

REGULATING RAILWAY SAFETY IN AN ENVIRONMENT CHARACTERISED BY CHANGE

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SUMMARY

This paper begins by discussing how global economic shifts have reshaped the ways in which Governments have addressed their regulatory challenges in the rail transportation sector. Lessons learnt from these changes suggest moves away from the more traditional styles of regulating to more participatory ‘meta-regulatory’ approaches that rely on innovative market mechanisms to achieve broad safety goals. By examining the evolution of rail transportation in South Africa, the paper revealed that rail reformations were politically driven and performed in the absence of an independent safety and economic rail regulator, a National Rail Policy and impact assessments. The paper also established that the conceptualization and establishment of the national Railway Safety Regulator (RSR) and the imminent implementation of rail revitalization and economic reform initiatives have been performed in the absence of objective policy reviews and impact studies. These challenges contextualised the need for the RSR to review the adequacy of its regulatory approach. The review of the RSR’s regulatory approach focused primarily on its ability to contribute to a modern, flexible and efficient regulatory regime that supports continued improvements of safe railway operations. It drew heavily from reviews and impact assessments of regulatory frameworks and approaches conducted in the OECD (Organisation for Economic Development) countries, in particular Canada and Australia. The underlying argument advanced in this paper is that the RSR’s regulatory approach should take into account the country’s socio-economic disparities. The instruments and approaches used to regulate safety should reflect this disparity for the regime to be sufficiently flexible, efficient and reflective to successfully cater for the country’s existing challenges and to allow the regulatory regime to adapt to changes in the external environment whilst ensuring safety in the rail transportation sector.

INTRODUCTION

Throughout the world rail regulatory regimes are characterised by change – a change that is mirrored in global economic shifts from the industrial era where the focus was on the production of goods to the information and knowledge economy where emphasis is placed on service provision. Railway restructuring has resulted in new roles for public rail safety regulators. The challenges presented by these new roles raise questions about the suitability of existing rail regulatory regimes. Different countries have addressed these questions in different ways that reflect their constitution, history and their railway industries.

Regulatory Trends in the Global Industry

Economic growth is based on an increased supply of transport overall. How this supply is met depends on the country’s transport infrastructure, patterns of consumer behaviour and state of socio-economic development [12]. The demand for more reliable and efficient forms of transportation, coupled with substantive investments in roads and airlines, have forced the world’s railways to undergo a dramatic series of changes during the last two or three decades of the 20th Century and the opening of the 21st [12]. Nearly every country experienced its own version of what the World Bank called “the Railways Problem” [12]. Years of mis-regulation and political interference resulted in railways being unable (and in some cases unwilling) to respond to economic and political changes. Prior to these reforms, the author found that neither the exact role of rail within transportation agendas nor the cost of having them play that role was clear despite being perceived as being “essential” to the economy.

The economic pressures of globalization coupled with the need to provide safe, reliable and efficient long distance transportation for people and freight across political borders to facilitate national and international trading have forced numerous countries to reconsider their railway regulatory regimes and operating practices to meet their current social and economic challenges. With most of the major economies adopting

more liberal and commercially driven approaches in response to these challenges, concepts and methods of transport regulation have had to change accordingly since these economies drive the demand for transportation, both in total and modal share. The change in global economics witnessed shifts, albeit slow, in political philosophies concerning the role of open markets as opposed to command-and-control management as well as the roles and responsibilities of the private sector as opposed to the public sector. These shifts in regulatory paradigms accompanied numerous rail reformation initiatives. As opposed to focusing on ensuring and enforcing safety compliance, the newer approaches tend to focus on providing mechanisms and processes that can influence the internal regulatory systems of its target population.

Evolution of Rail Regulation in South Africa

South Africa was not immune to the economic pressures of globalization. However, up until very recently, reformations in the rail transportation sector were primarily politically driven with little consideration given to the role of rail in the country's social and economic development.

South Africa underwent a process of economic and structural rail reform in the 1990s with the promulgation of the Legal Succession to the South African Transport Services (SATS) Act No. 9 of 1989. SATS was strongly centralised and inwardly focused to marshal all of the State's resources and limit access to outside information [12]. The Legal Succession to the SATS Act No. 9 of 1989 made allowances for the corporatisation of rail where Transnet, a corporate government company and single shareholder came into effect. Transnet was largely self-regulating by default due to its market dominance and was responsible for rail economic and safety regulation as well as infrastructure maintenance and provision. However, despite having had access to all the economies of scale and despite the opportunities that the 'unification' of rail and ports (and pipelines) could arguably offer, Transnet was found to be inefficient, inadequate with respect to service delivery, and incapable of maintaining its assets properly [12].

The absence of the market mechanisms in rail transportation to allocate resources efficiently to maximize social welfare gave rise to the concept of a single national rail regulator. The rail regulatory model that was decided upon focused exclusively on safety. Safety not only confers a competitive advantage on rail as a mode of land transportation but is also a basic human right. Thus, an organ of State was required to oversee, promote and ensure safety in the rail transport sector. In addition, legislation governing the regulation of the rail transport sector was needed as neither the Occupational Safety and Health Act (Act No. 85 of 1993) nor the Mine Health and Safety Act (Act No. 29 of 1996) comprehensively addressed the safety risks associated with rail operations. In developing a rail regulatory framework, Canadian support via CIDA (the Canadian International Development Aid Programme) was provided¹. With Canadian assistance, the first phase of identifying a suitable regulatory framework and approach was put into motion. Based on the Canadian experience, the planning committee opted for a railway safety regulatory agency that resided outside the Department of Transport (DoT). The rail regulatory legislative framework was envisioned to optimise railway safety through²:

- *the consistent application of standards for regulating operators;*
- *the dissemination of rail safety performance information in annual State of Safety Report publications where occurrences were listed and risk reduction was assessed with the aid of trend analyses;*
- *determining acceptable levels of risk as opposed to tolerable levels of risk; and*
- *promoting a culture of safety as opposed to a command-and-control culture of enforcing with the aid of punitive measures.*

The Railway Safety Regulator came into effect when the National Railway Safety Regulator (NRSR) Act No. 16 of 2002 (subsequently amendment in 2008 and hereafter referred to as the NRSR Act) was promulgated on 20th September 2002. The basic principle introduced by this Act is that railway operators are primarily responsible and accountable for the safety of their own operations, whilst the regulator must retain the power to protect people, property and the environment by ensuring that the railways operate safely within a national framework. The NRSR Act reflects a move towards more flexible schemes in public intervention where the role and responsibility of railway operators in ensuring safe railway operations is prioritised.

Purpose of the Regulatory Review

Despite the development and existence of various policy documents (namely, the National Development Plan (NDP), The National Growth Plan, the White Paper on National Transport Policy, the National Rail Policy Green Paper, etc.) that allude to the role of rail in supporting and facilitating socio-economic growth

^{1, 2} Derived from interviews with one of the RSR's founding members.

and development, there still exists no clear and unambiguous political directive that examines how rail, together with other transport modes, will be positioned within South Africa's economy and the costs involved in fulfilling this directive. Despite this, South Africa is in the process of revitalizing and transforming its rail transport sector in order to make rail a more competitive mode of land transportation, to maximize social welfare and to contribute to the country's, as well as the South African Development Community (SADC) region's economic growth and development strategies and plans.

Given the need to revitalize rail infrastructure and reform rail operations and governance, it has become imperative to critically review the Railway Safety Regulator's (RSR) regulatory regime to develop an implementation approach that best supports the revitalization and restructuring processes underway whilst ensuring the integrity of railway safety. The OECD experiences in rail reformation revealed that some countries changed their regulatory structures or procedures at the start of rail restructuring processes in anticipation of possible safety problems and that these changes may have helped prevent what might otherwise have been deterioration in safety performance. In other countries, changes occurred only after rail systems and structures were reformed.

To achieve this aim, the review concentrated on ascertaining whether the RSR's current approach to regulating railway safety is conducive to facilitating a modern, flexible and efficient regulatory regime that ensures the continuing improvement of safe railway operations by critically examining its current regulatory regime. The outcome of this review was to forward recommendations for strengthening the RSR's regulatory approach.

SOUTH AFRICA'S CURRENT RAIL REGULATORY REGIME

Regulatory Framework

The RSR is primarily responsible for the independent safety regulation of railway operators within the South African railway industry. The NRSR Act reinforces this principle by providing for the development of regulations and industry standards that can be legally recognized as equivalent to regulations (in the absence of a regulation) through approval by the Minister. However, it should be noted that the NRSR Act does stipulate in Subsection 5 of Chapter 1 that regulations take precedence over standards: "Any regulation made under this Act prevails over any standard adopted by the board under section 29 (2)". The advantage of having an Act that makes provision for the development of standards is that standards may be adapted according to the needs of different railway operators and may be developed and approved more quickly than regulations, hence affording the regulatory regime a greater degree of flexibility. However, given the relative weight of regulations, standards should not be used as substitutes for regulations but rather to further develop (and inform) regulations.

In accordance with the NRSR Act, the RSR's operational legislative mandate is to give effect to its oversight function, promote improved railway safety performance, monitor and ensure compliance, and to develop regulations. Emphasis is placed on the NRSR Act's requirement for the RSR to facilitate a modern, flexible and efficient regulatory regime that ensures the continuing enhancement of safe railway operations since this objective forms provided the review with a point of departure as well as context. The strength of the NRSR Act is that it allows for an approach that is sufficiently adaptive to positively respond to a country's economic, social and political pressures and challenges.

Application and Interpretation of the NRSR Act

South Africa's Constitution supports a purposive approach to the interpretation of its legislation. This approach encourages the use of a wide range of both internal³ and external⁴ aids when interpreting the NRSR Act. Thus, the interpretation of the RSR's mandate within the context of the Act's purpose, must take into account, among others, the Bill of Rights, the National Transport Rail Policy, the National Development Plan, and other relevant policies and legislation e.g. the Occupational Safety and Health Act, the National Environmental Management Act, etc. By including both internal and external factors in its interpretation, the NRSR Act makes allowances for the safety of workers, the safety of the public and the safety of the environment associated with railway operations as per its preamble "*recognizing that safe railway operations are fundamental to the safety of all persons and the environment*". The use of the phrase 'safe railway operations' means that the NRSR Act addresses the safety of people and property transported by railways as well as the safety concerns of people, property and the environment in close proximity to railway operations.

³ Internal aids comprise the legislation under review and all its parts.

⁴ External aids refer to legislation and national policies outside the text of the legislative literature under review. The stipulates in the Bill of Rights (s39(2) of the Constitution) must be factored into the interpretation.

An examination of the RSR's oversight role established that the term 'oversight' functionally implies that of managing, directing, controlling and guiding. The RSR is therefore legally responsible for the management, control, guidance, and directing of safety operations within railways thereby making train operators directly accountable to the RSR with regards to their safety performance and management rules, policies, procedures and systems. The RSR's oversight function, coupled with its directive to promote improved safety performance in the rail transport sector, facilitates the provision of a modern and flexible regulatory approach in that the RSR does not have to rely solely on command-and-control enforcement regulatory instruments and mechanisms to achieve its purpose but it affords the Regulator the freedom to develop a range of regulatory tools and techniques that make use of risk-based and collaborative approaches.

The NRSR Act also clearly encourages stakeholder participation and collaboration in the rail transportation industry to facilitate and enable continuous improvements in railway safety. Managing, guiding and promoting safety performance and safe railway operations are inherently adaptive, reflective and responsive functions that require further investigation with regards to their applicability in the rail transport sector as they present the RSR alternative approaches to handling the complexities and uncertainties associated with an environment being transformed.

How Modern, Flexible and Efficient is the RSR's Regulatory Regime?

The guiding philosophy and theory of the SMS approach enables a regulatory regime to be sufficiently efficient, flexible and modern to effectively deal with emerging and often unforeseen issues that impact on railway safety. However, its ideals have rarely been realized in practice. This is because the success of the SMS approach depends on the effectiveness of the collaborative partnerships established between industry and the regulator to better manage the risks inherent in rail transport and to continuously improve safety performance. A SMS-approach to regulating railway safety requires a performance-based regulatory framework to support its implementation [11]. The effective governance of SMS in conjunction with the institutional arrangements in place to support a performance-based regulatory framework is essential for the success of performance-based approaches. In addition, less regulatory emphasis should be placed on penalties and other forms of punitiveness with more emphasis being concentrated on collaboration and relationship building and a strong impetus on building social capital within the regulator-industry network [11.]

However, the South African regulatory approach is strongly compliance driven with the over-reliance of RSR driven industry to regulate rail safety and monitor and enforce compliance. The following suite of standards have been developed and adopted by the Board of Directors under the SANS 3000 (*Railway Safety Management*) series of standards:

Part 1: General.

Part 2-1: Technical requirements for engineering and operational standards – General.

Part 2-2: Technical requirements for engineering and operational standards – Track, civil and electrical infrastructure.

Part 2-2-1: Technical requirements for engineering and operational standards – Track, civil and electrical infrastructure- Level crossings.

Part 2-3: Technical requirements for engineering and operational standards – Rolling stock.

Part 2-4: Technical requirements for engineering and operational standards – Train authorization and control, and telecommunications.

Part 2-5: Technical requirements for engineering and operational standards – Operational principles for safe movement on rail.

Part 2-6: Technical requirements for engineering and operational standards – Interoperability, interface and intraface. (In the process of being adopted)

Part 3: Railway occurrence management. (In course of preparation)

Part 4: Human factors management.

Part 5: Railway stations. (In course of preparation)

Although Parts 2-3 to 2-6 of the SANS series for Safety Management are technical standards, these standards tend to be more descriptive than prescriptive when compared with the operators Train Working Rules. The strength of performance standards, in the light of the NRSR Act's requirements for an efficient, flexible and modern regulatory regime, is that it allows railway operators the freedom to determine the best technology to meet the requirements of the established standards. This flexibility also encourages innovation within the industry. However, some of these standards are currently being reviewed with the aim of making them more prescriptive. This goes against the ethos of the SMS approach.

It should be noted that no Regulatory Impact Assessment (RIA) has been conducted to date. This would include the assessment of impacts of the SMS and its suite of standards on the efficiency, reliability and

safety of railway operations. The danger of converting from the more modern performance-based standards approach to the traditional (and increasingly outdated) form of prescriptive standards is that the flexibility of the regulatory regime will be affected. In addition, operators like Transnet Freight Rail (TFR) who have formed numerous bilateral partnership and mentorship programmes with academic institutions in both South Africa and abroad may be limited in their capacity to innovate and improve on existing patterns of understanding of how railway safety can be better managed and directed.

Safety Management System (SMS)

In Canada and Australia, SMSs are premised on performance-based approaches to continuously reduce operational safety risks. The South African SMS specifies that risks need to be reduced to *levels as low as are reasonably practicable*. The subjectivity of the unqualified term 'reasonably practicable' is worrisome as the risk levels are largely left open to interpretation. This also begs the question "reasonable for whom – the operators, the Regulator or society?". SANS 3000-1 openly acknowledges that because the costs of achieving an ideal level of safety may strongly outweigh the benefits and limit the ability of operators to operate their rolling stock, the desired outcome of the risk-based approach i.e. 'to levels as low as reasonably practicable' was purposefully intended to be interpretive. It should be noted that what is meant by the "ideal level" has neither been quantified nor specified in the SANS 3000-1 document and importantly, no cost-benefit or social impact analysis (prior to and after implementing SANS 3000-1) has ever been conducted to either corroborate or refute this statement. 'Ideal' levels of safety and acceptable risk levels in SANS 3000-1 are therefore premised on assumptions. This is further reflected in its introductory statement "...it is understood that railway operators protect their commercial and social responsibilities by running safe railways" implying that the General Safety Standard assumes that all railway operations are inherently safe as the need to prioritise commercial **and** social interests underpins railway operations. However, lessons learnt from Lewis-Beck and Alford's Coal Mine Study contradicts this assumption – operators are incapable of self-regulation where safety is concerned [4]. These lessons serve as a reminder that, when given the option, businesses tend to prioritise costs above safety requirements regardless of their social and ethical obligations. In addition, lessons learnt from the National Transport Commission's (NTC) review of Australia's regulatory framework and approach reveal that poorly defined risk acceptability criteria constituted a risk of regulatory failure [9]. The NTC suggested that little or no direction was provided in its safety legislation to give track managers/operators a target level of risk mitigation (i.e. what risk levels trigger the need for control) or to aid regulators in determining whether a residual level of risk is 'acceptable' or not. To improve of regulatory efficiency, they recommended that risk acceptability criteria incorporate considerations of all relevant economic costs and benefits [9].

Transport Canada made provision for its regulatory authority to develop Safety Management Systems Regulations in its *Railway Safety Act 1989* a decade after this Act was promulgated. The RSR, on the other hand, repealed its Safety Management System Regulation in favour of a Safety Management Standard (as per Section 28 of the Act) as a more flexible instrument to ensure the *continuing enhancement* of railway safety given that SANS 3000-1 adequately provided for the development of a safety management system as well as for the development of an audit protocol to check compliance. Thus, no regulation mandating the objective of continuous improvement within the context of a safety management system currently exists in South Africa. In addition, Sub-section (b) of Section 28 of the NRSR Act, does not explicitly mandate operators to direct their performance reporting to demonstrate continuous improvement.

With regards to the absence of SMS regulations in the NRSR Act, the review of Transport Canada's regulatory framework observed the need for the regulated requirements of the SMS to be explicitly performance-based **with the aid of legislation** (by amending the Act or the SMS regulations). This is to focus the industry on demonstrating the functionality of the SMS requirements, rather than demonstrating that the requirements are in place. The focus of the RSR's SMS is on the ability of an operator to demonstrate that the SMS requirements are in place and not their functionality. The review also recommended that the rail industry should employ company safety-risk profiles to design and modify company SMS, and to assign priorities to ongoing risk mitigation activities to strengthen its regulatory regime.

Requirements for Operation

According to section 22 of the NRSR Act, a railway operator is officially authorized to begin operations when the RSR issues it with a railway safety permit. The issuing of a permit is subject to the operator having successfully demonstrating that the predefined list of minimum safety elements as outlined in SANS 3000-1 are in place as well as a non-refundable application fee determined by the Minister of Transport.

With regards to the efficiency of the approval process for railway operators, the review of the NRSR Act and the General Safety Standard (SANS 3000-1) indicated that no legislative provision has been made for

stipulating how long an operator is required to wait from the time a SMS has been submitted to the RSR to when it can operate. Instead, the RSR has made provision for this process in its Permit Application Guide (that has been subjected to Board approval). As it currently stands, the Regulator has 3 months in which to issue a rail operational safety permit. Efficiencies in expediting the application are hampered by the following constraints: limited human resource capacity, the quality of the applications and the speed at which safety permit fees are paid by the operators⁵.

On the issue of the quality of compliance with the requirements of a SMS, operators are given written feedback after the first assessment (should there be issues with the quality of the applications) asking for additional information to address those areas in which the initial application did not meet the requirements. The speed with which the operator responds, as well as the quality of the additional information submitted again impacts on the issuing date. In some cases up to 5 submissions are needed before the basic requirements have been met. Fifty to 60 % of all permit applications undergo this back-and-forth process before they can be finally approved on paper. The RSR's approach is to guide/train operators through the application processes should they not be able to cope initially.

On the subject of the speed of fee payments, permits may not be physically issued unless proof of payment of the permit fee has been received (as per the terms of the permit management procedures). The person issuing the permit needs to have site of the receipt issued by the Finance Department before the permit is issued. Should an operator delay the payment of the permit fee, the issuing of the permit is therefore delayed. Prior to the introduction of permit fees in 2008, the average time to issue a safety permit was less than 3 weeks. Since the introduction this has gone up to 3 months – with outstanding payments contributing the difference in the time period.

It should be noted that the Canadians have opted to legislate their permit application procedures in their SMS Regulations under the Railway Safety Act of 1989 to increase the efficiency of the permit/license application and approval processes. The Canadian RSA requires that a new railway operator submit its SMS information at least 60 days before operations begin. Transport Canada reviews the information to ensure that it contains all of the required elements but does not approve the SMS in terms of its effectiveness [5].

Provision for an effectiveness audit of a SMS does not form part of the legislative prerequisites for the approval of a safety permit application. SANS 3000-1 has only made provision for annual adequacy and effectiveness audits to be conducted once the permit has been granted and not for the pre-approval process of a permit. This allows for an element of risk in the permit approval process as the Regulator may not be aware of potential or existing dangers that could be picked up by an in-depth verification process prior to operation. The RSR is aware of this limitation and has endeavoured to audit some of the bigger operators' SMSs prior to issuing safety permits but time and human resource capacity constraints coupled with the volume of prerequisite annual audits, prevents the Regulator from formally institutionalizing this initiative.

Section 26 of NRSR Act does make provision for the Regulator to suspend or revoke a safety permit as well as for the operator to surrender a safety permit should there be issues of non-compliance with the permit conditions and/or the NRSR Act. This is an important enforcement tool but should only be deployed cautiously and as a last resort since the severity and extent of punitiveness has been shown to impact negatively on safety performance.

REGULATORY APPROACH

Overview

The RSR's approach to regulating rail safety is largely defined by, and dependant on, the provisions set forth in its regulatory framework. This sub-section pays attention to the tools, mechanisms and processes that the RSR has developed to translate the NRSR Act's requirements, stipulations and conditions into meaningful actions. It is how rail safety laws, regulations and policies are interpreted and enacted that determines the impact and sustainability of the RSR's intentions in ensuring that railways are safe, secure and efficient. Governance of railway safety thus forms an essential component of the RSR's regulatory approach. The RSR is governed and controlled by a Board of Directors. The role of the Board members is ensure that the RSR executes its mandate as well as exercise oversight over the Regulator's performance functions.

Governance of railway safety forms the foundation of the regulatory framework and the relationship among its partners. Governance in this context refers to the "process by which institutions, organisations and

⁵Information obtained from the RSR's Senior Manager for Safety Permits.

individuals involved in governing rail safety communicate with each other, make decisions, are accountable and generally guide themselves” [5]. Figure 1 below is a diagrammatic representation of the roles and relationships of those entities that are responsible for directly influencing, affecting and ensuring railway safety.

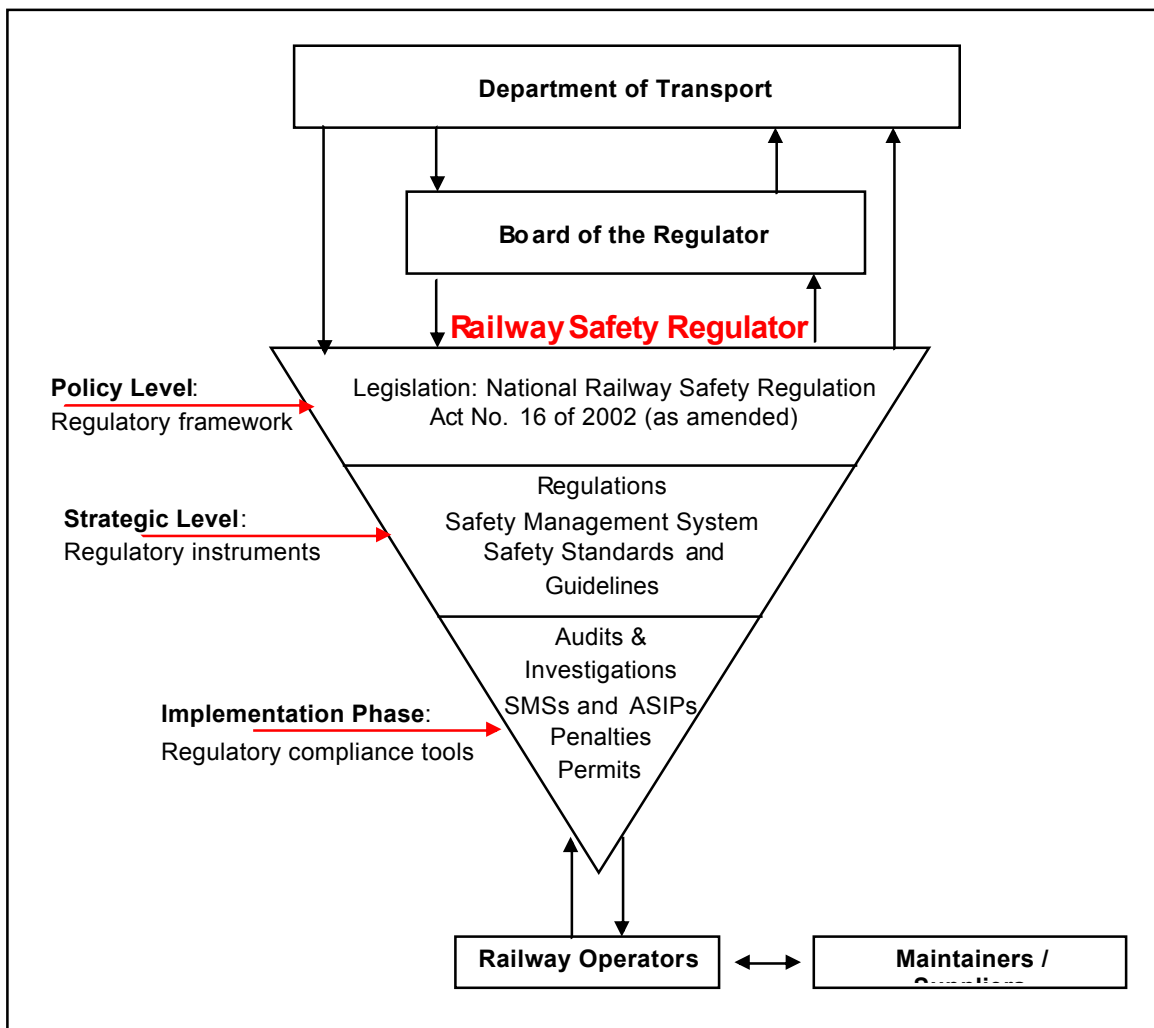


Figure 1: Diagrammatic depiction of the RSR's approach to regulating railway safety

Based on a review of factors that contributed to best practice in the Canadian urban transport, the team of experts from the University of Toronto found effective governance to be the most critical requirement [3]. According to these authors, “a failure in governance leads to poor decision-making processes, compromises accountability and encourages public transport infrastructure and services network that exhibits sub-optimal performance”. The importance of good governance is explicitly recognised and provided for in the NRSR Act.

Memorandums of Understanding (MoUs) and Co-operative Agreements serve to formalize the RSR's collaborative networks with its stakeholders. They also provide a vehicle for ensuring constant communication between the various railway safety role-players as well as guide their interactions to prevent duplications of their regulatory functions as far as railway safety is concerned thereby contributing to the oversight function. Although the RSR has been quite active in initiating MoUs with other national government bodies and agencies, its relationship with local municipalities is missing in these formal collaborative initiatives. Local authorities and the Department of Human Settlements have a pivotal role to play in how the RSR can work with local communities in addressing railway safety issues in the rail reserve areas.

In addition to the formalized co-operative agreements with local stakeholders, the RSR has also initiated informal horizontal network partnerships with various Southern African Development Community (SADC) railway safety regulatory stakeholders to promote the harmonization of the RSR's railway safety regime with that of the SADC region. The aim of these partnerships is to ensure that railway safety receives centre-stage in interoperability policies and agreements. Railway harmonization among the SADC partners is important in promoting provide cost-effective, efficient, safe and reliable transportation services that facilitates the country's socio-economic development strategy as set out in the National Development Plan. Although a technical standard on Interoperability has been produced and is in the process of being adopted, SADC-wide railway safety harmonization policies, strategies and protocols still need to be developed.

The development of a standard to address responses to rail accidents would improve the efficiency of the current regulatory regime. An emergency response standard and protocols would need to be developed in collaboration with the relevant government departments/agencies and industry associations to be effective.

Figure 1 also illustrates that the RSR does not regulate the supply/maintenance chain of railway infrastructure and rolling stock. Since the NRSR Act holds operators accountable for the safety of their own operations, it assumes that the operators would put into place mechanisms to conduct quality assurances on infrastructure and rolling stock components and products. However, not all the operators are capable of performing this function given the costs and technical skills required to implement a quality assurance monitoring and evaluation programme. The RSR has identified this gap in its regulatory framework and approach and is in the process of developing mechanisms to address it especially as South Africa intends to further develop the rail industry by introducing assembly factories for its new rolling stock.

CRITIQUE OF THE REGULATORY APPROACH

Instruments and Mechanisms

As evidenced, the RSR's tool-kit of regulatory instruments and mechanisms that have been developed to oversee and promote improved safety performance as well as to monitor and ensure compliance is limited to a few regulations and a suite of technical and human factor standards and guidelines as outlined in its general safety standard. With only these traditional regulatory tools and mechanisms at its disposal, the ability of the RSR to facilitate a modern, flexible and efficient regulatory regime is constrained. The over reliance on traditional regulatory tools also affects the participatory nature of the NRSR Act in that the RSR is limited to dictating what operators must do to comply with an established standard or regulation and can only rely on penalty mechanisms to enforce those dictates.

Rules

Many of the larger railway operators have well developed Train Working Rules. In Canada, most rail stakeholders have acknowledged that the use of a system of rules, rather than the more formally created regulations and standards, offer greater flexibility and efficiency since they reflect the operators' experiences, institutional memory and knowledge base. The RSR's regulatory approach has not formally acknowledged the decision-making and operational importance as well as the ownership properties of these Working Rules. Given that operators are ultimately responsible for operational safety, the NRSR Act does, to some extent, encourage a "co-regulatory" approach. The RSR needs to consider how to integrate the existing technical and engineering Train Working Rules into the standards to prevent inefficiencies in reporting and decision-making processes at the operator level.

Target Population

A major limitation of the current regulatory approach is that no provision for the duality in the country's social and economic development has been made. The RSR regulates a dual economy and society. The impact of South Africa's skewed economic and development policies during the apartheid era is evidenced in the Passenger Rail Agency of South Africa's (PRASA) struggling rail safety track history as opposed to TFR's numerous bilateral partnerships with various local and international academic institutions. TFR appears to have a much stronger human capital base than PRASA. Given this distortion in critical resources, how the RSR enacts its mandate will differ from one operator to the next. A more flexible and participatory approach that encourages innovation and responsibility should be adopted when regulating a better resourced operator e.g. by encouraging the use of performance standards. Less resourced and experienced operators, on the other hand, would benefit from stronger command-and-control penalty-based prescriptive enforcement approaches. This does not necessarily imply a separate set of safety regulations and standards for different operators. What it does mean is that the regulations and standards should be sufficiently broad to cater for the duality without compromising the need for safety performance monitoring and evaluation information that demonstrates continual performance improvements. These instruments and mechanisms should consider the ability and willingness of operators to comply with the NRSR Act and its conditions.

Consultation – Transparency and Communication

Communication forms an integral component of the regulatory environment. It is a prerequisite for effective decision-making regarding safety-related issues, for transparency throughout the regulatory process and for the accountability of all those responsible for railway operational safety. The recognition of this essential regulatory component is highlighted in chapter eight of the NRSR Act and aptly titled “Monitoring, Assessment and Information”. The public’s right to access railway safety monitoring information has also been acknowledged in section 41 of the Act – “Access to information”. Section 39 of the Act’s requirement for the RSR to establish a national railway safety information and monitoring system is reinforced in sub-sections 7.6 and 10.3 and section 11 of the SANS General Standard on Railway Safety Management (SANS 3000-1) whereby operators are required to record and report railway safety occurrences and security incidents to the RSR according to a prescribed reporting procedure and time-frame for adequate monitoring.

The RSR is currently in the process of designing a National Information Management System (NIMS) that will facilitate in monitoring and evaluating the impact of the RSR’s regulatory approach on making rail a safe, reliable and efficient form of transportation. It is also presently reviewing its current approach to monitoring employee performance in relation to effecting its mandate. Structures and processes for making explicit provision for both individual and departmental accountability and learning as well as information sharing and communication have been conceptualized and are in the process of being implemented.

Inspections, Investigations and Audits

The NRSR Act confers powers and duties on the railway safety inspectorate. An appointed railway safety inspector is allowed to carry out a compliance inspection and/or audit of the operator’s SMS. The NRSR Act does not distinguish investigation responsibilities from those of auditing SMSs i.e. an inspector is conferred with the powers to perform both functions. There may be a conflict of interest for an inspector to both audit and inspect a railway operator in that the objectivity of the inspector may be compromised. Also, the training requirements for accident investigations differ to those for SMS audits. In promoting an efficient and modern regulatory regime, the report recommends that the roles and responsibilities of safety inspectors to be more clearly defined and delineated so that audits and investigations are seen as two distinct (albeit related) functional areas that require a unique set of skills and the relevant experience.

Reviews of rail safety in the OECD countries have emphasized the need for a single investigator, independent of the national regulator and with adequate powers to improve safety outcomes. These reviews have established that under some existing institutional arrangements, there is scope for conflicts of interest where investigators make judgments about whether the safety standards are met as well as whether the existing standards (of which they have been instrumental in setting) are adequate. This conflict was commented on in the investigation into the Ladbroke Grove rail inquiry:

“... it was inappropriate for the safety regulator to carry out the function of investigation since it might be necessary for the investigation to examine the decisions and activities of the safety regulator itself.” ([8] as quoted in [1]).

In order to provide more clarity on the concerns raised in this section regarding the flexibility and efficiency of RSR’s regulatory regime, the paper examined the outcomes of several rail safety regulatory reviews and impact studies done within the last twenty years in Australia and Canada as quite a few of the RSR’s regulatory limitations identified are not unique to South Africa.

REGULATORY LESSONS FROM ABROAD

The Need for Periodic Safety Regulatory Reviews and Impact Assessments

Due to the influence of Canada’s amended Rail Safety Act of 1989 and Australia’s regulatory approach on the RSR’s regulatory regime, the outcomes of the periodic reviews and impact assessments (RIAs) of their rail policies, regulatory frameworks and SMS based regulatory approaches provide the RSR with opportunities to reflect on its current approach to regulating railway safety. Of weighted importance to this review was the need to conduct an objective Regulatory Impact Assessment prior to making and implementing amendments to the existing legislative framework and its concomitant approaches for regulating railway safety due to their impacts on **economic efficiency and societal behavior**. The socio economic and environmental impacts of NRSR Act and the regulatory approach that has been adopted in translating the Act’s prescriptions into meaningful action have never been investigated and are still, at large, poorly understood. Thus, in the absence of baseline information, the impacts of revised rail transportation policies on the efficiency and flexibility of the RSR’s regulatory regime cannot be fully gauged and appreciated.

Successfully Implementing an SMS

Another important lesson obtained from the OECD experiences with monitoring regulatory changes is that the adoption of a SMS approach to regulating safety does not necessarily ensure a flexible, modern and efficient regulatory regime. Canada experienced a sharp increase in railway accidents between 2002 and 2005 after having implemented its SMS approach. This necessitated an extensive review of its Railway Safety Act to improve on its regulatory approach. The review revealed the need to re-examine Transport Canada's performance-based regulatory approach for the purposes of restructuring it and that a SMS approach to regulating railway safety required performance-based legislation to support its implementation. The effective governance of SMS in conjunction with the institutional arrangements in place to support a performance-based regulatory framework was found to be an essential criterion for the success of performance-based approaches. Within the context of Canada's co-regulatory approach, the review established that less regulatory emphasis should be placed on penalties and other forms of punitiveness with more emphasis being concentrated on collaboration and relationship building and a strong impetus on building and strengthening social capital within the regulator-industry network.

Ownership of the SMS approach

Both the Canadian and Australian regulatory reviews revealed that for the philosophy of the SMS regulatory approach to be realised, operators are required to take ownership of the SMS process. SMS should be integral to their daily operational functions and be driven by industry. It should not be regarded as an add-on to their existing *modus operandi*. In this way, the RSR's mandate pertaining to its oversight role can be realised as the Regulator would then be responsible for guiding, supporting, directing and managing railway safety as opposed to focusing exclusively on ensuring rail operator compliance to the SMS requirements.

The Role of Risk in Regulation

Another important lesson learnt was the role of risk assessments, risk management and risk mitigation/control in the SMS/performance-based approach to regulating railway safety. Performance-based approaches are predicated on risk identification and management capabilities as it provides industry with the flexibility to identify and implement the most cost effective and lowest cost means of mitigating against risk. The OECD reviews also found that the regulatory efficiency could be improved by making sure that risk acceptability criteria incorporate considerations of all relevant economic costs and benefits. However, it should be noted that poorly defined risk acceptability criteria constitute a potential source of regulatory failure in that safety standards could be set too high (or too low) and that uncertainty could lead to disagreement and unproductive debate [9]. The paper on *Risk Tolerability in Rail Safety Regulation* produced by Bray [2] assisted in informing the NTC's position on recommending the 'net social benefit' approach to defining risk tolerability. This approach allows for safety standards to be set at levels that ensure that the benefits of regulation are equal to or greater than the cost of implementing the measures (including the costs of the regulatory processes).

SOUTH AFRICA'S REGULATORY CHALLENGES

Having reviewed the NRSR Act's mandate and regulatory precepts as well as the regulatory problems experienced in Canada and Australia, the paper has provided a summary of the main challenges and pressures that could be responsible for impacting on the successful implementation of the RSR's regulatory framework:

Policy Changes

Impacts of the imminent rail revitalisation initiative and economic policy on railway safety performance.

Socio-Economic Disparity

The socio-economic disparities prevalent in South Africa that are reflected in the skills and knowledge base of its rail operators.

The SMS Approach

The SMS approach not only requires operators to be primarily responsible for railway safety but also to take ownership of the SMS approach. Investigations into the efficiency of the approval processes in place for rail operational safety permit applications revealed that 50-60 % of all permit applications needed to undergo several revisions before they could be considered. At face value, this implies that more than half of South Africa's rail operators do not understand the foundation principles of the SMS approach if they are incapable of understanding and complying with base-line requirements. Yet, the approach requires that operators not only demonstrate that the requirements for an SMS are in place but to also how these requirements would function in their organisations. Thus, they can't take ownership of a system and its processes if they can't understand its value to ensuring safety and continuous improvements in safe railway operations.

Ambiguities in the NRSR Act.

Although the Act acknowledges that “safety and security matters are interconnected and that the regulator has a primary role to play in safe railway operations and a supporting role in occupational health and safety, and security”, it has not provided the Regulator with clear instructions of how to operationally distinguish between the terms ‘safety’ and ‘security’. Of concern is that the RSR’s regulatory approach is premised on unclear interpretation of the term ‘safety’.

Given the purposive nature of interpreting and applying legislation in South Africa, ambiguities regarding the Regulators target population exist. An examination of the Act’s interpretation and application revealed that the phrase ‘safe railway operations’ is not restricted to railway operators but also implies the safety of people and property transported by railways as well as the safety concerns of people, property and the environment in close proximity to railway operations. However, the Act has limited its application to rail systems of specified track gauges that have been designed to transport passengers and/or freight. This has, in turn, limited the regulatory regime to focusing on railway operators at the expense of understanding and addressing the safety *concerns* of people, property and the environment.

The Absence of Risk Acceptability Criteria.

The RSR SMS approach requires operators to continuously reduce operational safety risks to *levels as low as are reasonably practicable*. However, these levels have neither been quantified nor specified. Lessons learnt from the National Transport Commission’s [9] review of Australia’s regulatory framework and approach reveal that poorly defined risk acceptability criteria could constitute a risk of regulatory failure.

The absence of a RIA prior to the design and implementation of the NRSR Act and its adoption of the SMS approach to regulating railway safety for base-line information regarding the impacts of legislation. The absence of base-line information makes an objective assessment of any revisions and/or amendments to the NRSR Act and/or the RSR’s regulatory approach in improving railway safety performance difficult to prove. In addition, the impact of new rail policies e.g. the National Rail Economic policy and the Single Transport Economic Policy, on railway safety performance should to be gauged before legislation can be implemented.

CONCLUSION

In summation, railways all over the world have always been amenable to state interventions since conception. They have thus been managed politically and socially and not economically. The economic pressures of globalization coupled with the need to provide safe, reliable and efficient long distance transportation for people and freight across political borders to facilitate national and international trading have brought about paradigm shifts in how railways should be managed. As opposed to focusing on ensuring and enforcing safety compliance, the newer approaches tend to focus on providing mechanisms and processes that can influence the internal regulatory systems of its target population. South Africa has not been immune to these global changes. Although its railway networks have largely been managed politically, it now has to give due consideration to the role of rail in the country’s social and economic development.

To achieve this objective as well as address its challenges, the RSR has to conduct a regulatory impact assessment or analysis (RIA) to improve and strengthen its regulatory regime. If properly designed and applied, the RIA can improve the effectiveness and efficiency of the RSR as well as address the broader issues of competitiveness and economic performance in the rail transport sector and their potential impacts on regulating safety. To enable the Regulator to fully realize its objective of facilitating a modern, flexible and efficient regulatory regime that ensures the continuing enhancement of safe railway operations, the proposed RIA should also address the challenges identified and mentioned in this paper.

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