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**DATE:** September 30<sup>th</sup>, 2016  
**TO:** Charles Kistler, First State Community Action Agency  
**FROM:** Daniel Bausch and David Carroll, APPRISE  
**SUBJECT:** Findings from On-Site Observations of First State RRHACE Inspections

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The purpose of this memo is to furnish First State Community Action Agency (First State) with findings from on-site observations conducted by APPRISE for the Repair Replace Heaters and Conserving Energy (RRHACE) program. APPRISE staff accompanied First State staff on several inspection visits to client homes to observe the heating equipment inspection process, the provision of program services, and First State's interactions with program participants.

These on-site observations are part of a comprehensive Process Evaluation described in the APPRISE memo submitted to First State on 12/21/2015. The purpose of this Process Evaluation is to provide First State and the Delaware Department of Health and Social Services (DHSS) with information to assess whether the program model is meeting the stated objectives, to confirm if protocols and procedures are being successfully implemented, and to identify any barriers to service delivery that need to be addressed through program modifications. This memo is one of several memos providing findings related to the RRHACE program's heating equipment assessment and services.

## I. RRHACE Program Description

The RRHACE program is designed to provide eligible low-income Delaware homeowners with a customized set of free services that match each household's needs. Those services include the following:

- Heating Equipment Assessment and Services – The status of the heating equipment is assessed and equipment is repaired or replaced as needed.
- Healthy Homes Assessment and Services - The status of the housing unit and household are assessed on an array of Healthy Homes indicators and services are provided to address potential hazards in the home.
- LIHEAP Assurance 16 Services – Staff identify opportunities for clients to reduce the amount of energy they use and to improve the household's ability to maintain their energy services.

The core program component of RRHACE is the heating equipment assessment and services. The program process for heating equipment assessment and services is as follows:

1. A homeowner with a broken or malfunctioning main heating system applies for RRHACE services at one of fifteen DHHS State Service Centers. Eligible clients' paperwork is sent to First State.
2. First State reviews the client's paperwork and contacts the client to enroll them in the program and schedule a Site Inspection visit.
3. First State inspectors conduct a Site Inspection at the client's home. The Site Inspection includes an assessment of the heating system, a brief client interview to capture data on household and home characteristics, and the provision of an EcoKit with energy-saving measures. During the Site Inspection, the First State inspectors determine whether a client's heating system will be repaired or replaced, or if the work will be deferred due to substantial problems in the home that prevent work from going forward.
4. If the Site Inspection determines the heating equipment will be repaired or replaced, First State solicits bids from licensed subcontractors who participate in the program. Each subcontractor that is asked to submit a bid is provided with the Site Inspection information and client paperwork. The subcontractors contact the client and schedule a visit to assess the broken or inoperable heating unit and develop a bid.
5. First State reviews subcontractor bids and selects a subcontractor to complete the work.
6. The selected subcontractor contacts the client to schedule a time to complete the heating system repair or replacement work.
7. The selected subcontractor visits the home and completes the heating system repair or replacement work. In addition, programmable thermostats are installed in homes with nonprogrammable thermostats.
8. First State inspectors schedule and complete a Final Inspection visit at the client's home. The Final Inspection includes an assessment of the new or repaired heating system and a brief client interview asking about the client's experience with the subcontractor and their awareness of the work completed. If the inspector identifies problems or deficiencies with the work, the subcontractor is contacted to rectify the problem prior to receiving payment. If the inspector determines the work was completed according to the final work scope, the job is considered complete.

This timeframe for the heating equipment assessment and services varies from a few days for emergency crisis situations to several weeks before the work is completed.

## **II. On-Site Observation Purpose**

On-site observations are a valuable research method to collect qualitative information on how program services are delivered. By directly observing how a program is implemented "in the field", researchers can learn information that would otherwise be unknown or unclear from program data, program documents, and interviews. This includes understanding how staff follow program protocols and how well the program model works.

APPRISE conducted on-site observations of the RRHACE heating equipment assessment and services to attempt to answer the following key questions:

- RRHACE Program Targeting – Is the program successfully targeting low-income homeowners? Are vulnerable households prioritized?
- Client Interactions – How well do First State inspectors interact with clients? Are staff informing clients of key information to maximize program success?
- Client Scheduling – Are clients present when First State staff arrive for inspections? Are clients generally prepared for the inspection visits?
- Inspector Qualification – Are inspectors adequately trained in program protocols, HVAC systems, and inspection testing procedures?
- Inspections and Safety – Does First State follow adequate protocols for ensuring that the repaired/replaced heating system meets safety requirements and operates properly?
- Inspection Forms and Protocols – Do the current inspection forms provide clear guidance on the appropriate inspection protocols and procedures? Do the inspection forms capture the information needed to produce program statistics and to assess program success?

### **III. RRHACE On-Site Observation Approach**

APPRISE Senior Policy Analyst Daniel Bausch conducted the RRHACE on-site observations. Prior to the visits, Mr. Bausch reviewed program forms and documentation, and he worked closely with First State staff.

Mr. Bausch accompanied First State staff on inspection visits during the morning and early afternoon of March 10, 2016. All inspections were conducted by two First State inspectors. Due to warm outdoor temperatures, all homes visited were not in need of immediate heating and did not have their main or supplemental heat in use at the time of the visit.

Mr. Bausch observed three inspection visits and one attempted visit where the client was not home. During each visit, Mr. Bausch followed inspectors into the client home and observed them inspect the heating equipment, speak with clients, and fill out the inspection forms. For consistency across each observation, Mr. Bausch used an observation form with specific categories to record information. Between visits, Mr. Bausch also asked the inspectors questions about the inspections and their experience to obtain additional insight and information.

Following the observations, Mr. Bausch requested and received scanned program forms from First State for the observed inspection visits. Mr. Bausch reviewed these forms and his completed observation forms to draft a summary of the observations.

### **IV. Summary of RRHACE On-Site Observations**

The following are summaries of the four on-site observation visits.

#### *Site Inspection Visit #1*

- First State Inspectors = Donyell and Feliz
- Client Name = Jacqueline Conyers-Williams

- House Type = Ranch
- Existing Heating System = Gas Furnace (Closet Unit)

Upon arrival, the inspectors greeted the client and another adult household member. The inspectors listened while the clients described the problem with the furnace not working properly.

The inspectors then each completed different tasks. Donyell sat with the clients, showed them the Site Inspection Form, and proceeded to explain the program process and ask questions to fill in the form. He provided the clients with an EcoKit and explained the items included in it. Feliz proceeded to examine the furnace, which was located in a closet. Feliz visually examined the furnace and used a Bacharach Leakator 10 combustible gas leak detector to inspect for leaks around the unit. He took pictures of the model plate. Finally, he went to the programmable thermostat and examined it. Felix indicated that the client already had this furnace repaired last year through the program, so they would most likely have the unit replaced.

Donyell and Feliz briefly discussed the furnace, but appeared to have already concluded the recommendation would be to replace the unit. Donyell finished the Site Inspection form and had the client sign it. He explained to the clients that they would be contacted soon by three different companies to schedule times to examine the unit and prepare cost estimates for First State. Overall, the Site Inspection was complete in under 20 minutes.

#### Final Inspection Visit #1 (No Show)

- First State Inspectors = Donyell and Feliz
- House Type = Single Family Home

When the inspectors arrived at the home, there was no answer at the door. Donyell called the client, and the client said he was out of town because he was told by First State's scheduler that the inspectors would come later in the afternoon. Donyell commented that there was an apparent misunderstanding on the window in which they would come.

#### Final Inspection Visit #2 (Replacement)

- First State Inspectors = Donyell and Feliz
- Client Name = Glenda Houston
- House Type = Single Family
- New Heating System = Oil Boiler (Basement Unit)

When the inspectors arrived at the home, they found the client's husband at the neighboring home. Donyell explained to me that the client owned two neighboring homes.

Donyell and Feliz explained they came to conduct the final inspection for the new heating system. With his approval, both inspectors left him and proceeded to the basement of the home that received the new boiler. The home appeared to be unoccupied and not the primary residence of the client. The inspectors visually examined the new boiler and worked to fill out the Final Inspection form. They did not conduct any tests or turn the unit on. The duct from the unit to the chimney was not fully sealed. After the visual inspection, they proceeded upstairs and examined the thermostat to confirm it had been installed. The inspection took place in under 10 minutes.

The inspectors then left the home and went to the neighboring home to speak with the client's husband. They asked him the client questions on the Final Inspection Form. He indicated the contractor did not leave the manual, tell them about filters, or tell them how to read the fuel gauge. After answering the questions, the inspectors told him his wife needed to sign the form as the listed client. The husband left to another room to have his wife sign the form. Overall, the visit took less than 30 minutes.

#### *Final Inspection Visit #3 (Replacement)*

- First State Inspectors = Donyell and Feliz
- Client Name = Catherine Griffin
- House Type = Mobile Home
- New Heating System = 95.1% Direct Vent Condensing Gas Furnace (using LP gas)

When the inspectors arrived at the home, the client was not present. The inspectors attempted to call the client. The condition of the Mobile Home and yard were very messy and included broken glass and the old furnace unit in the front yard. The old furnace unit was visibly rusted and several decades old. The inspectors said the contractor must not have had room to take the unit during the replacement and would be returning for it.

The client arrived after a few minutes, and mentioned she was not called in advance by First State. She took the inspectors to the home and opened the front door. There was an immediate strong odor of gas. The indicator lights on the inspector's Bacharach Leakator 10 combustible gas leak detector went to the top bar, indicating an extremely dangerous amount of combustible gas in the client's mobile home. The Inspectors shut off the gas to the new heating unit, which was located in a closet by the kitchen. The client explained that the subcontractor had been there this morning to finish the work on the new furnace. She mentioned noticing the smell and opening windows, but she did not seem to be aware of the danger and extent of the leak. After the gas was shut off, both inspectors asked the client questions to confirm if any other appliances used gas and were recently used or touched. They used the gas leak detector and found the highest readings by the gas connection to the new furnace. At this time, Feliz worked to call the subcontractor to return to address the problem. Donyell went outside with the client to inspect the outdoor tank and did not detect any problems or leaks. Feliz and Donyell then opened the door and confirmed windows were open to air out the home. They did not have any fans in the work van to help air out the home. The inspectors did not clearly tell the client about the danger of the leak, and they did not immediately remove her from proximity to the home.

Due to the schedule, the observation concluded prior to the subcontractor returning to rectify the work. The final inspection form indicates that the subcontractor returned, fixed the issue, and the job successfully passed the Final Inspection.

## **V. Findings and Recommendations**

This section provides a summary of the findings from the on-site observations and recommendations based upon those findings.

### **RRHACE Program Targeting**

RRHACE is designed to serve low-income households, especially vulnerable households in crisis situations.

#### **Findings**

- RRHACE is successfully targeting low-income households, many of which are in crisis situations that impact health, safety, and comfort.
- One observation indicated that the home provided with a new heating system may not have been the primary residence for the client.

***Recommendation:** RRHACE should implement new procedures to ensure that work is only occurring in the applicant's primary residence.*

### **Interactions with Clients**

First State seeks to build positive relationships with RRHACE clients through professional and respectful treatment of all clients.

#### **Findings**

- First State inspectors have positive relationships with clients.
- First State inspectors are friendly, respectful, helpful, and professional.
- First State inspectors explained the program steps and the inspection tasks they are doing, but the amount of information related to the EcoKits and energy education varied.

***Recommendation:** First State should develop written guidelines with information to assist inspectors in consistently explaining the EcoKits and energy education.*

#### **Findings**

- First State inspectors do not provide substantial information to clients on how to identify and report safety issues with combustible appliances and fuels.

***Recommendation:** First State inspectors should provide all clients with information on identifying potential safety issues with combustible fuels, and with information emphasizing to immediately report suspected gas leaks.*

### **Scheduling Inspections**

#### **Findings**

- Two clients were not at home when First State inspectors arrived. Both were reached by the inspectors via phone. One arrived after being called, but she indicated she was not given a specific time frame for when they would arrive. The other client indicated he was out of town that morning because he was told



by First State that they would come in the afternoon. Based on discussions, this is common.

*Recommendation: To reduce no-show instances and enhance customer service, First State should work to provide a more specific time frame for when they will arrive. Ideally, this would be a two to three hour window.*

*Recommendation 2. To reduce no-show instances and enhance customer service, First State should make reminder calls the day before the inspections, or potentially the day of the inspections.*

#### Findings

- One observation found a severe gas leak resulting from an improper heating system installation by the subcontractor. This situation was extremely dangerous and underscored the need to inspect completed work soon after it is completed by the contractor.

*Recommendation: Given safety risks related to improper heating equipment installation or repair, First State should prioritize final inspections for combustion furnaces and boilers.*

### **Inspector Qualifications**

#### Findings

- First State inspectors do not have substantial training in HVAC systems and inspection testing. The Inspection primarily consists of a visual examination of the heating system, checking for external gas leaks, and confirming with the client that the system is working correctly.

*Recommendation: Inspectors should receive additional training in HVAC, specifically in worst-case CAZ testing, vent examination, safety control testing, and measuring gas in the flue. First State should seek to have inspectors obtain professional certifications, such as through BPI, NATE, or RSES.*

### **Heating System Inspection and Testing Procedures**

#### Findings

- First State inspectors currently determine if broken or malfunctioning heating systems should be replaced or repaired without formal guidance.

*Recommendation: First State should develop specific criteria for determining whether a broken or malfunctioning heating system should be repaired or replaced.*

#### Findings

- First State inspectors do not appear to have specific protocols for inspecting each type of heating system and job. The current approach appears to include a visual inspection of the work and testing for gas leaks, but not substantial testing of unit performance and safety.

*Recommendation:* First State should develop specific written protocols and step-by-step outlines for inspecting each type of heating system and job. These protocols should include worst-case CAZ testing, vent examination, safety control testing, and measuring gas in the flue.

*Recommendation:* First State should purchase testing equipment and tools to conduct comprehensive heating system safety testing.

#### Findings

- One observation was with a client who previously had their unit repaired through the program, but the repaired unit later failed.

*Recommendation:* First State should implement procedures to track “repeat” clients to determine how often this occurs and to identify any patterns with these jobs.

### **Inspection Forms**

#### Findings

- Currently, inspectors use the Site Inspection and Final Inspection form as a guideline to the Inspection process, but these forms do not clearly indicate what steps were taken or capture adequate information about the steps taken.

*Recommendation:* First State should develop a form to capture information to show that the written protocols were completed and to capture data from each step.

#### Findings

- The existing Site Inspection and Final Inspection forms are not organized systematically to align with the inspection process. These forms also do not capture all the relevant information for understanding program impacts, and inspectors fill in items differently due to unclear instructions.

*Recommendation:* First State should revise the Site Inspection Form and the Final Inspection form to organize items clearly, to capture more information relevant to understanding program impacts, and to standardize the format in which questions are answered.

*Recommendation:* First State should provide guidance and training to the inspectors on filling out the forms completely.

#### Findings

- On Final Inspections, First State will pass or fail jobs. If a job fails, the contractor must return to rectify the problem. Once rectified the job is passed and the Final Inspection form is updated. This approach results in little information being captured on specific job deficiencies and contractor performance.

*Recommendation:* First State should consider ways to report and track problems found during the Final Inspection. Those should be used to report information to the contractors and to provide more detail on performance.