

Command, controlling and signalling

1. Executive summary

Command, control and signalling systems are fundamental to the safe management of railways because they ensure that trains are spaced safely apart and that conflicting movements are avoided. Failures in these systems have the potential for catastrophic consequences.

ORR's strategy for regulating the management of train movements and signalling safety recognises both the need for the entire industry to continue to operate existing systems safely, and to increase its capability to introduce future changes safely. This includes managing long-established systems that remain in service beyond their originally anticipated life, as well as the risks that arise during transition from older to newer technologies.

Train accidents caused by faults in signalling equipment are rare but potentially catastrophic. Railway organisations must therefore remain alert to the precursors of such events. Signalling wrong-side failures must be correctly identified, categorised, reported and then be thoroughly investigated so that root causes are understood, addressed and any risks are managed effectively. The quality of dutyholder investigations is critical to preventing low-frequency, high-consequence events.

ORR monitors the rollout of the Digital Railway programme, including automated traffic management and in-cab train control systems, to ensure that transitional risks from legacy to modern systems are effectively managed. This requires effective cooperation across the industry, particularly where multiple technologies and operating models coexist over extended periods.

ORR continues to actively monitor Network Rail's move from traditional signalling locations to Railway Operating Centres (ROCs). This includes consideration of workstation ergonomics, operator workload and contingency arrangements, to avoid creating single points of failure that could affect large geographic areas of the network.

Train Protection and Warning System (TPWS) remains a key safety control on the mainline railway. Although originally envisaged as a short-term solution, TPWS is now required for many more years. ORR engages with railway organisations to ensure the continued integrity of TPWS and actively monitors exemptions to ensure they remain valid when changes are made to signalling systems, rolling stock or operating conditions.

Whether signalling systems are newly designed, renewed or enhanced, ensuring software integrity is essential. ORR undertakes this through its formal role in authorising equipment into service and, where necessary, through enforcement. ORR also expects signalling schemes to take opportunities to improve related safety risks, such as those associated with level crossings or track worker protection.

ORR's focus for command, control and signalling



- ✓ Ensure RUs are working together to address the risk of overspeeding
- ✓ Maintain safety on existing signalling and train control systems
- ✓ Identify and address precursors to catastrophic signalling failures
- ✓ Ensure safe transition from legacy to digital and automated systems
- ✓ Manage risks arising from centralisation and new operating models
- ✓ Maintain the integrity of train protection systems and signalling software
- ✓ Influence design early to embed safety and exploit improvement opportunities

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