

BlueDragon™ Users Group

Experiences at Lawrence Livermore National Lab

December 17, 2020

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Organizational Overview

- Organizational Structure
 - MAS organization has overall oversight of the CA program
 - Delegated authority to the PADs
 - Assurance Managers generally lead the analysis
 - Involve other organizations as necessary
- Training
 - Initial training on Causal Analysis provided by MAS organization
 - Previously taught an in-hours RCA / Incident Analysis
 - Very structured and proceduralized



Introduction of BlueDragon™ at LLNL

- First heard of the methodology in early 2018 from a Parent Company
- Decision to bring DLE Technical Services, LLC for on-site training
 - MAS sponsored the course (2 courses to date: 2018 & 2020)
 - Trained LLNL and LFO personnel (40)
 - Diverse levels of Causal Analysis Training
 - Brand New to 15+ years experience
- Gaining momentum in applying the skills
 - Off to a fast start
 - Sample Flashover – week following class
 - Larger institutional events – still organizational dependent



Putting it to Work - Livermore Examples

- Hazardous Energy Common Cause Analysis
 - Common Cause Analysis
- Unauthorized Site Access
 - Done in the Current Shelter-in-Place Environment



Hazardous Energy

Common Cause Analysis



Hazardous Energy OR – 2016 to present

- ORPS Events related to hazardous energy
 - 24 events reported in ORPS; several more “Site Reportable”
 - 9 attributed to subcontractors
- Cause Code results
 - 45 different cause codes applies to the events

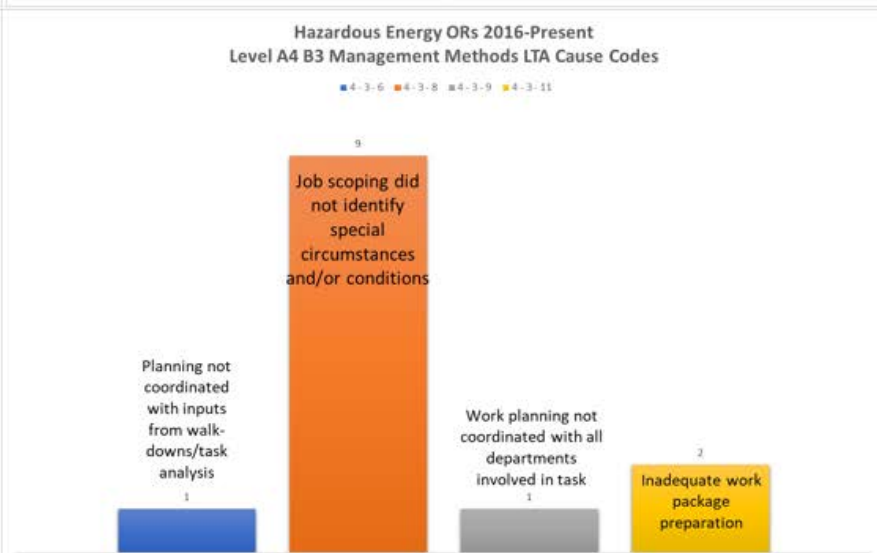
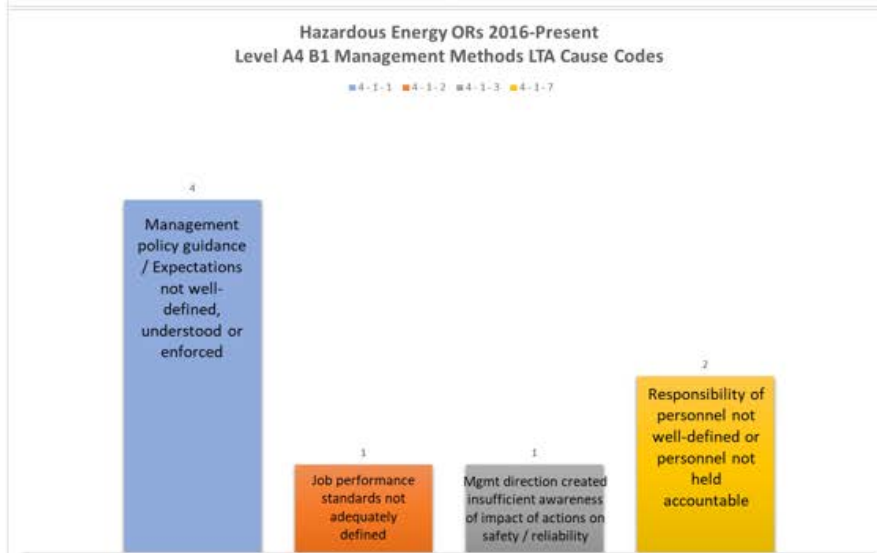
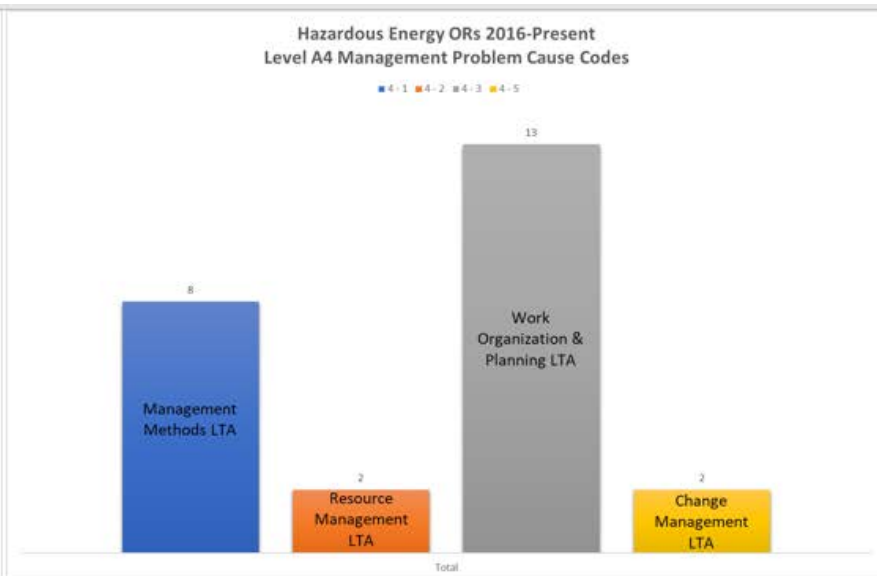
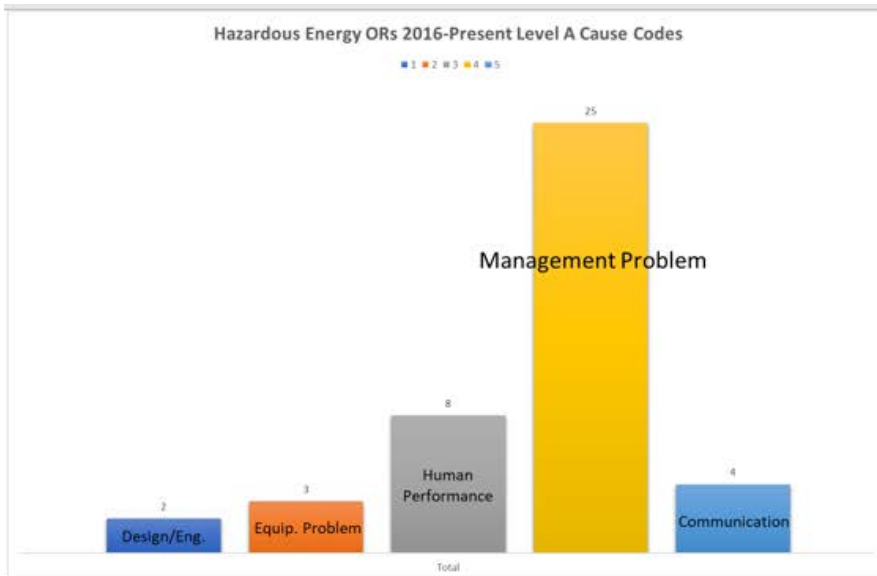


How BlueDragon™ is applied

- Utilize the ORPS cause codes from the identified events' previous causal analyses to identify a common theme
- Develop LOIs from the common themed events
- Perform Socratic Questioning on the LOIs
- Initially evaluated Subcontractors vs Non-Subcontractors
 - Not a significant number of subcontractor events to evaluate.
 - Analysis used the entire data set.



Breakdown by Cause Codes

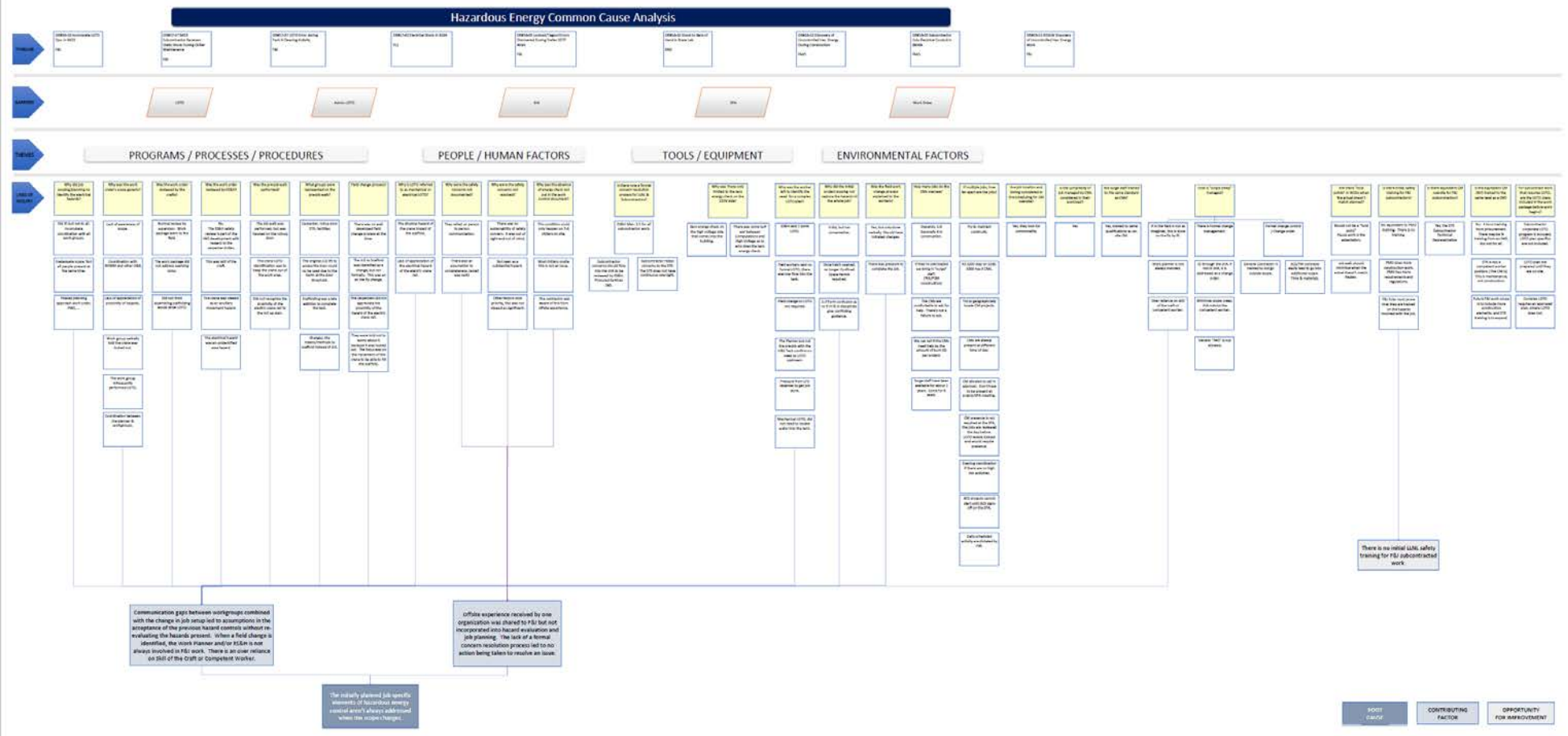


Common Cause Codes

- 4 Instances of A4 B1 C1
 - Management policy guidance / expectations not well-defined, understood or enforced.
- 8 Instances of A4 B3 C8
 - Job Scoping did not identify special circumstances and/or conditions.
- Next Step
 - Further analyze the eight A4 B3 C8 events
 - Generate LOIs based off the A4 B3 C8 events
 - Use Socratic Questioning to evaluate the LOIs



Hazardous Energy Common Cause Analysis



Results of the Analysis

■ Contributing Factors

- Communication gaps between workgroups combined with the change in job setup led to assumptions in the acceptance of the previous hazard controls without reevaluating the hazards present. When a field change is identified, the Work Planner and/or ES&H is not always involved in F&I work. There is an over reliance on Skill of the Craft or Competent Worker.
- Offsite experience received by one organization was shared to F&I but not incorporated into hazard evaluations and job planning. The lack of a formal concern resolution process led to no action being taken to resolve an issue.

■ Root Cause

- The initially planned job specific elements of hazardous energy control aren't always addressed when the scope changes.



Successes and Challenges



LLNL Experience with BlueDragon™

- How efficient was the process compared to previous efforts (resources savings)
 - Time savings and quicker response
 - Brought groups in for more meaningful discussions
 - Adaptable to multiple situations (events, issues, common cause)
- How effective was the process compared to previous efforts (identifying the deeper issues)
 - Process could be used by the less experienced analysts
 - Worker safety and health as well as security events
 - Quickly came to the ACs
 - Ready to continue to RC if necessary
 - Easily presentable to large audience



LLNL Challenges with BlueDragon™

- Small cadre trained at this time.
 - Two classes now held on-site with the second class being in January. Most people unable to implement prior to shelter in place changing the entire workforce.
 - Currently reliance on MAS group; performance or encourage
- Ongoing challenges
 - Trained investigators are hesitant to change and continue to try to blend the old and new processes. Audience looks for the old Barrier Chart and Change Analysis Table
 - Managers are wanting reports in the old format, so we end up backfitting the results; very time consuming
 - People key to the event are being assigned to the teams and not available to be interviewed.
 - Virtual work environment poses unique challenges





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