August 3, 2004

CCN 51290

Mrs. Elizabeth D. Sellers
Manager
U.S. Department of Energy
Idaho Operations Office (NE-ID)
1955 Fremont Avenue
Idaho Falls, ID 83401-1203

CONTRACT NO. DE-AC07-99ID13727 - ELECTRICAL SAFETY PERFORMANCE BASELINE

Dear Mrs. Sellers:

Based on a review of the Department of Energy (DOE) Complex Occurrence Reporting Processing System (ORPS) data, DOE Headquarters (HQ) determined that Electrical Safety is an area for focused improvement. Subsequently, the Idaho Operations Office of DOE (NE-ID) issued letter TS-QSD-04-058, requesting Bechtel BWXT, LLC (BBWI) to develop a performance baseline of electrical safety occurrences. Pursuant to that request, BBWI has developed a performance baseline of electrical safety occurrences for Calendar Year (CY)-02, CY-03, and CY-04 to date (May 2004).

A diverse sub-team of the Idaho National Engineering and Environmental Laboratory (INEEL) Electrical Safety Committee (ESC) performed the baseline review and was specifically tasked to review the associated ORPS data, identify event common causes, root causes and to provide areas to focus our electrical safety improvement actions. The team was further chartered to identify any electrical safety trends, single point failure issues and to provide suggestions for improvement.

The review identified the following baseline performance information:

CY 2002	10 of 102 events involved electrical safety performance problems.
CY 2003	14 of 92 events involved electrical safety performance problems.
CY 2004	6 of 25 events involved electrical safety performance problems through June.

The review concluded that three primary common causes existed for the events.

1. Human error caused majority of events primarily due to misinterpretation of requirements and expectations.
2. Latent organizational weaknesses contributed to the events and included poor work instructions, pre-job brief deficiencies and communications problems.
3. Pre-work planning for low risk tasks has not been sufficient to ensure successful operations.

The ESC improvement plan focuses on preventing human errors, eliminating the identified organizational weaknesses and improvements to pre-work planning. The plan is included in the attachment.

We evaluated your letter's suggestion that we modify our existing safety performance challenge plan to include these corrective actions. We have concluded that the ESC's direct ownership of a stand alone plan will better manage the activity.

Please find the attached presentation of the ESC Electrical Safety Improvement Plan with baseline review data and the areas identified for improvement. We would suggest the tracking of our plan and its status be conducted as an integral activity during DOE's attendance at the ESC meetings.

Should you have any comments or questions regarding this information and approach please contact R. F. French at (208)526-5218.

Sincerely,

Paul H. Divjak, P.E.
President and General Manager

CWB:le

Attachment

cc: W. L. Bauer, NE-ID, MS 1221
S. S. Crawford, INEEL, MS 3810 (w/o Att.)
R. S. Watkins, INEEL, MS 3898

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Electrical Safety Improvement Plan

BBWI BWXT

Chris Bingham – Electrical Safety Committee (ESC)

June 9, 2004

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ESC Improvement Plan

- DOE Complex data indicates Electrical Safety is an area for focused improvement
- DOE Request
  - Develop Electrical Safety Performance Baseline
  - Integrate initiative / actions
- ESC Approach
  - Identify electrical safety areas for improvement
    - Look for trends
    - single event may point to improvement area
    - Pro-active improvements desired
  - Initiate improvement actions
  - Monitor for improvement
  - Return (continuous improvement)

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ESC Improvement Plan

- *Definition: For the purposes of this review, Electrical Event is defined by the following:*
  - *Unplanned personnel, tool, equipment, or vehicle contact, intrusion, or near miss intrusion into an electrical flash or shock protection boundary.*
  - *Other events specific to electrical energy or apparatus*

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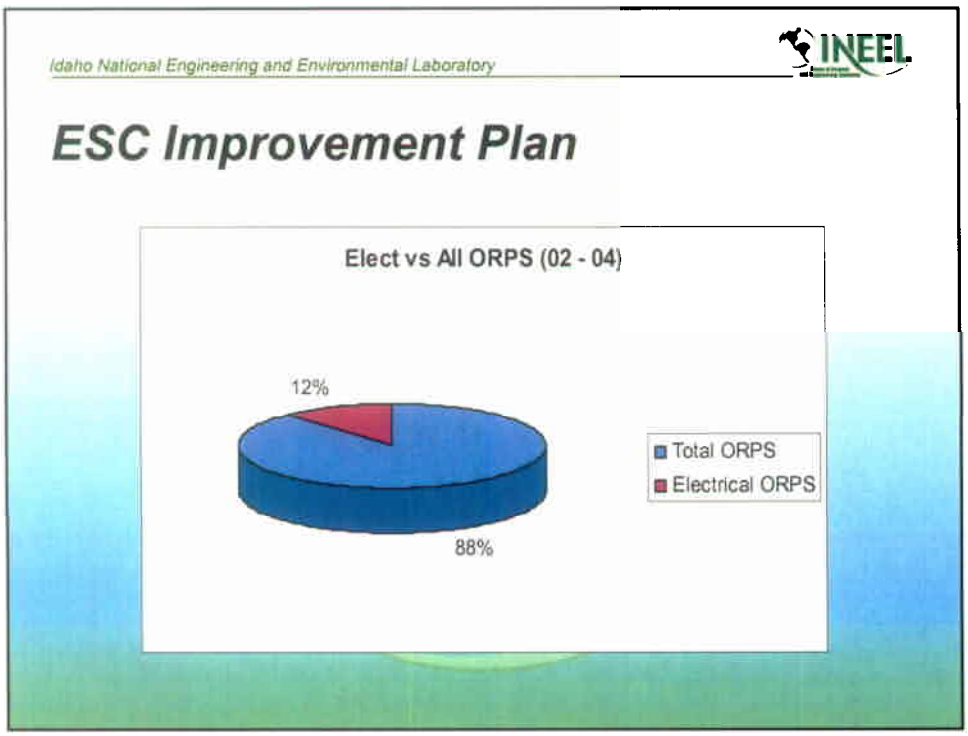
ESC Improvement Plan

Electrical Safety Improvement Plan				
	Activity	Start	Finish	Status
1	Evaluate Historical Data - Identify Areas For Improvement			
1.1	Identify ORPS electrical events			complete
1.2	Develop draft data bins			complete
1.3	Establish ESC sub-team			complete
1.4	Sub-team review of events			
1.4.1	Sub-team review and binning (individual)	18-May	31-May	complete
1.4.2	Follow-up information / interviews	26-May	31-May	complete
1.4.3	Sub-team trending and binning interactive meeting	3-Jun	3-Jun	complete
1.5	Draft report of data review			
1.5.1	Develop Draft	7-Jun	9-Jun	complete
1.5.2	ESC review	9-Jun	14-Jun	complete
1.6	MILESTONE #1 - verbal outbrief w/ sponsors	15-Jun	15-Jun	complete
2	Develop Improvement Plan			
2.1	Draft improvement plan	1-Jul	8-Jul	complete
2.3	ESC review	8-Jul	14-Jul	complete
2.4	MILESTONE #2 - Verbal outbrief w/ sponsors	15-Jul	15-Jul	complete
3	Establish Electrical Safety Performance Monitoring			
3.1	Develop Elect Safety measures and indicators	19-Jul	11-Aug	in progress
3.2	Baseline against other DOE sites (ESC conference)	26-Jul	29-Jul	complete
3.3	DOE handbook final working meeting	19-Aug	19-Aug	cancelled
4	Final report and outbrief			
4.1	Prepare final report	19-Jul	12-Aug	in progress
4.3	ESC Review	18-Aug	24-Aug	scheduled
4.4	MILESTONE # 3 Senior Management / DOE outbrief	25-Aug	25-Aug	scheduled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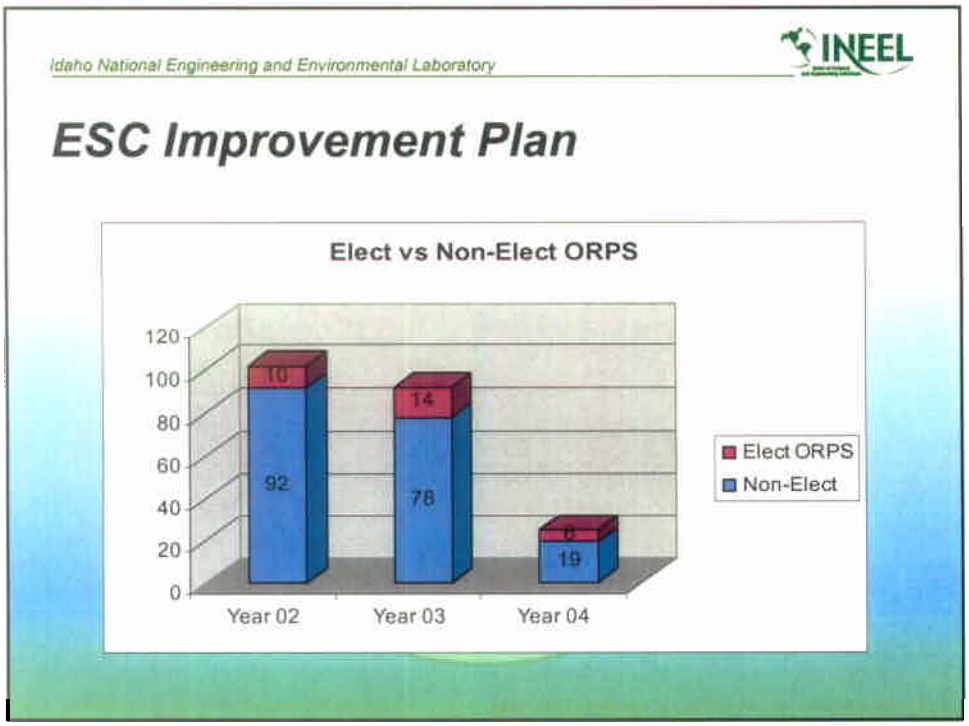
ESC Improvement Plan
Elect vs All ORPS (02 - 04)
12%
88%
Total ORPS
Electrical ORPS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ESC Improvement Plan
Elect vs Non-Elect ORPS
120
100
80
60
40
20
0
10
92
14
78
0
19
Year 02
Year 03
Year 04
Elect ORPS
Non-Elect

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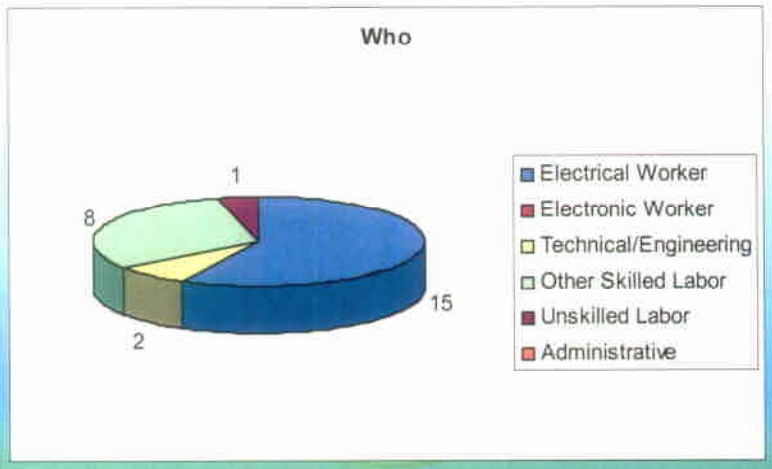
ESC Improvement Plan



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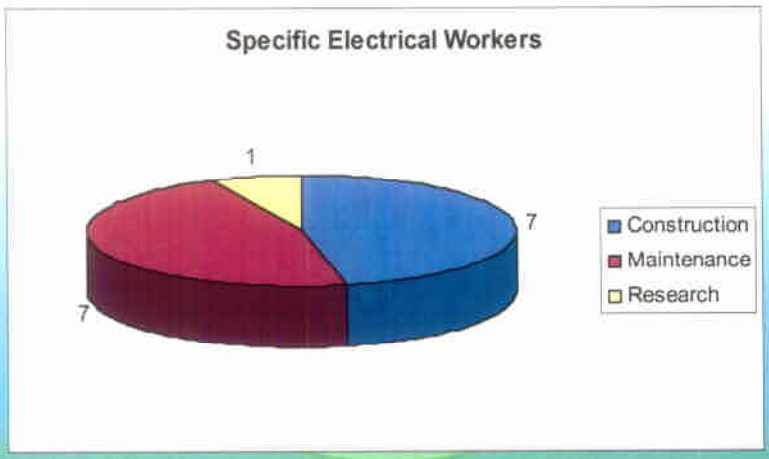
ESC Improvement Plan



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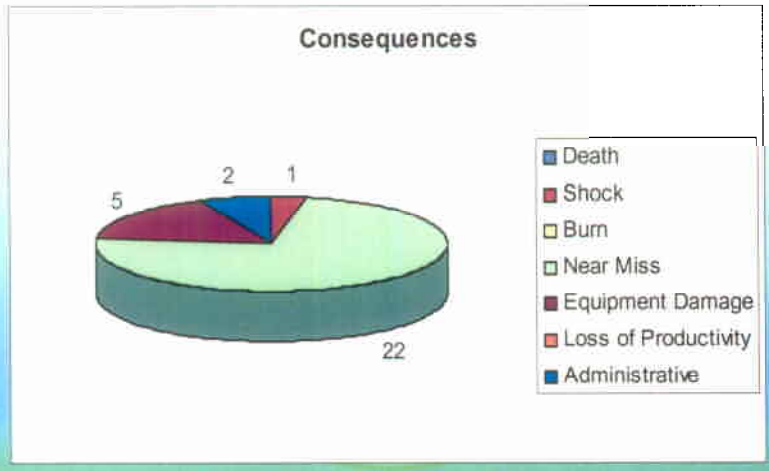

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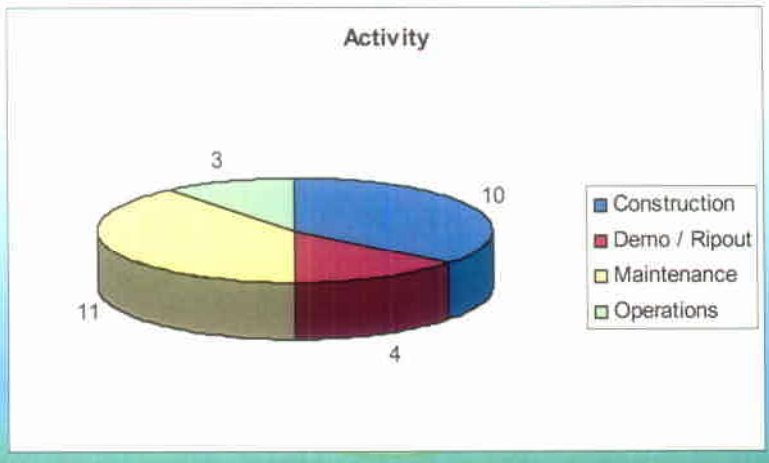

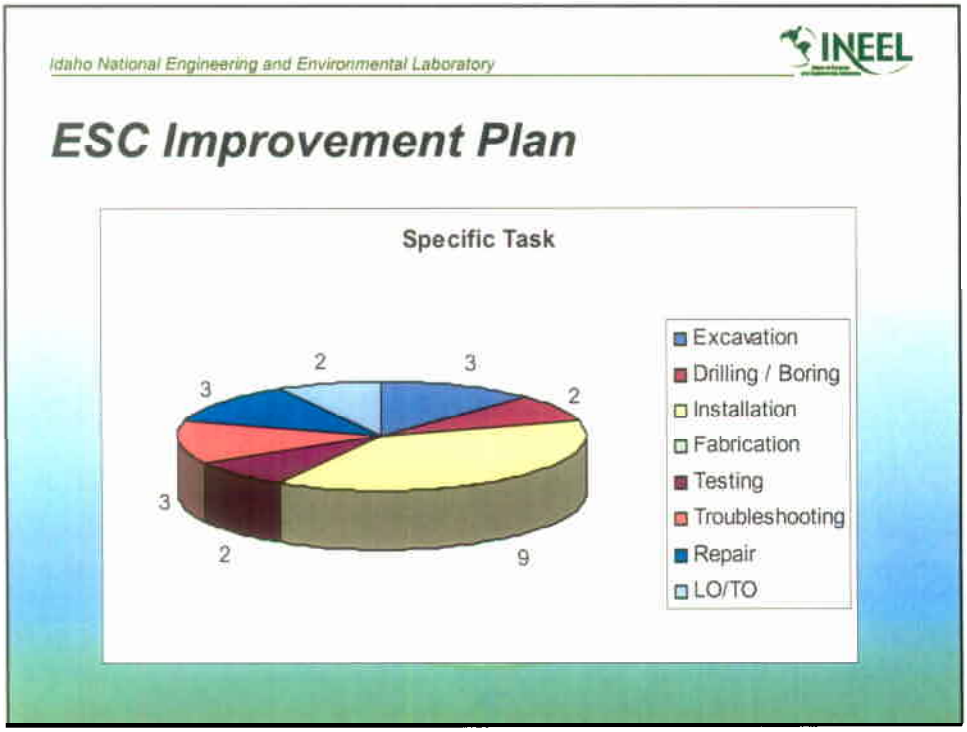
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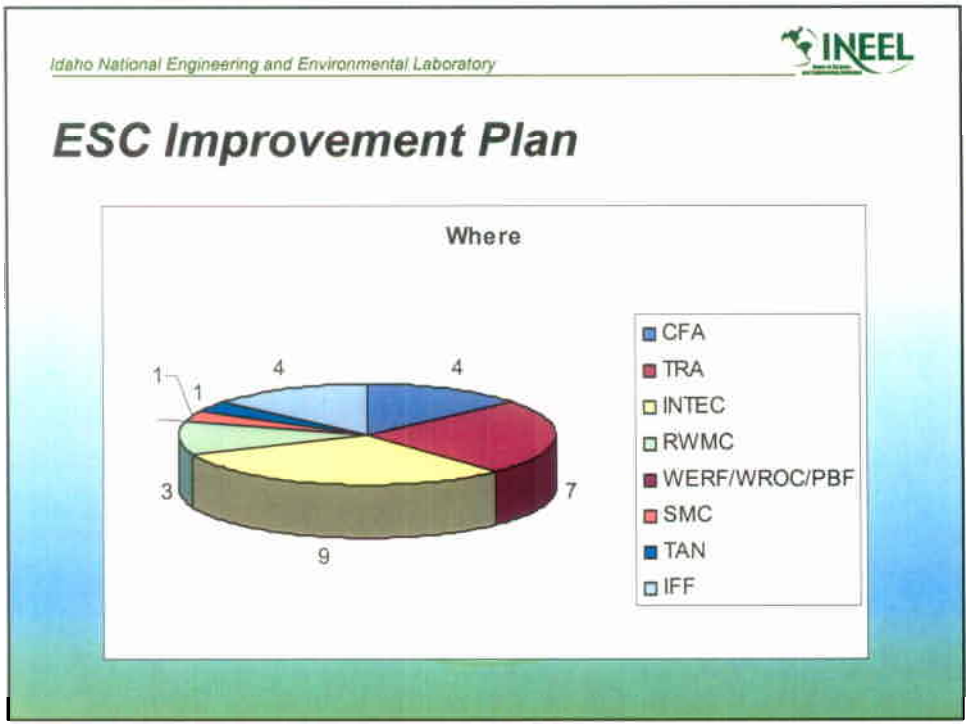
ESC Improvement Plan
Specific Task
2
3
3
2
3
2
9
Excavation
Drilling / Boring
Installation
Fabrication
Testing
Troubleshooting
Repair
LO/TO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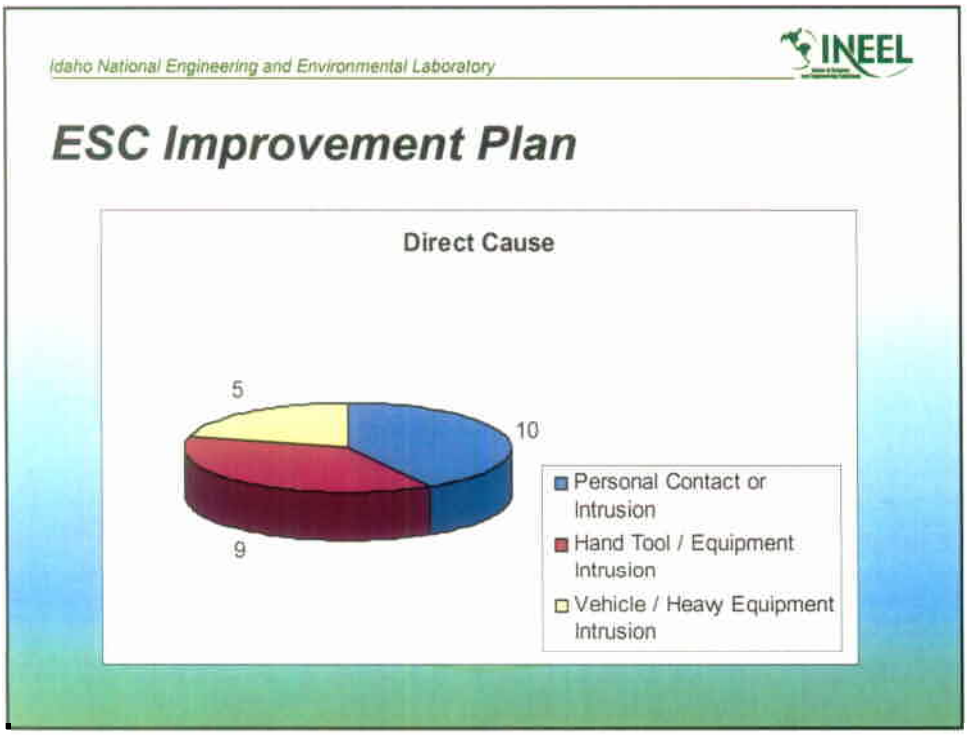
ESC Improvement Plan
Where
1
1
4
4
3
7
9
CFA
TRA
INTEC
RWMC
WERF/WROC/PBF
SMC
TAN
IFF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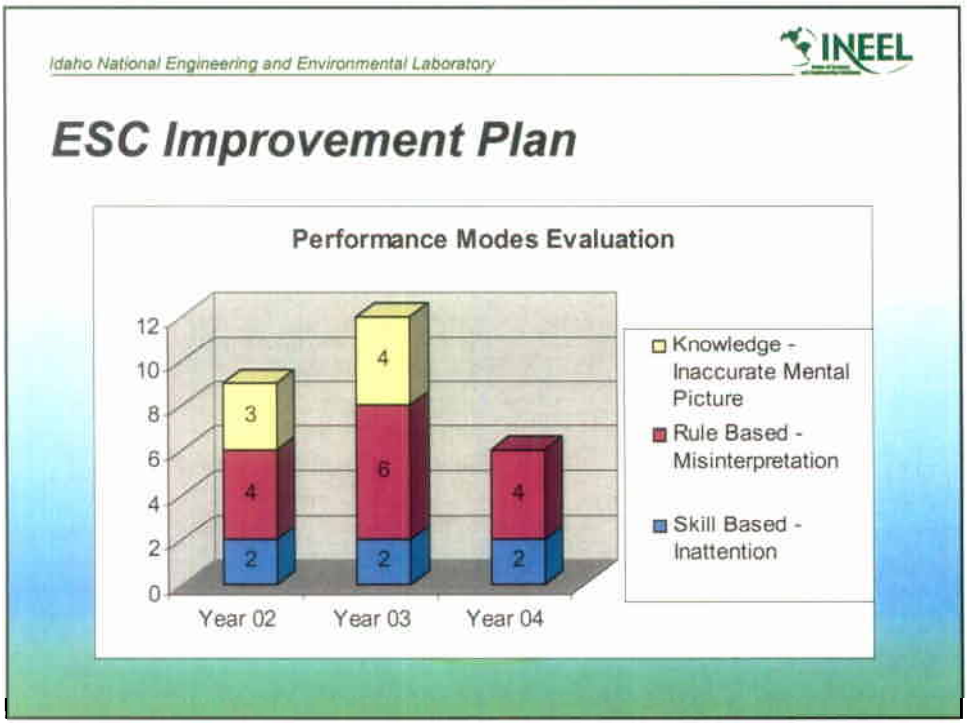
Direct Cause
5
10
9
Personal Contact or Intrusion
Hand Tool / Equipment Intrusion
Vehicle / Heavy Equipment Intrusion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Performance Modes Evaluation
12
10
8
6
4
2
0
3
4
2
4
6
2
4
2
Year 02
Year 03
Year 04
Knowledge - Inaccurate Mental Picture
Rule Based - Misinterpretation
Skill Based - Inattention

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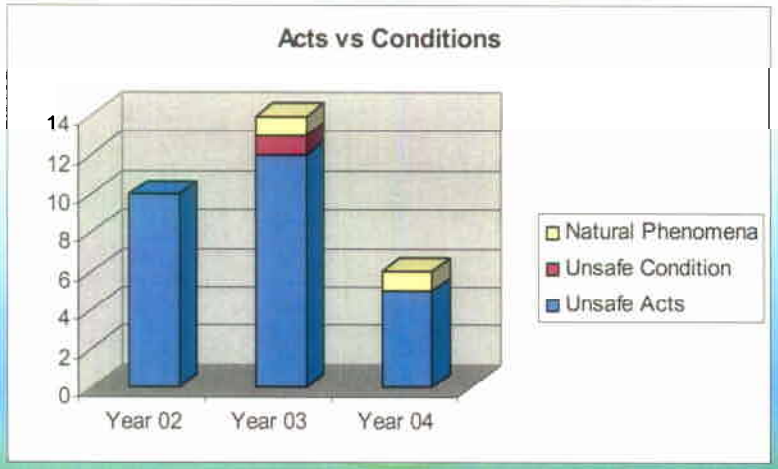

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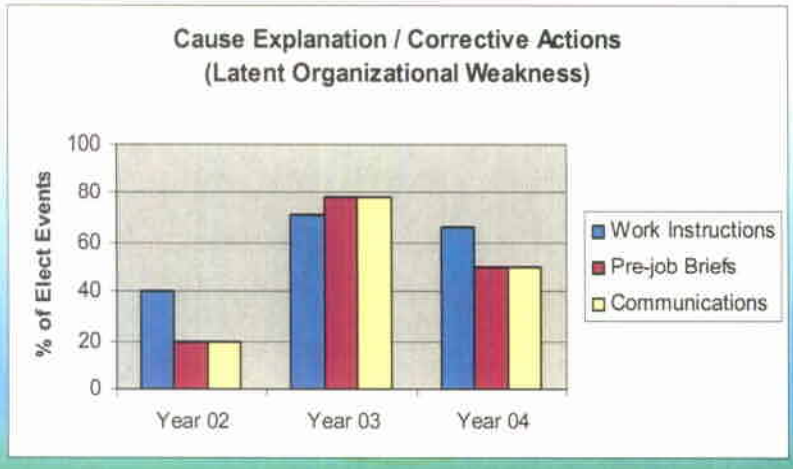

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ESC Improvement Plan

- Initial Data Evaluation:
  - Unintentional human errors caused most events
  - Most errors not unique to electrical safety
  - Normal distribution on who/where
  - Normal performance mode distribution
  - High risk tasks are not initiating events
  - Low risk / low planning level tasks are
  - "Installation task" trend needs further review
  - Pre-work effort for low risk tasks is an improvement area

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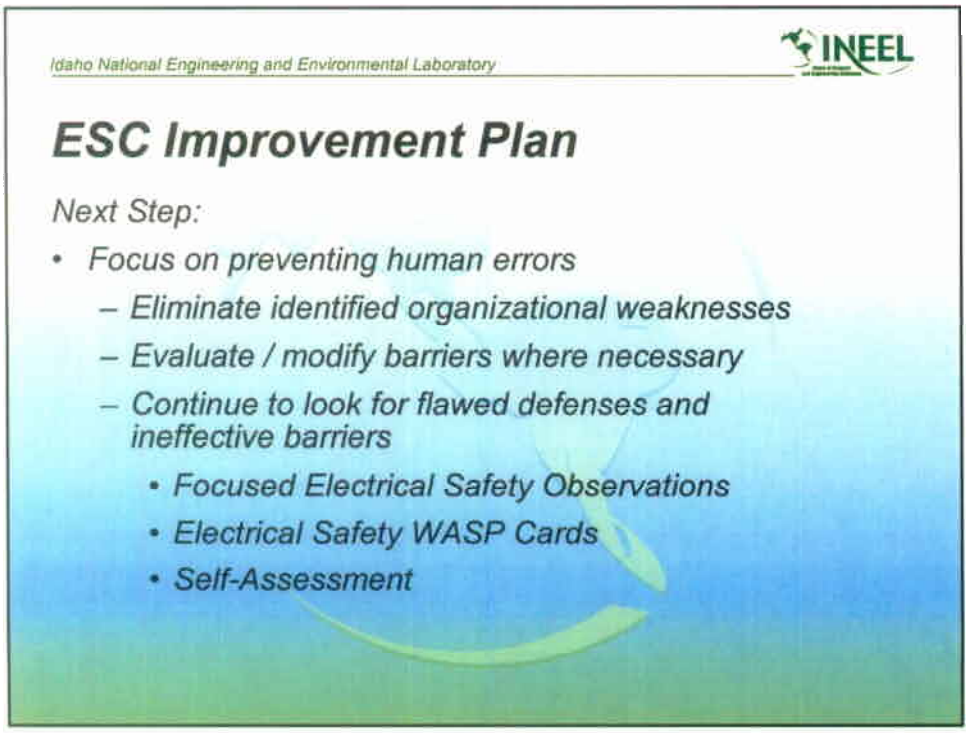
ESC Improvement Plan

Other Areas With Latent Weaknesses:

- GFCI Testing
- Pre-use cord and tool inspections
- Personal Safety Grounds
- Electrical Safety for Instrument Technicians
- Elect Safety for Operators – Switching Operations
- General Employee Electrical Safety Awareness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ESC Improvement Plan
Next Step:
• Focus on preventing human errors
– Eliminate identified organizational weaknesses
– Evaluate / modify barriers where necessary
– Continue to look for flawed defenses and ineffective barriers
• Focused Electrical Safety Observations
• Electrical Safety WASP Cards
• Self-Assessment