

# NAVIGANT

9. (Refused)

9. (Refuse)

HS-9a. Have you changed how you service the valve?

1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF HS-9a =1, else SKIP to HS-10a]

HS-9b. Did you make changes to your existing cooling valve service procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

HS-9c. Are you adjusting your valve service procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

1. More frequently
2. Less frequently
3. Haven't made a change
8. (Don't know)
9. (Refused)

HS-10a. Have you changed how you insulate the pipe?

1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF HS-10a =1, else SKIP to HS-11a]

HS-10b. Did you make changes to your existing pipe insulation procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

HS-10c. Are you adjusting your pipe insulation procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

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1. More frequently
2. Less frequently
3. Haven't made a change
8. (Don't know)
9. (Refused)

HS-11a. Have you changed how you conduct water treatment on your heating system?

1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF HS-11a =1, else SKIP to HS-12a]

HS-11b. Did you make changes to your existing heating system water treatment procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

HS-11c. Are you adjusting your heating system water treatment procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

1. More frequently
2. Less frequently
3. Haven't made a change
8. (Don't know)
9. (Refused)

HS-12a. Have you made any other changes in your facility with regards to the heating system?

1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF HS-12a =1, else SKIP to HS-13]

HS-12b. What change did you make? [OPEN ENDED]

HS-12c. Did you make changes to your existing heating system procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)



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2. No
8. (Don't Know)
9. (Refuse)

[ASK IF ME-2a =1, else SKIP to ME-3a]

ME-2b. Did you make changes to your existing motor part lubrication procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

ME-2c. Are you adjusting your motor part lubrication procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

1. More frequently
2. Less frequently
3. Haven't made a change
8. (Don't know)
9. (Refused)

ME-3a. Have you changed the way you perform belt alignment, check belt tension, or replace the belt?

1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF ME-3a =1, else SKIP to ME-4a]

ME-3b. Did you make changes to your existing belt procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

ME-3c. Are you adjusting your belt procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

22. More frequently
23. Less frequently
24. Haven't made a change
8. (Don't know)
9. (Refused)

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ME-4a. Have you changed the way you perform coupling alignment?

1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF ME-4a =1, else SKIP to ME-5a]

ME-4b. Did you make changes to your existing coupling alignment procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

ME-4c. Are you adjusting your coupling alignment procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

25. More frequently
26. Less frequently
27. Haven't made a change
8. (Don't know)
9. (Refused)

ME-5a. Have you changed any policy for efficient motor purchases?

1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF ME-5a =1, else SKIP to ME-6a]

ME-5b. Did you make changes to your existing efficient motor purchase procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

ME-5c. Are you adjusting your efficient motor purchase procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

1. More frequently
2. Less frequently
3. Haven't made a change
8. (Don't know)

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9. (Refused)

ME-6a. Have you changed the way you use motor repair specifications to improve or ensure energy efficient operation?

1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF ME-6a =1, else SKIP to ME-7a]

ME-6b. Did you make changes to your existing motor repair procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

ME-6c. Are you adjusting your motor repair procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

1. More frequently
2. Less frequently
3. Haven't made a change
8. (Don't know)
9. (Refused)

ME-7a. Have you made any other changes with regards to your motor equipment?

1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF ME-7a =1, else SKIP to ME-8]

ME-7b. What change did you make? [OPEN ENDED]

ME-7c. Did you make changes to your existing motor procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)



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ES-2a. Have you changed thermal analysis and connection tightening?

1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF ES-2a =1, else SKIP to ES-3a]

ES-2b. Did you make changes to your existing thermal analysis and connection tightening procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

ES-2c. Are you adjusting your thermal analysis and connection tightening procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

1. More frequently
2. Less frequently
3. Haven't made a change
8. (Don't know)
9. (Refused)

ES-3a. Have you made any other changes with regards to your electrical system?

1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF ES-3a =1, else SKIP to ES-4]

ES-3b. What change did you make? [OPEN ENDED]

ES-3c. Did you make changes to your existing electrical procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

ES-3d. Are you adjusting your electrical procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

1. More frequently



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2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

VS-2c. Are you adjusting your economizer procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

1. More frequently
2. Less frequently
3. Haven't made a change
8. (Don't know)
9. (Refused)

VS-3a. Have you changed the way you adjust the damper or repair seals?

1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF VS-3a =1, else SKIP to VS-4a]

VS-3b. Did you make changes to your existing damper and seal repair procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

VS-3c. Are you adjusting your damper and seal repair procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

1. More frequently
2. Less frequently
3. Haven't made a change
8. (Don't know)
9. (Refused)

VS-4a. Have you changed the way you calibrated the sensor?

1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF VS-4a =1, else SKIP to VS-5a]

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VS-4b. Did you make changes to your existing sensor calibration procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

VS-4c. Are you adjusting your sensor calibration procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

1. More frequently
2. Less frequently
3. Haven't made a change
8. (Don't know)
9. (Refused)

VS-5a. Have you changed the way you perform setpoint optimization?

1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF VS-5a =1, else SKIP to VS-6a]

VS-5b. Did you make changes to your existing setpoint optimization procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

VS-5c. Are you adjusting your setpoint optimization procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

1. More frequently
2. Less frequently
3. Haven't made a change
8. (Don't know)
9. (Refused)

VS-6a. Have you changed the way you perform air balancing?

1. Yes
2. No
8. (Don't Know)

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9. (Refuse)

[ASK IF VS-6a =1, else SKIP to VS-7a]

VS-6b. Did you make changes to your existing air balancing procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

VS-6c. Are you adjusting your air balancing procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

1. More frequently
2. Less frequently
3. Haven't made a change
8. (Don't know)
9. (Refused)

VS-7a. Has there been a change in the way you deal with the filter of your ventilation system?1.

- Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF VS-7a =1, else SKIP to VS-8a]

VS-7b. Did you make changes to your existing filter changing procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

VS-7c. Are you adjusting your filter changing procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

1. More frequently
2. Less frequently
3. Haven't made a change
8. (Don't know)
9. (Refused)

VS-8a. Have you changed the way you perform system diagnostics?

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1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF VS-8a =1, else SKIP to VS-9a]

VS-8b. Did you make changes to your existing system diagnostic procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

VS-8c. Are you adjusting your system diagnostic procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

1. More frequently
2. Less frequently
3. Haven't made a change
8. (Don't know)
9. (Refused)

VS-9a. Have you changed the way you seal duct leaks and/or replace door gaskets?

1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF VS-9a =1, else SKIP to VS-10a]

VS-9b. Did you make changes to your existing duct leak and door gasket procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

VS-9c. Are you adjusting your duct leak and door gasket procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

1. More frequently
2. Less frequently
3. Haven't made a change
8. (Don't know)
9. (Refused)

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VS-10a. Have you changed the way you clean fan wheels?

1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF VS-10a =1, else SKIP to VS-11a]

VS-10b. Did you make changes to your existing fan wheel cleaning procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

VS-10c. Are you adjusting your fan wheel cleaning procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

1. More frequently
2. Less frequently
3. Haven't made a change
8. (Don't know)
9. (Refused)

VS-11a. Have you changed the way you specify energy-efficiency requirement for ventilation components?

1. Yes
2. No
8. (Don't Know)
9. (Refuse)

[ASK IF VS-11a =1, else SKIP to VS-12a]

VS-11b. Did you make changes to your existing energy efficiency requirement procedures or are you using new procedures that you were not doing before the BOC program?

1. Improvements to existing procedures
2. New procedures
3. (Both)
8. (Don't know)
9. (Refused)

VS-11c. Are you adjusting your energy efficiency requirement procedures more frequently, less frequently, or haven't you made a change to how often you adjust these procedures?

1. More frequently



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VS-16. When thinking about all these ventilation maintenance changes that you have made since participating in the BOC training in the buildings you are responsible for, would you say that the changes generally affect:

1. All of the square footage you are responsible for
2. About 75%
3. About half
4. About one-quarter
8. Don't know
9. Refused

## Maintenance Spillover

ALLM-1. Thinking about all of the O&M changes that you made to enhance energy efficiency since participating in the BOC training, did you do anything that led to the implementation of similar measures in **any facilities you are not directly responsible for**, for example, by discussing what you had done with your colleagues?

1. Yes
2. No
8. Don't know
9. Refused

Skip to LC-1 if 2, 3, or 4.

ALLM-2. Would you say that the savings impact from those measures in the other building or buildings was

1. Significantly greater than in your facility
2. Greater than in your facility
3. About the same as in your facility
4. Less than in your facility
5. Much less than in your facility
8. Don't know
9. Refused

If 4 or 5, skip to LC-1.

ALLM-3 Would you mind if I pass your information on to a colleague of mine with more experience in this area so they can speak to you about this?

1. Yes
2. No
8. Don't know
9. Refused

## 5.2 Equipment Upgrade

That concludes the questions relating to maintenance. Now, I'm going to run through a list of possible equipment upgrade or installation projects to improve the energy efficiency of your facility.

### Lighting Controls

LC-1. WITHIN 2 YEARS BEFORE the training: Had you installed any lighting controls?

1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

LC-2. How about SINCE you began the training?

1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

[ASK IF LC-2=Y ELSE SKIP TO EL-1]

LC-3. You mentioned that you installed lighting controls after taking the BOC training. On a scale from 0 to 10 where 0 is "not at all" and 10 is "very much", how much did the training influence your decision to install lighting controls?

0	1	2	3	4	5	6	7	8	9	10	DK	Ref
Not at all										Very much		

LC-4. How soon after completing the course did you install lighting controls?

1. Within a year
2. One to two years later
3. Two to three years later
00. (Other, specify)
88. Don't know
99. Refused

LC-5. What is the square footage of the area that new lighting controls were installed in?

[NUMERIC OPEN END, UP TO 9,999,999; DK, Ref]

LC-6. Please describe the types of your new lighting controls (**DO NOT READ LIST**) [Mark all that apply].

1. (Motion sensors)
2. (Timers)
3. (Dimmers)
4. (Night lighting)
00. (Other, specify) [record response]
88. Don't know
99. Refused

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LC-7. Did you receive a rebate from DCEO or your utility for the installation of new lighting controls?

1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

[ASK IF LC-7=1, else SKIP TO LC-9]

LC-8. Do you recall the approximate amount of the rebate/incentive you received from DCEO or the utility?

- [DOLLAR OPEN END UP TO \$99,999]  
999998 DK  
999999 Ref

LC-9. What are the estimated energy savings per month from installing lighting controls, in terms of Kilowatt hours per month?

- [NUMERIC OPEN END UP TO 999,999]  
999998 DK  
999999 Ref

[ASK IF LC9=DK]

LC-10. Could you estimate energy savings per month using another measure?

1. Yes, specify [OPEN END]
2. No
8. Don't know
9. (Refused)

## Efficient Lighting

EL-1. WITHIN 2 YEARS BEFORE the training: Had you installed efficient lighting?

1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

EL-2. How about SINCE you began the training?

1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

[ASK IF EL-2=Y, ELSE SKIP TO EMS-1]

EL-3. You mentioned that you installed energy efficient lighting after taking the BOC training. On a scale from 0 to 10 where 0 is "not at all" and 10 is "very much", how much did the training influence your decision to install efficient lighting?

0    1    2    3    4    5    6    7    8    9    10    DK    Ref

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Not at all

Very much

EL-4. How soon after completing the course did you install energy efficient lighting?

1. Within a year
2. One to two years later
3. Two to three years later
00. (Other, specify)
88. Don't know
99. Refused

EL-5. What is the square footage of the area that new efficient lighting was installed in? [NUMERIC OPEN END, UP TO 9,999,999; DK, Ref]

EL-6a. What type of lighting did you remove?

1. (Fluorescent T12)
2. (Fluorescent T8)
3. (Fluorescent T5)
4. (Incandescent)
6. (CFL)
7. (High-Intensity Discharge (HID))
8. (Pulse start metal halide)
9. (LED)
00. (Other, specify) [record response]
88. Don't know
99. Refused

EL-6b. What type of lighting did you install?

1. (Fluorescent T12)
2. (Fluorescent T8)
3. (Fluorescent T5)
4. (Incandescent)
6. (CFL)
7. (High-Intensity Discharge (HID) ~~replacement~~)
8. (Pulse start metal halide)
9. (LED)
96. (None/delamping measure)
00. (Other, specify) [record response]
88. Don't know
99. Refused

EL-7. Did you receive a rebate from DCEO or your utility for the installation of new efficient lighting?

1. (Yes)
2. (No)
8. (Don't know)

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9. (Refused)

[ASK EL-7 =1, else SKIP to EL-9]

EL-8. Do you recall the approximate amount of the rebate/incentive you received from DCEO or the utility?

[DOLLAR OPEN END UP TO \$99,999]

999998 DK

999999 Ref

EL-9. What are the estimated energy savings per month from installing energy efficient lighting, in terms of Kilowatt hours per month? [Record units, NUMERIC OPEN END UP TO 999,999]

999998 DK

999999 Ref

[ASK IF EL-9=DK]

EL-10. Could you estimate energy savings per month using another measure?

1. Yes, specify [OPEN END]

2. No

8. Don't know

9. (Refused)

## EMS

EMS-1. WITHIN 2 YEARS BEFORE the training: Had you installed a new or expanded an existing Energy Management System?

1. (Yes)

2. (No)

8. (Don't know)

9. (Refused)

EMS-2. How about SINCE you began the training?

1. (Yes)

2. (No)

8. (Don't know)

9. (Refused)

[ASK IF EMS-2=Y, ELSE SKIP TO M-1]

EMS-3. You mentioned that you installed or upgraded an Energy Management System after taking the BOC training. On a scale from 0 to 10 where 0 is "not at all" and 10 is "very much", how much did the training influence your decision to install or upgrade your Energy Management System?

0 1 2 3 4 5 6 7 8 9 10 DK Ref  
Not at all Very much

EMS-4. How soon after completing the course did you install an EMS?

1. Within a year

2. One to two years later

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- 3. Two to three years later
- 00. (Other, specify)
- 88. Don't know
- 99. Refused

EMS-5. What is the square footage of the area that the Energy Management System controls?  
[NUMERIC OPEN END, UP TO 9,999,999; DK, Ref]

EMS-6. Please describe the function(s) of your new Energy Management System. **(DO NOT READ LIST)** [Mark all that apply].

- 1. (On and off schedule)
- 2. (Does everything)
- 3. (Cooling plant optimization)
- 4. Cooling distribution optimization
- 5. Outdoor air ventilation (economizer)
- 6. Outdoor air ventilation (demand controlled ventilation w/ CO<sub>2</sub> sensor)
- 7. Air distribution optimization
- 8. Heating plant and distribution optimization
- 00. (Other, specify) [record response]
- 88. Don't know
- 99. Refused

EMS-7. Did you receive a rebate from DCEO or your utility for the installation of the energy management system?

- 1. (Yes)
- 2. (No)
- 8. (Don't know)
- 9. (Refused)

[ASK IF EMS-7=1, ELSE SKIP TO EMS-9]

EMS-8. Do you recall the approximate amount of the rebate/incentive you received from DCEO or the utility?

[DOLLAR OPEN END UP TO \$99,999]  
999998 DK  
999999 Ref

EMS-9. What are the estimated electric energy savings per month from installing or upgrading the Energy Management System, in terms of Kilowatt hours per month?

[Record units, NUMERIC OPEN END UP TO 999,999]  
999998 DK  
999999 Ref

[IF EMS-9=DK]

EMS-10. Could you estimate electric energy savings per month using another unit?

- 1. Yes, specify [OPEN END]



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M-6. What is the TOTAL horsepower of ALL new motors? [NUMERIC OPEN END, UP TO 9,999; DK, Ref]

M-7. Did any of these new motors have VSDs?

1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

[SKIP IF M-7=2]

M-8. What was the total horsepower of the VSDs that were installed on the new motors? [NUMERIC OPEN END]

[Record units, NUMERIC OPEN END UP TO 999,999]  
999998 DK  
999999 Ref

M-9. Did you receive a rebate from DCEO or your utility to install the **new motors**?

1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

[ASK IF M-9 = 1, else SKIP TO M-11]

M-10. Do you recall the approximate amount of the rebate/incentive you received from DCEO or the utility?

[DOLLAR OPEN END UP TO \$99,999]  
999998 DK  
999999 Ref

M-11. Did you receive a rebate from DCEO or your utility to **install VSDs on these new motors**?

1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

[ASK IF M-11 = 1, else SKIP TO M-13]

M-12. Do you recall the approximate amount of the rebate/incentive you received from DCEO or the utility?

[DOLLAR OPEN END UP TO \$99,999]  
999998 DK  
999999 Ref



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[NUMERIC OPEN END, UP TO 99,999; DK, Ref]

VSD-7. Did you receive a rebate from DCEO or your utility to install new VSDs?

1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

[ASK IF VSD-7 = 1, else SKIP TO VSD-9]

VSD-8. Do you recall the approximate amount of the rebate/incentive you received from DCEO or the utility?

[DOLLAR OPEN END UP TO \$99,999]

999998 DK

999999 Ref

VSD-9. What are the estimated energy savings per month from installing new VSDs on existing motors, in terms of Kilowatt hours per month?

[NUMERIC OPEN END UP TO 999,999]

999998 DK

999999 Ref

[IF VSD-9=DK]

VSD-10. Could you estimate energy savings per month using another unit?

1. Yes, specify [OPEN END]
2. No
8. Don't know
9. Refuse

## Heating System Efficiency Improvements

HSE-1. WITHIN 2 YEARS BEFORE the training: Had you made any heating efficiency improvements?

1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

HSE-2. How about SINCE you began the training?

1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

[ASK IF HSE-2=Y, ELSE SKIP TO ACE-1]





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- 00. (Other, specify)
- 88. Don't know
- 99. Refused

ACE-5. What is the size of the area, in square feet, served by upgraded Cooling Equipment? [NUMERIC OPEN END, up to 9,999,999; DK; Ref]

ACE-6. Please describe the Air-conditioning system project in general (**DO NOT READ LIST**) [Mark all that apply]

- 1. New high-efficiency chiller(s)
- 2. New cooling towers
- 3. New terminal units
- 4. New Packaged (rooftop) units
- 5. New Cooling coils
- 00. Other (specify) [record response]
- 88. Don't Know
- 99. Refused

ACE-7. What A/C efficiency improvements did you implement after the training?  
[OPEN END; DK, Ref]

ACE-8. Did you receive a rebate from DCEO or your utility to undertake any of these actions?

- 1. (Yes)
- 2. (No)
- 8. (DK)
- 9. (Refused)

[ASK IF ACE-8 =1, else SKIP TO ACE-10]

ACE-9. Do you recall the approximate amount of the rebate/incentive you received from DCEO or the utility?

[DOLLAR OPEN END UP TO \$99,999]

999998 DK

999999 Ref

ACE-10. What are the estimated electric energy savings per month from the A/C efficiency improvements for air conditioning, in terms of Kilowatt hours per month?

[Record units, NUMERIC OPEN END UP TO 999,999;]

999998 DK

999999 Ref

[IF ACE-10=DK]

ACE-11. Could you estimate electric energy savings per month using another unit?

- 1. Yes, specify [OPEN END]
- 2. No
- 8. Don't know

9. (Refused)

ACE-12. Can you estimate *additional* energy savings per month (such as therms of natural gas or millions of BTUs)?

1. Yes, specify [OPEN END]
2. No
8. (Don't Know)
9. (Refused)

### Water Heating Efficiency Improvements

WHE-1. WITHIN 2 YEARS BEFORE the training: Had you made any water heating efficiency improvements?

1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

WHE-2. How about SINCE you began the training?

1. (Yes)
2. (No)
8. (Don't know)
9. (Refused)

[ASK IF WHE-2=Y, ELSE SKIP TO EAH-1]

WHE-3. You mentioned that you made efforts to improve water heating efficiency after starting the BOC training. On a scale from 0 to 10 where 0 is "not at all" and 10 is "very much", how much did the training influence your decision to improve water heating efficiency?

0	1	2	3	4	5	6	7	8	9	10	DK	Ref
Not at all										Very much		

WHE-4. How soon after completing the course did you improve water heating efficiency?

1. Within a year
2. One to two years later
3. Two to three years later
00. (Other, specify)
88. Don't know
99. Refused

WHE-5. What specific actions did you take to improve water heating efficiency? (DO NOT READ LIST)

[Mark all that apply, OPEN END, 98=DK, 99=Ref]

1. Insulate pipes

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2. Install timeclock to turn off circulation pump after hours
3. Heat recovery
4. New High Efficiency Equipment
00. Other (specify) [record response]
88. Don't know
99. Refused

WHE-6. Did you receive a rebate from DCEO or your utility to undertake any of these actions?

1. (Yes)
2. (No)
8. (DK)
9. (Refused)

[ASK IF WHE-6 =1, else SKIP TO WHE-8]

WHE-7. Do you recall the approximate amount of the rebate/incentive you received from DCEO or the utility?

[DOLLAR OPEN END UP TO \$99,999]

999998 DK

999999 Ref

WHE-8. What are the estimated electric energy savings per month from water heating efficiency improvement, in terms of Kilowatt hours per month?

[NUMERIC OPEN END UP TO 999,999]

999998 DK

999999 Ref

[IF WHE-8=DK]

WHE-9. Could you estimate electric energy savings per month using another unit?

1. Yes, specify [OPEN END]
2. No
8. Don't know
9. (Refused)

WHE-10. Can you estimate *additional* energy savings per month (such as therms of natural gas or millions of BTUs)?

1. Yes, specify [OPEN END]
2. No
8. (Don't Know)
9. (Refused)

## Economizer on an Air Handler

EAH-1. WITHIN 2 YEARS BEFORE the training: Had you installed or retrofit an economizer on an air handler?





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2. (No)
8. (DK)
9. (Refused)

[ASK IF OE-5 = 1 else SKIP TO OE-7]

OE-6. Do you recall the approximate amount of the rebate/incentive you received from DCEO or the utility?

[DOLLAR OPEN END UP TO \$99,999]

999998 DK

999999 Ref

OE-7. What are the estimated electric energy savings per month from these efforts in terms of Kilowatt hours per month?

[NUMERIC OPEN END UP TO 999,999; DK, Ref]

999998 DK

999999 Ref

[IF OE-7=DK]

OE-8. Could you estimate electric energy savings per month using another unit?

1. Yes, specify [OPEN END]
2. No
8. Don't know
9. (Refused)

OE-9. Can you estimate *additional* energy savings per month (such as therms of natural gas or millions of BTUs)?

1. Yes, specify [OPEN END]
2. No
8. (Don't Know)
9. (Refused)

## Summary and Equipment Spillover

Ask if ONE OR MORE "Y" or "1" ANSWERS in (LC-2, EL-2, EMS-2, M-2, VSD-2, HSE-2, ACE-2, WHE-2, EAH-2, OE-2), ELSE SKIP TO SU-2.

SU-1a. Thinking about all of the equipment changes that you made to enhance energy efficiency since participating in the BOC training, did you do anything that led to the implementation of similar measures in **any facilities you are not directly responsible for**, for example, by discussing what you had done with your colleagues?

1. Yes
2. No
8. Don't know
9. Refused



## 6 ADDITIONAL IMPACTS

Now I would like to ask you some questions about the BOC training more generally.

I'd like to know if the BOC training has helped you to achieve any of the following objectives that I will specify. For example, this could mean that you learned a new skill or technique, or the BOC course provided you with a specific idea that you had not previously considered, or the certification helped you to convince colleagues to invest in an energy efficiency measure.

Have you... [ASK YES=1, NO=2, DK=8, Ref=9 FOR EACH ODD numbered question. Scale of 0-10 with 0 not at all influential and 10 being very influential for EVEN numbered questions]

AI-1. Tracked energy use systematically over time

AI-2. [ASK if AI-1 = 1] On a scale from 0 to 10, (With 0 meaning not at all influential and 10 meaning very influential?) how influential was the BOC to your achieving this outcome?

AI-3. Set energy savings goals

AI-4. [ASK if AI-3 = 1] On a scale from 0 to 10, how influential was the BOC to your achieving this outcome?

AI-5. Achieved energy savings goals

AI-6. [ASK if AI-5 = 1] On a scale from 0 to 10, how influential was the BOC to your achieving this outcome?

AI-7. Saved electric energy or reduced peak electricity demand at your facility.

AI-8. [ASK if AI-7 = 1] On a scale from 0 to 10, how influential was the BOC to your achieving this outcome?

AI-9. Saved your facility money otherwise spent on energy.

AI-10. [ASK if AI-9 = 1] On a scale from 0 to 10, how influential was the BOC to your achieving this outcome?

AI-11. Enhanced the comfort of your facility's occupants.

AI-12. [ASK if AI-11 = 1] On a scale from 0 to 10, how influential was the BOC to your achieving this outcome?

AI-13. Made any changes that have improved the Indoor Air Quality of your facility.

AI-14. [ASK if AI-13 = 1] On a scale from 0 to 10, how influential was the BOC to your achieving this outcome?

AI-15. Developed an energy budget for your facility

AI-16. [ASK if AI-15 = 1] On a scale from 0 to 10, how influential was the BOC to your achieving this outcome?

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[ASK AI-17 through A-20 IF any AI-odd numbered questions = 1, else SKIP TO AI-21]

AI-17. Approximately how much did you save from all of the energy savings actions that you implemented as a percentage of your annual electricity costs? (DO NOT READ LIST)

1. (None)
2. (5% or less)
3. (6%-10%)
4. (11-25%)
5. (Over 25%)
8. (Don't Know)
9. (Refuse)

AI-18. Approximately, how much did you save from all of the energy savings actions that you implemented as a percentage of your annual natural gas costs? (DO NOT READ LIST)

1. (None)
2. (5% or less)
3. (6%-10%)
4. (11-25%)
5. (Over 25%)
8. (Don't Know)
9. (Refuse)

AI-19. Approximately, how much money on average did you save on your electricity bill per month? (DO NOT READ LIST)

1. (Less than \$500)
2. (\$500- \$1,000)
3. (\$1,000-4,999)
4. (\$5,000-9,999)
5. (\$10,000-19,999)
6. (Over \$20,000)
8. (Don't Know)
9. (Refuse)

AI-20. Approximately, how much money on average did you save on your gas bill per month? (DO NOT READ LIST)

1. (Less than \$500)
2. (\$500- \$1,000)
3. (\$1,000-4,999)
4. (\$5,000-9,999)
5. (\$10,000-19,999)
6. (Over \$20,000)
8. (Don't Know)
9. (Refuse)

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AI-21. Aside from the utility rebates that I asked about earlier, were there any other sources of funding that motivated your pursuit of energy efficient building operations measures, such as funding from the American Recovery and Reinvestment Act, grant funding, or other sources?

1. (Yes)
2. (No)
8. (DK)
9. (Refused)

[ASK IF AI-21 = 1, else to AI-22]

AI-21a. What were the other sources of funding? [Open End]

AI-21b. How were these additional funding sources influential? [Open End]

AI-22. Did you learn about the energy saving measures that this survey covered from any other source or training besides the BOC program?

1. (Yes)
2. (No)
8. (DK)
9. (Refused)

[ASK if AI-22 = 1, ELSE SKIP TO AI-23]

AI-22a. Which of the following describes the alternative source from which you learned about similar energy efficiency measures as were covered in the BOC training? (Mark all that apply)

1. Similar training course not associated with workplace.
2. In-house training.
3. Word of mouth from colleagues.
4. Publications.
5. Other
8. (DK)
9. (Refused)

[ASK IF AI-22a = 1, else SKIP to AI-22c]

AI-22b. What was the name of the course sponsor? [Open End]

AI-22c. How was the additional information influential? [Open End]

AI-23. Since completing the BOC training program has your job title changed?

1. (Yes)
2. (No)
8. (DK)
9. (Refused)

AI-24. Since completing the BOC training program is your compensation different than what it otherwise would have been?

1. (Yes)



## 7 BARRIERS

B-1. What do you think are the best ways to recruit building operators to participate in the BOC training? **(DO NOT READ LIST)** [MULTIPLE RESPONSE, UP TO 3]

1. (Educate management about the program)
2. (Advertise in industry journals)
3. (Provide financial support for attendance)
4. (More advertising)
5. (Word of mouth/referrals)
6. (Distribute materials at supply stores)
7. (Certification: offer or require)
00. (Other, specify)
88. (DK)
99. (Refused)

B-2. What do you think are the barriers to getting building operators to participate in the BOC training? **(DO NOT READ LIST)** [MULTIPLE RESPONSE, UP TO 3]

1. (Cost)
2. (Time)
3. (Not aware of it)
4. (Getting authorization/approval)
5. (Not enough time)
6. (Supervisor support)
7. (Staffing restrictions)
96. (None)
00. (Other, specify)
88. (DK)
99. (Refused)

**Read If B-2=2. Else skip to B-4**

B-3. You indicated that time is a barrier to getting operators to participate in the BOC training, what course format do you think could BEST reduce or eliminate this barrier? Would it be better to [**Read List**]:

1. Condense the schedule to one day every week
2. Provide on-line/Webinar training
3. Split the courses into 14 to 16 half day sessions, possibly at night
4. Provide an intensive 8 days of training Monday through Monday including the weekend.
00. Other, (specify)
88. (Don't know)
99. (Refused)

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B-4. What kinds of barriers have prohibited you from implementing Operations & Maintenance improvements to your facility? **(DO NOT READ LIST)** [MULTIPLE RESPONSE, UP TO 3]

1. (Money)
2. (Time)
3. (Lack of support from management)
4. (No appropriate situations)
96. (No barriers)
00. (Other, specify)
88. (DK)
99. (Refused)

## 8 DEMOGRAPHICS

I just have a few questions for you regarding your facility.

D-1. What is your current job title? **(DO NOT READ LIST)**

1. (Operations/Facilities operations manager)
2. (Maintenance manager)
3. (HVAC supervisor or technician)
4. (Engineering manager)
5. (Facilities manager)
6. Engineer)
7. (Maintenance manager)
8. (General contractor)
9. (Building management specialist)
10. (Other engineering position)
11. (Other manager, team leader, supervisor)
00. (Other, specify [OPEN END])
88. (Don't Know)
99. (Refuse)

D-2. How many years have you worked in this role?

[NUMERIC OPEN END, UP TO 50 YEARS; 88=DK, 99=Ref]

D-3. How many hours per week is your site open for business? [NUMERIC OPEN END, UP TO 168; DK, Ref]

D-4. What is your site's estimated total annual energy cost (electricity and natural gas) (Cost per year in dollars)? [NUMERIC OPEN END, UP TO 999,999; DK, Ref]

D-5. What is your site's estimated total electricity cost (Cost per year in dollars)? [NUMERIC OPEN END, UP TO 999,999; DK, Ref]

D-6. What is your site's estimated total natural gas cost (Cost per year in dollars)? [NUMERIC OPEN END, UP TO 999,999; DK, Ref]

## 9 CLOSE

C-1. In the event that we have anything we'd like to clarify, do you mind if we call or email you for a quick follow-up?

1. Call
2. Email
3. Either
4. Prefer not to be contacted
5. Other

[ASK IF C-1=1,3]

C-1a. What is the best number to reach you at?

[ASK IF C-1=2,3]

C-1b. What is your email address?

C-2. Do you have any questions or anything that you would like to offer regarding this survey or the BOC certification training? [OPEN END]

*Those are all the questions I have for you.  
Thank you for your time and participation in this survey.*