



Electrical Safety



EFCOG Hazardous Energy Control Working Group

Chairs: Stephanie Collins, LBNL
Dave Lipinski, Portsmouth

Date: July 24, 2017

HEC Working Group Purpose

- Work towards consistent and effective hazardous energy control (LOTO) programs at DOE sites which are in compliance with standards such as NFPA 70E Article 120 and 29 CFR 1910.147.
- Determines Electrical Safety Month topic and develops supporting materials.
- Provides input to standards-making bodies where justified.

Membership

From EFCOG 2016:

Orlando Abeyta

Rodney Baker

Richard Biscardi

Brian Brass

Rod Briscoe

Stephanie Collins

Russ Harwood

Dave Lipinski

Troy Rogers

Mike Rosenow

Lucille Roybal

Gary Sanchez

Edward Sierra

Eric Stromberg

Richard Waters

Goals for HEC Working Group for 2016 EFCOG

- LOTO Cross-walk
- Select Electrical Safety Month topic
- Look Alike Equipment framework for a Best Practice
- ARMS/ERMS (Arc Reduction Maintenance Switch)/(Energy Reduction Maintenance Switch) control

Deliverable Progress During 2016 EFCOG ESW

- Each group presented their work and the group provided feedback.
- Dropped ARMS/ERMS due to lack of manpower (30 participants signed up for HEC/ 15 showed up for the group)
- Products completed:
 - 1. LOTO Cross-walk agreed format
 - 2. ES Month topic: Batteries
 - 3. Look Alike Equipment framework for a Best Practice

2016 Follow-On Goals and Deliverables

- Develop LOTO procedure template and address:
 - Determining the need for LOTO and type of LOTO (Simple and Complex)
 - Plan for the specific type of LOTO
 - LOTO application
 - LOTO removal (including system restoration)
 - Special conditions

2016 Follow-On Goals and Deliverables

- May is Electrical Safety Month – Batteries
- Deliverables Timeline:
 - Presentation – continue development
 - Field Aids and Posters – develop
 - All materials to be completed and sent to the ES Executive Committee by January 2017 (Winter meeting at IEEE)

2016 Follow-On Goals and Deliverables

- Look Alike Equipment Best Practice - Areas to be addressed:
 - Temporary labeling to reflect current equipment status (de-energized/energized)
 - Equipment ID and highest voltage labels outside equipment access
 - Barricades and signage following ANSI standards
 - Use of Attendants
 - Examples of proper barricades and signage – showing what “Good” looks like

Unplanned Work

Continuously addressing arising needs across the Complex based on:

Hazard Severity

Risk

Trends (ORPS reporting, collaborative calls and info sharing)

HEC – Progress since last EFCOG Workshop

1. LOTO Procedure Template – expect to finish up this workshop and submit before end of this fiscal year
2. ES Month – Batteries – didn't complete; changed direction to address negative trends within the Complex regarding LOTO
3. Look Alike Equipment Best Practice – didn't complete, lack of manpower

Previous Commitments

- Formulate a Generic LOTO program based on cross-walk
- Electrical Safety Month Materials
- Look Alike Equipment

Current Issues within Complex

- Shocks received by improperly plugging in/un-plugging equipment
- Shocks received on degraded equipment
- Improper hazardous energy control
- Not implementing LOTO as required
- Not following prescribed HEC Process
- Worker Inattention – Excavation, Cutting, Drilling, etc.

Issues Across the Complex – Electrical Shocks & Injuries

Reported June 18, 2016 up through July 20, 2017

Electrical Incidents (LOTO and contact with energized sources) – 200 +

Electrical Shocks and Injuries (32)

- C & P while plugging/unplugging devices – 7
- Improper installations & degraded equipment - 11
- Plugging in thermocouples - 1
- Capacitive and induced voltage shock – 5
- Capacitor and Battery short-circuit burn - 3

Issues Across the Complex – Trending the Wrong Way)

- LOTO
 - A LOT of Procedural Violations resulting in potential electrical hazard exposure (including several involving traditional HV switching and grounding device installation/and forgetting to remove)
 - (5) Personnel performing maintenance/servicing/repairs that were not on the LOTO (1 more than last year)
 - (7) Unexpected hazardous energy found during ZVV or Test Before Touch
 - (3) Failure to recognize requirement for LOTO to control Hazardous Energy
- (36) Unplanned contact with energized conductors or damaging electrical equipment/cables due to drilling, excavating: walls, ceilings, underground and overhead contact – no electrical injury (more than doubled since last year)

Shock and Burn Population

Research Equipment

- Burns (3)
- Shocks (11)

Facilities(traditional) Equipment

- Burns (0)
- Shocks (4)

- HV Switching near misses (6)
- Isolations LOTO'd in the wrong position (4)

HEC Sub-Group Decision Factors

Site Management Responsibilities

- Procedural Compliance
- Ensuring people are trained and qualified for job tasks
- Authorizing Work
- Providing Safety Training, PPE, etc.

HEC

- # of previous occurrences
- Likelihood of future incidents
- Severity & risk if incident occurred
 - Injury to people
 - Operational risk
 - Impacts on DOE labs
- R & D issues inadequately or not addressed in current standards

2017 ESW HEC Goals and Priorities – Break into 5 Groups

1. Finalize generic LOTO program
2. 2018 ES Month topic – Batteries? assign folks to work on the materials (presentation, Field Aids & Posters)
3. Look Alike Equipment Best Practice Proposal

If we can support additional areas:

1. Contact Release Best Practice Proposal
2. ARMS/ERMS (Arc Reduction Maintenance Switch)/(Energy Reduction Maintenance Switch) control

Tuesday (all day)/Wed AM

Break into groups and get to work

1. LOTO
2. 2018 Electrical Safety Month
3. Look Alike Equipment

Wednesday PM

Generate products for HEC Working Group review

1. Generic LOTO program template
2. ES Month Materials
3. Look Alike Equipment draft BPP

Thursday Morning

- Complete Closeout presentation and review with HEC group
- Identify continuing work and assign members & get commitment for completion

Thursday Afternoon

- Present HEC Working Group 2017 Closeout Report

Two Habits That Work

