

## ES16 – Pre-Instructional Survey

1. What is the purpose of a Burner Management System (BMS)?
  - a. Prevent Boiler Explosions
  - b. Prevent Boiler Implosions
  - c. Prevent damage to equipment and injury
  - d. All of the above
  
2. What is the standard(s) for the design of a boiler BMS?
  - a. NFPA Series 8500
  - b. NFPA 85
  - c. NFPA 86 Series
  - d. Pressure vessel codes
  
3. The BMS is the final control system to prevent an incident.
  - a. True
  - b. False
  
4. What is the most common cause of boiler explosions?
  - a. Fuel rich condition in a boiler system
  - b. Equipment failure
  - c. Human error
  
5. What is the standard for ovens, furnaces?
  - a. NFPA 85
  - b. NFPA 86
  - c. NFPA 87
  
6. The purge of a multiple burner boiler is complete after:
  - a. 4 minutes
  - b. 5 air changes
  - c. 5 air changes for at least 5 minutes
  - d. When the operator is ready to admit fuel
  
7. Re-purge of a multiple burner boiler is required after a:
  - a. Loss of all flame
  - b. Failure of the first igniter to ignite
  - c. If an igniter is not ignited 10 seconds after purge is complete.
  - d. All of the above

8. What is considered to be failsafe?
  - a. Energize to trip
  - b. De-energize to trip
  
9. The time to prove flame for heavy oil is less than the time to prove flame for light oil.
  - a. True
  - b. False
  
10. The ISA 61511 standard requires a PLC to be “safety certified” for BMS.
  - a. True
  - b. False

## ES16 – Pre-Instructional Survey Answers

1. d
2. b
3. a. True
4. c
5. b
6. c
7. a
8. b
9. b. False, light oil requires a 10 sec proof time, heavy oil requires 15 sec.
10. False, ISA standards do not require the PLC to be certified, however it makes system verification a lot easier if it is.