeter asked anonymously: Will the Guideline 36 SOO's be written in standard/traditional verbiage at some point as opposed to a series of charts and graphs?**
    a. CASE Team Response (Hwakong Cheng): I'm not sure if I fully understand the question. The sequences in G36 are mostly traditional language in paragraph form, organized by different equipment and within each equipment type there are logical control sections. In many cases there are supporting charts/graphs that are complementary to the written sequences. So the sequences would stand alone where the graphic would provide clarity. Sometimes it's easier to visually see than in writing. Let me know if I've misunderstood this comment.

NR Space Heating

1. **Question from Mentimeter asked anonymously: Can you further explain how non-condensing boilers can comply? There are pre-emption issues.**
    a. CASE Team Response (Jeff Stein): The simplest way would be if you had a heat exchanger so that the non-condensing boiler would operate at say, 180 degrees supply and 140 degrees return. The heat exchanger would then bump down the temperature and could still supply at 130 degrees and return at whatever the coils return at, say 100 degrees/desired temperature. You would still get the benefit of the

lower temperature in terms of the piping losses. But it would not trigger pre-emption issues. You'd still be able to apply the non-condensing boiler.

18. **Question from Mentimeter asked anonymously: Are you going to address the prescriptive limitation of air-cooled chiller plants at 300 tons?**
    a. CASE Team Response (Jeff Stein): No, we will not be addressing this, that is in a separate CASE Report (Cooling Towers CASE Report).

19. **Question from Mentimeter asked anonymously: Do you see heat pump technology playing an expanded role?**
    a. CASE Team Response (Jeff Stein): Yes, we are already seeing very rapidly expanding role for heat pump technology in large part because of gas bans in many jurisdictions. Heat pumps are generally more efficient, we expect to see more heat pump technology.

20. **Question from Mentimeter asked anonymously: Technical resources need to be developed like the thermal overlap calculator and storage sizing tools like Ecotope built for DHW.**
    a. CASE Team Response (Jeff Stein): Agree, there needs to be more education.

21. **Question from Mentimeter asked anonymously: What roadmap will be provided for designers to implement the controls required for the TIER system? It makes great sense in theory but may exceed the capabilities of many designers and controls contractors.**
    a. CASE Team Response (Jeff Stein): Agree with this comment, and it is related to other questions mentioned in terms of resources. It's important to remember we are talking about the 2025 code that doesn't go into effect until 2026. So were 3+ years away before this affects projects, there will be a lot of progress made in that time between now and then. One development is ASHRAE G36 and that is a continuously maintained document. By the time we get to the 2025 and 2026 period, there will be ASHRAE sequences for things like TIER systems.

22. **Question from Mentimeter asked anonymously: Compliance tools need to be able to have that thermal overlap calculation.**
    a. CASE Team Response (Jeff Stein): There's going to be the need for some catch up in things like the prescriptive forms and the performance tools. There are some limitations in the software in terms or being able to model some of these things. Those are things that will need to be ironed out for sure.
    b. CASE Team Response (Bryan Boyce): Part of the proposal we submit to the CEC will include some specific recommendations around enhancements to better capture thermal energy storage and heat recovery. If there are modelers out there that are doing that right now, please reach out to us.

23. **Question from Mentimeter asked anonymously: Will the code include a path to utilize wastewater energy recovery as a source for these systems?**
    a. CASE Team Response (Jeff Stein): It probably won't be prescriptively required, but it isn't something that's prevented in any way.

24. **Question from Mentimeter asked anonymously: Will you be expanding the electric resistance allowed in supplement to a heat pump in terms if a packaged unit to this built up system arrangement?**
    a. CASE Team Response (Jeff Stein): There is an allowance now for a certain amount of electric resistance with a heat pump system. The short answer is no, this proposal would not change that part of the code. It might be something we'd be interested in talking with you about if you see an opportunity there, but it's unrelated to heat pumps.

25. **Question from Mentimeter asked anonymously: You mentioned that this would only be a prescriptive pathway. Is the current prohibition on electric resistance reheat mandatory or prescriptive?**
    a. CASE Team Response (Jeff Stein): Correct, the current prohibition is prescriptive. There are actually plenty of buildings that do have electric resistance because they used the Performance path, so that would not change - they would still have that option of going the Performance path and showing that you made up the deficiency (if you would) with some other component elsewhere (better envelope for example), so it's only relaxing the prescriptive limitation.

26. **Question from Mentimeter asked anonymously: Total installed cost $/linear ft. for hot water distribution: does this include the cost for the insulated supply and return as is code required?**
    a. CASE Team Response (Jeff Stein): I think so but not 100% sure (upon further review, yes, pipe insulation cost is included)

27. **Question from Mentimeter asked anonymously: Electric Resistance Cost Calculator: How did the maintenance cost go from $1000 annually boiler and air-to water heat pump to $5550 annually for parallel fan power box electric resistance?**
    a. CASE Team Response (Jeff Stein): The big cost that we included here was the filter replacements. I suspect that these costs are low because there is a lot more maintenance with a boiler and a heat pump than there is with just electric resistance coil. The main takeaway is that it's cost-effective even using conservative assumptions.

28. **Question from Mentimeter asked anonymously: Gina Rodda – I see nothing about prescriptive envelope requirements for 140.4(g).**
    a. CASE Team Response (Bryan Boyce): We're in prescriptive code so it's implied that all of the rest of the prescriptive code would also have to be complied with in

order for that exception be achievable. Something we didn't mention today is that there's also a solar and storage requirement in the prescriptive code as well, but we don't have to call that out because this is the prescriptive code that we're in.

29. **Question from Mentimeter asked anonymously: Neil Bulger - Title 24 has been promoted primarily as a performance energy code with a prescriptive option… could compliance options for the items not accounted for in regards to electric resistance expand compliance options?**
    a. CASE Team Response (Bryan Boyce): I'm not sure I understand the question, maybe we can talk after the meeting.

Wrap-Up

- All Draft CASE Reports will be posted March through June at title24stakeholders.com
- Round 2 meetings begin in April
- Meeting adjourned at 1:00 PM

Questions / Comments Submitted Via GoTo Webinar

The questions and comments below are provided verbatim (as-submitted) in the GoTo Webinar Question pane.

Name	Time Asked	Question / Comment	CASE Team Response
Neil Bulger	10:14:50 AM	Has the certification process and maintenance of a library by the CEC been recognized as a potential market-adoption barrier? Have other lists of certified elements by the CEC or outside parties been reviewed for ways to minimize costs and time to the CEC?	As it stands, the CEC has no responsibility for certification or library maintenance. The manufacturers self-certify that their library complies. This is by attestation. There is currently no third-party verification. Additional response to this question: The Statewide Codes and Standards Team has reached out to most large BAS control manufacturers directly and through the ASHRAE Guideline committee. Responses so far are that there are no barriers for them to release libraries and sign a CEC certification declaration.
Kevin Callahan	10:20:29 AM	Could a controls MFG design and develop a fixed function controller that incorporates certified G36 sequences?	This should be entirely feasible. For example, a packaged VAV controller could (and ideally would) include the Dual max VAV logic and Request generation logic of G36 as a selectable, pre-programmed option. To further expand on this: Note that for air handlers, the Guideline includes numerous options for different equipment configurations (e.g. do you have a return fan, a relief fan, or passive relief). A manufacturer's pre-programmed fixed-function controller would need to give the contractor the ability to specify the equipment configuration. These "choice points" are clearly called out in the Guideline.
Kevin Callahan	10:30:59 AM	Would the library application certification be tied to the version of G36 to which it was developed under?	Yes. Title 24 will refer to a published version of the Guideline, current version is 2021.
Blaine Conner	10:21:14 AM	The Proposed Exception 1 to Section 140.4(r) reads "Logic from the certified programming library may be modified to suit application-specific needs that are not supported by Guideline 36 sequences.". The intent of exception is unclear. Is the intent to permit non-G36 sequences for the equipment listed in Table JAX.X2-1?	The intent is to start with G36 libraries created by the manufacturer as a starting point. But the logic can be modified as required to support equipment for which there is no "official" G36 control strategy. So for example, the Guideline does not include logic for energy wheels, so this is something the contractor would customize, building upon the standard G36 AHU logic from the manufacturers library.
Jim Coogan	10:32:05 AM	It sounds like using controls from the HVAC mfg is a way around the code. Why?	Jim, can you clarify your question? Are you referring to our response that our current proposal is that non-field programmable controls are not covered by this proposal?

Name	Time Asked	Question / Comment	CASE Team Response
Jim Coogan	10:43:04 AM	Certification text says: Programming library shall include complete control programming for each of logic sections from G36 listed. Don't we want to certify one logic section at a time? We might fully support the VAV terminals, but not have gotten around to the Snap Acting Dual-Duct. We would want to certify what we have.	For practicality, our current plan is to have a single certification for the entire library, rather than in piecemeal increments.
Jim Coogan	11:00:50 AM	What we see of the JA looks good, in that it is pretty specific about exactly what parts of G36 are required. When will we see more of it and how will it get filled out?	The full JA table will be included in the draft CASE report
Marshall Hunt	10:07:56 AM	ASHRAE charges for its publications. Is 36 available at no charge? If not can a summary be provided by CEC and the IOU?	You are correct that ASHRAE charges for the full Guideline document. There are a number of free trainings and summaries of the Guideline that we can share with stakeholders.
Spencer Lipp	10:03:56 AM	What are the proposed trigger(s) for inclusion of G-36 as the control sequences?	[The proposed triggers are:] new construction, or new equipment added to an existing system. To further clarify, the requirement only applies to equipment that has DDC control that is field programmable and accessible to the contractor. So equipment with packaged controls are not required to comply.
Faith Patrick	10:40:23 AM	Is the PNNL study available for reference?	The study is published. It is referenced in the CASE report. I don't have the reference immediately on hand, but we can follow up with that information.
Gina Rodda	10:07:26 AM	What happens in an alteration in which the existing equipment cannot meet the Guideline 36 requirements?	Only new equipment is required to comply, and only equipment where the controls programming is accessible to the contractor. So in this case, it would not be required to comply.
Gina Rodda	12:53:44 PM	I see nothing about prescriptive envelope requirements for 140.4(g)	Answered verbally (see question #12 above)
Gina Rodda	12:59:13 PM	You can always use the performance method to trade all combinations of prescriptive requirements, hence you will not get that savings you plan on for envelope. Gina	Thank you for your comment
Meg Waltner	11:38:39 AM	Would all of this apply to new construction only? If it applies to existing buildings, how would Option B apply in the scenario where you are replacing an existing boiler with an air-to-water HP?	Limit HWST (measure A) and allow electric resistance heating (measure C) are planned to apply to new construction and Additions/alterations. All-electric hydronic EE is intended to apply to new construction only.

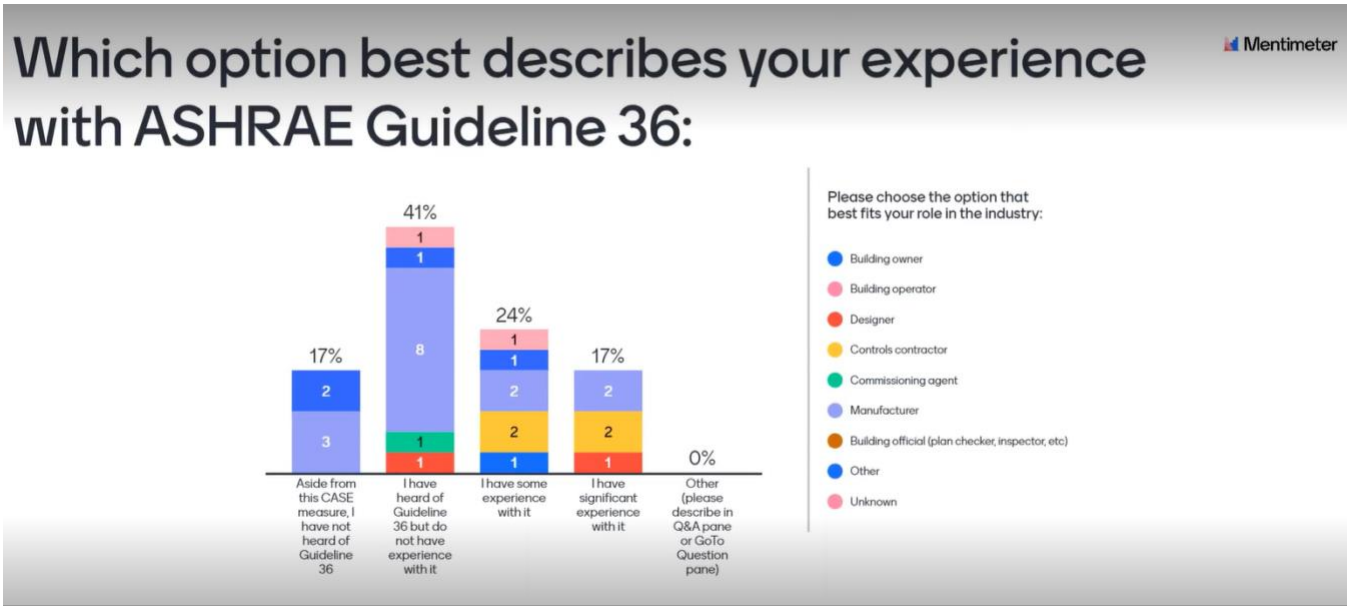
Name	Time Asked	Question / Comment	CASE Team Response
Meg Waltner	12:30:36 PM	Have you looked at creating an electric resistance reheat package that does not result in increased LSC? I support the current proposal as a prescriptive path, but it seems like it could be useful to have an electric resistance reheat option with equivalent LSC energy use to serve as a potential baseline system.	Right now the electric resistance heating modeling is fairly conservative, so this could be possible. Currently the laundry list of requirements needed to trigger the electric resistance heating allowance aren't fully captured in our proposed case model. We could also make less conservative assumptions around the gas boiler baseline energy consumption/runtime hours beyond what the ACM Reference Manual assumes for the standard design. We'd note that our electric resistance heating measure has a positive B/C ratio.
Meg Waltner	12:31:40 PM	Are you including modeling recommendations on improving the software's calculation of pipe losses in boiler systems so that it better reflects real-world energy use?	We're discussing this, but our preference would be to not solely focus on hydronic piping but also refrigerant piping, so if this capability is added to the ACM Reference Manual, it's not done in a way that favors hydronics or VRFs. Since this proposal doesn't otherwise deal with VRFs, we're thinking this specific enhancement belongs in a standalone specification.
Meg Waltner	12:43:04 PM	Thanks -- on my first question my main point is that I think it would be supportive of the CEC's baseline work to have an electric resistance reheat path that does not increase LSC use. Sounds like you may already be there, but just haven't accounted for it in your modeling. On my second question, if you look at refrigerant piping, you should look at VRF modeling accuracy more broadly. I don't think it makes sense to address refrigerant piping without addressing other elements of VRF performance.	Thank you for your comment
Meg Waltner	12:57:43 PM	Great work on this measure -- overall I'm strongly supportive! Looking forward to seeing the full CASE report.	Thank you for your comment
skip ernst	10:04:55 AM	What is a "certified Guideline 36 Programming Library?"	Programming Library is a collection of programming logic used for controlling HVAC equipment with direct digital control systems. Each building automation system (BAS) manufacturer or controls supplier wishing to certify that their G36 libraries conform to the G36 library requirements of Title 24, Part 6, may do so in a written declaration.

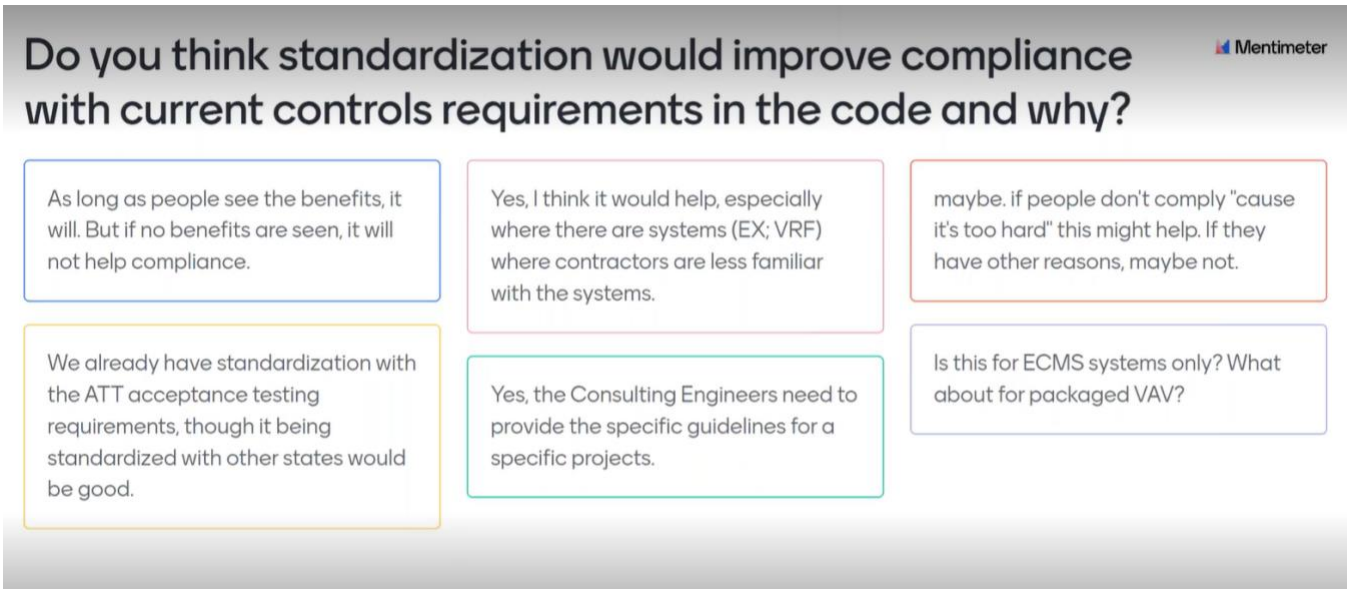
Public Input Submitted Via Mentimeter

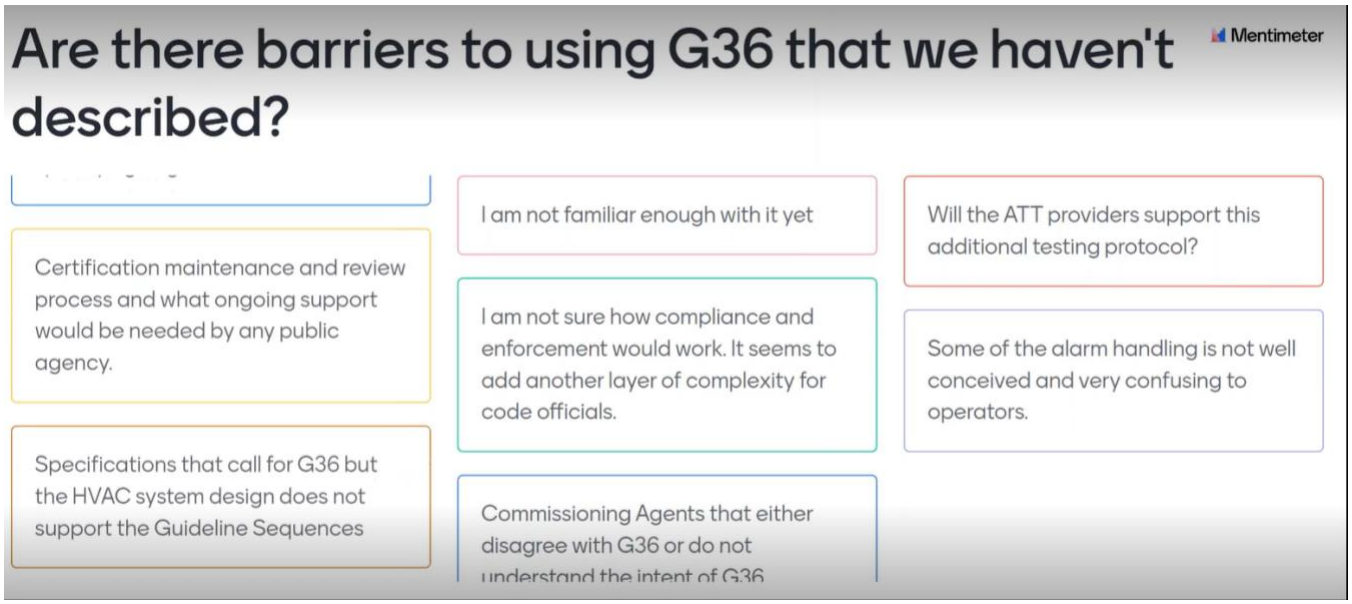
Note: all questions and comments submitted via Mentimeter are anonymous. **Those that were discussed during the meeting are incorporated into the 'In-Meeting Questions / Comments' section above; others are shown below.**

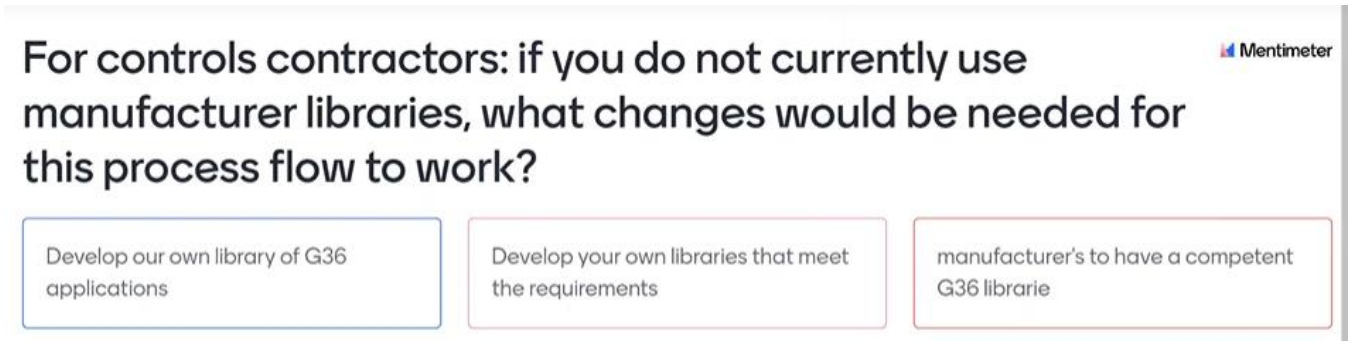
Mentimeter Polls & Responses

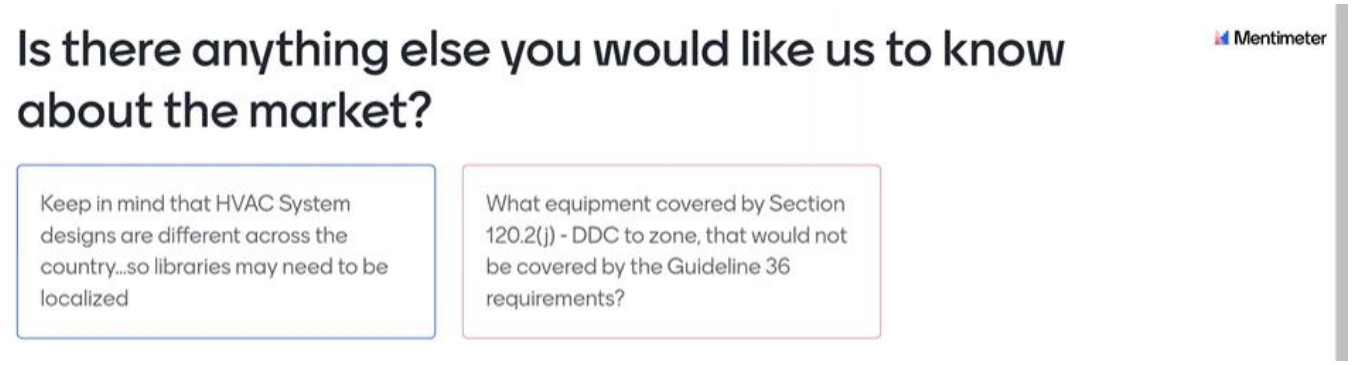
Controls/ASHRAE Guideline 36






Are there barriers to using G36 that we haven't described?
Mentimeter
I am not familiar enough with it yet
Will the ATT providers support this additional testing protocol?
Certification maintenance and review process and what ongoing support would be needed by any public agency.
I am not sure how compliance and enforcement would work. It seems to add another layer of complexity for code officials.
Some of the alarm handling is not well conceived and very confusing to operators.
Specifications that call for G36 but the HVAC system design does not support the Guideline Sequences
Commissioning Agents that either disagree with G36 or do not understand the intent of G36


For controls contractors: if you do not currently use manufacturer libraries, what changes would be needed for this process flow to work?
Mentimeter
Develop our own library of G36 applications
Develop your own libraries that meet the requirements
manufacturer's to have a competent G36 librarie


Is there anything else you would like us to know about the market?
Mentimeter
Keep in mind that HVAC System designs are different across the country...so libraries may need to be localized
What equipment covered by Section 120.2(j) - DDC to zone, that would not be covered by the Guideline 36 requirements?

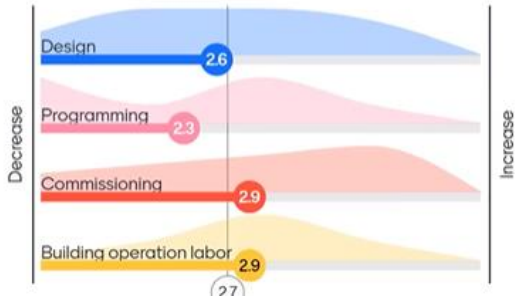
Do you agree with the assumptions for the base case? Why / why not?

Mentimeter

- the assumptions ensure that G36 looks better.
- Since 2022 only in play for 2 months, how can you even find that out in the field???
- What is the basis for the assumption that they don't meet the requirement? Studies? Anecdotal?
- T-24 2022 requires the proposed case for systems with DDC. So your assumption is that all/most systems do not have DDC?
- Do the base case assumptions assume deviation from T24-2022 prescriptive requirements?
- Yes, the base case describes the
- The zone group assumption for base case seems extreme given ability of newer DDC systems
- VAV minimums for DDC to zone have been 20% in code for several code cycles for DDC.. 2022 set this to ventilation minimum. I recommend considering starting either at 20% or ventilation.

How will project costs be impacted with comprehensive and robust application libraries developed around Guideline 36 sequences of operation?

Mentimeter



We want to hear from you! Please provide any last comments or questions.

Mentimeter

- If G36 specifies fpts in the future, the Acceptance Tests should be aligned so we aren't asking folks to do two separate and slightly different fpts for the same thing.
- Will the Guideline 36 SOO's be written in standard/ traditional verbiage at some point as opposed to a series of charts and graphs
- Can you clarify if the use of Guideline 36 would be a mandatory or prescriptive requirement?

HVAC Space Heating