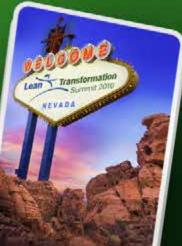
Mining for Gold and Value at the Kinross Gold Mine

Ernie & Tracey Richardson (Teaching Lean Inc.) Frank Wagener, Vicente Ramirez and Deanna Hall (Kinross – Round Mountain)



Let's Deal With The Work

March 17-18, 2016 | Las Vegas © Copyright 2016, Lean Enterprise Institute, Inc., Cambridge, MA, lean.org. Lean Enterprise Institute, the leaper image, and stick figure image are registered trademarks of Lean Enterprise Institute, Inc. All rights reserved.

Introduction

- Why are we successful? How did we do it?
 - Support from the highest level
 - Keep it simple
 - Don't force it
 - Integrate into everyday business
 - Listen and empower people
 - Recognition

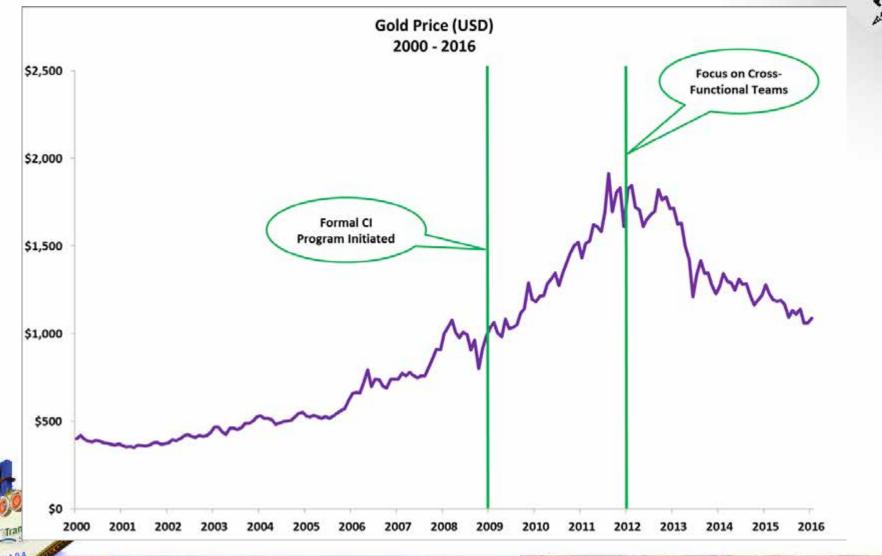


It was too late



3

Gold Price Year 2000-2016



REVADA

Lean

Round Mountain Mining History



Round Mountain Mining Today







1 ean





Round Mountain, Nevada



- Located 270 north of Las Vegas and 240 miles southeast of Reno
- Over 13 Million Ounces of Gold Produced Since 1977
- ~900 Employees

Round Mountain Mining Today and the Future





Objectives

- How lean applies to mining and how any process can benefit
- Cross-functional benefits to optimization with lean facilitation
- How to capture improvement ideas from the people and knock down the walls of suggestion boxes
- Which key performance indicators often mask the truth and how to bridge the gap
- Common pitfalls to help you plan how you will apply lean principles and practices
- The power of fundamental principles for success
 - How to shift mindsets and behaviors using coaching and True North aligning
- Pull vs. push for lean cultural beliefs and training

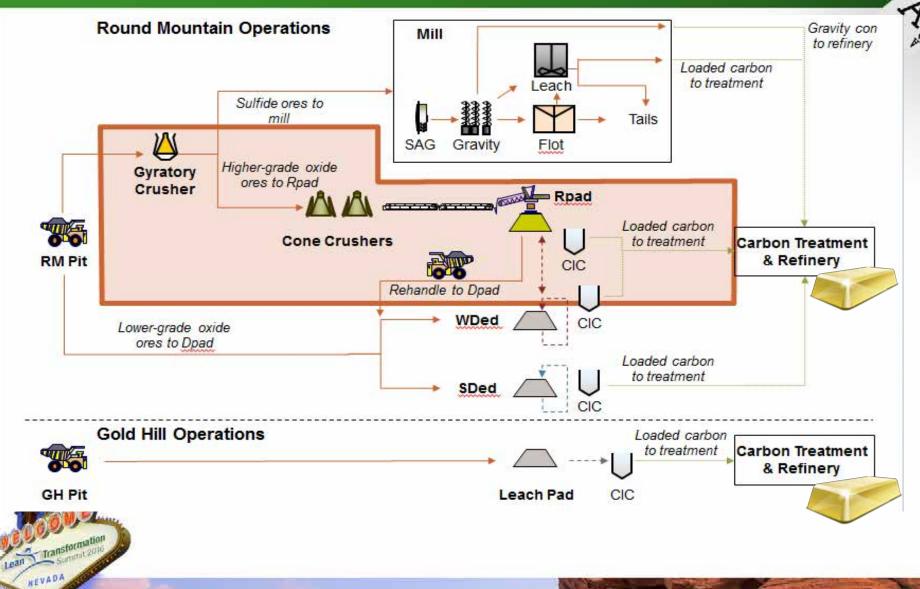
How lean applies to mining and how any process can benefit



Town of Round Mountain

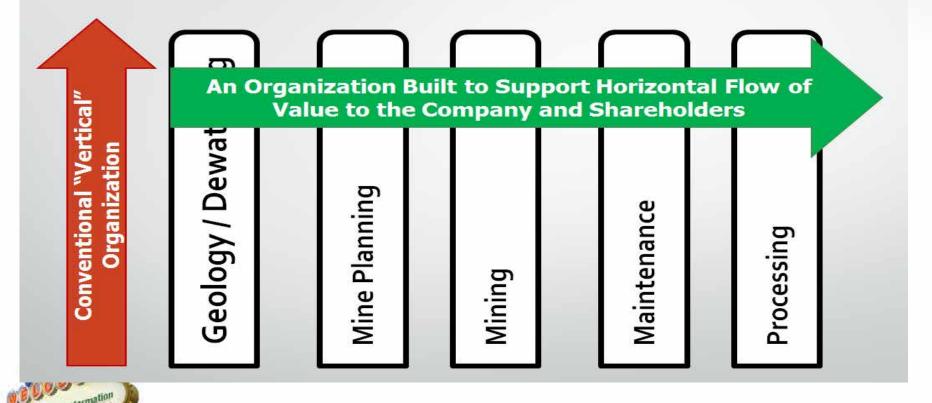


How lean applies to mining and how any process can benefit -continued



How lean applies and how any process can benefit -continued

Value Streams vs. Functional 'Silos'



Cross-Functional Team

- What are they
 - Choose areas that are receptive
 - Cross departmental team to achieve a specific goal
 - Areas of large impact
 - Value stream
 - Critical path
 - Who touches the product
 - Having CI Facilitator to help break down silos
 - Support from Management at all kick off meetings
 - If it's important to my boss, it's important to me

Cross-Functional Team-continued

- Focus on value stream How do we get more product?
- Break down paradigms "We've always done it this way"
- Pit Way Forward (PWF)
- A multi-department team focused on improving mining efficiencies and reducing costs
- Leach Way Forward (LWF)
- A multi-department team focused on increasing leaching area and efficient use of solution to increase gold recovery

Cross-Functional Team Members



16

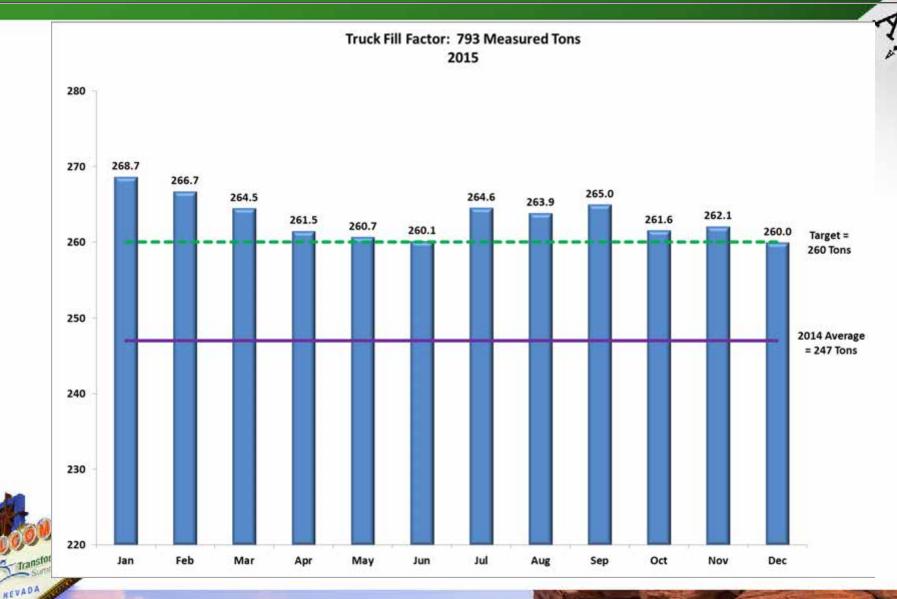


Cross-Functional Team Members

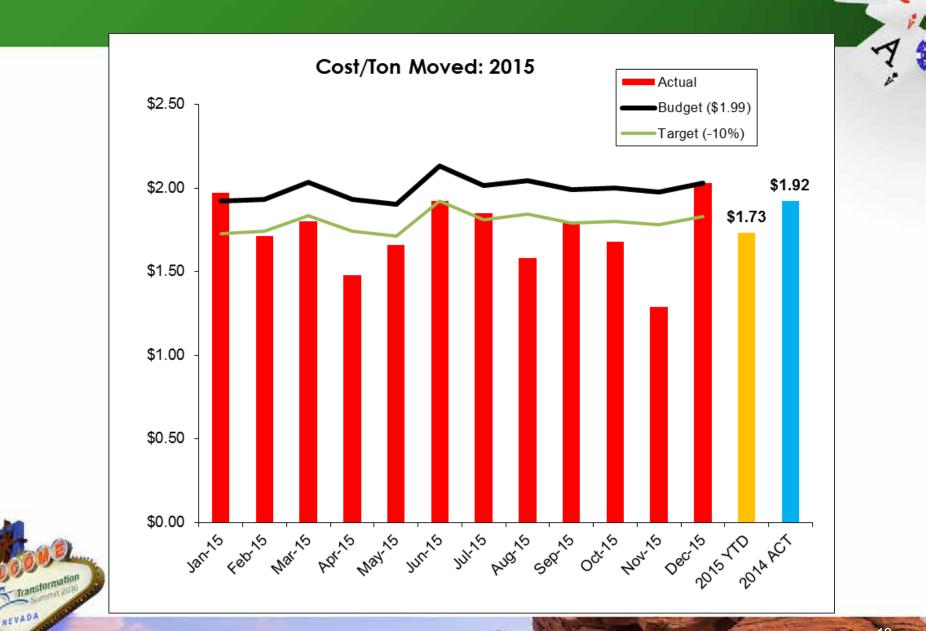
1.631

PWF-Loading Optimization

Lean

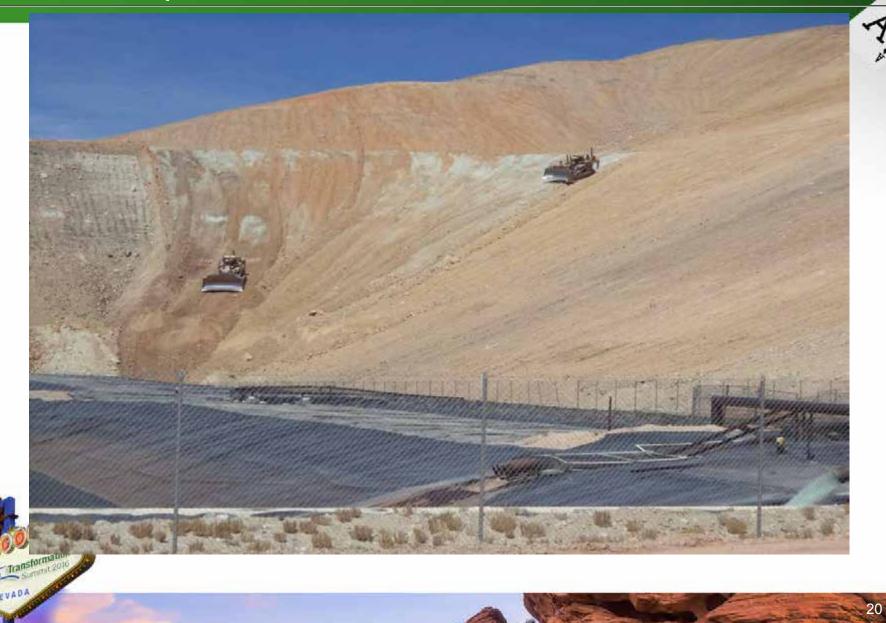


PWF-Bottom Line



LWF- Heap Leach Pad

Lean



Raise the bar!

Transform

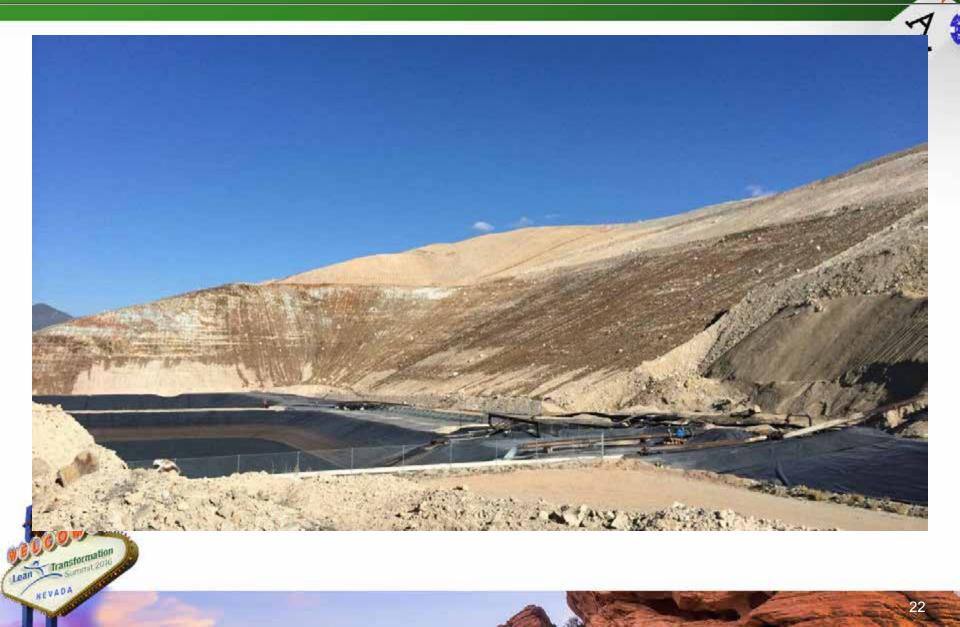
KEVAD.

Lean

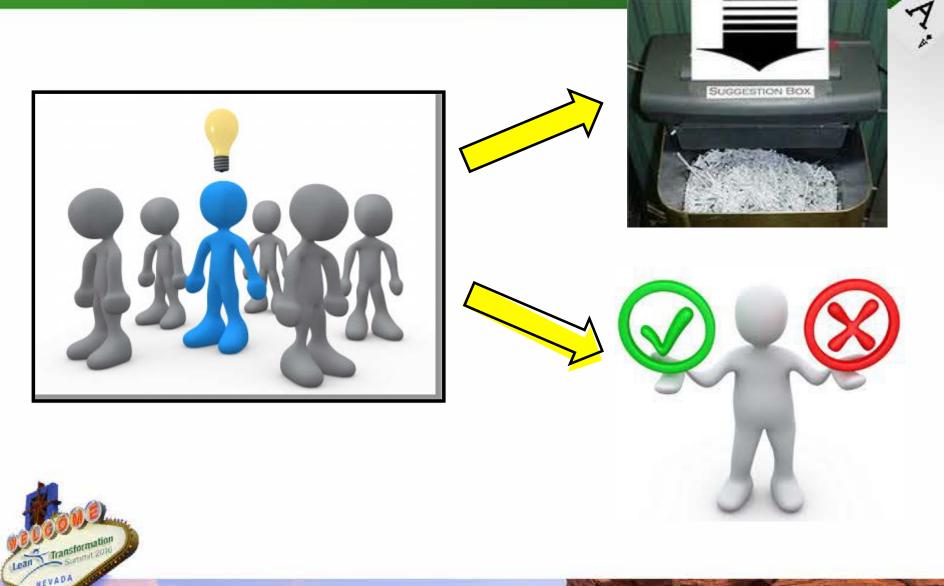




LWF- Heap Leach Pad - After



What do we do when we have an idea?



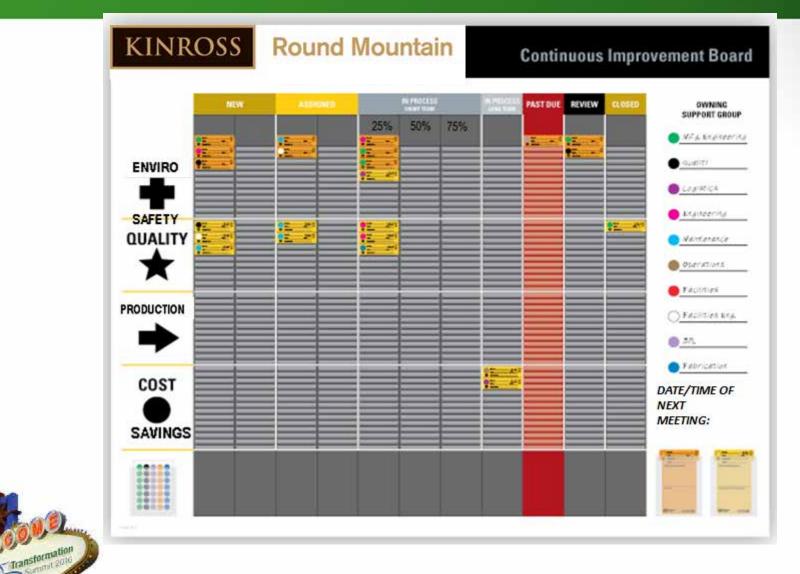
How to capture improvement ideas

- Employee engagement where we were
 - Suggestion boxes
 - Gap in feedback
- Desired State
 - Feedback that is visual and transparent
 - Continuous flow of improvement ideas from workforce, support groups and management
 - What approach was taken?

How to capture improvement ideas

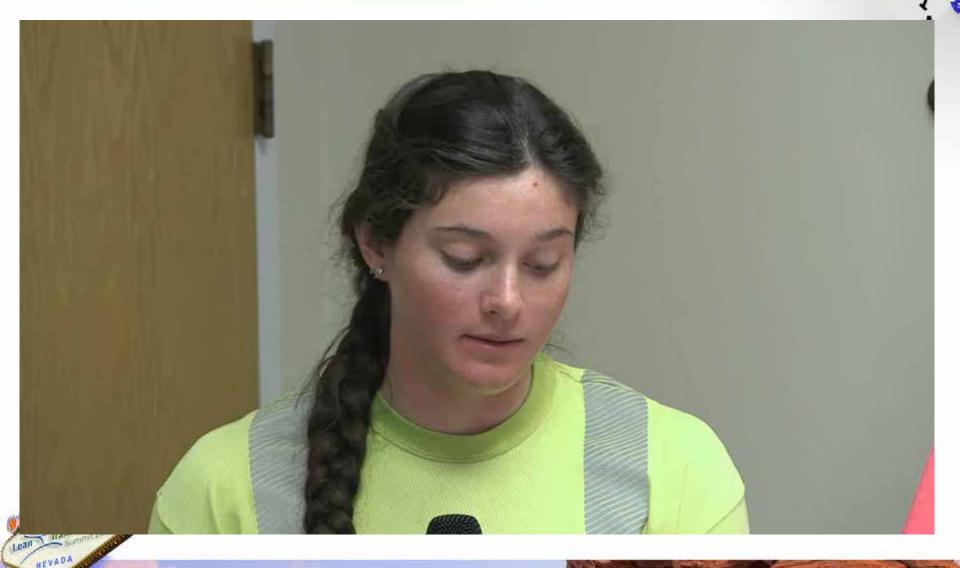
Lean

REVADA



1

New ideas matter

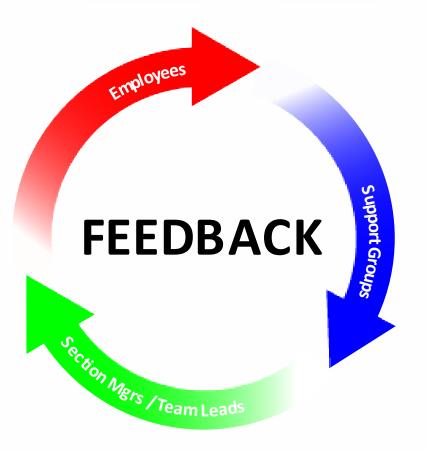


Put it out there



27

CI Board Communication Process Flow



Feedback is important

Transformation

Lean

CI Board Statistics 2015

Lean

EVADA

Board		Closed	Completed	Open	Total
Mill/*Mill Maintenance		24	17	37	78
Met Lab		2	13	11	26
Assay Lab		2	12	12	26
Pad/ADR/Refinery		40	44	9	93
Truck Shop		28	20	32	80
ALPM		8	6	11	25
Mine		29	8	10	47
*Security		15	4	7	26
*Plant Maintenance		1	5	12	18
*General/Electrical Maintenance		4	7	14	25
Admin/Tech Services/Projects		8	10	16	34
*General Store		0	0	1	1
tion storm and	Total	161	146	172	479



Key Performance Indicators

1 ean

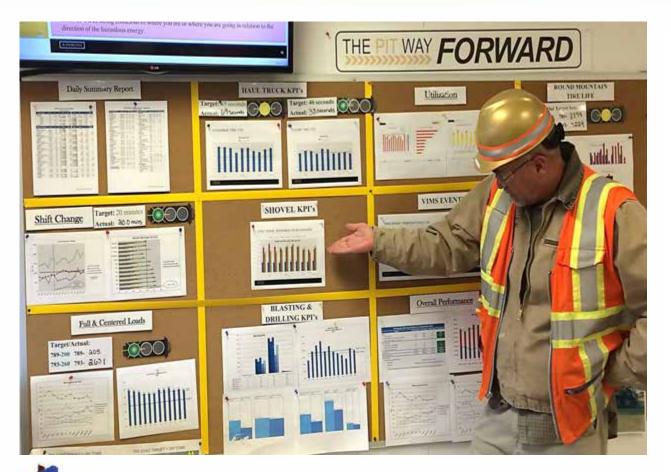


Key Performance Indicators

4th Quarter 2015 Key Results (as of December 31st)							
Subject	2015 Target	YTD Actual	4QTD Target	4QTD Actual			
Safety							
- LTI Frequency	0.0	0.07	0.0	0.00			
- MSHA Reportable Frequency (TMIFR)	0.86	0.66	0.86	0.33*			
- MSHA High Negligence Citations	0	0	0	0			
Environmental							
- NOV (Notice of Violation)	0	0	0	0			
- Federal Reportable Spill	0	0	0	0			
- State Reportable Spill	0	3	0				
Gold Ounces	364,863	385,159	96,588	99,599			
Direct Mining Cost	\$871/oz	\$758/oz	\$824/oz	\$724/oz			
Future Growth							
- Increase Reserves/Resources							
Phase W		Scoping Study June 2016					
Gold Hill	Additional	Additional 70k Ounces Added to Mineable Resources					

* One reportable removed from bonus calculation as a result of 75 "Free Lessons" reported in 4Q15

Visual Key Performance Indicator (KPI) boards



Alignment

Vision

 What are we shooting for?

Communication

- Target vs actual
- How does it apply to them

Monitoring

- Achieving target
- Sustaining gains

Bottom line

- Process improvement
- Cost savings

How to shift mindsets and behavior?

- Embracing change
 - Identify change agents
 - Start small and show value
- Challenge beliefs
 - "We've always done it this way"
 - "It's too hard"
 - "We tried that already, it didn't work"
- Thinking outside the box
- Coaching and guiding
 - Saturate from new hire through experienced employees & supervisors

Cultural Beliefs

Share the Win:

I empower others to help get it done

Work Together:

I challenge myself to foster effective relationships by listening, considering, supporting & accepting

t's Possible:

I strive for effective, safe production today and for our future - PHASE W

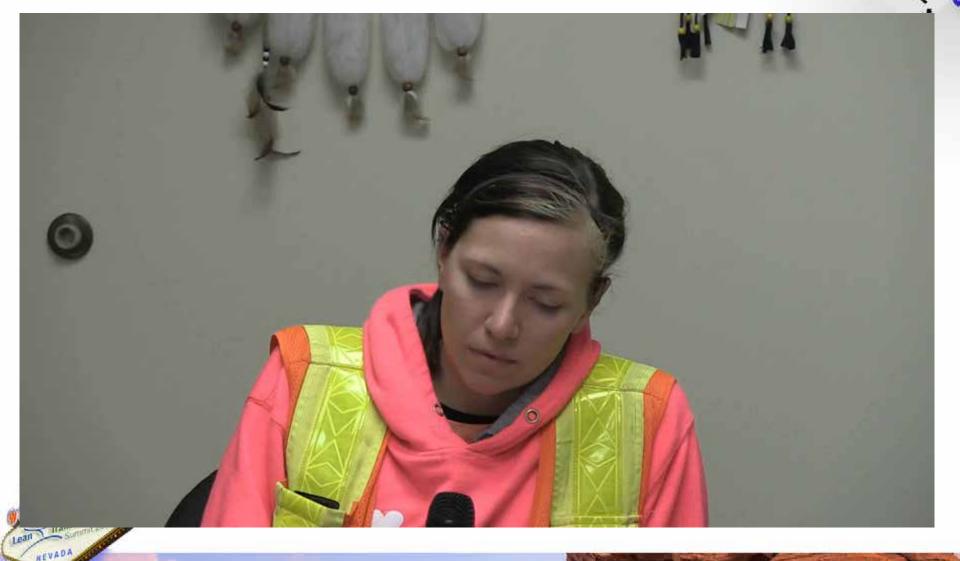
My Money:

I pledge to operate RMGC with financial common sense

Common pitfalls

- Ensure clear expectations
- Proper alignment
 - How do you know?
- Not one size fits all
 - Diversity
 - Adaptability
- Accountability
 - Organizational communication and commitment
- Feedback
 - Success?
 - Areas for improvement?

Someone challenged me



Pull vs. push

Transn

Lean

- Lean leadership training
 - Who should attend?



Pull





1

Feedback from Workforce

Thanks for this opertunity the way I in my crew.

to better myself, and

Any other comments are welcomed: THANK YOU. THIS is THE BEST "REAL WORLD" LEADERSHIP TRAINING THAT I HAVE ATTENDED.

D

I appreciate having been given the oppositurity to Attend this class, I would really like to see made of this concept. I really believe it will help ne to do much more for the company.

Thank you! Best class yet. Share withurs.

5. Any other comments are welcomed: *CINIE AND TRACTE- THANKE YOU*, THIS TRAINING HAS SAMELED VERY RESTIVE CHANGE FOR ME AS IT LEADER. *SAMELED VERY RESTIVE CHANGE FOR ME AS IT LEADER*. *I'M HOPING TO IMPLEMENT IT AS MUCH AS I CAN TO MEET MY EMPLOYERS "TRUE NERTH" AND MAKE ME HEBETTER LEADER*.

Summary – Raising the Bar

- Key Points
 - Support from the highest level
 - Most likely not successful without this support
 - Keep it simple
 - Don't force it
 - Integrate into everyday business
 - Listen and empower people
 - Recognition
- Yesterday's accomplishments are tomorrow's expectations
- If it's not broken, break it
- CI Team of 900



Questions

P

