



**Goal 3: Field Detection & Diagnostics (FDD) Committee**  
**Monday, September 18, 2017, Meeting Notes**

**WHPA Code of Conduct:** Please note that all participants of all Western HVAC Performance Alliance (WHPA) meetings, committees, working groups, and ad hoc groups shall adhere to the WHPA Code of Conduct: <http://www.performancealliance.org/Home/CodeofConduct/tabid/205/Default.aspx>.

**Call to Order**

Co-Chair Sean Gouw (SCE) called the September 18, 2017, meeting of the FDD Committee to order at 10:04 a.m. PDT.

TOPIC	FACILITATOR
Roll Call	Bonnie Gustavson
Introduction – Review of Goals/Implementation Plan	Sean Gouw
BSR / ACCA 15 OBD – 201x On-Board Diagnostic Codes for HVACR Equipment	Glenn Hourahan
FDD Roadmap Update – Final Review	Joe Schmutzler
CQM – FDD Activities	Sean Gouw
Next Steps and Adjourn	Joe Schmutzler Sean Gouw

**Roll Call**

Organization	First Name	Last Name	WHPA Category	P=Present
<b>Voting Members</b>				
ACCA (Air Conditioning Contractors of America)	Glenn	Hourahan	Contractor Association	P
Bes-Tech Inc.	Jeff	Gamble	Controls (Manufacturer or Distributor)	P
Carrier Corporation	Dick	Lord	HVAC Manufacturer	
Daikin Applied	Skip	Ernst	HVAC Manufacturer	P
Energy Solutions	Jim	Hanna	Energy Efficiency Program Consultant	
Ezenics, Inc.	Benjamin	Kelderman	Other Stakeholder	P
FDSI (Field Diagnostic Services, Inc.)	Dale	Rossi	Third Party Quality Assurance Providers	P
Goodman Manufacturing	Aniruddh	Roy	HVAC Manufacturer	P
JCI (Johnson Controls, Inc.) (YORK)	Wayne	Guelfo	HVAC Manufacturer	
NBI (New Buildings Institute)	Alexi	Miller	Energy Efficiency Organization	
Proctor Engineering	Abram	Conant	Other Stakeholder	P
SCE (Southern California Edison)	Sean	Gouw (Co-Chair)	California IOU	P
Trane-Ingersoll Rand, Inc.	Caleb	Joiner	HVAC Manufacturer	

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Organization	First Name	Last Name	WHPA Category	P=Present
Transformative Wave	Joe	Schmutzler (Co-Chair)	Controls (Manufacturer or Distributor)	P
TRC, Inc.	Farhad	Farahmand	Other Stakeholder	
Verified, Inc.	Robert	Mowris	Third Party Quality Assurance Providers	
XCSPec	Janet	Peterson	Controls (Manufacturer or Distributor)	
Guests				
PG&E (Pacific Gas and Electric Company)	Christian	Weber	California IOU	P
Staff				
BJGustavson Consulting (WebEx)	Bonnie	Gustavson	Other Stakeholder	P
Galawish Consulting Associates (Staff Support)	Elsia	Galawish	Energy Efficiency Program Consultant	P

**Introduction – Review of Goals/Implementation Plan**

Sean Gouw (SCE):

- On track to wrap up the FDD Roadmap update by the end of October.
- The CQM FDD activities are on hold – CQM program is in flux and the CQM Committee does not have enough resources to take on coordination work with this Committee. As a result of this, the Considerations & Recommendations document will not be updated. Sean Gouw (SCE) will draft a status report.
- 2019 California T-24 Codes & Standards FDD Activities were completed in May 2017. The FDD Committee’s discussions on this topic for both the residential and non-residential sectors were enough to feed into the ongoing T24 update process.

**Special Presentation: BSR / ACCA 15 OBD – 201x - On-Board Diagnostic Codes for HVACR Equipment**



9-18-17 Hourahan  
FDD Mtg PPT.pptx

Glenn Hourahan (ACCA) provided an update on the development of the draft standard BSR / ACCA 15 OBD – 201x. In January 2015, ACCA released a public information notice (PIN) through the ANSI process to indicate ACCA’s intent to develop an ANSI-intended standard for diagnostic code for HVAC equipment.

Purpose and Intent: ACCA developed a nomenclature naming schema for fault (F) and performance (P) codes associated with residential and commercial HVAC systems and refrigeration systems to uniformly and consistently designate F & P codes for use within and across OEM product offerings.

As contractors and technicians go into the field, they do not know which manufacturers’ equipment they will encounter. If it is equipment they are not familiar with, it becomes a challenge to work on that piece of equipment. Contractors and technicians need something similar to what the automotive industry has been doing for years—on-board diagnostics. Why not have consistent codes used across varied HVACR equipment?



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This will apply to new HVACR equipment and components for use in new and existing residential and commercial buildings and commercial refrigeration applications. Excluded are HVACR equipment types that do not provide electronic fault and performance codes and legacy equipment that was not designed or manufactured to support the naming schema.

The standard is expected to help reduce installation faults, thereby leading to reductions in warranty exposure (for contractors, distributors, and OEMs) as well as to help ensure that equipment performs as designed. The standard is 20 pages long with 5-6 pages of normative requirements.

- Slide 4: Is a full schematic of the standard.
- Slide 5: Is an abbreviated Naming Schema for ease of reading:
  - An 8-digit code (component, component modifier, process, attribute type, performance descriptors, mode of operation)
  - Followed by a 4-digit code (proprietary info which allows OEMs to provide more detailed information/guidance to their dealers/service people.)
- Slides 6-7: Are examples of fault code and performance code.

To the extent that the equipment conveys information regarding a fault or an operating performance metric, then the standard provides a schema for a standardized naming approach. Once you get an error code, this standard does not tell you what to do with it. The standard does not define, require or detail:

- (a) any minimum set or level of fault or performance identifications,
- (b) any minimum equipment communication capabilities, or
- (c) any causes or diagnostic information associated w/ the codes.

#### Draft Standard Upcoming Activities:

- End of September 2017.....ACCA OBD Committee meets to review latest working draft.
- November 2017.....Standard is released for a 45-day ANSI Public Review Period.
- January 2018.....Review comments processed, changes effected, next steps ascertained.

#### Discussion:

Sean Gouw (SCE) – Who were the key players involved in this ACCA standard development process? AHRI shared a list of faults with the FDD Committee earlier this year. Is this list consistent with the schema developed for fault codes?

Glenn Hourahan (ACCA) – In this case, it was a two-step process where the AHRI OEMs held separate committee meetings. Once the AHRI Committee completed its discussions, the ACCA Contractors moved forward with finalizing the standard. The intent of the standard is not to come up with a list of fault codes. The intention is for the future that if someone wants to put multiple sensors throughout an HVACR system, this schema will support them in having a common way of naming the sensor outputs. We want to make it something that can grow not be rigid.

Dale Rossi (FDSI) – T24 currently has fault detection algorithms in economizers and they provide fault information (e.g., should not be economizing when it should, economizing when it should not). Similarly, for refrigeration cycles—low efficiency or capacity faults—how would these two situations fit into this standard?

Glenn Hourahan (ACCA) – The schema takes all these situations into account. Whether it is a compressor, economizer, or damper; if something is not performing the way it should, the standard accounts for these consistently across products of OEMs and within all product lines of OEMs.

Skip Ernst (Daikin Applied) – What is the process for inclusion of additional information and future updates?

Glenn Hourahan (ACCA) – There are two ways to go about updating the standard:

1. Draft standard is going out for public review shortly. Comments and recommendations will be solicited via public review for the new draft standard.
2. Once a standard is approved, interested parties can submit recommended changes and rationale for ACCA to take into consideration.

The last four (4) digits of the 12-digit code is reserved for OEM proprietary codes that can provide more info; which might only be available to the OEM's dealer base. The proposed standard does not state that equipment must contain any specific sensors. Indeed, it is possible that you may have pressures and temperature values and can calculate super heat, for example. It is whatever information the OEMs want to share.

Sean Gouw (SCE) – This is a very good step in attempting to lay the groundwork for a common language when talking about faults.

Glenn Hourahan (ACCA) – There are no specifications requiring certain diagnostic or sensing capabilities but to the extent that a system has these capabilities and wants to be in compliance with this standard, then use the fault naming schema. The draft standard was shared with manufacturers (AHRI and their OEMs) in addition to other ACCA contacts, and we received very good feedback that has been incorporated where appropriate.

Skip Ernst (Daikin Applied) – This looks good: it is flexible, allows you to standardize or have commonality on items that fit into scope, and sets a common platform and approach for every organization of interest to follow. Basically, it eliminates the mystery.

Aniruddh Roy (Goodman Manufacturing) – I agree with Skip's comments.

Sean Gouw (SCE) – Is there a comprehensive list beyond these slides?

Glenn Hourahan (ACCA) – Slide 4 shows the comprehensive list. However, when the draft standard goes for public review in November 2017, we may receive additional information.

Joe Schmutzler (Transformative Wave) – Are there plans to test the standard?

Glenn Hourahan (ACCA) – Next week, ACCA committee will be reviewing primarily the changes made to the underlining document by OEMs. Then it goes out for public review. We are trying to make life easier for technicians. Regarding how faults are to be displayed and conveyed, the draft standard does not talk about display or how to convey the information. This will be the subject of another document.

### **FDD Roadmap Update – Final Review**



9-18-17 Schmutzler  
FDD PPT.pptx

Joe Schmutzler (Transformative Wave) – I have incorporated support deliverables—relevant FDD research documents, reports, and a list of companies that manufacturer FDD controls—into the Roadmap appendices. These appendices will be updated periodically. This provides the industry with a vehicle to see what FDD info is available. Each California IOU is slightly different in its use of fault detection technologies. Most utilities have not used fault detection much, and going forward we can expect to see less of its use. It is unsure why CA IOUs are dropping Advanced Digital Economizer Control (ADEC) incentives, but programs are under review. I surmise that this may be due to programs not having an integrated approach making quality installations difficult. This could result in programs not being cost effective.



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Christian Weber (PG&E) – PG&E continues to have a strong interest in ADEC and still offers ADEC rebates.

Joe Schmutzler (Transformative Wave) – Over the coming months, there will be a major overhaul of HVAC programs. HVAC programs in California will have a statewide approach across all IOUs. In addition, a minimum of 60% of HVAC programs are required to be implemented by third parties. Pay-for-performance will be the major incentive approach, and small-to-medium EMS programs may include FDD. However, the QM program is not going statewide at this point in time. For future program updates—lots of uncertainty. For FDD integration—what can the FDD Committee bring to the table? Where do we go from here?

- Fault designations
- Technology review: fault test, fault reporting
- BSR / ACCA 15 IBD – 201x On-Board Diagnostic standard can help

Christian Weber (PG&E) volunteered to make a presentation to the group regarding the state of HVAC programs in California at the IOU-level.

### CQM – FDD Activities

Sean Gouw (SCE) – At this time, FDD should play a passive role in the California statewide CQM program. Overall and moving forward, FDD has a future role assisting with pay-for-performance savings calculations via Normalized Metered Energy Consumption (NMEC) methods for High Opportunity Programs & Projects (HOPPs).

### Next Steps and Adjourn

No more meetings are currently scheduled for this Committee for 2017.

The meeting adjourned at 10:56 a.m. PDT.

### **ACTION ITEMS:**

1. Finalize and submit Final FDD Roadmap Update – Joe Schmutzler (Transformative Wave) **Completed**
2. Finalize and submit Status Report for the Considerations & Recommendations document for CQM FDD – Sean Gouw (SCE)
3. Bonnie Gustavson to distribute Glenn Hourahan’s 9/18/2017 presentation for reference. **Completed**
4. Bonnie Gustavson to cancel the previously scheduled meeting on 11/20/2017. **Completed**

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