



ALL INDIA RAIL SAFETY COUNCIL

www.railsafety.co.in

IMPROVING SAFETY & ACCIDENT PREVENTION IN INDIAN RAILWAYS

Prevent Risks • Protect Lives • Build Trust



Safe Infrastructure



Modern Signalling



Predictive Maintenance



Skilled Workforce



Passenger Awareness



Emergency Readiness



Railway safety is a **system-wide responsibility**—designed into planning, construction, operation, maintenance and every decision.



Every Journey Safe. Every Employee Protected. Every Risk Addressed.



Viksit Bharat 2047



Make in India



Net Zero 2070



Digital India



Vision Zero

Vision 2047 • Safety Culture • Innovation • Responsibility

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UNDERSTANDING RISKS, NEAR MISSES & PREVENTIVE ACTION

Identify Weak Signals • Learn Early • Act Before Harm



Track
Defects



Signal
Failure



Equipment
Malfunction



Human
Factors



Trespass



Extreme
Weather

PREVENTION CYCLE



REPORT



ANALYSE



PRIORITISE



CORRECT



VERIFY



SHARE
LEARNING



KEY MESSAGE

Serious accidents often result from several weaknesses occurring together. Near misses reveal where the system must improve.



Every Near Miss Is a Warning. Every Warning Is an Opportunity.



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MODERN SIGNALLING, TRAIN CONTROL & KAVACH

Prevent Conflict • Control Speed • Protect Every Movement



ELECTRONIC INTERLOCKING

Ensures safe route setting and locking. Prevents conflicting movements.



AUTOMATIC SIGNALLING

Automatic block signals maintain safe train separation.



CENTRALISED TRAFFIC CONTROL

Real-time monitoring and control for smooth traffic and rapid decision-making.



AUTOMATIC TRAIN PROTECTION

KAVACH - Indigenous ATP system that prevents SPAD, controls speed and ensures safe braking.

KEY FUNCTIONS



SIGNAL-PASSING PROTECTION



OVERSPEED PREVENTION



SAFE SEPARATION



DRIVER ALERTS



FAIL-SAFE BRAKING



KEY MESSAGE

Advanced systems strengthen safety only when correctly installed, tested, maintained and supported by trained personnel.



TECHNOLOGY ENFORCES SAFETY. PROFESSIONALS SUSTAIN IT.



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TRACK, ROLLING-STOCK & PREDICTIVE MAINTENANCE

Inspect Continuously • Detect Early • Repair Correctly



Rail &
Weld Integrity



Track
Geometry



Wheel & Axle
Condition



Brake
Performance



Fire-Safe
Coaches



Digital
Records



MONITOR



DIAGNOSE



PRIORITISE



MAINTAIN



QUALITY CHECK



RETURN TO SERVICE



Maintenance safety depends on calibrated tools, approved parts, competent teams and verified completion—not inspection alone.

Reliable Assets Create Reliable Journeys.



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BRIDGE, TUNNEL & CLIMATE-RESILIENT INFRASTRUCTURE

Inspect Structures • Monitor Hazards • Strengthen Resilience



Bridge Foundations



Tunnel Linings



Embankments



Drainage



Flood & Scour



Heat & Landslide



MONITOR



WARN



INSPECT



RESTRICT SPEED



REPAIR



VERIFY



Structures must be managed for ageing, traffic, water, geology and future climate—not historical conditions alone.

Resilient Infrastructure Protects Every Journey.



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LEVEL CROSSINGS, TRESPASS PREVENTION & PASSENGER AWARENESS

Use Safe Crossings • Respect Barriers • Stay Off the Tracks



Never Cross
Closed Barriers



Use Footbridges
& Subways



Never Walk
on Tracks



Stand Behind
Platform Line



Never Board
a Moving Train



Report
Hazards

PREVENTION THROUGH 4 STRONG PILLARS

ENGINEERING • EDUCATION • ENFORCEMENT • COMMUNITY PARTNERSHIP



Railway authorities must provide safe infrastructure;
communities and passengers must choose safe behaviour.



Tracks Are for Trains—Choose the *Safe Way*.





HUMAN FACTORS, TRAINING & A STRONG SAFETY CULTURE

Fit for Duty • Competent for the Task • Empowered to Act



Fatigue Management



Medical Fitness



Practical Competency



Standard Communication



Simulation & Drills



Near-Miss Reporting

CULTURE PRINCIPLES



SPEAK UP



STOP UNSAFE WORK



REPORT HONESTLY



LEARN WITHOUT UNFAIR BLAME



LEAD BY EXAMPLE



KEY MESSAGE

Safety improves when people are trained, rested, supported and confident that operational targets will never be placed above life.



Professional Discipline.

Courageous Reporting. Shared Responsibility.



FIRE PREVENTION, STATION & CROWD SAFETY

Prevent Ignition • Protect Platforms • Manage Movement



COACH FIRE-SAFETY EQUIPMENT



SMOKE DETECTION SYSTEMS



INSPECTED ELECTRICAL SYSTEMS



STATION PLAN



CLEAR
INFORMATION



CONTROLLED
FLOW



OPEN
EMERGENCY
ROUTES



TRAINED
RESPONSE



MEDICAL
COORDINATION



KEY MESSAGE

Safe design, maintained equipment, clear information and disciplined crowd management reduce both everyday injuries and emergency consequences.

Safe Coaches. Safe Platforms. Safe Passengers.



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CYBERSECURITY & THE DIGITAL RAILWAY

Secure Systems • Trusted Data • Safe Operations



Network Separation



Separate critical systems from corporate & public networks.

Strong Authentication



Multi-factor access and role-based controls for all systems.

Secure Updates



Regular patching and secure update processes for all devices and software.

Continuous Monitoring



Real-time monitoring, alerts and anomaly detection across networks.

Supplier Security



Assess, audit and manage supply chain and third-party risks.

Backup Operations



Backups, redundancy and fallback modes to ensure continuity of operations.

CYBER RESPONSE CHAIN



DETECT



ISOLATE



MAINTAIN
SAFE
OPERATION



INVESTIGATE



RESTORE



LEARN



As railways become more connected, cybersecurity becomes directly connected with physical and operational safety.

FUTURE TOOLS



SENSORS



AI SUPPORT



DIGITAL TWINS



DRONES



ROBOTIC INSPECTION



Validate algorithms. Protect data. Keep human experts accountable.

Digital Innovation Must Strengthen—not Weaken—Safety.



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EMERGENCY RESPONSE & DISASTER MANAGEMENT

Prepare Together • Respond Rapidly • Recover Safely



EMERGENCY OPERATIONS CONTROL CENTRE



DIGITAL ACCESS MAP



Clear
Command



Rescue
Equipment



Medical
Response



Reliable
Communication



Passenger &
Family
Information



Psychological
Support

RESPONSE CHAIN



READINESS ENSURES EFFECTIVE RESPONSE



KEY MESSAGE

Written plans become effective only when roles are understood, equipment works and teams practise together.

Prepared People and Coordinated Action Save Lives.



INVESTIGATION, CONTRACTOR SAFETY, AUDITS & ORGANIZATIONAL LEARNING

Find Causes • Assure Quality • Close Every Action



INVESTIGATION & ANALYSIS



CONTRACTOR SAFETY & QUALITY



AUDITS & ASSURANCE



Root-Cause
Investigation



Human-Factor
Analysis



Corrective-Action
Tracking



Contractor
Competency



Component
Traceability



Independent
Safety Audits

LEARNING & CONTINUOUS IMPROVEMENT CYCLE



INVESTIGATE



RECOMMEND



ASSIGN



IMPLEMENT



VERIFY
EFFECTIVENESS



SHARE
NETWORK-WIDE



KEY MESSAGE:

The purpose of investigation is prevention—not automatic blame.
Recommendations must remain open until their effectiveness is verified.

PERFORMANCE INDICATORS



NEAR
MISSES



OVERDUE
INSPECTIONS



DEFECTS



COMPETENCY



RULE
COMPLIANCE



ACTION
CLOSURE

Transparent Learning Builds Public Confidence.



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INTEGRATED SAFETY ROADMAP FOR VISION ZERO

Preventive • Predictive • Professional • People-Centred



Risk-Based
Investment



Modern
Signalling &
Kavach



Asset
Renewal



Predictive
Inspection



Competent
Workforce



Passenger
Partnership



Cyber &
Climate
Resilience



Emergency
Preparedness

IMPLEMENTATION PATH

MEASURE
RISK



PRIORITISE



MODERNISE



TRAIN



VERIFY



LEARN



IMPROVE
CONTINUOUSLY



A mature railway safety system does not wait for an accident. It studies weak signals, learns from near misses and corrects unsafe conditions at the earliest opportunity.



VISION ZERO PLEDGE

Every Journey Protected • Every Employee Empowered • Every Hazard Reported
Every Action Verified • Every Life Valued

Safer Railways for Viksit Bharat 2047



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Safety Culture • Innovation • Research • Responsibility