

# Schaedler Yesco

## Expo 2010

### Written Electrical Safety Programs – Do I Need One?

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# INTRODUCTIONS

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- ✘ Presenter
- ✘ Attendees



# WHY A PROGRAM?

#1 – SAFETY

#2 – SAFETY

#3 – SAFETY



Oh; Something about OSHA



# ELECTRICAL HAZARDS.....SAFETY 1ST

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- ✘ Shock – 1,000 fatalities per year, >50% from <600 volts
- ✘ Arc-flash
  - + 35,000° F
  - + 2,000 severe burn cases per year
  - + Kill out to 10 feet
- ✘ Arc-blast
  - + Cu expands 67,000 x's from solid to gas
  - + Pressures = thousands of pounds per square feet
  - + Noise >160 dB
  - + Molten shrapnel >700 mph



# OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)



- ✘ Worker protection “police”
- ✘ General Industry (1910) and Construction (1926)
- ✘ 29CFR Part 1910 Subpart “S” – Electrical
  - + Methods to eliminate/minimize electrical hazards
  - + Safe work practices (1910.331-335)
  - + Training requirement (1910.332)
- ✘ 29CFR Part 1926 Subpart “K”
  - + Written Program Requirement for Grounding
- \* Problem: Limited specificity (ex. Flash protection)

# NFPA 70E – STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE BACKGROUND

- Assist OSHA in developing workplace safety (NFPA 70 – NEC: Limited Application)
- Four Parts to 70E (Latest Edition: 2009)
  - I. Safety Related Work Practices  
Chapter 1 (Articles 100 – 130)
  - II. Safety Related Maintenance Requirements  
Chapter 2 (Articles 200 – 250)
  - III. Safety Requirements for Special Equipment  
Chapter 3 (Articles 300 – 340)

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Examples include: Battery Rooms, Lasers, R&D Labs, etc.  
Annex A → 0

# SCOPE OF 70E –



- Public and private premises including building, structures, mobile homes, RV's, and floating buildings
- Yards, lots, parking lots, carnivals, and industrial sub-stations
- Installations used by electric utilities, such as offices, buildings, warehouses, garages, machine shops, recreational that are not an integral part of a generating plant, sub-station, or control station
- Conductors that connect installations to a supply of electricity

# NOT COVERED –

- Installations in ships, watercraft, railway rolling stock, aircraft, or automotive vehicles other than mobile homes and RV's
- Installations underground in mines
- Installation of railways
- Installation of communication equipment (must be exclusive control of communication utilities)
- Installation under exclusive control of electric utilities (service laterals/meters, rights-of-ways/easements, and property [owned or leased] for purpose of generation, transmission, transformation, etc.)





# CHAPTER 1: SAFETY-RELATED WORK PRACTICES

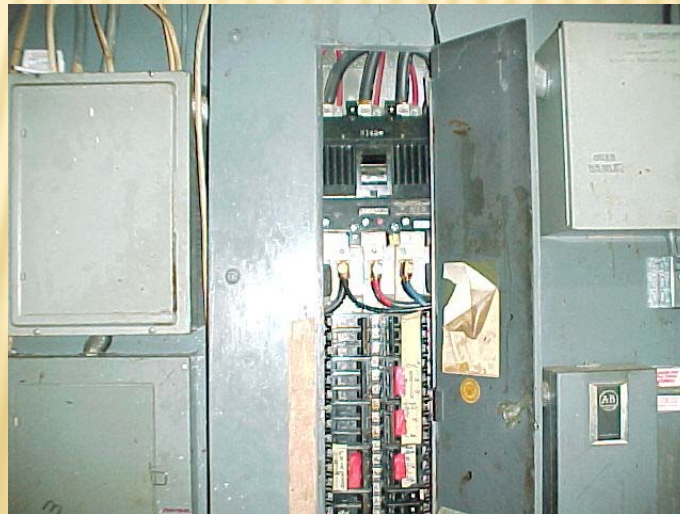
## “THE DRIVER”



# CHAPTER 1: SRWP

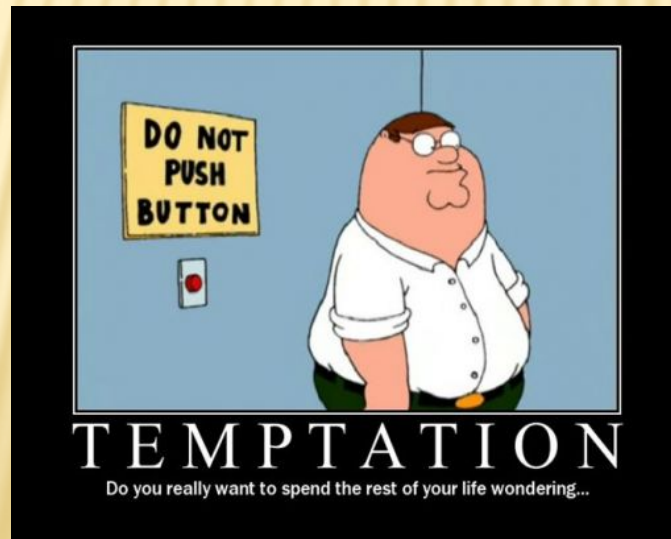
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- × Definitions,
- × Training,
- × Qualified vs. Unqualified Persons,
- × Approach Boundaries,
- × PPE,
- × Lockout/Tagout,
- × Energized Electrical Permits, and.....



# × Electrical Safety Program

- Article 110.7 and Annex E  
Also identified in ANSI Z10-1005 (OSH Management Systems)
  
- Shall implement and DOCUMENT  
Directs activity appropriate to hazard
  
- A. Provide awareness and self-discipline
  - ★ Working in area of electrical energy
  - ★ Recognizing hazard(s)
  - ★ Follow the rules.....don't be tempted!



# × Electrical Safety Program

- B. ID electrical safety principals
- Inspect/evaluate
  - Insulation and enclosure integrity
  - Plan and document procedures
  - Deenergize
  - Anticipating the unexpected
  - ID and minimize hazards
  - Employee protection
  - ID appropriate tools
  - Personnel abilities
  - Auditing



## **C. ID Electrical Safety Controls**

- **Assumed “energized”**
- **No bare-hand contact**
- **Deenergizing procedures**
- **Training**
- **Equipment use for ID of hazards**
- **Equipment training**
- **Categorize tasks**

## D. ID procedures when working on $\geq 50$ volts and inside Limited Approach Boundary

- Purpose
- Qualifications
- Hazard/extent of task
- Limits of approach
- Safe work practices
- PPE
- Insulating tools/materials
- Special precautions
- Diagrams/details/pictures
- References



Photo courtesy of FEMA.  
This picture shows actual disaster site work conditions and may not illustrate proper safety and health procedures.

## E. Hazard/risk evaluation procedures

- See Annex “F” for procedure, decision making flow chart, and procedural form
- Must ID employee decision making process (New for 2009)
- Similar to JHA/JSA

## F. Job briefing(s) – each shift unless repetitive

- Refer to Annex “I” → Check List
- Covers
  - Job Hazards
  - Work Procedures
  - “Special” Precautions
  - LO/TO
  - PPE
- Can be minimal for routine tasks



## G. Self-Auditing for Effectiveness (New in 2009)

- Frequency determined by employer
- Revise as necessary



# Note – Energized Electrical Work Permit

- Exceptions - voltage measuring
- equipment testing
- troubleshooting

<b>⚠ WARNING</b>	
<b>Arc Flash &amp; Shock Hazard Appropriate PPE Required</b>	
<b>FLASH PROTECTION</b>	<b>SHOCK PROTECTION</b>
Flash Hazard Category: <u>4</u>	200 VAC Shock Hazard When: <u>the front cover is open</u>
Min. Arc Rating (cal/cm <sup>2</sup> ): <u>40</u>	Limited Approach Boundary: <u>48 inches</u>
Flash Protection Boundary: <u>38</u>	Restricted Approach Boundary: <u>20 inches</u>
PPE: [x] Cotton underwear	Prohibited Approach Boundary: <u>10 inches</u>
[x] FR shirt and pants (or FR coveralls)	PPE: [x] Class 43
[ ] Full face suit and hood	[x] V-Rating 3
[x] Hard hat	[ ]
[ ] Safety glasses or goggles	
[x] Hearing protection	
[ ] Leather gloves and shoes	
[x] Non melting shirt and pants	
Equipment ID: 15624	

# PROGRAM IMPLEMENTATION

The Key is Employee Buy-in.....and Yes, Management Too.



HOW?

1. Participation in program development



- a seat at the table
- homework assignments

# PROGRAM IMPLEMENTATION

2. Education (Continuous...)
3. Supervisors.....Lead by Example
4. Be Persistent
5. Define Metrics
6. Recognition Programs.....Caution!
7. Allow for Improvement....Continued Employee Participation



# Questions/Answers

