***Ewing-Foley, Inc. Technical Training***

**Electrical Continuing Education, 4-Hr 2023 National Electrical Code (Model) Code Changes**

**Power Point slide presentation, Articles 500-516**

**Course Outline, Instructor Ralph Bliquez \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**2023 NEC CHAPTER 5, SPECIAL OCCUPANCIES**

**(Articles 500-516) Hazardous Locations**

BRIEF COURSE DESCRIPTION:

This 4-hour course is based on Articles 500-516 of the 2023 National Electrical Code (Hazardous Locations). The course reviews the Class, Division and Group categories of the NEC (501-503), Intrinsically Safe Systems (504) and the NEC additions and restrictions on the IEC Zone System (Articles 505-6). The course will explain the protection techniques of both systems as they apply to conduit installations, cable and cord, enclosures and luminaires. Finally, the course will review special applications like bulk storage, commercial garages and gas stations, aircraft hangers, spray applications, etc. (510-516).

This course is a Power Point presentation of the model code to meet part of the minimum requirements for individuals who hold an electrical license, limited maintenance license or are trainees preparing for their license examination.

CLASS CONTENT:

 This course will meet the minimum code-change requirements for the license types specified. Code changes for the 2023 NEC will be in red.

There follows the class outline and a summary of changes in the 2023 NEC for Articles 500-516:

500-500.8: 45 Minutes

500.1 Scope (A) & (B) are both new in 2023 and clearly distinguish between the NEC Class, Division, Group which are covered at all voltages and the IEC Zone Method which is not.

500.4 Documentation must be available to the AHJ and other authorized persons. There are now 8 informational notes for standards applicable to these locations from authorities like NFPA, IEEE, ANSI/UL, CSA & IEC. The new 8th informational note has to do with impedance heating of pipelines and equipment.

500.5 (A) has been rewritten with (2) new Ammonia requirements.

500.5 (B) Summarizes the Class 1,2 & 3 Areas & Division 1 & 2 Categories but with extensive revisions for Class III Divisions in 2023.

500.6 Materials

500.7 (K) (1) & (2) New: Gas detection systems and protection techniques (K). Protection techniques (P)--(T) are new.

500.8 Equipment: Identification requirements especially (C)(4) Surface temperature requirements and (E) Threading.

501-503: 60 Minutes

501.1 Class I: Gasses and Vapors

501.10 (A) Revision (1-8) Permitted wiring methods (8) is new: Type P

501.30 (A) Grounding methods are specified as are (B) Bonding with new specific bonding means (1) & (2).

Part III Equipment: Requirements for transformers, luminaires, motors, instruments, meters, general purpose assemblies, etc.

501.100 ff.

501.141 Extensive new material on Flexible Cables

502 Class II: Dusts

502.10 (A) & (B) Wiring Methods

 Note on TC-ER-HL, PLTC-ER, & RTRC-XW

502.30 Grounding and Bonding requirements like Class I

Part III Equipment: Requirements for transformers, luminaires, motors, instruments, meters, general purpose assemblies, etc.

Article 503 Class III (Mirrors changes in Class II) but with extensive revisions for Class III Divisions in 2023.

504 Intrinsically Safe Systems (30 Minutes)

Article 505: 30 Minutes

Article 505.1 Scope Zone 0, 1 & 2 (B) New specifies what is not covered.

505.5 (A) 1& 2 New Combustible Gas Detection and New requirements which are like 500.5 (A) (1& 2)

505.6 Material Groups: IIC, IIB, & IIA

505.8 New Protection Groups: 0, P & Q

505.9 Equipment

Table 505.9 (C)(2)(4) Equipment Suitability

 505.9 (E)(1 & 2) NPT and Metric threaded conduit

505.9 (G) Optical Radiation sources from 380 nano meters to 10 micrometers

505.15 (A) Revision: Zone 0 is in accordance with 504.20

505.15 (B & C) Wiring Methods Revision: Flexible Connections

 Note on TC-ER-HL, PLTC-ER, & RTRC-XW

505.16 Extensive Revisions on Sealing and Drainage

505.20 Equipment Requirements (A-C) Marking requirements for Zone 0,1 &2

505.30 New Requirements for Grounding and Bonding: (A) & (B)

Article 506: 30 Minutes

506.1 & 4 Scope New for Covered/Not Covered (A) & (B)

506.8 (A-P) Protection Techniques Revision: Similar to 505.8 but without gas detection. (O) and (P) are new.

Table 506.9 (C) (2 & 3) Revisions: Equipment Suitability

506.15 Wiring Methods Revisions: Similar to 505.15

511-516 30 minutes

511 Commercial Garages 511.2 has new classifications.

512 New Article on Cannabis Oil Equipment and Systems

513 Aircraft Hangers 513.2 has new classifications and new warning signs.

514-516 All these locations have the same classification in the 2023 Code requirements as the other .2 above and will be reviewed as time allows.

There will be a 15 Minute break after approximately 2 hours of class time.

COURSE OBJECTIVES:

* The objectives of this course are to ensure that the student understands the NEC categories of Class, Division and Group and the Zone categories of the IEC System.
* The student reviews the changes in the 2023 NEC regarding the Articles 500-516.
* The student will have examples of how the changes in the 2023 NEC will affect electrical work in these special occupancies.

LEARNING OUTCOMES:

Licensed Electricians will be able to install electrical products in hazardous locations according to either the NEC or IEC requirements (subject to certain restrictions the NEC places on the IEC method in the territories where the NEC has jurisdiction).

COURSE ATTENDEES: Licensed Electricians or Apprentices

PROGRAM MATERIALS:

National Electric Code 2023 Edition (NFPA 70).

Interpreting the Requirements of Articles 500-516 of the NEC®

(Appleton publication, 2020 edition [latest edition available])

COURSE DOCUMENTATION

* Within two weeks, attendees will be given a “Certificate of Completion” showing the title of the course, date of training with name and license number
* A roster of attendees will be maintained and available on request.