

Oil Sands Producer Benefits from VISTA's TruckLogic™ Training System

Suncor Energy significantly improved the effectiveness of haul-truck operator instruction by using an innovative structured training curriculum

By Chuck Frey

Many mines miss a key opportunity for productivity improvement by not taking a closer look at the most significant group of people who influence it—haul truck operators—and more specifically, how they are trained. How can haul truck operator training be more effective and result in significant reductions in incidents and increases in productivity? By:

- Considering how adults learn most effectively. By engaging them in three dimensions: hearing, seeing and doing (experience), trainees are better able to develop the knowledge, skill and (most importantly) the attitude to be safe, productive operators.
- Improving the handoffs from the classroom to field coaching so skill-building and knowledge are enhanced.
- Providing everyone involved in the onboarding process with the insight, training and tools they need to support, coach, evaluate and ensure consistency.
- Helping operators understand how their performance impacts the performance of others.

It's not that current training content is incomplete, but rather how it's delivered. In many operations, operator training consists of trainees viewing classroom or computer-based training (CBT) programs in one giant "brain dump"—after which trainees are expected to remember everything from which truck braking system to use under which circumstances to the best techniques for turning in to a failing dump.

Trainees then immediately transition to an actual haul truck, where they ride with an experienced operator, often called a coach or "mentor," for a certain period of time. Ideally, these ride-alongs should reinforce the knowledge the trainee has gained in the training lessons. But more often than not, field training is unstructured and inconsistent—dependent to a large extent upon the mentor knowing what the trainee should be taught and the correct proce-



The keys to an effective driver training program, according to the author, are: 1) delivering knowledge in easily digestible "chunks;" 2) providing hands-on opportunities for trainees to apply recently acquired knowledge before moving on; and 3) ensuring ride-along coaches or mentors understand and accept their role in the training process.

dures for doing so, and most importantly, on the mentor being motivated and rewarded for sharing those procedures.

Why is the new approach for training haul truck operators piloted at Suncor a better solution?

- It employs "chunked" learning to help trainees retain knowledge. Trainees learn one critical skill (for example, how to operate a haul truck safely on the mine's haul roads), then have an opportunity to apply it in one or more hands-on settings before moving on to the next concept.
- It employs a PC-based simulator (which generates a wealth of performance data), "check your knowledge" questions within the training modules and field assessment forms and checklists to generate a record of training of each student.
- The curriculum goes beyond training to consider the environment in which the training is taking place. Supervisors, coaches and dispatchers experience the training, too, so they can better understand what trainees are learning and support them. And, they also learn how to coach in the process.

- It provides a solid foundation in safe operating practices, and helps trainees appreciate how their work directly impacts those around them. This lays the foundation for them to operate safely and productively throughout their careers in the mine.

Do These Issues Sound Familiar?

Safety: While mines around the world use different languages and extract different materials from the ground, they share similar challenges when it comes to training haul truck operators. Haul truck operation is typically an entry level position in most operations. So, why is it that mines typically start their most inexperienced operators on one of the most expensive, massive pieces of equipment in the operation? Operators are expected to operate a vehicle the size of a three-story house, under extreme conditions such as inclement weather, challenging haul road conditions and steep grades.

In addition, haul trucks are the prime movers of ore and overburden in the mine. As such, they are a key element of

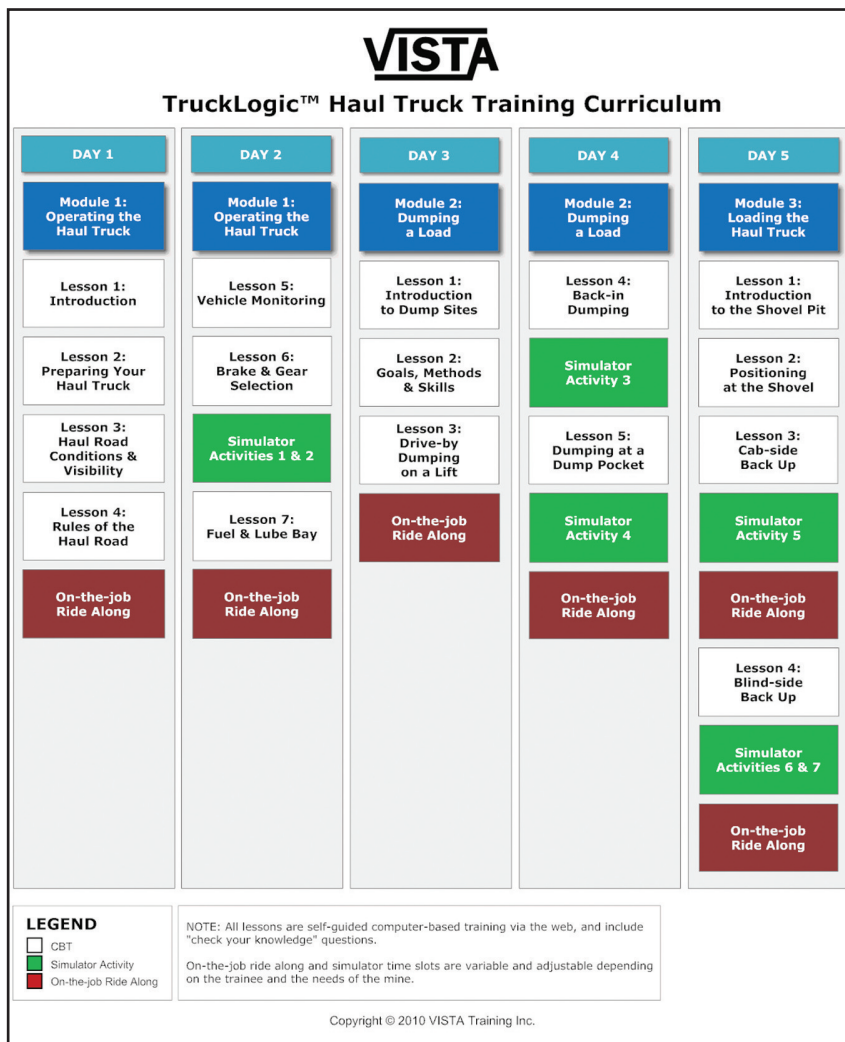


Figure 1—VISTA Training's curriculum structure for Suncor's driver training program is designed to efficiently transfer and reinforce important job-related information. For example, as shown here on Day 4 the curriculum includes classroom instruction on dumping at a dump pocket. The simulator and OJT activities that follow are also focused on the same topic.

any mine's productivity. Inefficiencies in haul cycles tend to be multiplied across the rest of the mine's production operations. That's why it's critical mine management train new operators how to properly balance safety and productivity. For example, new operators are expected to maintain the same pace as the trucks ahead of and behind them on the same haul road, while taking corners safely and not overspeeding on downhill grades.

Skilled-labor shortage: Another persistent and escalating challenge is the shortage of skilled labor. In the past, finding operators with previous experience in other mining operations, or in related industries such as construction and forestry, wasn't difficult. But the global workforce is aging, and experienced operators are retiring, taking their expertise and knowledge with them. A growing per-

centage of new haul truck operator trainees in the northern Alberta oil sands, where Suncor is located, and in many areas around the world have no previous experience operating heavy machinery. In other words, they don't have operating skills transferrable to the mine environment. On the other hand, this trend provides mines with a unique opportunity: These inexperienced operators are "blank slates" who haven't developed bad habits, and who can more easily be trained to be safe equipment operators.

Retaining the best: A related challenge is worker retention. In labor-constrained markets there are more jobs than there are workers. This imbalance in supply and demand tends to inflate wages and ratchet up the competition for skilled workers among mines, giving the most skilled operators the opportunity to job

jump from one mine to another. Training isn't the total answer to this challenge, but if an employee feels valued and capable in his or her job, they are more likely to stay with a company. Watch for the ability to hire and retain laborers to become a big issue for the global mining industry in the years ahead.

The power of a good coach: A final difficulty faced by many mines is that they expect coaches will pass along the "right" knowledge to their trainees and know how to do so. In reality, these interactions are often not adequately structured to ensure the experienced operator's knowledge will be transferred to the trainee. Worse still is the operator who unknowingly transfers bad habits or unsafe practices to trainees. Often, supervisors show up at an operator's truck with a trainee and say, "Bob's going to be riding with you today." Without a structured program for field training, there isn't much consistency to what trainees learn while riding with coaches. When you have a group of people independently deciding what trainees will learn, the results are bound to be inconsistent.

Suncor's Specific Challenges

Suncor also faced several unique challenges that contributed to the need for a new approach to training haul truck operators:

- A major mine expansion resulted in the need to hire a large number of new haul truck operators.
- The existing computer-based training program had a number of shortcomings. The program was traditional in structure, which means it "dumped" a large quantity of knowledge on the trainee all at once, which trainees were expected to remember. Trainees tested well in the training lab, but when they transitioned to the haul trucks, they weren't retaining enough of what they had learned.
- The content of the training program was focused on do's and don'ts of haul truck operation, but didn't cover the all-important whys—information adult learners need to know. In addition, the existing training did not provide job aids to assist trainees in retaining knowledge. Nor did the mentors have any training or tools to provide their trainees with meaningful coaching or feedback.
- The knowledge contained in the existing training materials was superficial in nature. It didn't contain enough detail, and it wasn't aligned with Suncor's

'Journey to Zero' initiative—which aims to improve the safety of Suncor employees and contractors working in the mine.

To address these challenges, Suncor partnered with VISTA Training to develop TruckLogic, a comprehensive haul-truck operator training curriculum that integrates computer-based lessons with a PC-based simulator and on-the-job training guides for both mentors and trainees. This was supplemented by "train the trainer" sessions for coaches, dispatchers and supervisors to help them understand what trainees were learning and why.

This new model of training provides not only more training content, but it has been instructionally designed and "chunked" to improve knowledge retention. For example, as shown in Figure 1 the curriculum includes instruction on Dumping at a Dump Pocket (Module 2, Lesson 5). The simulator and OJT activities that follow are also focused on the same topic, so trainees get the knowledge of how to back up to a dump pocket and dump their load from the CBT, followed by two hands-on opportunities to "anchor" that knowledge in their minds. As a result of this integrated learning approach, by the time trainees transition to a haul truck, they are much better prepared for what they will experience.

The Pilot Program

Suncor and VISTA Training conducted a three-and-a-half-month pilot of the TruckLogic training curriculum beginning in April 2010 and concluding in July. To ensure scientific validity, an "experimental" group was formed that included four trainers, 24 truck mentors and 22 haul-truck operator trainees from the mine's K and L shifts. The "control" group, which continued to use Suncor's existing training program, consisted of I and J shift trainers, truck mentors and new haul-truck operator trainees. Because these shifts work during opposite time periods, there was no significant interaction between the two groups. This enabled Suncor to obtain more accurate data comparing the performance of the two groups.

As previously described, content in the computer-based program was delivered in chunks, to improve knowledge retention and was followed by immediate, practical and structured application practice (hands on activities). Several of these structured on-the-job activities are worth mentioning because they were

new to Suncor and they turned out to be very effective:

Shock and awe: Early in the TruckLogic program, trainees take part in a field exercise where one person sits in the cab of a 400-ton haul truck with a portable radio. The rest of the students and the field trainer (who also has a radio) place orange cones around the perimeter of the truck, one at a time. They do this by walking a succession of straight lines away from the front and sides of the truck. As soon as the person in the cab can see the field trainer with the cone, he or she lets them know on the radio, and the trainer drops a cone on that spot.

Additional cones are placed in the same way. In approximately 10 minutes, the team has created a visual representation of the perimeter of the blind area of the truck. This unique, memorable hands-on activity tends to shock trainees into the realization that they must take great care when operating such a large haul truck.

Narrative coaching: As the mentor drives the truck, he describes what he is doing and, more importantly, why. This

helps the trainee understand the nuances of controlling the truck, how the mentor makes decisions and trade-offs when approaching the shovel pit or a dump site, and other tips that help the trainee understand how to become a more skilled operator. This technique improves the transfer of the mentor's valuable knowledge—tips and know-how gleaned from years of experience—to the trainee. When the mentor and trainee switch seats and the trainee is driving the truck, this form of "talk out loud" performance helps the mentor understand what the trainee is thinking and planning to do, so he or she can keep both of them, and others in the mine, safe.

Observation worksheets: These worksheets help initiate meaningful conversations between the trainee and mentor during the time spent driving in the mine. Trainees are directed to observe and record how the mentor handles the truck in various situations; for example, when approaching an intersection or encountering a disabled truck. Trainees are also provided questions to ask their mentor.

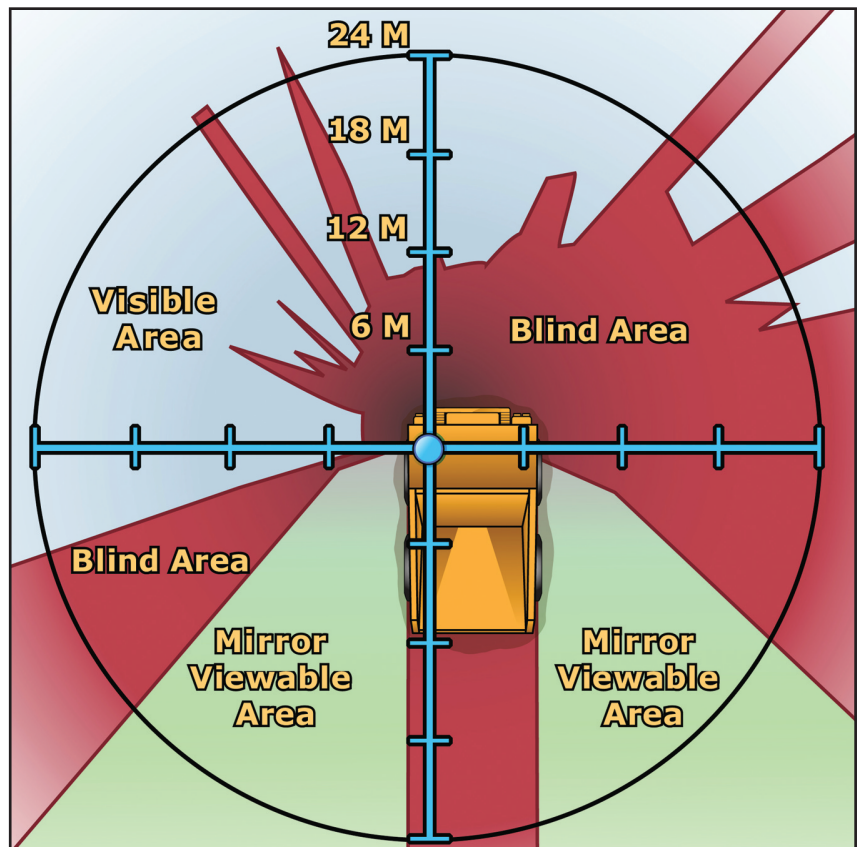


Figure 2—To make trainees aware of the large blind spots encountered by haul truck operators, VISTA's program had Suncor trainees walk slowly away from a haul truck, carrying orange marker cones. When they became visible to the driver trainee, they were instructed to drop their cones on the spot to visually reinforce the importance of driver awareness.

The questions focus on concepts, skills and areas within the mine; for example, the dump site or crusher that will be introduced in the next set of lessons.

Assessment forms and checklists: As part of the OJT tools, VISTA Training developed assessment forms and checklists, which are used to document what each trainee has learned.

The Secret to Success

A key element in the success of this training program is that it was extended to include the truck mentors—the critical link in the transfer of knowledge from the learning lab to the real-world environment of the haul truck. Suncor made a major investment in developing its mentors by taking them through the entire training program, providing them with coaching skills and tools, and by providing a forum where they could share their concerns and discuss how to overcome obstacles encountered during field training.

Mentors who participated in the program reported very positive experiences. Although they had been filling these roles for some time, they now felt validated and recognized as a key part of the training process. Not only that, but they were given tools to help them be more successful as mentors. Rather than having to ask, “What do you want us to do with these trainees?” they had the answer, in the form of structured activities within the coaching guide.

As supervisors and dispatchers began to interact with trainees and mentors who were trained in this new program, some of them asked to participate in it, too—an unexpected but welcome development. It was particularly important to gain the cooperation and support of the dispatchers, because several of the on-the-job activities require trucks to be taken out of the production loop (for pre-use walk-around inspections, for example). Also, as trainees were learning how to operate a truck, mentors needed to arrange trips to specific pits and dump locations. At Suncor, new hires are assigned to haul waste rather than ore, which means they would otherwise have to wait many weeks before they could practice positioning the haul truck at a crusher pocket. Dispatchers wanted to understand why the training department was requesting these changes and the benefits of doing so.

In addition, as word began to spread throughout the mine about TruckLogic, operators on the I and J shifts became anxious for the new program to be expanded to include them—the key point being they didn’t view it as something that was being forced upon them; rather, they openly embraced it after hearing their coworkers talk about it.

The Payoff

As part of this pilot program, VISTA Training completed a full, four-level evaluation of the program. In training terms

that means they looked at everything from the trainees’ reaction to the computer-based lessons, to whether they learned the content, to whether or not they were able to apply it in on an actual haul truck. Performance data for the pilot period was collected for both the experimental group (trainees who experienced the new TruckLogic training program) as well as for the control group (those new hires who continued using the old program).

At the conclusion of the four-month pilot program, Suncor data showed incidents on the K and L shifts decreased by 50% compared to the I and J shifts. In addition, the experimental group delivered a 3.5% increase in productivity. (Suncor reports the lowered incident rate has held steady throughout the past year, to date.)

As part of the data collection process, VISTA Training conducted one-on-one interviews with more than half of the trainees, mentors and dispatchers who participated in the pilot program. Here are several selected data points from these sessions:

- Trainees were asked to rate the value of the information in each block of content in the CBT lessons; 85% reported that these lessons were “very useful.”
- Trainees were also asked to rate the helpfulness of their truck mentors in preparing them for the OJT activities and their comfort level when asking their mentor questions. On a scale of 1 to 4, where 4 was “extremely helpful” or very comfortable, mentors were rated at 3.8 in both areas.
- However, mentors only rated the narrative coaching component of the program at 3.3 on a scale of 1 to 4, mainly because some of them weren’t completely comfortable with this technique. This could easily be improved by providing them with more practice in the technique, more examples of how to do so, and by creating opportunities for mentor and trainee to meet prior to ride-along sessions.

Chuck Frey is marketing manager for VISTA Training Inc. (www.vista-training.com/trucklogic), headquartered in Waterford, Wisconsin, USA. Kirk McLain, manager, mine operations training at Suncor Energy, contributed to this article as a subject matter expert. The complete version of this paper was originally presented at Mining Media's 2011 Haulage & Loading Conference.



To ensure the effectiveness of mentor input as part of its training program, Suncor first “trained the trainers” before assigning them to interact with the student drivers.