

Health and safety by design

1. Executive summary

Health and safety by design (HSbD) is the elimination or control of health and safety risks in infrastructure, equipment, products or processes by early consideration and dealing with those potential risks at the design stage. While this principle is simple, and offers numerous benefits, too often we find the planning of new works or modifications has failed to take simple steps to avoid hazards to the health and safety of passengers and workers.

It requires those planning new or modified works to consider, at the earliest stages, what the impact of the change will be on the whole railway system throughout its lifecycle. They should design out issues, or where elimination is not reasonably practicable, ensure that residual risks are capable of effective control and communicated to those who will manage them.

Better planning, consistent application of appropriate standards and early engagement with operators and users can avoid future hazards, reduce late design changes, and drive down levels of ill health, incidents and accidents. Good design can also improve functionality, productivity and cost-effectiveness by reducing the need for costly changes later.

Health and safety by design is not a new approach; Britain's railway safety systems are built on nearly 200 years of learning from incidents. ORR wants the industry to move from learning only after incidents occur to proactively identifying and designing out potential issues before they arise.

Everyone planning new work or changes to existing systems should consider how good design can make their systems inherently safer for passengers, employees and the public, and with less risk to health. In particular, ORR's Vision includes:

Design leadership



- Industry ownership of HSbD as part of routine business management
- Early and routine application of HSbD to renewal, enhancement and new-build projects

Risk assessment and decision-making



- Review of risk assessments and controls to inform design decisions
- Updating guidance and standards where necessary
- Using CSM-RA or other credible methods
- Considering reasonably practicable H&S enhancements, including impact of residual risk their introduction could pose
- Reviewing how similar risks are controlled in other sectors
- Recording the optioneering process, including realistic costs and benefits

Systems view and lifecycle integration



- Taking a holistic view of how different activities and projects interact
- Ensuring HSbD decisions are delivered by the project
- Integrating enhanced controls into equipment, systems and operations
- Reviewing performance after implementation

Human factors and user involvement



- Iterative human-factors consideration throughout the design and development process
- Active participation of end users, including operators and maintainers

ORR expects designers, clients, manufacturers, contractors and others involved in planning or changing systems to apply health and safety by design consistently across all parts of the railway, including high-speed rail, mainline, metro, light rail, innovative systems and heritage operations.

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