Industry Training Challenges, Benefits and Use Cases of VR, and ROI (Session #2)

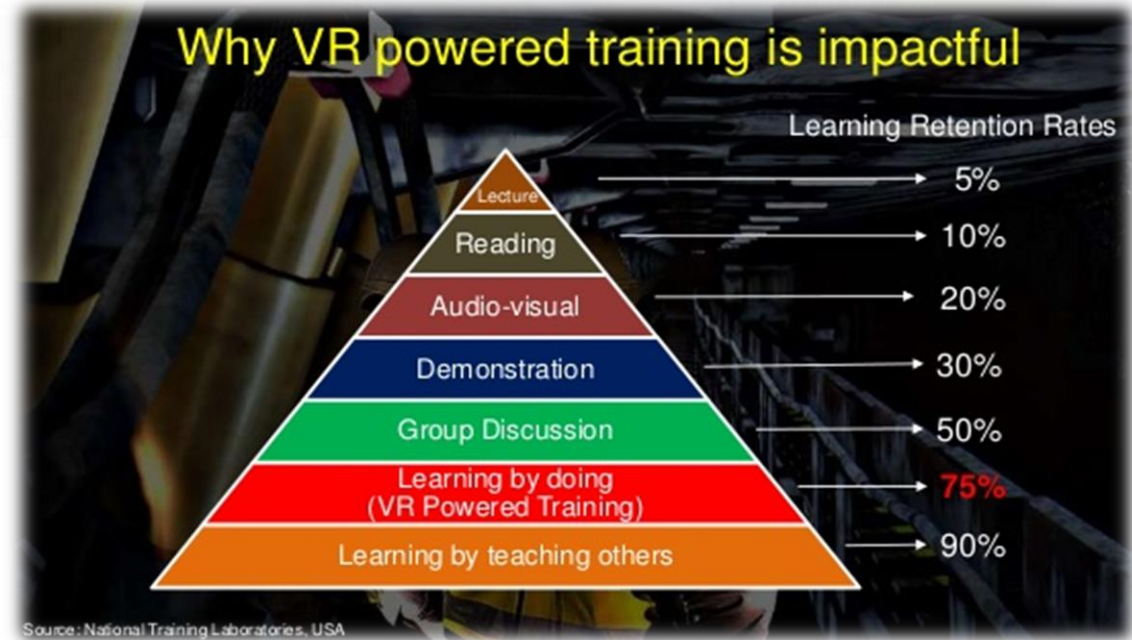April 21, 2020

Presented by Ray Deatherage

Webinar Series Overview – 8 Sessions

- Session #1: VR Users Committee Introduction (April 9)

- Session #2: Industry Training Challenges and VR Benefits and Use Cases (April 21)

- Session #3: Hardware Equipment, Software, and Network Requirements (May 5)

- Session #4: Control Center Overview (May 19)

- Session #5: Authoring Tool (Scoring Manager) (June 2)

- Session #6: Module Development and Maintenance (June 16)

- Session #7: Current and Future VR Training Modules (June 30)

- Session #8: Technology Integration and Support Services (July 14)

Meeting Agenda

- Session #1 Recap

- Survey Data Review from Session #1

- Industry Training Challenges

- Benefits of VR Training and Use Cases

- ROI Considerations and Examples

- Developer Update (PixoVR)

- Group Discussion

- Next Steps

Why VR powered training is impactful

Learning Retention Rates

- Lecture → 5%
- Reading → 10%
- Audio-visual → 20%
- Demonstration → 30%
- Group Discussion → 50%
- Learning by doing (VR Powered Training) → 75%
- Learning by teaching others → 90%

Source: National Training Laboratories, USA

Session #1 Recap

- Introduction of VR Users Committee

  – Discussed roles and responsibilities

  – Discussed immediate needs

  – Discussed identification of members

  – Currently have confirmed participation of (9) members, in process of confirming (8) additional members.

- Conducted overview of webinar series – 8 sessions

- Sent out webinar survey for session #1

- Added participants to PixoVR monthly online newsletter

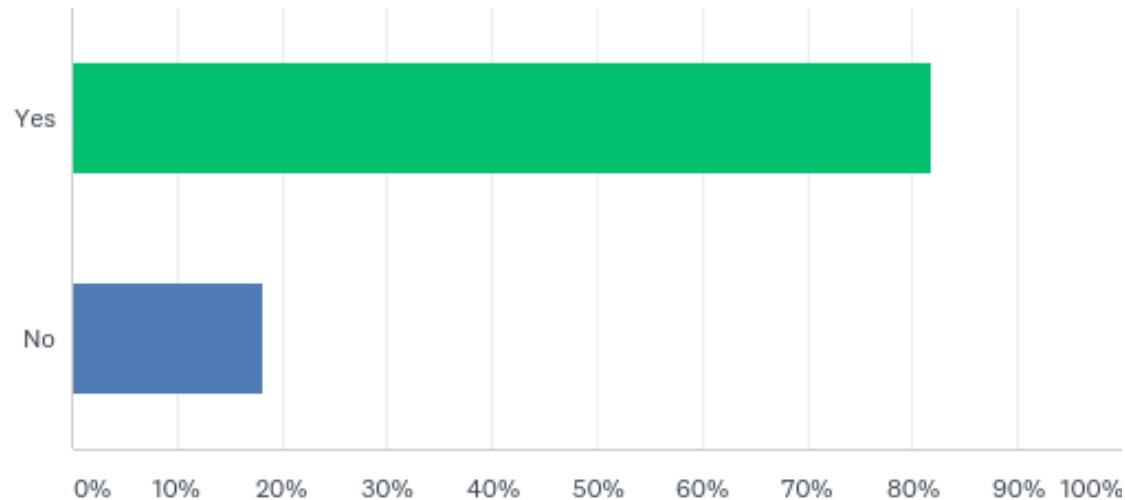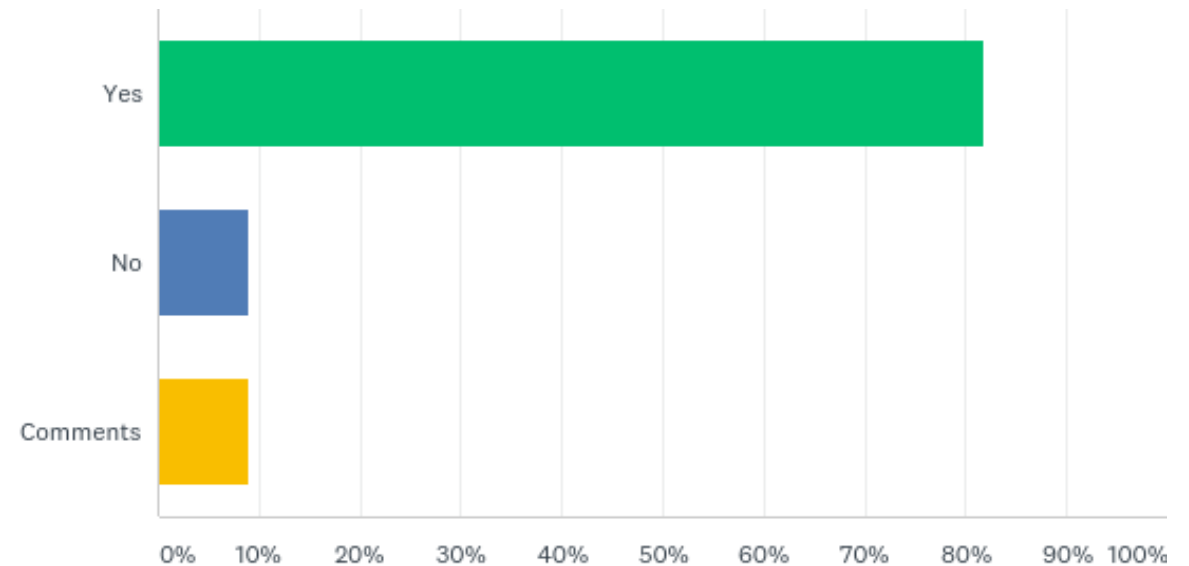- Overview of three questions submitted

Survey Data Review from Session #1

Survey Questions #1 & #2 – VR Experience

Have you previously experienced VR?

Is your organization currently evaluating the use of VR training technology?

Survey Question #3 – Technology Adoption

Biggest challenge for VR training technology adoption by organizations.

1. Budget (5.8)

2. Leadership support (5.6)

3. Internal resource knowledge (5.2)

4. Employee adoption (5.0)

5. Internal IT support of technology (4.7)

6. Internal resource availability (4.3)

7. Identification of VR developer (3.8)

8. Space requirements (2.8)
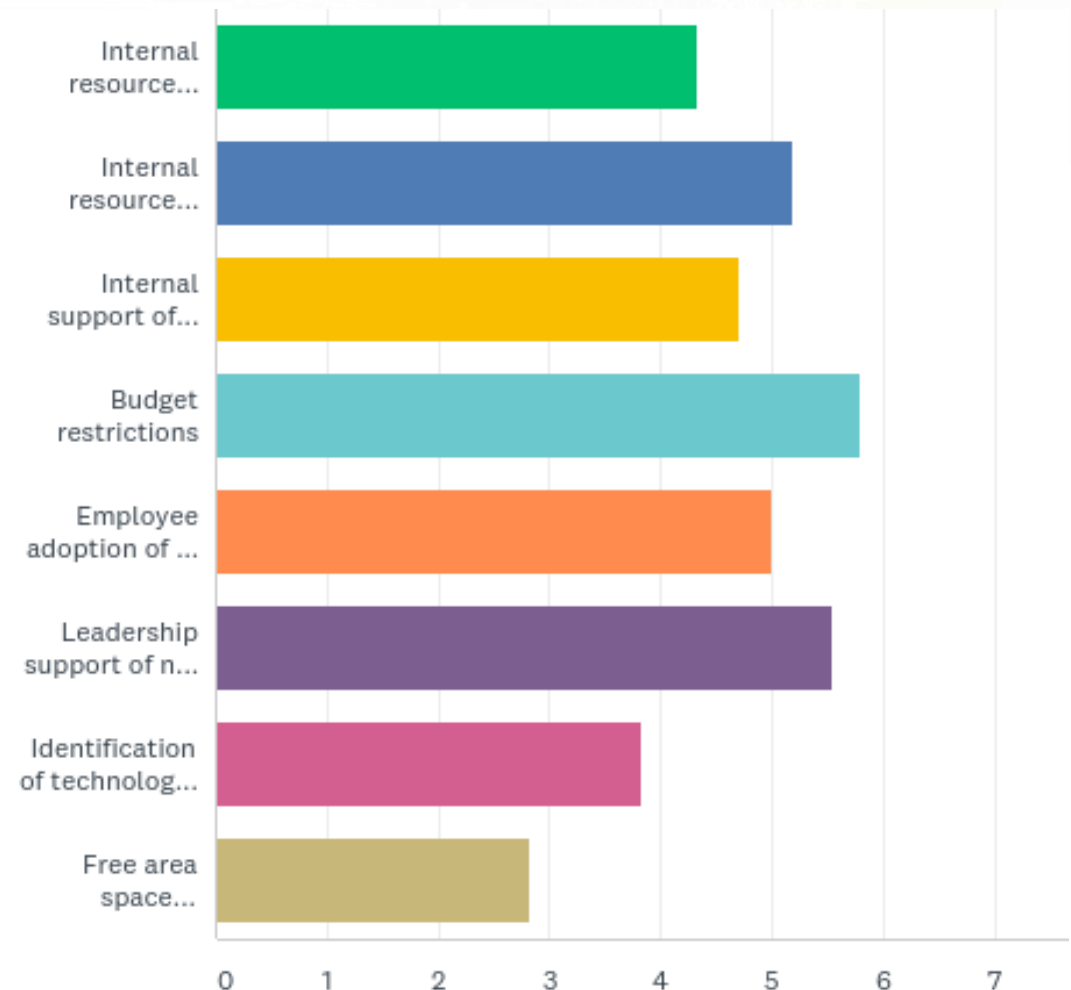
Survey Question #4 – VR Training Benefits

Greatest benefit of VR training for organizations.

1. Increased on-demand training (4.4)

2. Increased training consistency (4.2)

3. Increased exposure to scenarios (3.9)

4. Reduced travel expenses for attending training (3.2)

5. Ability to conduct remote and multi-user training (2.9)

6. Reduced instructor prep time (2.3)
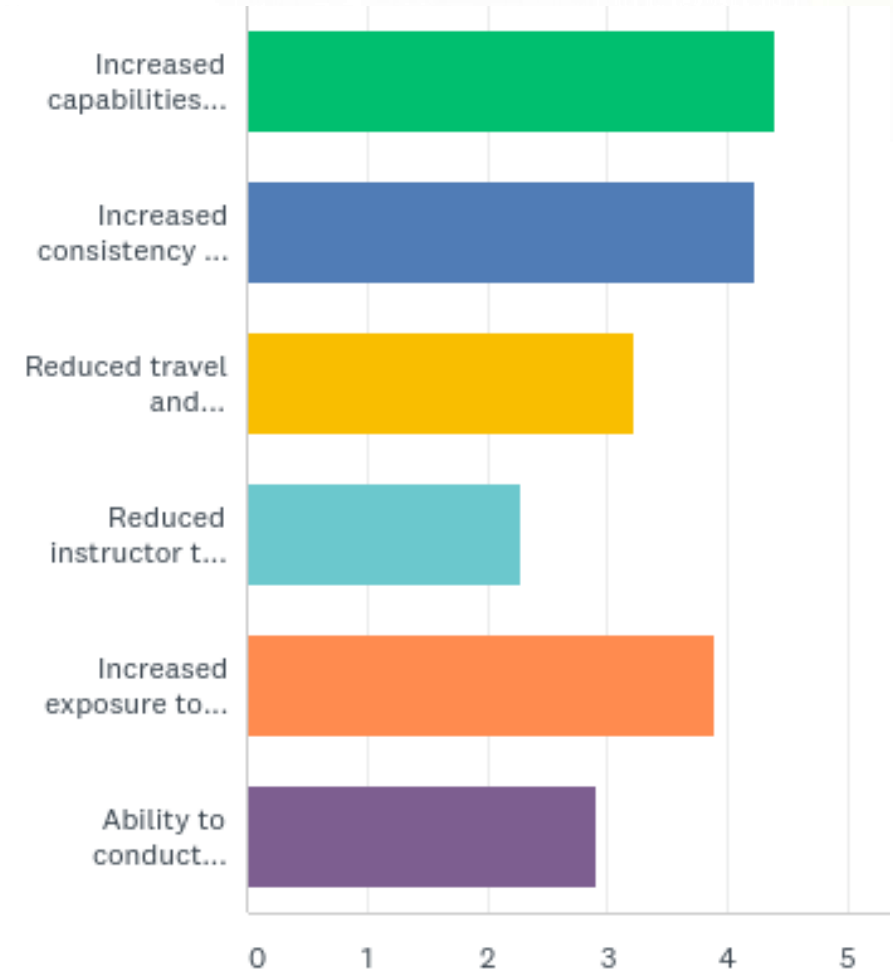
Survey Question #5 – VR Training Platform Capabilities

Importance of VR platform capabilities.

1. Authoring tool (3.6)

2. Remote training (3.6)

3. Ability to operate training in headset and on a desktop (3.4)

4. Multi-user capabilities (3.2)
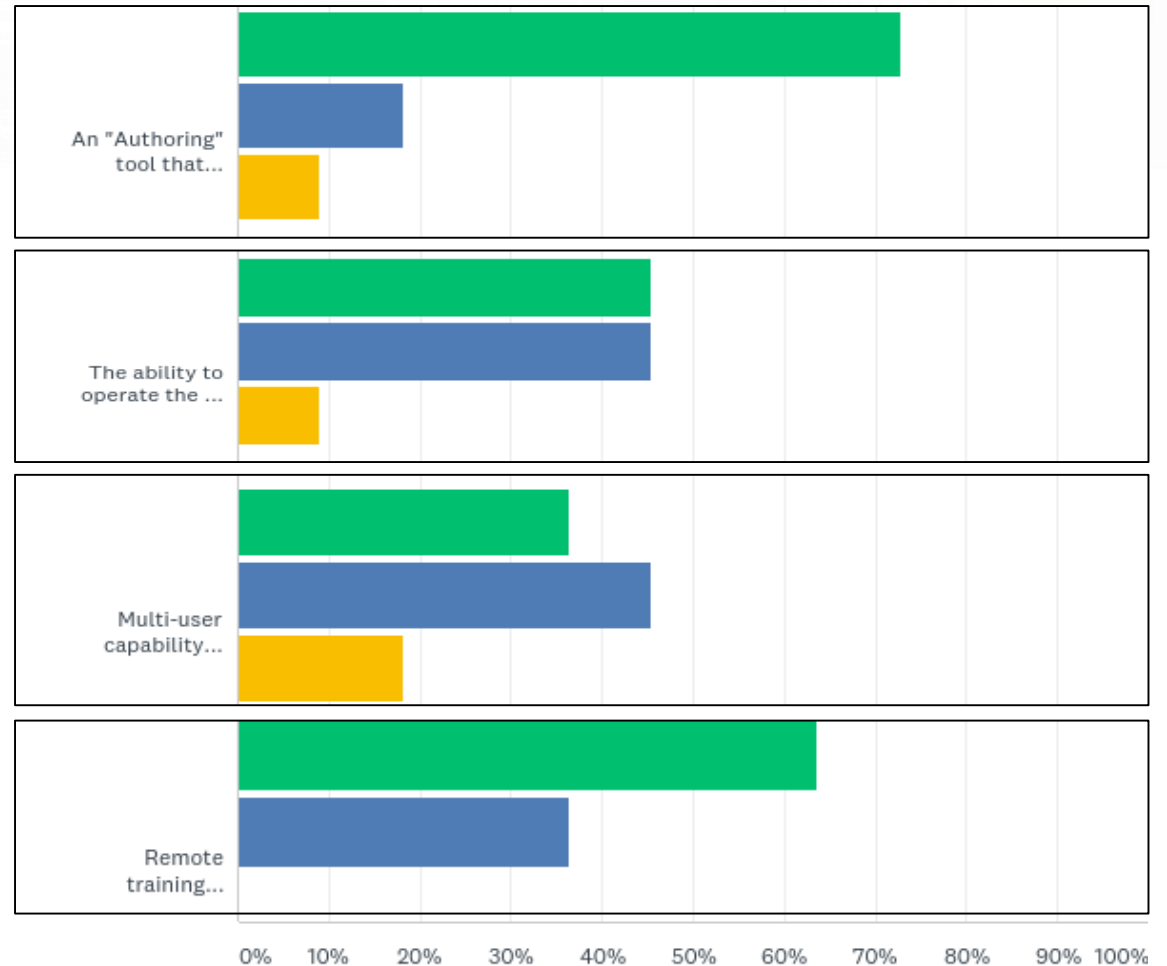
Survey Question #6 – Next Modules to be Developed

- Leak Survey – Walking (6.7)
- Meter Installation/Change (6.7)
- Service Pressure Regulator Install/Inspect (6.7)
- Job Site Hazard Mapping (6.6)
- Industrial Meter Set Inspection (6.5)
- Construction Inspector (4.8)
- Excavation Pre-Inspection (4.7)
- Exposed Meter and Piping Inspection (4.5)
- Leak Survey – Driving (4.0)
- Meter Reader Hazards (3.8)
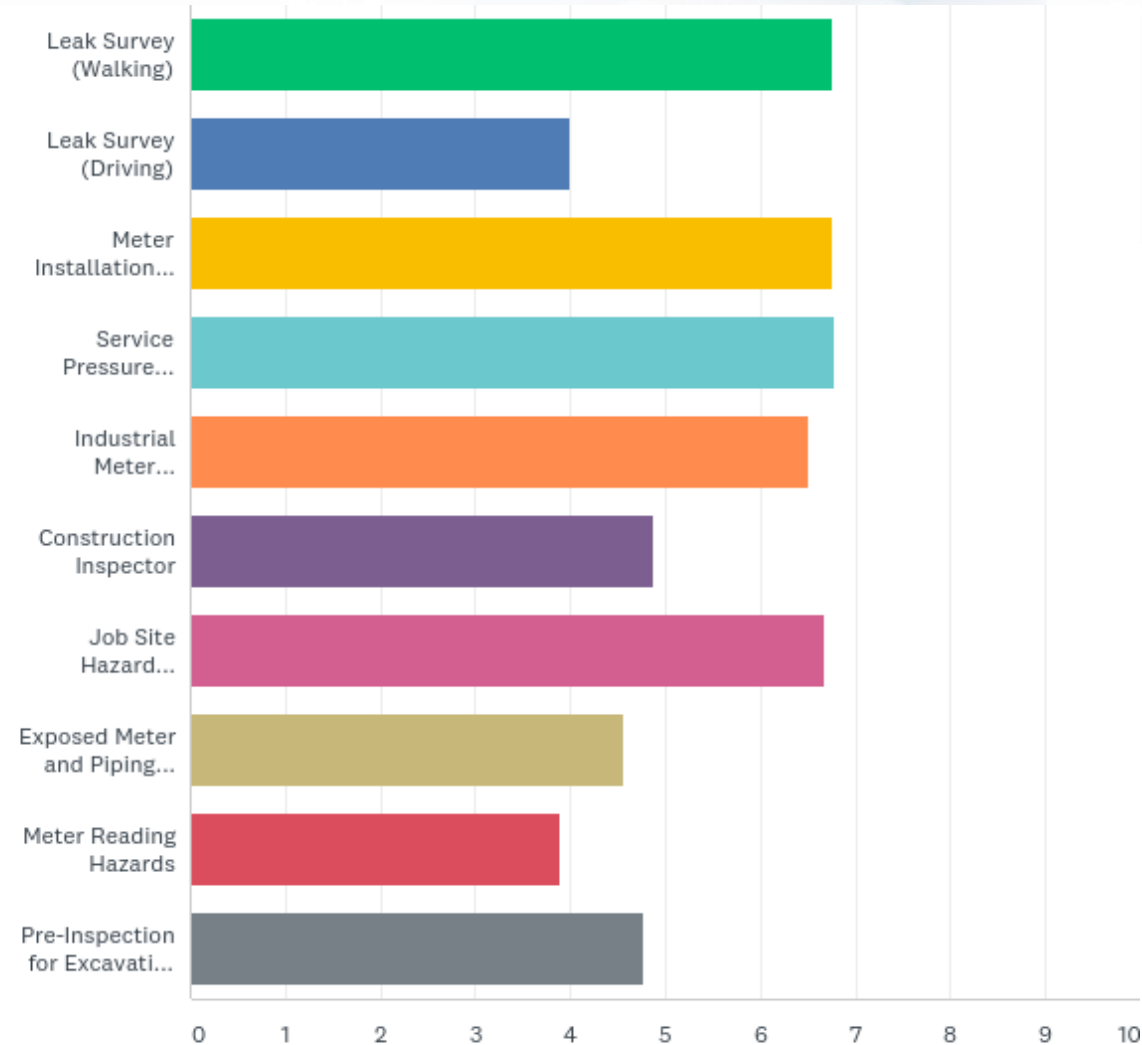
Survey Question #7 – Interest in VR Users Committee
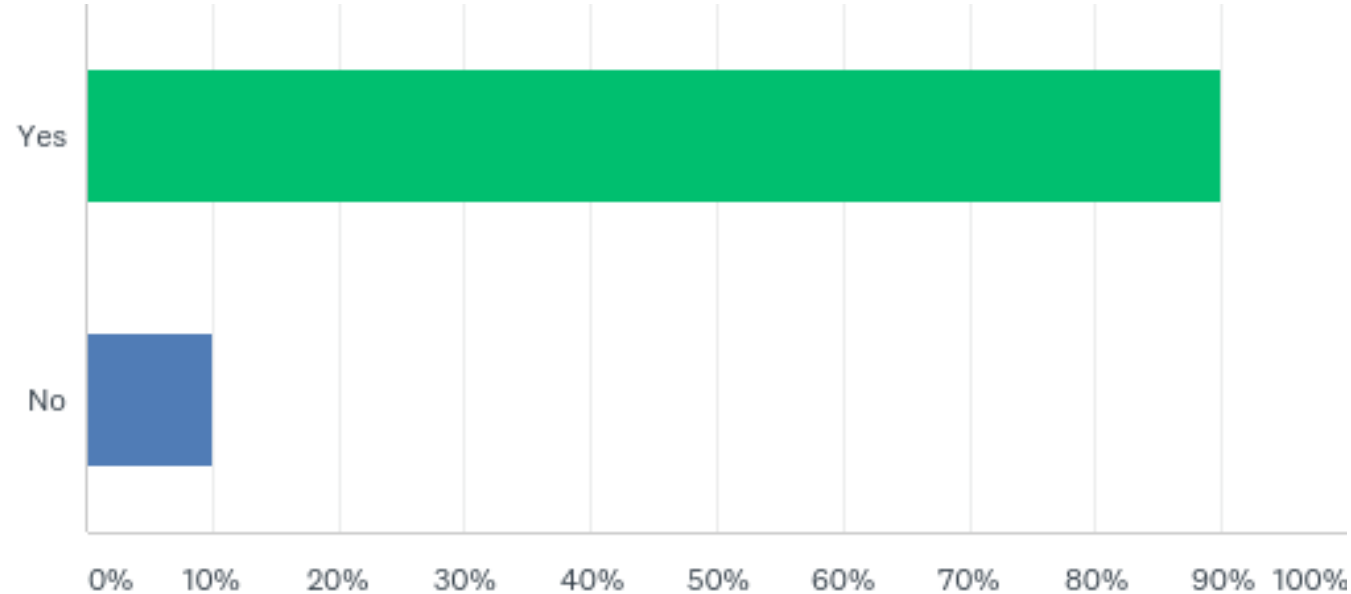
Natural Gas Industry Training Challenges

- Aging workforce at all levels, estimated at 40-50% over the next five years.
- Increasing training demand
  - New hires
  - Increasing regulations
  - Standardization efforts
- Increasing employee responsibilities early during employment.
- Lack of training resources
  - Trainers
  - Facilities

- Decreasing knowledge and experience among training staff.
- Learning needs of new employees are different than senior employees.
- Large spread-out service territory and workforce that limits training opportunities.
- Ability to maintain consistency of training and evaluations among trainers and office locations.

gti®

Industries Successfully Using VR Training

- Healthcare
- Automotive
- Education
- Skilled Trades
- Military & Law Enforcement
- Energy (Oil, Nuclear, etc.)
- Safety & Risk Management

Benefits of VR Training

- Increased learner retention

- Increased on-demand training opportunities

- Remote and multi-user training and qualification opportunities

- Increased consistency of training and qualification programs

- Increased exposure to different scenarios including hazard situations.

- Improved reporting capabilities and training effectiveness data

- Decreased O&M expenses associated with training (e.g., travel, classroom prep, etc.)

Additional Benefits of VR Training
(Depends on Developer Platform)

- Remote & multi-user capabilities

- Enhanced data analytics of trainee performance

- Randomization of training scenarios (e.g., 66,000+)

- Ability to add new scenarios to each module.

- Ability to author training modules to company specific procedures.*

Why VR powered training is impactful

Learning Retention Rates

Lecture	5%
Reading	10%
Audio-visual	20%
Demonstration	30%
Group Discussion	50%
Learning by doing (VR Powered Training)	75%
Learning by teaching others	90%

Source: National Training Laboratories, USA
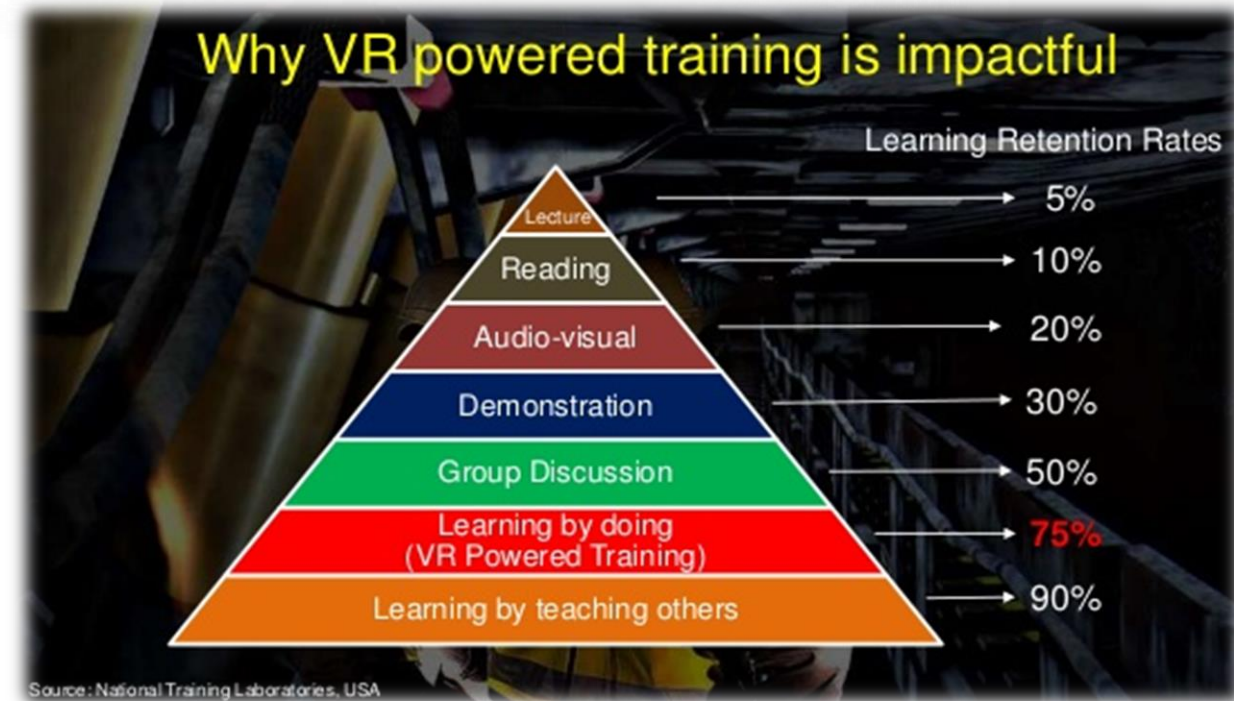
VR Training and Qualification Use Cases

- Computer generated training
  - Training library
  - HR empathy training
- 360° video of actual environment*
  - Construction site
  - Gate station
- Operator Qualification (OQ) Evaluations*
  - Increased consistency
  - Ability to complete on-demand
  - Ability to complete remotely
- Virtual Classroom*

  - Equipment and tool inspections (e.g., CDL pre-inspection, McElroy 412, etc.)

Intel Commits $50 Million with Pandemic Response Technology Initiative to Combat Coronavirus

ROI Considerations to Support Investment in VR

- State commission citations related to human performance or non-compliance for training and qualifications. (30%)

- State commission recommendations related to human performance. (30%)

- Company time required for investigating and responding to human performance issues related to training. (30%)

- Company incidents related to human performance. (30%)

- Significant decreases in productivity from one work group to another. (50%)

- Remedial training sessions conducted over the past three-years. (50%)

- Reduction in face-to-face classroom time required with instructors. (30%)

- Reduction in remedial training for OQ requalification process. (50%)

The percentages after each example represents the estimated O&M savings for a specific period of time being evaluated.

ROI Considerations to Support Investment in VR

- Reduction of classroom and prop prep time for instructors. (30%)

- Lost time expenses due to injuries as the result of human performance. (30%)

- Reduction in travel expenses for attending training. (30%)

- Reduction in unproductive time for attending training. (30%)

- Reduction in cost reviewing and maintaining training content. (30%)

****

- Increase in on-demand training and qualifications capability.*

- Decrease in on-boarding time of new or upgraded employees.*

- Increase in consistency of training and qualifications.*

Each organization should place a value on these examples based on employee population size.

ROI Example for Entire Organization

- **Improved Compliance = $10,000 annually (30%)**
  - State Commission Citations and Recommendations ($5,000)
  - Internal Investigation and Response (50 hrs x $100 =$5,000)
- **Increased Productivity = $10,000 annually (50%)**
  - Workforce (50 hrs x $100 = $5,000)
  - Training Department (50 hrs x $100 = $5,000)
- **Improved Safety = $10,000 annually (30%)**
  - Employee: Reduction in lost time injuries and/or system failures ($5,000)
  - General Public: Reduction in injuries and/or property damage ($5,000)
- **Improved Operational Efficiencies = $10,000 annually (Value TBD)**
  - On-demand training, consistency of training, remote training and qualifications, etc.

VR Training Benefit Value of $40,000

ROI Example for Training and Qualification Program

	Full Day Class Example (ROI)					Year 1	Year 2	Year 3
			Total Time	Loaded Rate				
	Time Required (Hrs)	Total Sessions	Required (Hrs)	$100	VR ROI (30%)	15%	30%	30%
Review of Course Material	1	5	5	$500	$150			
Classroom and Prop Set-up	1	5	5	$500	$150			
Classroom and Prop Disassembly	1	5	5	$500	$150			
Classroom Instruction Time	6	5	30	$3,000	$900			
Classroom Evaluation	2	5	10	$1,000	$300			
Training Documentation	2	5	10	$1,000	$300			
	13	5	65	$6,500	$1,950	$975	$1,950	
			19.5					
Unproductive Field Time (50 employees)	8	5	2,500	$250,000	$75,000	$37,500	$75,000	
	400		750					

				YEAR 1		
			Total O&M Savings (15%)	$38,475	
			VR Investment Year 1 (Equip, Module, Support)	$40,000	
			Total VR ROI Year 1	-$1,525	
			Intructor Hours Gained	9.8	
			Workforce Hours Gained	375	

				YEAR 2	
			Total O&M Savings (30%)	$76,950
			VR Investment Year 2 (Equip + Module)	$27,500
			Total VR ROI Year 2	$49,450
			Intructor Hours Gained	19.5
			Workforce Hours Gained	750

				YEAR 3	
			Total O&M Savings (30%)	$76,950
			VR Investment Year 2 (Equip + Module)	$27,500
			Total VR ROI Year 3	$49,450
			Intructor Hours Gained	19.5
			Workforce Hours Gained	750

VR Training Investment Per Employee (ROI)

Employee Count: 100

Employee Investment: $10 a month

Total Investment: $12,000

Employee Size: 100

Employee Investment: $20 a month

Total Investment: $24,000

Employee Count: 250

Employee Investment: $10 a month

Total Investment: $30,000


Employee Count: 250

Employee Investment: $20 a month

Total Investment: $60,000

The estimated cost to develop a new CBT and classroom training course is $19,400. This includes all labor for design and discovery, development, review and approval, train-the-trainer, props and handouts, etc.

gti®

Developer Update (PixoVR)

PixoVR will provide examples of their first-hand experience related to today's topics.

- Survey Data Review from Session #1

- Industry Training Challenges

- Benefits of VR Training and Use Cases

- ROI Considerations and Examples
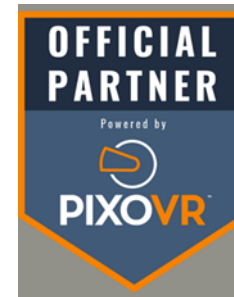
Group Discussion

- How has the pandemic response affected your current training and qualification programs?

- What types of remote training and qualification offerings are currently being evaluated (e.g., video conferencing, CBT, etc.)?

- How can the industry improve remote training and qualification offerings?

Next Steps

- Invite the necessary company stakeholders to participate in Session #3 on May 5th: **Hardware Equipment, Software, and Network Requirements**

- Complete VR survey – Based on the topic of each webinar session and the questions raised by participants, a short survey will be created and distributed. The results will be shared with participants during the next webinar session.

- Continue to collect VR questions from your organization and submit to GTI (Ray).
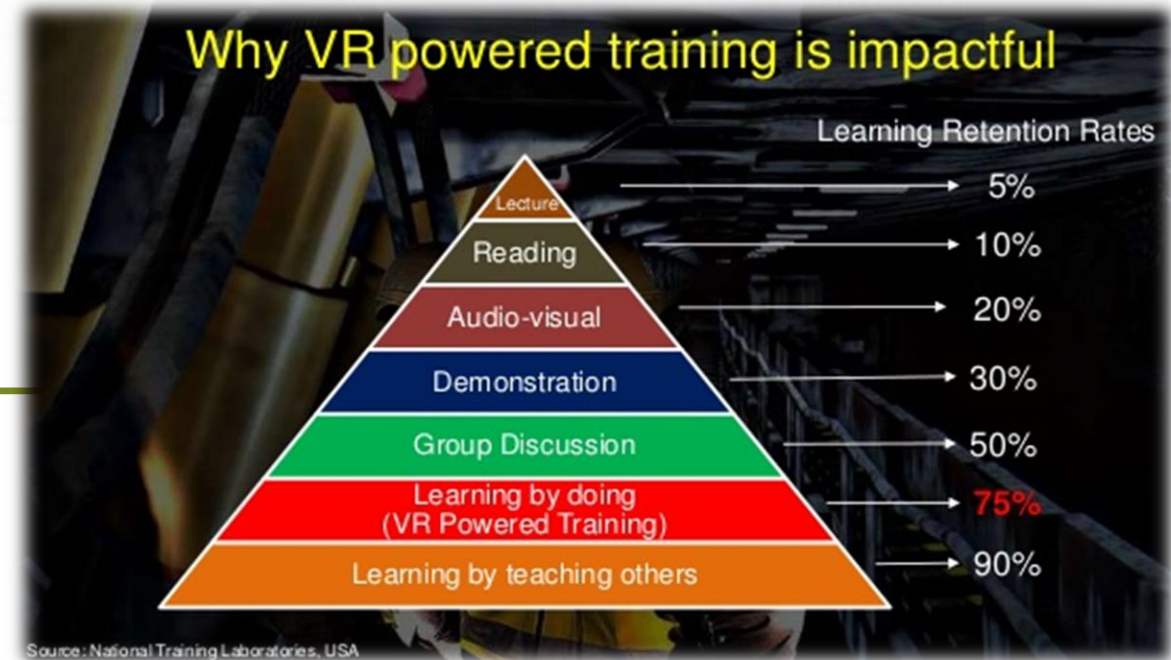

Stay Safe and Healthy!

Questions?

Ray Deatherage

rdeatherage@gti.energy

(847) 768-0942

Presenter Introduction

Ray Deatherage – Senior Program Manager with GTI

- 27+ years experience in the natural gas industry
- 25+ years experience with a gas distribution company
  - Operations, Standards, Materials, Failure Analysis, Quality Assurance, Compliance, Training, and Operator Qualification
- 15+ years experience developing, delivering, and maintaining training and qualification programs
- 4+ years experience evaluating and developing VR training technologies
- VR/AR Association Member – Chicago Chapter
- VR/AR Energy Committee Member
- MEA Technical Training Committee Member