ROCKY MOUNTAIN POWER

Let's turn the answers on.

Rocky Mountain Power ENERGY STAR®
New Homes Program

QAQC:
The Good, the Bad, and the Ugly

2006-2009 Quality Assurance

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ENERGY STAR AWARD 2009
PARTNER OF THE YEAR

Introduction

- Rocky Mountain Power supplies electricity to about 85% of Utah, as well as parts of Idaho and Wyoming
- ENERGY STAR Homes program exists only in Utah
- The Rocky Mountain Power ENERGY STAR New Homes program launched in 2005
- Program has certified 7,754 homes since 2005
- Program has 84 participating builders

Program incentives 2006

- Incentives for ENERGY STAR certification
- Additional incentives for
  - Ducts in conditioned space
  - ENERGY STAR dishwasher

Program incentives now

- Incentives for ENERGY STAR certification
- 50% CFLs now required
- Additional incentives
  - More CFLs
  - ERERGY STAR light fixture incentive
  - 14 SEER HVAC incentive
  - Still have ducts in conditioned space incentive

QAQC Year one

- All in-house program staff completing QAQC fieldwork
- 118 homes QAQCd (kwakd®) in year one, 3% of total homes
- Visual inspections only, no testing
- REM/*Rate*™ analysis done on all 118 homes

QAQC Year one

- Inspection field work began in October
- QAQC focus
  - Report production, not builder feedback
  - Because of this focus and short timeframe, there was not much feedback at inspection time
  - Report was presented to Rocky Mountain Power and reviewed with program raters

QAQC data points year one

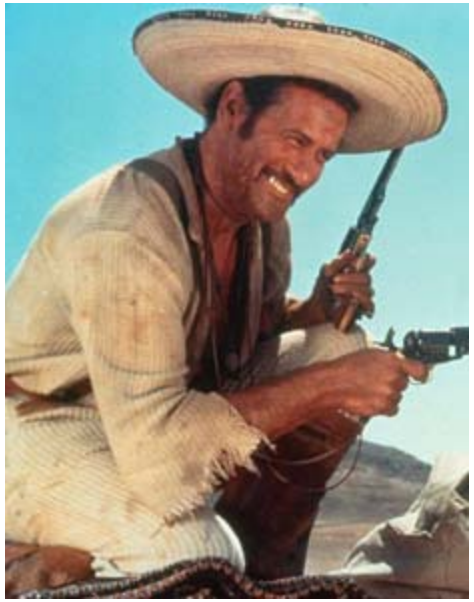
- Number of conditioned floors
- Attic insulation
- Foundation type
- Programmable T-stat Y/N
- Outdoor AC unit- make & model #
- HVAC rating (as determined by QAQC staff)

Year one: The Good

- Extensive REM/*Rate*™ analysis
- Program admins get a better sense of what is happening on the ground

Year one: The Bad

- Started too late
- No testing
- No real-time feedback
- No photos
- Home plan & REM/*Rate*™ files not matching



Year one: The Ugly

- Poor duct sealing
  - We did not have duct blasters so we used a rule of thumb
- Notes from year one
  - Ductwork has visible leakage points
  - Good use of mastic on joints, still nothing on gores
  - Mastic more decorative than functional

AND THE UGLY

Year two: What we changed

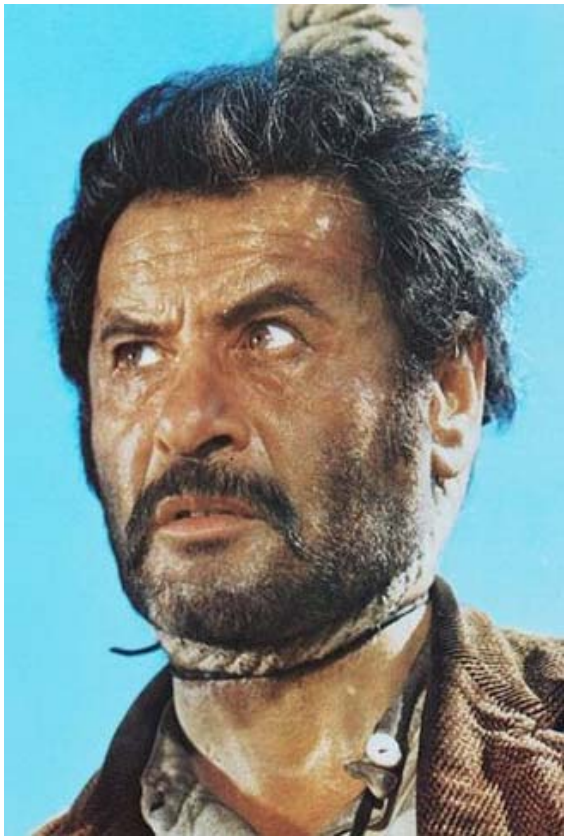
- Limited blower door & duct blaster testing
- Thermal bypass inspections
  - Full thermal bypass inspection at pre-sheetrock
  - Available TBI items at final

The good from year two

- Test data
- TBIs gave us an additional metric
- Fewer homes tested
- Duct blaster knowledge
  - Different acceptable ways to test ducts (e.g., tap placement)

Year two: The bad

- REM/*Rate*™ ,home plan confusion
- Continued feedback problems
- Thermal Bypass efforts



Year two: The ugly

- Duct leakage results
- Attic hatch details

Year three changes

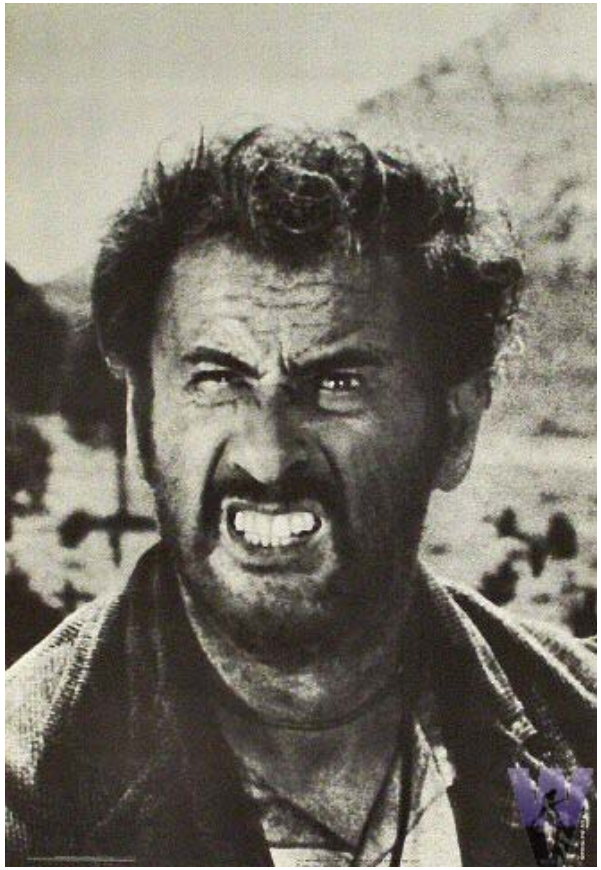
- Gas utility information added
- Divided inspections into categories
  - Full tests (ICF QAQC protocol) (20 homes)
  - Visual unique to our program (60 homes)
  - Pre-sheetrock TBIs (20 homes)
- Photos taken at inspections

Year three: The good

- Separation of qualitative info vs. quantitative info
- Photos taken at inspections

Year three: The bad

- Still doing inspections in short time frame (7 of 20 tests done in 2 days)
- Still not organized about real-time feedback



Year three: The ugly

- Duct leakage
- Attic hatches
- Isolated insulation alignment issues

Year 3 more ugly

- No caption needed

Year four changes

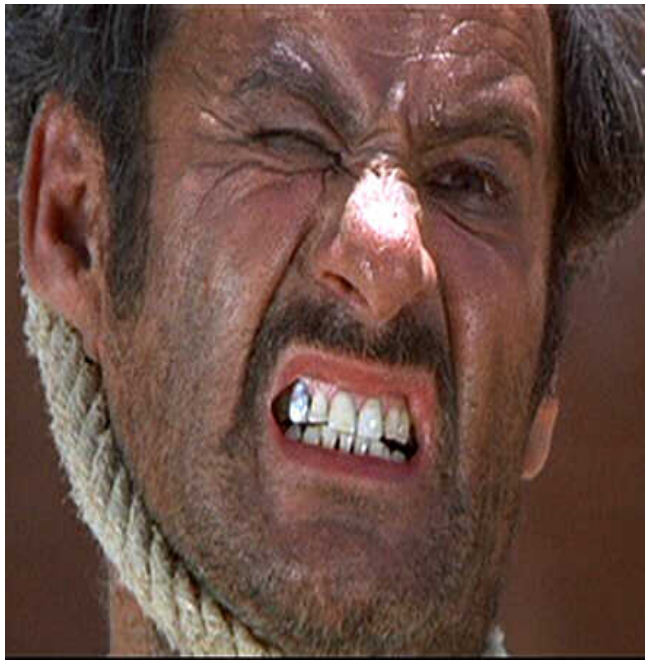
- All testing done by in-state program staff
- Further distinction with inspection types
  - Visuals with REM/*Rate*™ analysis
  - Visuals with rater form analysis (prior to this we used ICF inspection standards on visuals)
- Included limited thermal imaging inspections
- Added emphasis on kwaking® test homes vs. batch homes

Year four: The good

- More consistent testing
- Started earlier
- Better feedback system
- Money talks
- TBC details greatly improved

Year four: The bad

- Significant rater inconsistency (what does a ceiling fan look like?)
- Home submission time table



Year four: The ugly

What we have learned

- Test & inspect throughout the year
- Take pictures of everything
- Perform blower door & duct blaster tests
- Immediate feedback to raters & builders
- Worry about the little things
- Hit builders where they live
- Let raters know they are being watched

QA to teach

- We found QAQC can be a great teaching tool
  - Show builders on their own homes
  - Reason to listen and understand (incentive for home in which they are standing)

Thank you

- Good, Bad, & Ugly of our program

Questions?