



SC 2023

INTERNATIONAL RAILWAY SAFETY COUNCIL

“Reshaping Railways in an Uncertain World”

CAPE TOWN, OCTOBER 1 - 6, 2023



IR
INT



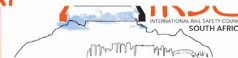
Kebaabetswe Tlhoale
Railway Safety Regulator

Software application as a learning enhancer during Technical Workshops

BACKGROUND

As part of ensuring that the Rail Industry is well versed in regulatory knowledge and tools, the Railway Safety Regulator (RSR) offers Technical Awareness Workshops which are:

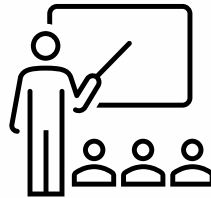
- a. The training and awareness platform that is provided to Railway Operators and RSR internal staff.
- b. The method for dissemination of information on regulations and applicable standards to facilitate safe railway operations, therefore enhancing safety culture practices.
- c. A method adopted to observe and report on the technical awareness workshops over time.



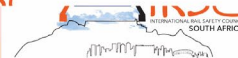
BACKGROUND (Contd.)

Technical Awareness Workshops were adapted and or remodeled to provide insights on:

- Effectiveness of the technical awareness workshops for reaction and learning,
- Effectiveness of technical awareness workshops for retention, and
- Effectiveness of the technical awareness workshops for application/implementation.



Sub-theme 5: Safety culture improvements, adaptations, and successes in rail



PROBLEM STATEMENT

- Observation Statement 1: Previously the Technical Workshops were conducted traditionally, which lacked active engagement with the attendees, more so if the training was conducted on a virtual platform.
- Observation Statement 2: This meant that Operators did not fully engage with the content.
- How well are the Operators engaging, responding, and learning to enhance their Safety Management Systems as a response to safety culture practices and successes in rail?



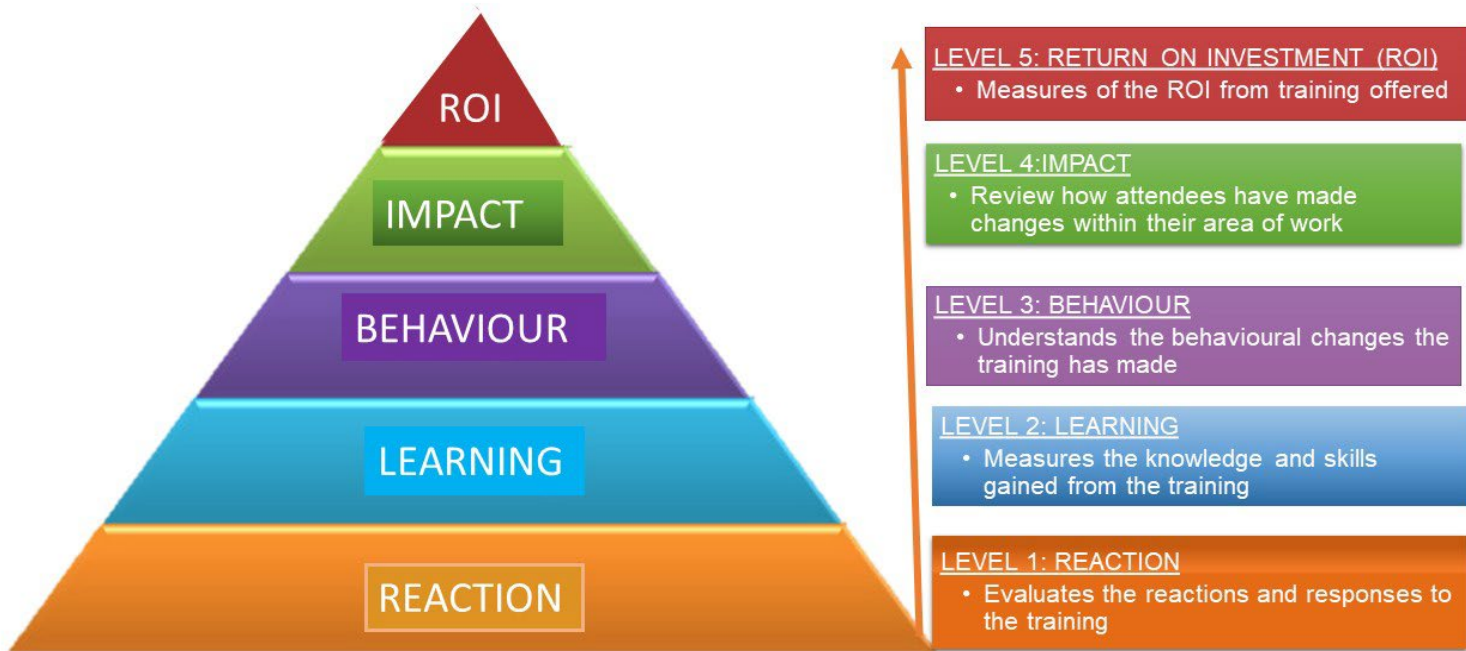


Figure 1: The Kirkpatrick model and the Phillips Return of Investment, Adapted from Komal Ahuja, 2022. 5 Simple Methods to Measure the Effectiveness of Training

METHODOLOGY

1

Step 1: Define the goals and objectives of the Technical Awareness Workshop training.

2

Step 2: Develop the evaluation methods.

3

Step 3: Develop the questions of what is required to be achieved.

4

Step 4: Conduct the Technical Awareness Workshops.

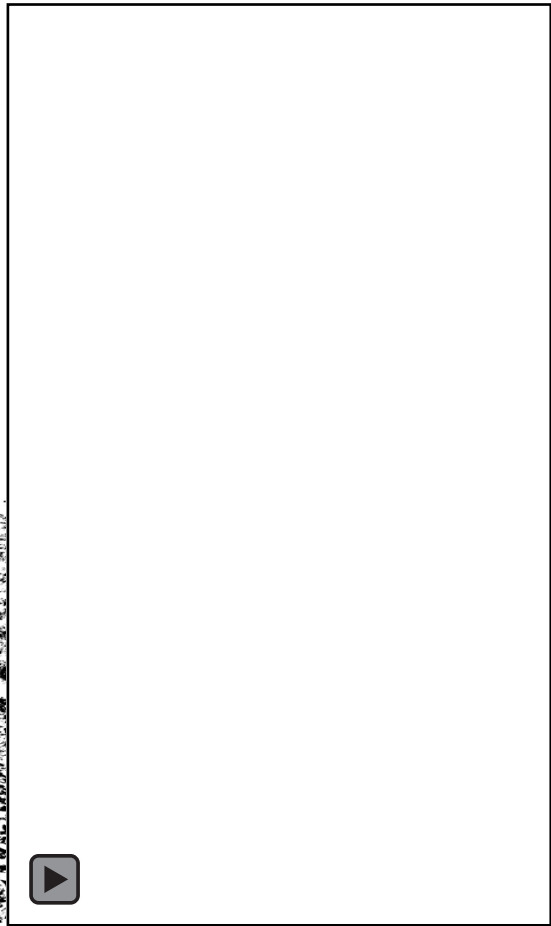
5

Step 5: Collect the data from the Operators (pre-, during, and post).

6

Step 6: Monitor and follow-up on outcomes of the training analysis.

DATA COLLECTION



Sub-theme 5: Safety culture improvements, **IPSC** adaptations, and successes in rail



DATA COLLECTION (Contd.)

- In the first quarter of the financial year 23/24, **Eight (8) Technical Awareness Workshops** were conducted in South Africa.
- In the second quarter of the financial year 23/24, **Eight (8) Technical Awareness Workshops** were conducted.
- For purposes of this presentation a sample of **Four (4) Technical Awareness Workshops** will be discussed.

Table 1: The sampled Technical Awareness Workshops conducted in Q1 in the 2023/24 Financial Year

Stakeholders	Region	Topic	Description	Mode of Attendance	Total of no. of attendees
Operators	ALL	SANS 3000-4	Human Factors Management	Virtual	114
Free State Province Operators	Central Region	SPCAM	Safety Permit Conformity Assessment Methodology	Virtual	11

Table 2: The sampled Technical Awareness Workshops conducted in Q2 in the 2023/24 Financial Year

Stakeholders	Region	Topic	Description	Mode of Attendance	Total of no. of attendees
Operators	ALL	SANS 3000-4	Human Factors Management	Virtual	110
Gauteng Province Operators	Central Region	SPCAM	Safety Permit Conformity Assessment Methodology	Contact	27



Table 3: The sampled Technical Awareness Workshops (HFM) conducted in Q1&Q2 of the 2023/24 Financial Year

No.	Software application Questions
Pre-knowledge 1	Human Factors refers to a study that considers the perceptual capabilities and limitations of employees with the work environment.
Pre-knowledge 2	The following are example(s) of human factors that can increase risk: (mental workload, physical demand, lack of teamwork, lack of knowledge, and all of above.
Post-Knowledge 3	What type of approach is the Human Factors Management standard focused on? Rights based approach, competency-based approach, and risk-based approach.



Table 4: The sampled Technical Awareness Workshops (HFM) conducted in Q1&Q2 of the 2023/24 Financial Year (Contd.)

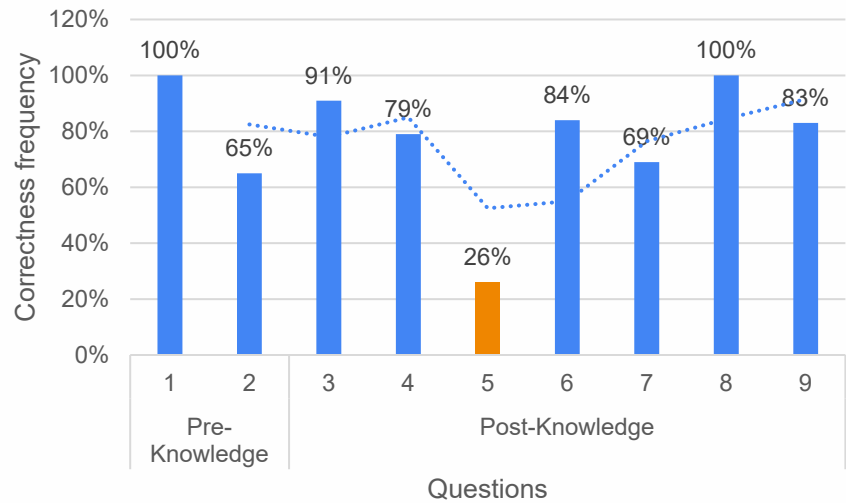
Post-Knowledge 4	Safety critical work refers to functions not related to the direct movement of trains.
Post-Knowledge 5	Safety-related work refers to functions and activities related to the authorization and control of the movement of rolling stock.
Post-Knowledge 6	Policies, processes and procedures, roles and responsibilities, risk assessments, education and training, controls, and monitoring are part of the requirements to manage HFID, noise, vibration & thermal environment.
Post-Knowledge 7	The following is required to manage Fitness for Duty (Yearly medical examinations, verify competency, post occurrence tests, monitor absence duration).
Post-Knowledge 8	The physical and psychological conditions that builds up when an individual's maximum physical and mental limits have exceeded (often resulting in a felling of tiredness or exhaustion) refers to (lethargy, fatigue, drained).
Post-Knowledge 9	What does fatigue do that makes it a safety hazard?

- The bolded questions indicate the scores lower than the 60% success factor.



HFM RESULTS COMPARED

Software application Quiz



Software application Quiz

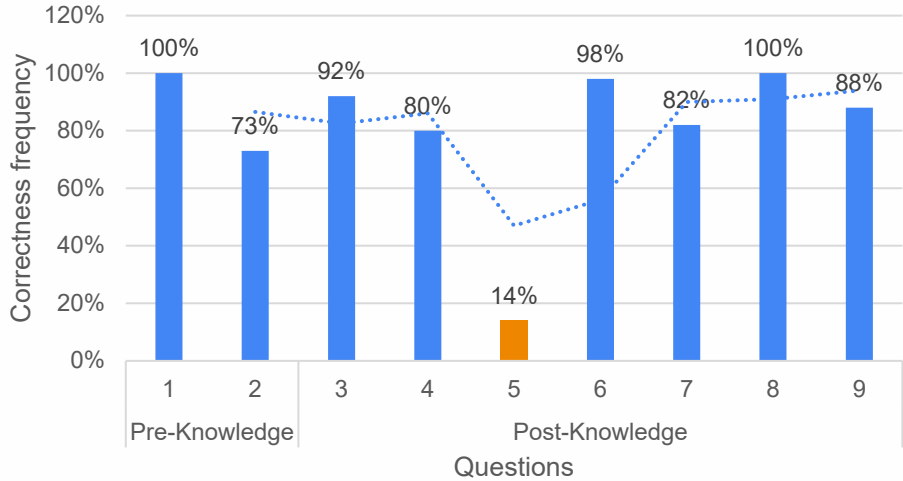


Figure 2: Q1 Human Factors Management results for All Operators

Figure 3: Q2 Human Factors Management results for All Operators



Table 5: The sampled Technical Awareness Workshops (SPCAM) conducted in Q1 & Q2 in the 2023/24 Financial Year

No.	Software application Questions
Pre-knowledge 1	The Act defines the SMS as...
Pre-knowledge 2	What is the overall purpose of the SMS?
Post-Knowledge 3	What are the driving processes of the New SMS and SMSR Determination?

- The bolded questions indicate the scores lower than the 60 % success factor



Table 6: The sampled Technical Awareness Workshops (SPCAM) conducted in Q1 & Q2 in the 2023/24 Financial Year (Contd.)

No.	Software application Questions
Post knowledge 4	How many main elements are there on the SMS wheel?
Post knowledge 5	How many sub-elements are there on the SMS wheel?
Post-knowledge 6	What are some of the components to be considered in management commitment?
Post-knowledge 7	Interface Risk Assessment is to ensure that two or more operators identify interface risks
Post-knowledge 8	One of the roles of the organisational structure is
Post-knowledge 9	The Risk management policy and processes provide detail of the principles and means by which the organisation will enact the management of assets.
Post-knowledge 10	Part of the workload planning is to ensure that the volume of tasks to be completed is not excessive at times when a safety-critical task being carried out.
Post-knowledge 11	The following should be included into the Annual Safety Improvement Plan (ASIP).



SPCAM RESULTS COMPARED

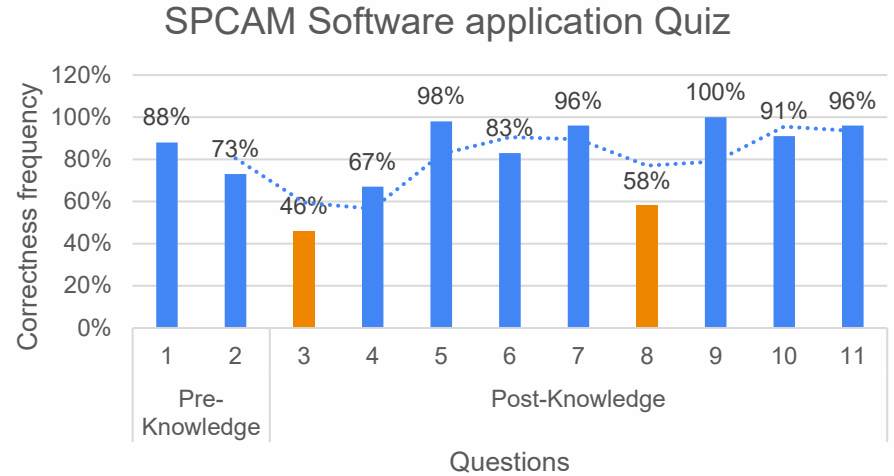
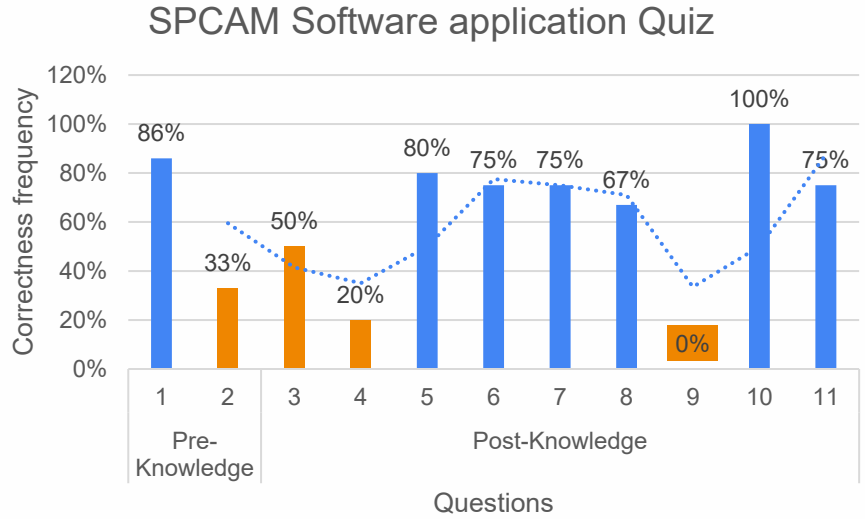


Figure 4: Q1 SPCAM results of the Free State Operators

Figure 5: Q2 SPCAM results of the Gauteng Operators



DISCUSSION

- Outcome 1:** There was greater attendance of the HFM Technical Awareness Workshops than the SPCAM Technical Awareness Workshops.
- Outcome 2:** The use of Software applications is the first of its kind in Technical Awareness Workshops.
- Outcome 3:** Positive response in terms of the reaction to the Technical Awareness Workshops.
- Outcome 4:** Positive shift in learning taking place, with an increase in learning post the knowledge sharing.

DISCUSSION (Contd)

Based on the use of the Software application the following was observed:

- When utilising the Software application, it is embedded into the training.
- Provide immediate feedback.
- Software applications used for training encourage engagement and interaction, virtually and in person.
- It reinforces learning.
- It reveals the areas of improvement in terms of the formulation of the questions.
- It reveals the areas of improvement for the trainer.
- Technical workshops provide a baseline analysis of the Technical Awareness Workshops and what needs to be done in the future.
- Therefore, the current Technical Awareness Workshops provide a better model of assessing engagement and interaction in the future.

BENEFITS

The benefit of the changes made to the Technical Awareness Workshops administration methods is:

For the Regulator

- ✓ Tracks the progress of knowledge dissemination.
- ✓ Assists in further analysing industry trends and identify areas that may need further intervention.



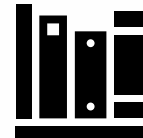
For the Industry

- ✓ Assists in consuming and retaining presented regulatory tools with increased participation.
- ✓ Better understanding of regulatory tools leads to improved process compliance.
- ✓ Assists the operators in reflecting on their processes and areas of improvement.



Adding to the body of knowledge

- ✓ Research.



LIMITATIONS

A time limit was placed for each question, meaning:

- i. The measure from all participants was not obtained.
- ii. The time pressure might add to the decrease in the quality of responses from participants because of the inability to read the question in that time.
- iii. The formulation of the questions themselves.
- iv. There may not be an equal number of responses for each question may not have been received based on the number of participants.

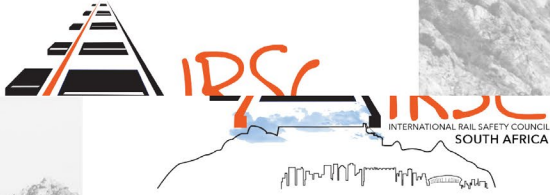
FUTURE LEARNINGS & ADJUSTMENTS

There is potential in making use of the Software application tools by:

- i. By ensuring that all attendees respond to the Software application questionnaires.
- ii. The participants will adjust to the time factor.
- iii. Assessing reaction, learning, and conveyance of information.
- iv. Assesses the areas of improvement within the Operators' Safety Management System and understanding of the regulatory knowledge and tools.
- v. The inclusion of a practical aspect of the training that can be embedded in the HFM and SPCAM Technical Awareness Workshops, and for the other Technical Awareness Workshops.
- vi. Inclusion of virtual reality and practical assessments during the technical awareness workshops.

The Outcome Achieved is the Effectiveness of Technical Workshops in South Africa.





www.irsc2023.com

HOSTED BY



RAIL SAFETY ON THE RIGHT TRACK

