

OPM COMMUNITY OF PRACTICE HECP PRESENTATION

Briefing by:

Mr. John Cannon, Chief of Safety-NWP

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OBJECTIVES FOR THIS BRIEF

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DISCUSSION ON REVIEW OF ER 385-1-31

- NWP COMMENTS / CONCERNS
- EM / OSHA INCONSISTENCIES

TEMPORARY PROTECTIVE GROUNDING

- THE DALLES QUESTION
- OSHA CALCULATIONS
- EM INCONSISTENCIES



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ER 385-1-31 - UPDATE

The review of the Engineering Regulation (ER), The Control of Hazardous Energy has been ongoing since August 2017.

During our review of the ER, we found areas of concern that led us to asking HQ Safety not to go final with this ER.

The following are some of the concerns want to share with you:



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ER 385-1-31 - UPDATE

- As it relates to HECP Procedures, we note that this document does not include the rules found in OSHA, 29 CFR 1910.269(d)(8) which is exclusively aimed toward power generation side of the house. The language used in the ER “facility operators control” that co-mingles the definition found in 1910.269(m)(2) which applies to the transmission side of the house.



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ER 385-1-31 - UPDATE

- Section 3-5 discusses Temporary Protective Grounding (TPG's). While we will discuss this further in this briefing, the language used in the Draft ER, if applied literally, could create a condition where an unqualified person performing work on energized equipment.

The definition, the intent, and direction provided in the ER needs to be clarified.



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ER 385-1-31 - UPDATE

- Section 3-5 discusses Temporary Protective Grounding (TPG's), but it does not adequately address bonding.

Bonding could mimic the basic language developed in the ER for TPG's, but would be limited in scope based on the guidance provided by the National Electric Code (NEC).



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ER 385-1-31 - UPDATE

- Lastly, we have concerns with the language used for the; Designated Representative (DR), the Issuing Individual (II), and the Principal Authorized Individual (PAI) specifically as it relates to the placement of isolation locks on each lockable energy isolation devices.

Based on our review, we are asking for clarification of 3-6, Hazardous Energy Control Procedures (b)(2)(c).



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QUESTIONS ON THE ER 385 1-31



TEMPORARY PROTECTIVE GROUNDING (TPG)

November 2017, The Dalles Dam requests an interpretation from OSHA regarding the proper use of personal protective grounds.

Question from The Dalles centered on which OSHA standard applied:

- 29 CFR 1910.269(d), Generation
- 29 CFR 1910.269(n), Transmission



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TEMPORARY PROTECTIVE GROUNDING

NWP-SO reached out for assistance on the question to:

- Bureau of Reclamation (Mr. Monte Bowman, Chief of Safety for BoR)
- USACE Electrical High Hazard Working Group (POC: Mr. Matt Rorick, SAD, Regional Maintenance Program Manager)
- Bonneville Power Administration (BPA), Mr. Josh Mcellrath, Transmission-side Safety Manager



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TEMPORARY PROTECTIVE GROUNDING

In response to the original question, do we (The Dalles Dam) fall under the 1910.269(n) transmission standard or do we fall under the 1910.269(d) generation standard, there was unanimous agreement that we fall under the 1910.269(d) generation standard with respect to TPG.

Discussion looked at grounding on the high side >601 volts and grounding on the low side <600 volts. Matt Rorick and Josh Mcellrath led the discussions and covered several topics to include; bonding, static grounding, line-side disconnects, and grounding procedures, to name a few of the discussion areas.



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TEMPORARY PROTECTIVE GROUNDING

As noted during the discussion, there appears to be additional clarification of this subject addressed in these documents:

Appendix C, of OSHA regulation governing grounding.

- a. ER 385-1-31, The Control of Hazardous Energy,
- b. HDC guidance provided in 2010,
- c. FIST Manuals (Bureau of Reclamation) used during Power Reviews of USACE projects



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TEMPORARY PROTECTIVE GROUNDING

QUESTION TO BE RESOLVED:

Do we (NWP) want to pursue asking Federal OSHA for an Agency Technical Assistance Request (ATAR) with regards to the application of TPG's at NWP Operational Projects.

Impact: An ATAR from Federal OSHA would require NWP and NWD to become more consistent with respects to; Temporary Protective Grounding (TPG), Personal Protective Grounding (PPG).



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SUMMARY

- ✓ We continue to work with HQ Safety on the review and clarification of our questions related to the ER for the Hazardous Energy Control Procedures as stated in ER 385-1-31.
- ✓ We are seeking guidance from NWP / NWD with moving forward with our ATAR from Federal OSHA.



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DISCUSSION



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ARC FLASH SAFETY

Operations Project Manager Training

Tony Kirk

NWD Chief, Operations and Regulatory

30 August 2018



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NOTE:
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ACTION

Provide Arc Flash Hazard (AFH) Awareness training to Agency Leaders

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NOTE:
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CONDITION

Given:

1. ER 385-1-100 (Arc Flash Hazard Program, AFH)
2. EP 385-1-100 (Implementation of Arc Flash Hazard Program)
3. EM 385-1-1
4. 29 CFR 1910.303
5. 29 CFR 1910.305
6. NFPA 70E

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STANDARD

Awareness training will cover the following:

1. AFH awareness – definition and recognition
2. How Arc Flash Hazards affect the body
3. Emergency Procedures
4. Critical Components of an effective Arc Flash Program

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BACKGROUND



Shock and electrocution have long been recognized as risks to those who work on or around electricity. In recent years, additional emphasis has been placed on the dangers associated with arc flash and arc blast energy. This risk arises, not from the passage of electric current through the body, but from the concentrated energy during an arcing fault. An electric arc can instantly vaporize material such as copper or steel. The arc, passing through vaporized material, can create an extremely intense arc flash of very high and dangerous temperatures. The results may be severe burns to the hands, face and body.



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ARC FLASH HAZARD

Arc flash hazard defined

A dangerous condition associated with the possible release of energy caused by an electric arc.

Working on energized electrical equipment.

Employees working on energized electrical equipment have the potential for personal injury from arcing faults by conditions such as tools contacting electrical buses, insulation failures, loose connections, improper work procedures, impurities/dust buildup, corrosion, condensation, over voltage conditions, or equipment malfunctions. Arcing faults produce hazards of extreme temperatures and arc blasts.



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NOTE:
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ELIMINATION OF AFH'S

- A. Not possible in all cases
- B. Always de-energize when possible
- C. Only trained, qualified and properly equipped personnel should be near energized equipment

INTENT OF THE ARC FLASH HAZARD PROGRAM

- A. Identify and reduce incident energy levels

PROCEDURE COMPLIANCE

- A. Will reduce the possibility of burns and other injuries.
- B. Personnel that work in our facilities must be adequately protected from the risk of exposure to electric energy

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NOTE:
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ARC FLASH HAZARD AWARENESS

Definition and Recognition:

1. Arc Flash Hazard

A. Energized electrical equipment with voltages greater than 50 volts to ground.

2. An arc flash is an [electrical breakdown](#) of the resistance of air resulting in an [electric arc](#) which can occur where there is sufficient voltage in an electrical system and a path to ground or lower voltage.



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NOTE:
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ARC FLASH BOUNDARY



The distance at which an electrical arc can flash outward, which may endanger employees working on or near electrical equipment.

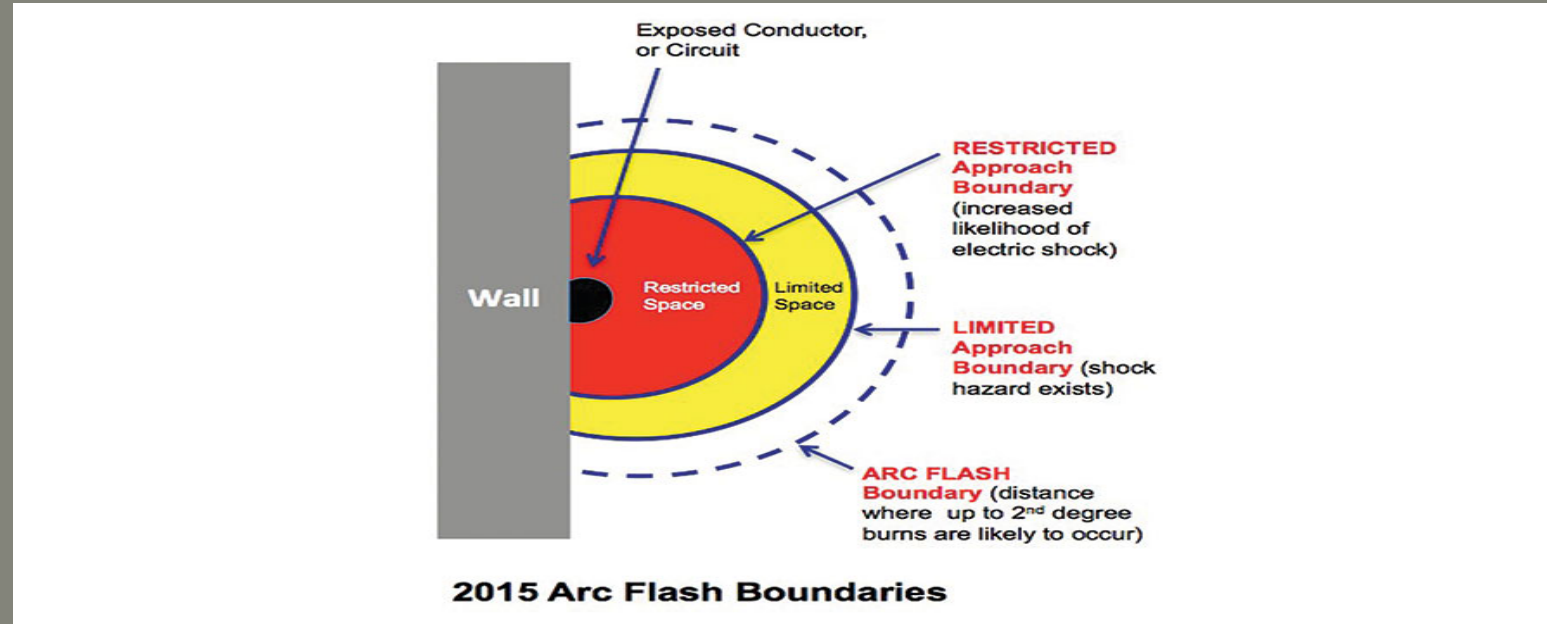


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NOTE:
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FLASH PROTECTION BOUNDARY



(FPB) – the calculated safe working distance from electrical equipment which would not expose the employee to the hazards associated with an electrical arc flash.

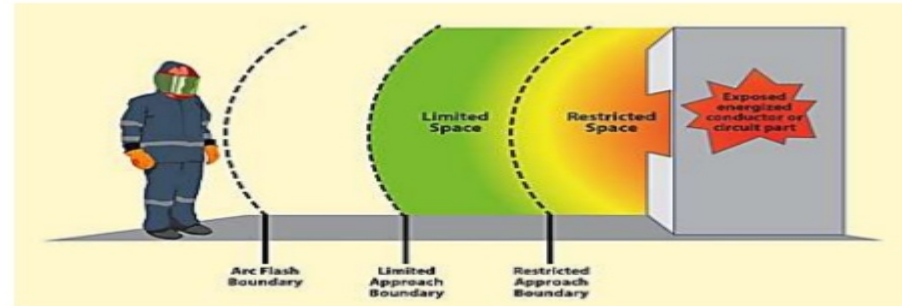


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ARC FLASH LOCATIONS

Arc Flash is not just in plants



Arc Flash can and does occur in a variety of locations have you covered this risk with staff?

P bar Y Safety Consultants Alberta Canada

Includes but is not limited to the following:

Warehouses, Powerhouses, Spillway, Navigation Locks, Storage facilities, Offices, Recreation areas, Mobile equipment, and other support areas.



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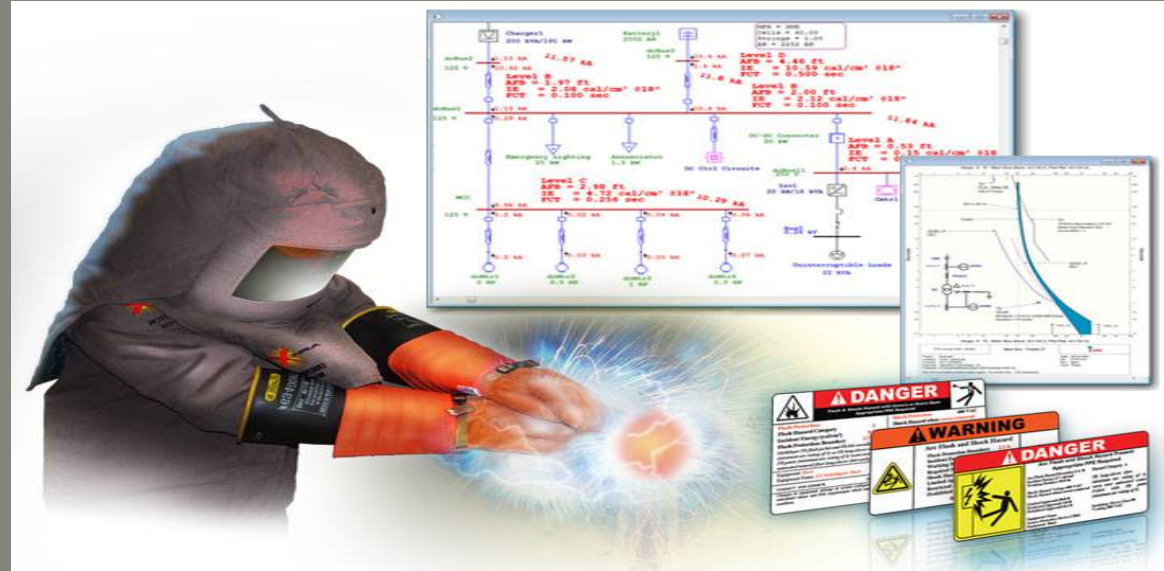
HOW ARC FLASH HAZARDS AFFECT THE BODY



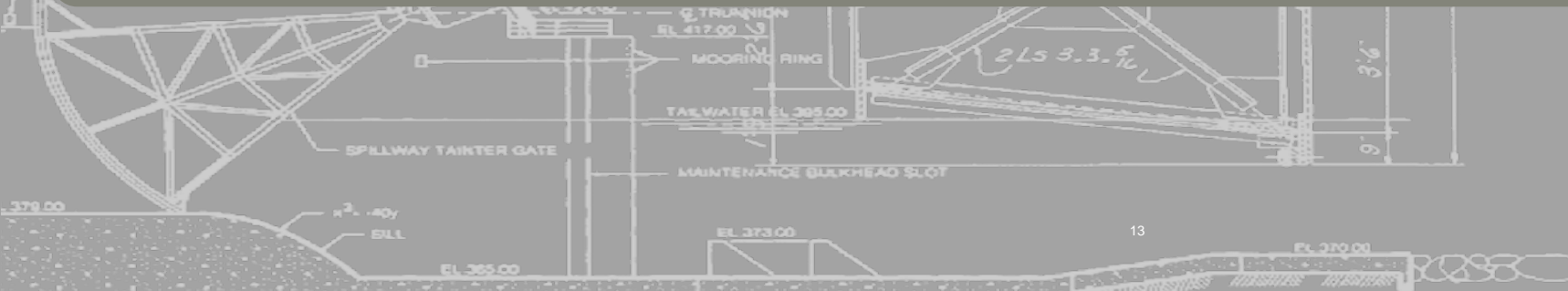
1. Severe burns to any non-protected area
2. Can cause temporary or permanent blindness
3. Temporary or permanent hearing loss
4. Temporary or permanent damage to lungs
5. The blast produced by vaporizing metallic components can break bones and irreparably damage internal organs
6. Death



KEY INGREDIENTS OF AN EFFECTIVE ARC FLASH PROGRAM



1. Training (Qualified and Unqualified)
2. Flame Resistant (FR) PPE
3. Arc Flash Analysis
4. Labeling of equipment
5. Written and Communicated site specific Arc Flash Program




LABEL EXAMPLES

Appendix E6 - Arc Flash Warning Labels - Existing

 WARNING	
Arc Flash & Shock Hazard - PPE Required	
55 inches	Flash Hazard Boundary
18 inch	Working Distance
14	cal/cm² Flash Hazard at 18 inches
Category 3	Cotton Underwear + FR Shirt & Pant +
13800 VAC	FR Coverall
2	Shock Hazard when cover is removed
60 inches	Glove Class
26 inches	Limited Approach
7 inches	Restricted Approach
	Prohibited Approach
Bus: Bank 5-6 Sec Prot: Differential	
****BUS SIDE FAULT****	
Warning: Changes in equipment settings or system configuration may invalidate the calculated results. (Date:Dec 2008 No:077)	

 WARNING	
Arc Flash & Shock Hazard - PPE Required	
52 inches	Flash Hazard Boundary
18 inch	Working Distance
12	cal/cm² Flash Hazard at 18 inches
Category 3	Cotton Underwear + FR Shirt & Pant +
13800 VAC	FR Coverall
2	Shock Hazard when cover is removed
60 inches	Glove Class
26 inches	Limited Approach
7 inches	Restricted Approach
	Prohibited Approach
Bus: Bank 9-10 Sec Prot: Differential	
****BUS SIDE FAULT****	
Warning: Changes in equipment settings or system configuration may invalidate the calculated results. (Date:Dec 2008 No:079)	

 WARNING	
Arc Flash & Shock Hazard - PPE Required	
55 inches	Flash Hazard Boundary
18 inch	Working Distance
14	cal/cm² Flash Hazard at 18 inches
Category 3	Cotton Underwear + FR Shirt & Pant +
13800 VAC	FR Coverall
2	Shock Hazard when cover is removed
60 inches	Glove Class
26 inches	Limited Approach
7 inches	Restricted Approach
	Prohibited Approach
Bus: Bank 7-8 Sec Prot: Differential	
****BUS SIDE FAULT****	
Warning: Changes in equipment settings or system configuration may invalidate the calculated results. (Date:Dec 2008 No:078)	

 WARNING	
Arc Flash & Shock Hazard - PPE Required	
123 inches	Flash Hazard Boundary
18 inch	Working Distance
28	cal/cm² Flash Hazard at 18 inches
Category 4	Cotton Underwear + FR Shirt & Pant +
480 VAC	Multi Layer Flash Suit
00	Shock Hazard when cover is removed
42 inches	Glove Class
12 inches	Limited Approach
1 inches	Restricted Approach
	Prohibited Approach
Bus: BIRVC Bus Prot: FP-5 Fu	
****BUS SIDE FAULT****	
Warning: Changes in equipment settings or system configuration may invalidate the calculated results. (Date:Dec 2008 No:080)	

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CONCLUSION



Awareness of the potential of an Arc Flash Fault is the first step toward preventing personal injury.

