

GLOBAL EXPLOSIVES MANAGEMENT LEGISLATION AND ITS LOCAL IMPACT

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As the world tightens regulations pertaining to explosives, Synertech, partner of the Explosives Track and Trace solution developed by TTE-Europe GmbH, discusses current global regulations and legislation frameworks for traceability, and a recent implementation case study at a South African mine.

Terrorist attacks in the past have presented a global need to maximise safety in explosives handling while minimising abuse and theft, leading to a European Union (EU) Directive to tighten regulations on the handling of civil explosives and firearms. These regulations aim to create a consistent framework for the traceability and control of explosives from their manufacture to their final use. Implementing such measures requires all stakeholders in the supply chain to be well-informed and to introduce the necessary systems and processes for compliance. Similar regulatory frameworks have been established in other continents and countries in the world.

Europe

The EU Directive 2014/28/EU on the harmonisation of the laws of the Member States relating to the marketing and control

of explosives for civil use was adopted in 2014. This directive replaced earlier legislation aiming to enhance the safety and security of explosives throughout the EU. The EU has since played a pivotal role in harmonising explosives regulations across member states. The directive mandates stringent controls on the manufacture, sale and use of explosives, requiring clear labeling and traceability mechanisms.

North America

In the United States, the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) regulates explosives under the Organized Crime Control Act of 1970, specifically through the provisions by the Federal Explosives Law and Regulations. Updated periodically, these regulations include detailed requirements for the storage, handling and record-keeping of explosives, emphasising security and traceability. Following the events of 11 September in 2001, the



A controlled explosion.

Supplied by TTE Europe GmbH

US has significantly tightened its explosives regulations, particularly concerning the tracking and security of explosive materials.

Canada follows a similar path with its Explosives Act and Explosives Regulations, administered by Natural Resources Canada (NRCan). The Canadian Explosives Regulatory Division (ERD) sets out comprehensive guidelines for the manufacture, storage, transportation and use of explosives, with a strong emphasis on safety and security. The regulations have evolved over time, with significant updates reflecting technological advancements and emerging safety standards.

Marking of explosives

These regulations mandate that every explosive article must be uniquely marked, comprising multiple components including both a visually and electronically readable form. This marking must be permanent and remain clearly visible under the challenging conditions of transport, storage and use in mining or quarry operations. In addition, the barcodes generated for marking must contain a unique identification number, which is only assigned once per item. This ensures that each individual item can be traced separately.

‘Visually Readable Marking’ requires that every explosive item must carry the manufacturer’s name, an alphanumeric code identifying the country of origin, manufacturing location and specific product information. These details allow for the product and its origin to be identified immediately upon visual inspection.

‘Electronically Readable Marking’ involves the adoption of RFID tags or similar technologies to facilitate rapid and efficient tracking of explosives. This plays a crucial role in automating inventory management and ensuring that all movements are accurately recorded.

Reporting obligations

The regulations stipulate that companies are required to produce reports at defined intervals containing detailed information about their handling of explosives. These reports must include both quantitative and qualitative data to provide a comprehensive view of activities, and they must be designed to be easily accessible to and understood by inspectors. Implementing a standardised reporting format could help to enhance the consistency and quality of reporting.

Practical implications and challenges

The practical implementation of these comprehensive regulations poses a significant challenge for affected companies. Smaller operations may struggle to implement the required technical and administrative systems. However, it is crucial that all stakeholders in the supply chain collaborate to achieve the objectives of the regulations to increase safety, prevent misuse and ensure efficient management of explosives.

Implementation: An SA case study

In 2024, TTE and Synertech began the process of implementing TTE’s Explosives Track and Trace solution at a mine in South Africa. Implementation involves a multi-layered process that requires careful planning and execution. Firstly, a thorough needs analysis is necessary to determine the specific requirements and needs of the customer. In this case, in addition to an on-site visit, several online meetings were held to gain a deep understanding of the challenges

and expectations of the users with the objective of selecting the appropriate software and hardware to ensure optimal and simple tracking of explosives for the customer.

The implementation is then planned on the basis of this initial analysis. In this planning phase, all objectives are defined, a time frame is set, and the required resources are determined. It is critical to form an interdisciplinary team to ensure that all perspectives and expertise are incorporated into the process.

Once the appropriate software and hardware products have been selected and ordered, a test phase takes place. This involves checking whether the individual products work together smoothly. After successful tests, the products were sent to the customer and the implementation phase then took place on site. During this phase, all the devices were installed and tested once again to ensure that the products functioned smoothly. After the implementation of the software, another crucial step followed – the training and preparation of the employees. This ensures that all employees can use and understand the new systems effectively.

After implementation, it is important to continuously collect feedback from users in order to improve any errors that occur as quickly as possible. This ensures that the systems continue to meet the customer’s needs.

In conclusion, the global landscape of explosives regulation is characterised by a shared emphasis on safety, security and traceability. While the specific regulations and their implementation timelines vary from region to region, the overarching goal remains consistent – to minimise the risk associated with explosive materials and enhance public safety. It remains to be seen whether there will be similar regulations promulgated in South Africa in the coming years.

Local regulations for explosives would set new benchmarks in terms of safety, traceability and transparency in South Africa. While compliance with these regulations will undoubtedly bring challenges, it also offers an opportunity to enhance safety and efficiency across the industry through improved practices and technologies. Ongoing adaptation and cooperation among all stakeholders are crucial to achieving these goals while meeting regulatory requirements. ■

Synertech (Pty) Ltd is the local partner for the renowned Explosives Track and Trace solution developed by TTE-Europe GmbH. Please feel free to contact us at www.rfid.co.za or sales@rfid.co.za.

As a result of terrorist attacks in the past, the EU tightened regulations on the handling of civil explosives and firearms. In collaboration with the most relevant associate representatives of the European Commission and the German government, the company TTE-Europe GmbH started early to develop standards for the making of explosives and weapons as well as the easy and hassle-free data exchange along the respective supply chain.