CCC PIER Research Program:

Program Advisory Committee (PAC) Meeting

June 9, 2011
Agenda

• Progress Overview
• Project Highlight: Verification of Savings Guideline
• Project Highlight: Title 24 Research
Project 2: Building Operations Assessment for Commercial Real Estate Transactions

- Research complete
- Pilots complete
- Optimized approach developed
- Final report drafted
- Outreach starting shortly
Project 3: Development of EBCx tools (1 of 2)

- ECAM updates complete
- User guide updated
- Testing underway
- Outreach planned
Project 3: Development of EBCx tools (2 of 2)

- Calculation tool 75% complete
- Internal testing ongoing
- Outreach planning in progress
Project 4: Building Performance Tracking

- Research complete
- Handbook published online
- Hard copies due by end of June
- Case studies due June/July
- Outreach started 2010

www.cacx.org/pier/handbook
PAC Highlight

Project 5: Verification of Savings Guideline
PAC Highlight

Project 6: Title 24 enforcement and effectiveness of testing
Presentation Agenda

- Project Objectives
- Research & Field Activities
- Findings
- Recommendations
- Planned Outreach Activities
Presentation Agenda

• Project Objectives
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Project Objectives:

• Inform policy makers on the current effectiveness of acceptance requirements:
  – Evaluate compliance issues
  – Investigate effectiveness of acceptance tests

• Provide recommendations:
  – To guide further code development, i.e. 2013 Title 24
  – For improving test protocols and forms
  – For improving training and support

• Conduct market outreach:
  – Address gaps in understanding and awareness
  – Increase code compliance
Presentation Agenda

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Research & Field Activities: Compliance

- 31 Phone Interviews
  - 8 Building Officials
  - 10 Contractors
  - 7 Design Engineers
  - 6 Building Owners

- 4 Building Department Visits
Research & Field Activities: Effectiveness

• Field Tests
  - 8 Contractors
  - 11 Commercial High-Rise/Low-Rise Buildings
  - 10 Unique Tests (7 Mechanical, 3 Lighting)
  - Each Performed Multiple Times for 47 Total Tests

• Pre- and Post-Test Technician Interview
## Research & Field Activities: Effectiveness

<table>
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<tr>
<th>Form</th>
<th>Test</th>
<th># of Times Performed</th>
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<tbody>
<tr>
<td>MECH-2A</td>
<td>NA7.5.1 Outdoor Air</td>
<td>8</td>
</tr>
<tr>
<td>MECH-3A</td>
<td>NA7.5.2 Constant Volume Single Zone Unitary Air Conditioner and Heat Pump Systems</td>
<td>5</td>
</tr>
<tr>
<td>MECH-4A</td>
<td>NA7.5.3 Air Distribution Systems</td>
<td>4</td>
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<tr>
<td>MECH-5A</td>
<td>NA7.5.4 Air Economizer Controls</td>
<td>8</td>
</tr>
<tr>
<td>MECH-7A</td>
<td>NA7.5.6 Supply Fan Variable Flow Controls</td>
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<td>MECH-9A</td>
<td>NA7.5.8 Supply Water Temperature Reset Controls</td>
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<td>MECH-10A</td>
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<tr>
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<td>NA7.6.3 Manual Daylighting Control</td>
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<tr>
<td></td>
<td>NA7.6.4 Automatic Time Switch Control</td>
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<tr>
<td>LTG-3A</td>
<td>NA7.6.1 Automatic Daylighting Control</td>
<td>7</td>
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<tr>
<td><strong>Total</strong></td>
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<td><strong>47</strong></td>
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</table>
Presentation Agenda

• Project Objectives
• Research & Field Activities
• Findings
• Recommendations
• Planned Outreach Activities
Findings – Compliance Evaluation:

• Compliance is generally low, varies by city/county
• Unclear who should perform the tests
• Financial disincentive to include in bid
• Often not included in bid unless specified
• Code officials provide limited feedback to technicians
• Onsite verification is uncommon
• Tests are not reviewed for validity
• Lack of enforcement results in incomplete/missing tests
• Intended benefit of acceptance tests is not being realized
Findings – Effectiveness Investigation:

- Insufficient contractor training is a significant barrier to completing the tests effectively
- Low contractor awareness is a barrier to completing the tests
- Acceptance requirements are complex and not well understood by technicians
- Some confusion around actual test results vs. ‘intent’
- Technicians not aware of reference materials
- Limited time allocated to tests
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Recommendations (1 of 2)

• Outreach
  – Owners:
    • Need acceptance testing in spec documents
  – Engineers:
    • Need to include test requirements on design documents
  – Contractors:
    • Need more familiarity with test procedures, requirements, and techniques
  – Building Department Officials:
    • Need more familiarity with test forms and requirements
Recommendations (2 of 2)

• Standardize test procedures and equipment
• Simplify forms and add helpline number
• Require sensors to be field-calibrated
Presentation Agenda

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Planned Outreach Activities (1 of 3):

- **Support contractors through education**
  - Conduct educational webinars
    - Recruit attendees through public relations and direct mail/e-mail campaigns utilizing industry publications and associations
    - Focus on code testing requirements, bidding best practices, compliance, and proper completion of forms
    - Trainings will be catalogued as a resource
  - Provide marketing collateral to use with bids explaining the importance and value of Title 24 acceptance testing
Planned Outreach Activities (2 of 3):

• Drive the market toward clarity regarding Title 24 and project bidding
  – Work through public relations and industry associations and publications to promote importance of Title 24
  – Highlight contractors that are leading their professions with Title 24 best practices
  – Conduct outreach to encourage design engineers to clearly state when Title 24 testing is required on design documents
  – Offer training sessions tailored to building owners/managers
Planned Outreach Activities (3 of 3):

• Support permitting departments through collateral and resources
  – Provide online training for building departments
    • Demonstrate how to quickly examine forms
  – Provide “cheat sheets” to help them examine forms
  – Provide promotional collateral to use in returning/rejecting noncompliant forms
Thank You!

http://www.cacx.org/PIER