



## **“NEXT-LEVEL” COMMUNICATION: A CRITICAL ROLE OF RISK MANAGEMENT – (AB 1017)**

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### **Summary**

This paper explores the critical role of communication in managing risks, particularly when the key stakeholders are diverse and varied in terms of mandate and level of interest in the issue. It does this by employing the Plan-Do-Check-Act principles in order to drive stakeholder communication that influences buy-in, as well as tracks the implementation of agreed action plans in order to achieve the desired change, thereby reducing or eliminating the risks identified.

This paper offers a model of stakeholder communication by using the National Level Crossing Technical Committees in South Africa as a case study. The Committees were established by the Railway Safety Regulator of South Africa in April 2015 to mitigate the risks at problematic level crossings throughout the country. The Committees are also used by the Regulator to monitor compliance to the Level Crossing Standard which aims to address any ambiguity regarding maintaining the crossings. Using the case study, the paper looks at the critical role of communication in driving change to mitigate the risks at some of the problematic level crossing.

In addition, lessons learnt – as part of the improvement process – are discussed in the paper. A key element of the paper looks at the process of communication from planning, implementing, and monitoring progress, right through to taking action based on lessons learnt. The model offered can therefore be used for communication to support the mitigation of risks of small groups of stakeholders with the same interest, to

large-scale programmes involving multiple and varied stakeholders with different mandates and interests. Best of all it is a model that encourages continuous improvement and can be customised and improved by any organisation that uses it.

## **Notation**

The Committees:	National Technical Level Crossing Committees
Financial Year:	01 April to 31 March
RSR:	Railway Safety Regulator of South Africa
The Act:	National Railway Safety Regulator Act No 16 of 2002, as amended
The Regulator:	Railway Safety Regulator of South Africa

## **Introduction**

The South African rail industry is rapidly developing due to substantial investments in commuter, freight rail infrastructure and new rolling stock. Such rapid developments require an engaged, informed, vigilant, engaging and connected Regulator whose approach matches these large-scale upgrades and expansions. To respond to these developments, the RSR has moved from a compliance-driven approach to a risk-based, collaborative and outwards-focused results-based approach. In line with the 80/20 principle, the RSR focuses on high-risk areas to target those that will achieve the greatest impact. This approach also supports the Regulator's vision of zero occurrences; a commitment to drive the number of occurrences down and make railway operations free of incidents and security related issues. As stated in the RSR's Strategic Plan [1] and Annual Performance Plan [2], "the focus on zero occurrences is a proactive approach to significantly reduce the number and frequency of operational occurrences and security incidents in order to promote rail as the preferred mode of transport in South Africa. It is about influencing a mind-set, embracing and living a value, setting an ideal goal and bringing about a culture change in the railway industry".

This paper, therefore, looks at the critical role communication plays in managing risks. It does this by first giving background on level-crossings in South Africa, level crossing occurrence statistics as well as the challenges faced by South Africa in dealing with these types of occurrences. It then takes a closer look at the National Level Crossing Technical Committees established by the RSR as a forum to bring together stakeholders to mitigate the risks associated with level crossings. It then zooms in on the role of communication in bringing together the diverse stakeholders. It also focuses on the role of communication in risk management in the Committees as well as ensuring that stakeholders deliver on agreed action plans, in addition to providing feedback and monitoring the progress made on corrective measures. The paper also provides a model for communication which can be applied in any context in order to achieve results-driven communication. Lastly, the lessons learnt in the Committee are discussed.

## **Background**

The impact of economic and spatial developments in South Africa has resulted in a changed railway landscape. The growth of mining areas in close proximity to railway lines in some provinces, namely Limpopo, Mpumalanga, North West and Northern Cape, has led to increased volumes of trains on these lines. There has also been an increase in the number of informal and formal settlements in areas such as Brits and Rustenburg in North West. In other areas such as Muldersvlei, Langeenheid and Paarl in Western Cape, Hammanskraal in Gauteng and Klaarwater, Pietermaritzburg in KwaZulu-Natal, rapid growth in

settlements (informal in most instances) in close proximity to the railway lines, has also resulted in an increase in the number of vehicles crossing the railway lines [4].

Historically, the design and commissioning of level crossing in the South African Railway industry was done without any formalised railway standard or guideline. The level crossings that were commissioned more than 40 to 50 years ago were done in line with the Department of Transport Guideline for Signage at Level Crossings, known as Chapter 7 Volume 2. This guideline did not provide for any form of life cycle planning or assessment of the intended level crossing. Therefore, some of the level crossings were not designed with future expansions of vehicle and train volumes in mind [3].

In most instances, the level crossing designs do not keep up with the requirements of the rapidly changing environment. Maintenance of such level crossings is also not done on a regular basis. The RSR occurrence investigations reports of level crossings have highlighted, among others, the following root causes;

- Poor maintenance;
- Lack of monitoring of level crossings in terms of changes in volumes and types of vehicles; and
- Changes in the rail volumes.

It has also become evident that the motorists' behaviour of not abiding by the rules of the road, as well as municipalities not providing adequate road warning and/or markings for level crossings further increased the risk of level crossing occurrences. Of more concern, however, was the lack of communication among key stakeholders who all had a responsibility in ensuring that level crossings are safe and secure at all times.

For instance, when there are developments close to a level crossing which might directly or indirectly impact on safety, affected stakeholders would need to communicate such to all affected parties. An example of this is a level crossing which was designed in 1967 to give access into a farm with a traffic volume of 20 cars a day. Forty years later, with urbanisation and developments in the area, the crossing's surroundings have changed dramatically as a residential area, shopping centre and other amenities have been added in the area. All these elements will result in more vehicle traffic on the crossing, which the old design does not cater for. This is a risk because the crossing does not meet the needs of the area around it. Communication and stakeholder engagement is, therefore, critical in bringing all these stakeholders together to address the risks at the crossing.

It is in the light of all these challenges that the RSR embarked on an exercise to establish a comprehensive database of all existing authorised level crossings in South Africa. The Regulator requested all operators, where applicable, to provide details pertaining to the location and design of the level crossing and the relevant parties involved. To date, the response received from various operators indicate that there are at least 9 767 authorised level crossings in South Africa.

### **Level crossing occurrences in South Africa**

Though the total number of level crossing occurrences are low in comparison to other types of occurrences (Figure 1), the emotional impact of such occurrences is very high. This is due to the fact that these occurrences usually affect members of the public travelling to their places of work or school, which provides immediate opportunity for media attention and negative publicity regarding the railway industry. Therefore, the reduction of level crossing occurrences sends a positive message to the public and the media that the Regulator and the rail industry are working hard to ensure safety in railways.

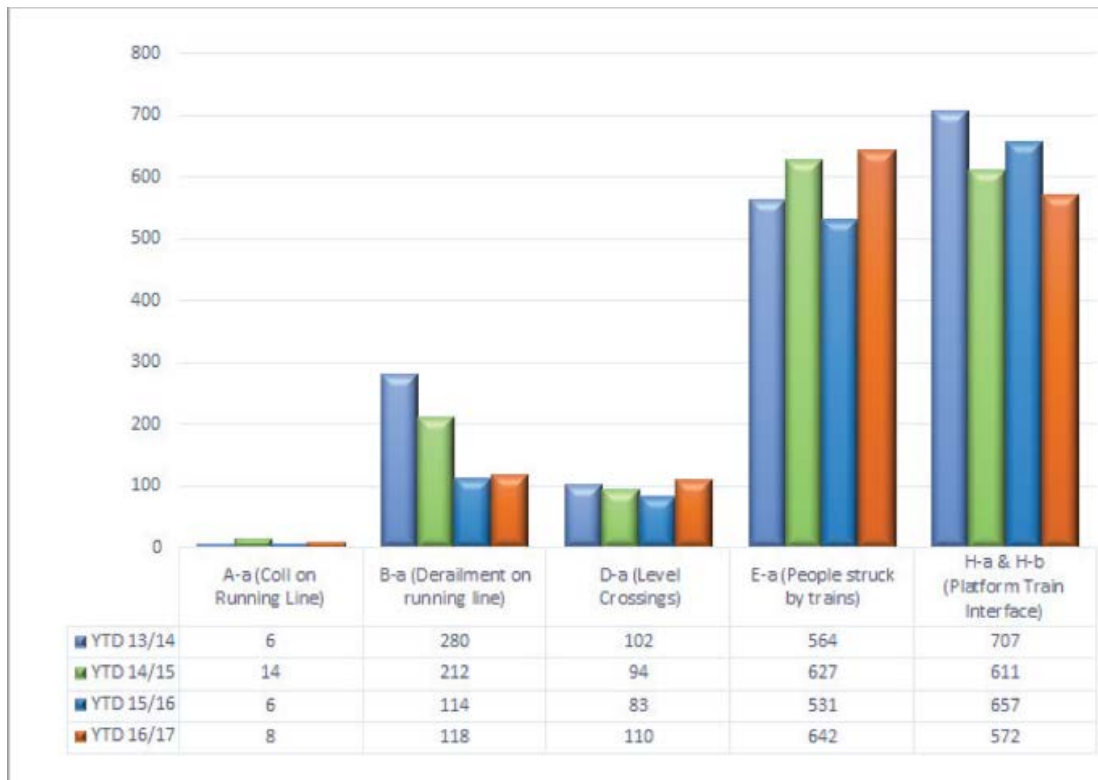


Figure 1: Comparison of occurrences in each category from 2013/14 – 2016/17 from the State of Safety Report 2016/17 [8]

### Establishment of national level crossing technical committees

October is recognised as Transport Month in South Africa. During the Transport Month in 2014, the RSR hosted a level crossing safety awareness campaign in the Western Cape which was attended by the Minister of Transport. A number of challenges were raised with the Minister during the campaign, which among others included the misalignment between rail and road authorities in terms of roles and responsibilities when dealing with level crossings. This was caused mainly by lack of communication among stakeholders responsible for level crossing safety.

It was after a level crossing campaign that the then Minister of Transport in South Africa suggested that the Regulator bring together all stakeholders involved in the management and maintenance of level crossing to come up with solutions to reduce the number of these occurrences. And this is how the Level Crossing Technical Committees were born. A resolution was then taken that the RSR should establish a project of identifying level crossing “high-frequency areas” nationally and to recommend possible solutions and plans to address the identified “high-frequency areas” per province.

In providing the necessary support as the Regulator, the RSR was requested to form Level Crossing Technical Committees in each of the nine provinces of South Africa. The composition of the Committees would include all the relevant road and rail role players to address the safety challenges. Part of the Committees’ responsibilities was to develop mitigation plans and ensure implementation of the plans in rectifying the safety threats identified at the various level crossings. These included [3]:

- Identification of the high-risk level crossings in the province. This is done by means of an historic analysis of occurrences and fatalities over a period of 5 years.

- Physical inspection and risk assessments conducted on site at each of the identified high-risk level crossings to determine:
  - a. Train and vehicle volumes,
  - b. Visibility,
  - c. Minimum level of protection required,
  - d. Current condition of level crossing,
  - e. Gaps in protection,
  - f. Corrective actions required, and
  - g. Responsible entity, that is, rail or road authority.
- Compile action plan with target dates and deliverables.
- Continued monitoring of level crossing occurrences to identify future areas to be addressed.

All the nine Committees constitute what is now called the National Level Crossing Technical Committees. Details regarding the stakeholders involved in the Committees and the role they play is provided in Table 1.

*Table 1: Composition of the National Level Crossing Technical Committees*

<b>Stakeholder</b>	<b>Role in the Committee</b>
Railway Safety Regulator of South Africa	<ul style="list-style-type: none"> <li>• Coordination of the Committees</li> <li>• Ensuring compliance of the Level Crossing Standard</li> <li>• Monitoring progress on the implementation of the action plans</li> <li>• Conducting public education and awareness</li> </ul>
National Department of Transport	<ul style="list-style-type: none"> <li>• Guidance on government policy</li> </ul>
Provincial Departments (Roads and Related matters)	<ul style="list-style-type: none"> <li>• Responsible for the maintenance of the road reserve at a level crossing/ compliance to the Level Crossing Standard.</li> </ul>
Other National and Provincial Departments as identified, e.g, Human Settlements	<ul style="list-style-type: none"> <li>• Responsible for spatial planning and land use issues that might impact on safety at level crossings e.g. informal settlements on the rail reserve</li> <li>• Public education and awareness</li> </ul>
Municipalities	<ul style="list-style-type: none"> <li>• Responsible for the maintenance of the road reserve at a level crossing and spatial planning</li> <li>• Public education and awareness</li> </ul>
Network operators (commuter and freight)	<ul style="list-style-type: none"> <li>• Responsible for the maintenance of the rail reserve at a level crossing/ compliance to the Level Crossing Standard/Design of the level crossing</li> <li>• Public education and awareness</li> </ul>
Other organisation as identified by the committee, e.g. Commuter Forums	<ul style="list-style-type: none"> <li>• Representing the interests of the interested or affected stakeholders on level crossing safety.</li> </ul>

## The role of communication in risk management

Communication is the glue that binds stakeholders together to an agreed objective. The identification and initial engagements of stakeholders for participation in the Committees revealed that all stakeholders were aware of their responsibilities towards ensuring safety of level crossings. However, because there was no one taking overall responsibility of coordinating individual stakeholders' contributions; no effort was made in mitigating the risks at level crossings. Communication, therefore, played a critical role in getting all relevant stakeholders involved in addressing the risks at level crossings in South Africa.

Covello [6] defines risk communication as the “process of exchanging information among interested parties about the nature, magnitude, significance, or control of a risk”. In establishing and coordinating the National Level Crossing Technical Committees throughout the country, communication played a central role and included the following:

- Identifying stakeholders;
- Inviting stakeholders to a discussion;
- Informing stakeholders about the purpose of the Committees;
- Collectively identifying risks at level crossings;
- Agreeing on action items to address and mitigate the risks, and
- Ensuring compliance to Level Crossing Standard [5], the National Road Transport Act and other applicable legislation.

The RSR is guided by the PDCA (Plan, Do, Check, Act) principles in communicating with stakeholders in the Committees (Figure 2). This methodology defines the four essential steps that should be carried out systematically to achieve continuous improvement. This is described as a continuous way to improve the quality of products and processes in order to decrease failures, increase effectiveness and efficiency, problem solving and to avoid potential risks.



Figure 2: The Deming Cycle is a continuous quality improvement model consisting of a logical sequence of four repetitive steps for continuous improvement and learning [10]

In addition, The RSR's work aimed at achieving its vision of "zero occurrences" is supported by three key pillars:

- **Education:** We provide access to railway safety related information and knowledge; conduct campaigns; create awareness and influence the perception and behaviour of the public.
- **Enforcement:** We conduct audits, inspections and investigations and we hold the railway industry accountable for achieving excellence in safety.
- **Engineering:** We promote the use of safer technologies, influence investment plans, evaluate strategic projects and research solutions to address safety challenges.

This model can, therefore, be adapted to demonstrate the planning, implementation, monitoring and evaluation of the work done by the Committees.

### The RSR's model of result-driven communication

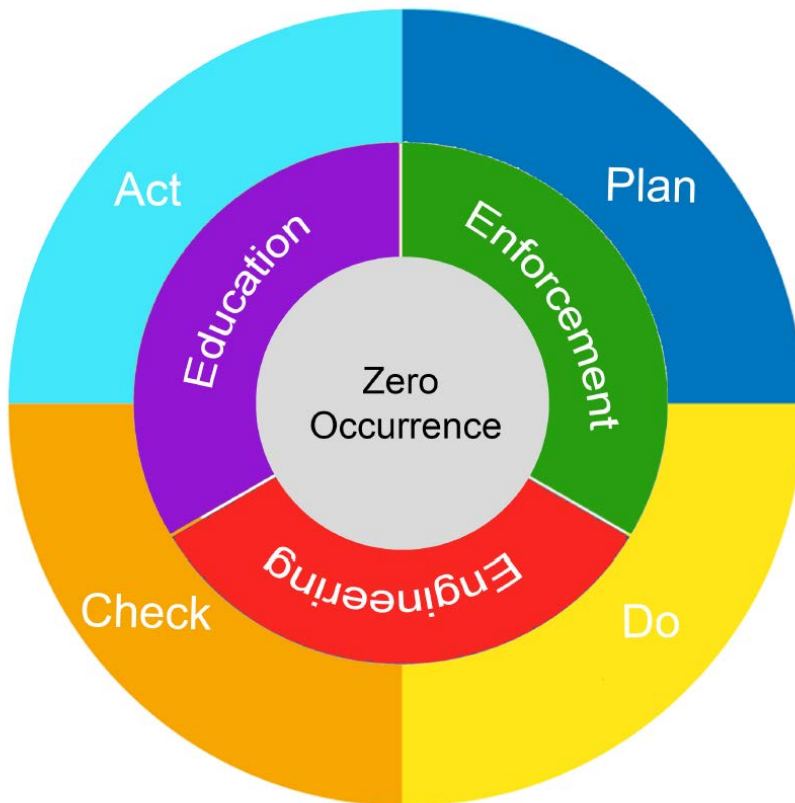


Figure 3: RSR model for results-driven communication

#### Plan

During the Committee meetings, a standard agenda was followed and it highlighted the following items:

- Level crossings' occurrence statistics or hotspot level crossings per province;

- Root causes for the occurrences;
- Authorities responsible for those level crossings; and
- Action plans on how to address the risks.

It is during this planning stage that more stakeholders are identified and invited to the Committee, in line with their role on the level crossings. Action plans with timelines are also agreed on, which are then monitored by the Media and Communications Department at the RSR and followed up in the next meeting). The table provides an example of findings and the action plans from a level crossing investigation report.

*Table 2: Example of findings from a level crossing investigation report*

Crossing Name	Network	Description of Crossing	Date of Occurrence	Findings of Investigation
Stellenbosch (Bergkelder)	PRASA	<ul style="list-style-type: none"> <li>• Single line</li> <li>• Flashing lights and short booms</li> <li>• Adequate signage</li> <li>• Very awkward layout</li> <li>• Vehicles enter/exit Bergkelder</li> <li>• Heavy vehicular and pedestrian traffic</li> </ul>	17 January '15 Investigation	<ul style="list-style-type: none"> <li>• Long vehicles leaving Bergkelder block the access road and have to ignore the stop sign to clear the road.</li> <li>• Numerous pedestrians use the crossing</li> <li>• The crossing is very close to the main road</li> <li>• Booms were inoperative at the time of incident.</li> <li>• No flagman despatched at the defected booms</li> <li>• High level on non-compliance by road drivers</li> </ul>
Eerste River (Lafarge)	PRASA	<ul style="list-style-type: none"> <li>• Single line</li> <li>• No protection</li> <li>• Signage in place</li> <li>• Gradient on road</li> <li>• Heavy road traffic</li> </ul>	20/6/13 Inspection	<ul style="list-style-type: none"> <li>• High level of non-compliance by road drivers</li> <li>• Road markings faded</li> <li>• Road surface uneven</li> <li>• High volumes of heavy road traffic</li> <li>• Significant gradient on road</li> <li>• Train drivers do not comply with siren sounding</li> </ul>

*Table 3: Example of action plans based on level crossing investigations reports*

No	Action	Responsible	Target date	Status	Update
1	Level Crossing inspections to be conducted at identified level crossings	RSR	Quarter 4	1 outstanding  RSR to have a risk assessment at Marikana level crossing, all stakeholders to be invited	Marikana assessment scheduled for 11 Feb 2015
2	Statistical Update to be provided	RSR	Quarterly	Q4 to be provided in the Q4 meeting.	Included in presentation
3	Terms of Reference to be approved	All	Quarter 3	Draft circulated for comments within 14 days.	No comments received. Matter to be finalised
4	Level Crossing study report to be provided to all meetings members	RSR	Quarter 3	Draft report provided distributed for comments Circulated by memory stick after the meeting.	No comments received. Final report submitted to RSR CEO for approval
5	City of Cape Town's Study on level crossings to be circulated.	RSR	Quarter 3	Comments to be sent within 14 days.	No Comments received



No	Action	Responsible	Target date	Status	Update
6	Awareness campaign planning to be provided by RSR for possible joint venture	RSR	Quarter 4	TFR has organised a LX campaign at Marikana for 11 November 2015	Feedback to be provided
7	Critical Stakeholders to be invited in the next meeting: -SANRAL -Provincial departments -Mines - RTMC	All	Ongoing	Mines still put aside for now, until all District Managers are involved. RTMC to be included as a stakeholder. Mr Van Wyk to use an existing platform to invite the RTMC	
8	Booklet on all roads within North West	NWDRPW		To be made available.	

### Do

In order to expedite the implementation of action plans, the Committees often decide collectively which level crossings to visit and inspect. The level crossings are selected based on their risk profiles and recorded occurrences. As explained in the planning stage, the results of the inspection are communicated to the Committee and allocated to the responsible authority for implementation. Where there is uncertainty in terms of responsibilities (that is, road authority versus rail operator), the Level Crossing Standard plays a crucial role in clarifying the responsibilities of each authority [5].

The Committee also embarks on public education and awareness campaigns. This is normally prompted by the geographical location of a level crossing; if a level crossing is next to a residential area, industrial site or any activity that might increase traffic on the rail-road interchange.

During the campaigns, pedestrians and motorists are educated on how to cross at level crossings and what to do when a train is approaching. According to the Federal Railroad Administration (FRA) statistics [9], Operation LifeSaver (OLI) – a non-profit public safety education and awareness organisation based in the US – managed to reduce the number of level crossing collisions annually by 83% from approximately 12 000 in 1972 to approximately 2 025 incidents in 2016. This indicates just how important public education and awareness is. The RSR has since signed an MOU with OLI and hope to collaborate on initiatives that reduce the number of level crossing occurrences in South Africa.

### Check

After allocating tasks through action plans and conducting safety campaigns, the Committees meet again in the next quarter to track progress on the tasks allocated. Again, communication is crucial in these meetings. Network operators and road authorities give feedback reflecting achievements and challenges on the tasks allocated. Achievements in this regard can only be measured in one way, and that is the reduction in level crossings occurrences. Challenges are then discussed in the committee and this creates opportunities to benchmark best practice. Figure 4 provides a statistical representation of level crossing

occurrences from the 2010/2011 financial year to the 2015/2016 financial year. It is worth noting that the Level Crossing Technical Committees were established in the 2015/16 Financial Year:

## Comparative Analysis

Total Number of Level Crossing Occurrences  
(All Cat D)  
April 2010- Mar 2016

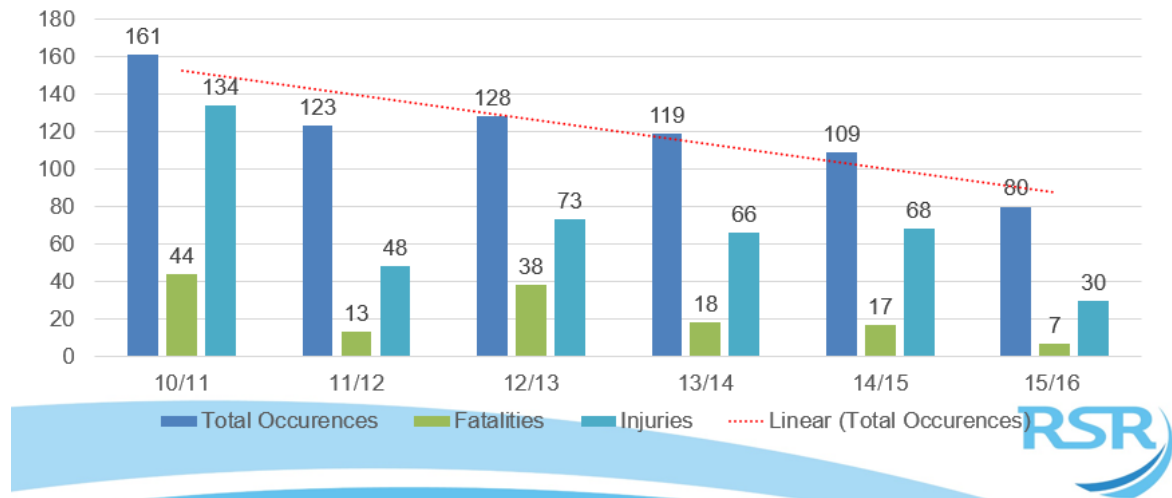


Figure 4: Level crossing occurrences (national) from 1 April 2010 to 31 March 2016

### Act

As mentioned in the introduction, the rail environment is rapidly changing and will continue to do so in the years to come. What is a risk today might not be a risk tomorrow, hence the Committees continue to meet on a quarterly basis to discuss current and potential risks at level crossings. The 2016/17 State of Safety Report has shown an increase in the number of level crossing occurrences which have been on a steady decline year-on-year. Level crossings occurrences are up to 119 from 87 in the 2015/16 Financial Year, which represents a 27% increase [8]. The spike can be attributed to a number of factors, including the increase in freight and road traffic volumes. These factors combined have shown internationally that they increase the risk of occurrences.

Given the success rate of the Level Crossing Technical Committees approach, it is now easier to analyse the root causes of occurrences at problematic crossings and to develop mitigation plans to address the risks. The approach has also made it easier to identify where the focus of awareness campaigns and communication should be. The Report [8] which was only released this month is an important measuring tool for the Committees as it provides an indication of where to intensify current efforts and to look for innovative ways to curb the rising number of level crossing occurrences.

The model for communicating risk can be used to mitigate any identified risks regardless of the number and diversity of stakeholders. The RSR used the model in dealing with level crossing occurrences, however, the model can be used to bring together stakeholders to mitigate any type of occurrences. The important factors to remember are that the role of each stakeholders in the Committee must be identified and communicated clearly in line with their mandate in order to ensure buy-in and ownership. Monitoring of action plans also plays a key role in ensuring stakeholders deliver on set objectives as well as remain motivated in executing their mandate, knowing that they are part of a bigger cause to improve railway safety.

## **Lessons learnt**

Given the varied and diverse nature of stakeholders involved in the Committees, most of whom rail is not their core business, it is important to maintain communication so that all parties keep the commitments made in the process. Any lapse in communication; or change that affects the way the committee operates has far reaching consequences.

The RSR's State of Safety Report 2016/17 has shown an increase in the number of level crossing occurrences from 80 level crossing occurrences in the 2015/16 Financial Year to 110 in the 2016/17 Financial Year [8]. Changes in freight and road traffic volumes, as well as the increase in urbanisation, have been shown internationally to increase the risk of level crossings occurrences. In addition, one of the challenges encountered by the RSR in its role as coordinator of the National Level Crossing Committees was the difficulty in convening meetings following the Local Government Elections in 2016. With changes in leadership, the representatives of the Committees were either changed or moved to deal with other challenges. As a result new or alternating representatives were offered, making it difficult for the Committees to hold the stakeholder responsible for not delivering on agreed objectives. The Committees are looking at having more than one representative per stakeholder group so that continuity is maintained.

Communication also plays a critical role in keeping Committees committed to their objectives. Any lapses in communication also affect the speed of execution of action plans. Communication and monitoring, therefore, plays a key role in ensuring that stakeholders deliver on their objectives.

## **Conclusion**

As this paper has demonstrated, communication plays a critical role in managing risk in the National Level Crossing Committees in South Africa. All stakeholders are brought together and encouraged and inspired to work together to reduce level crossing occurrences through a process of constant and targeted communication. Action plans are monitored and an evaluation is conducted regularly to ensure that stakeholders are on track with the action plans. However, any changes in leadership and priorities affects the work of the Committees, thereby compromising safety at Level Crossing Committees.

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