Department of Energy Project Management Workshop "Technology Implications"

# Changing the Culture in Capital Projects

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### Why good people make big mistakes (How our brain works – building rigor into work processes)



#### Automatic Processing ≥90%

- Fast, effortless and parallel
- Based on "pattern matching"
- What "usually happens"
- Biases based on experience
- "Frequency gambling"
- Overlooks the details

### **Conscious Processing ≤10%**

- Analytical Focused
- Controlled, intentionally-initiated sequences
- Rigorous Root Cause Analysis
- Careful, "best work"
- Resource limited takes energy



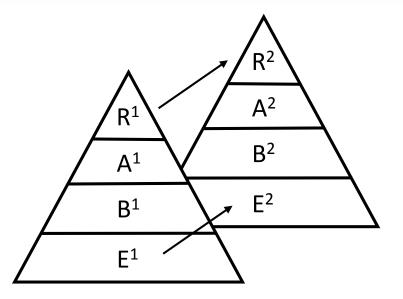


### **Culture – What is it?**



"The integrated pattern of human knowledge, belief, and behavior that depends upon the capacity for **learning and transmitting knowledge** to succeeding generations"

Merriam Webster



"Change the Culture, Change the Game"

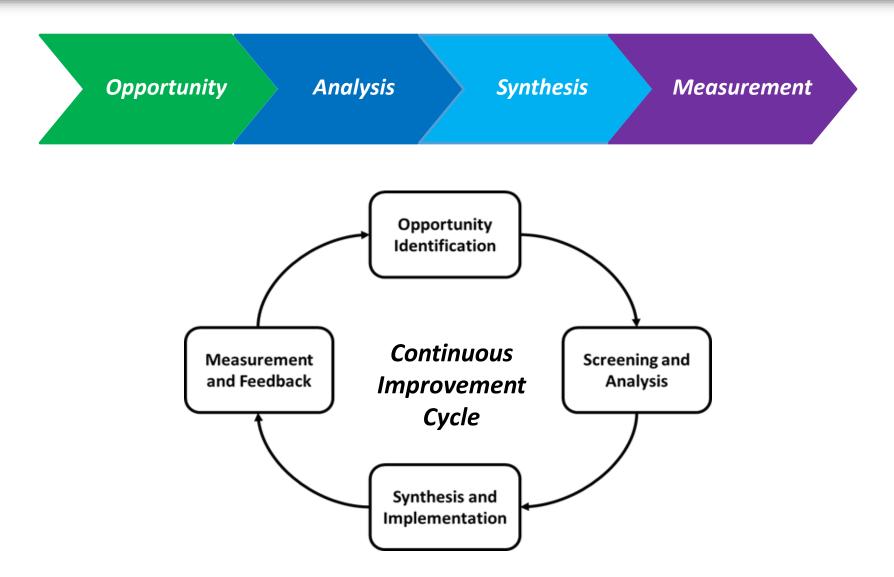
**Reward Positive Behaviors!!** These will come before measurable results



### **Creating a Learning Organization**

### "A learning organization is an organization skilled at *creating, acquiring, and transferring knowledge*, embracing change and innovation at all levels, and at *modifying its behavior* to reflect new knowledge and insights."

# Change Management Approach





## **Opportunity Identification**

### **Metrics / Data Mining**

- Safety / Performance Factors
- Unit Rates / Rates of Placement
- IWD Process Improvements

### **Best Practices / Breakthrough Strategies**

- BPPII Evaluation (CII)
- Technology Deployment Opportunities

### **Meetings / Interviews**

- Contractor / Craft Feedback
- Effectiveness Assessments

### Observations

- Pre-Job Briefs
- Team interaction / Collaboration

Breakthrough Strategies		
Technology Adopt	tion KPPs	
Planned Percent Complete RFIs		
Unit Rates	Safety Metrics	
Time on Tools	Craft Engagement	

**Performance Factors** 



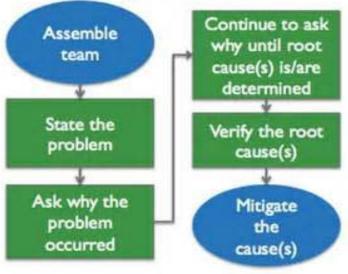
### **Root Cause Analysis**

- 5 Why's
- 5 How's
- Fishbone
- Plus / Delta

### **Leading Indicators**

- Questioning Attitude
- IWD Quality
- Pre-Job Briefing / Engagement
- Supervisor Ratio
- Crew Mix / Craft Tenure
- Contractor Turn-over

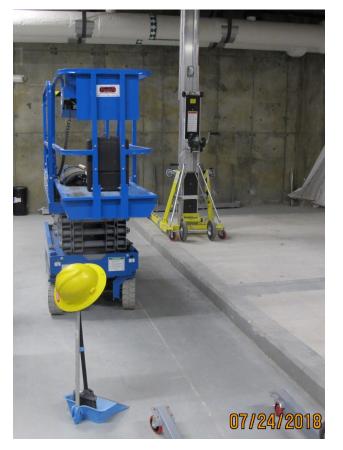








### **Recent Safety Incidents**



ECCCE Project July 2018

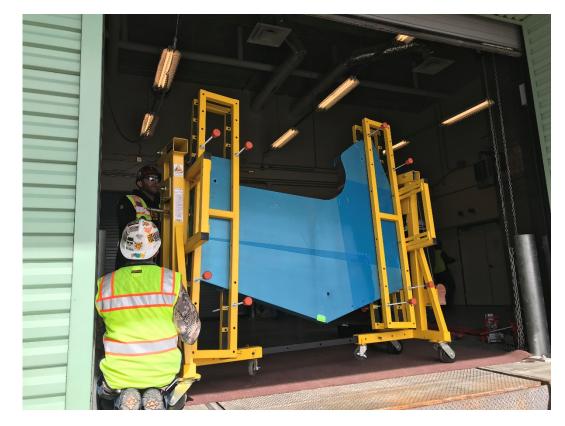




#### ECCCE Project December 2018



### **Recent Safety Incidents**



#### CMRR REI2 February 2019



### **Investigation Results: Similar Events**

Perception of low risk, leading to failure to pause work, making fieldmodifications of rigging or lift equipment configuration, standing below loads, not securing loads to lifting device, not barricading to ensure safety zone maintained.

- FL/Tour (TA-53) No barricading
- Angle Iron (CCI) Standing below load, load not secured
- Tipped sheet metal brake (TA-16)
- Bobcat-incorrect lifting attachment (CCI) Persons below load
- Lab machinists Below waste bin lift
- Spool piece Working below unsecured load
- VERE optical table hoist move Modified rigging while under load

### **Recent Safety Incidents**





ECCCE Project March 2019 SEP Waterline Project January 2019



### **Investigation** Results

Perception of low risk and failure to recognize job hazards. Both incidents were the result of complacency and failure to follow the Integrated Work-Planning Document (IWD). Changing conditions / personnel were not addressed, inadequate pre-job brief.

- Human Performance Improvement Orientation sessions were conducted jointly between Triad and S/C teams.
- Job Hazard Analysis (JHA) requirements reinforced with formal review by Triad prior to execution.
- Responsible Line Manager (RLM) appointment and responsibilities clarified.
- Accountability at all levels within Triad and Subcontractors emphasized.
- Additional Oversight / Mentoring being provided.



Previous corrective actions have been ineffective in arresting poor performance because they have been primarily focused on the teams that have experienced the event.

Therefore, many corrective actions have not been applied systematically across the laboratory to address what are actually crossfunctional/organizational issues.



### **Conclusions**, cont.

# Previous corrective actions have not successfully established a conservatively biased culture as pertains to:

- Enforcing controls identified in planning
- Non-working oversight for selected tasks
- Willingness to work at risk (results-oriented culture)
- Quality and consistency in conduct of Pre-Job Briefs
- Deliberate application of Lessons Learned
- Categorization of Lift Plans / Critical vs. Low Risk
- Recognition of High Hazard Activities
- Personal accountability to pause work / question



## **Implementation / Measurement**

### Communication

- Videos
- Safety Alerts / Lab wide
- Tool Box Topics

### **Work Process Enhancements**

- Work Instructions / Hold Points
- Planning Enhancements
- Performance Enhancements

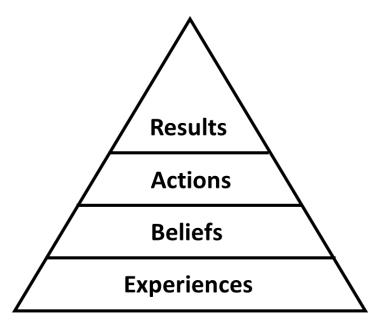
### **Mentoring / Coaching**

- SAFE / LOSA Leadership Immersion
- Human Performance Improvement
- High Hazard Identification

### **Recognition / Incentives**

- Self-pause Recognition
- "Good Catch" Program
- Repeat Awards / Business Continuity





"Change the Culture, Change the Game"

**Reward Positive Behaviors!!** These will come before measurable results



### **Communications / Path Forward**



#### 480-Volt Line contact during penetration drilling

Circuit Trip: On Tuesday, March 5, while drilling anchor holes for equipment installation on the ECCCE project, the drill bit that a LANL electrical subcontractor was using contacted an energized 480V circuit, causing the circuit to trip.

The employee was wearing di-electric gloves and footwear and two GFCI were providing protection as a precaution. The employee was transported to Occupational Medicine for evaluation and released with no injuries.

Factors contributing to the event: -The 480V circuit was providing power to a basin heater. The GPR process can detect electrical circuits, but only if the circuit is drawing current. In this case, the heater was not drawing a load and the circuit was not identified.

-The Subcontractor assumed that all unknowns and anomalies identified during the GPR scan were rebar or not electrical conduits.

-The project superintendent, PIC, and Project Safety Officer all believed that the electrical conduits were 24" below grade, which was below penetration depth.

-The Class 2 penetration permit was written to cover all outside work, rather than for specific slabs or areas.

If you are working with GPR and have questions about penetrations, pause work and seek direction from your PIC, supervisor, RLM or safety representative.



A GPR sketch showing objects, anomalies and unknowns at the ECCCE project at TA-3 2324.

#### Proposed Corrective Actions

-De-energizing of all adjacent equipment and equipment that may have circuitry running through the affected work area prior to performing penetrations.

-In areas where GPR results are indeterminant, adopt a conservative path forward where additional safeguards and controls are implemented.

-Consideration of Lab wide GPR interpretation training and development of a GPR field guide by the Electrical Safety Committee.

-For more information contact Tim Nelson of ALDCP at ton@lanl.gov or Bill Whelan at whelan@lanl.gov



#### LIFE CRITICAL RULES

Safer Together embodies our commitment to a caring, preventive safety culture across our organization. Rules regarding Fluor's nine highest risk operations are observed universally, and violations are treated with accountability.

NORK AT HEIGHT Follow required measures to protect vourself against falls and others from dropped objects.

ELECTRICAL WORK Be aware of arc flash hazards and only work on electrical systems if trained and authorized to do so.



Do not enter a confined space unless you are trained and authorized to do so and perform all work consistent with permit requirements.

Follow safe lifting procedures and stay clear of suspended loads.

_	EXCAVA
	Locate u
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ONS AND TRENCHING ilities before you dig and avation is properly sloped and safe routes of entry and are provided.

MOTOR VEHICLE OPERATION Wear seatbelts, obey road rules, and avoid distractions.

unexpected movement. MOTORIZED HEAVY EQUIPMENT Only operate equipment if you are

HAZARDOUS ENERGY

MATERIAL HANDLING

Move materials using proper

equipment and techniques and

store them securely to prevent

beginning work.

CONTROL AND LINE BREAKING

sources and verify zero energy before

Isolate, lock, and tag all energy

trained and certified to do so; use spotters and flaggers when operating near workers.

Download the Safer Together Playbook in the Knowledge OnLine<sup>sw</sup> HSE Community for more details.

FLUOR.





### Accountability

Culture Change begins when we change what we "Experience".

What gets Rewarded gets Repeated...

