

ES17PC Pre-Instructional Survey

Name _____ Date _____

1. Who is responsible for selecting Safety Integrity Levels?
 - a) OEM
 - b) Engineering Firm
 - c) Instrumentation Vendor
 - d) Control System Vendor
 - e) End User

2. A Safety Instrumented System is comprised of the following:
 - a) Sensor(s)
 - b) Logic Solver(s)
 - c) Final Element(s)
 - d) Burner Train
 - e) A, B and C

3. To meet FM-7605 and supply a Factory Mutual listed PLC based Burner Management System solution one must:
 - a) Apply the concepts of IEC61508
 - b) Apply the concepts of ANSI / ISA 84 standard
 - c) Apply the concepts of NFPA 85 and 86
 - d) Apply FM 7-45
 - e) None of the above

4. What Safety Integrity Levels are typically used in the process industry?
 - a) SIL 1 only
 - b) SIL 2 only
 - c) SIL 3 only
 - d) SIL 4 only
 - e) SIL 1, 2, and 3

5. What role does Functional Testing play in determining Safety Integrity Level capability of a given Safety Instrumented Function?
 - a) No impact at all
 - b) Impacts Safety Integrity Level by a factor of 2
 - c) Functional Test Interval is part of the equation used to calculate Safety Integrity Level
 - d) No impact for SIL 1 and 2
 - e) No impact for SIL 3

6. Which of the following Safety PLC architectures is the best to be used in Safety Instrumented Burner Management System Applications
 - a) 1oo1D SIL 3 certified Safety PLC
 - b) 1oo2D SIL 3 certified Safety PLC
 - c) 2oo4 SIL 3 certified Safety PLC
 - d) 1oo2D SIL 2 certified Safety PLC
 - e) Depends on SIL requirements and Lifecycle Costs

7. Which codes / standards are being revised and / or already invoke the concepts of a Safety Instrumented Systems associated with Burner Management Systems:
 - a) NFPA 86
 - b) API 556
 - c) FM 7605
 - d) EN50156-1
 - e) All of the above

8. To determine if a Burner Management System is a Safety Instrumented System one must:
 - a) Perform Risk Analysis
 - b) Perform Safety Instrumented Function Identification
 - c) Allocate Independent Layers of Protection
 - d) Perform Safety Integrity Level Selection
 - e) All of the above

9. The following statement in a client's specification is sufficient to design a Safety Instrumented Burner Management System.
 - a) BMS to be supplied to meet SIL 3
 - b) BMS to be supplied to meet SIL 2
 - c) BMS to be supplied to meet SIL 1
 - d) BMS to be supplied to have Safe Failure Fraction of > 95%
 - e) None of the above

10. A general purpose PLC can be used as the logic solver in a Safety Instrumented Burner Management System:

- a) If a SIL of 2 or higher is required a formal assessment must be completed per IEC 61511
- b) If a SIL of 2 or higher is required without any additional engineering
- c) In SIL 1 applications following the requirements of proven-in-use
- d) Only if the control system vendor supports the concept
- e) A & C

ES17PC Pre-Instructional Survey Answers

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1. E
2. E
3. A
4. E
5. C
6. E
7. E
8. E
9. E
10. E