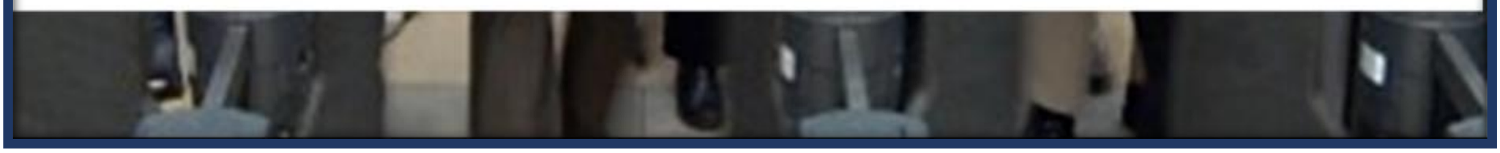
6. Delivering the Service

To optimise the reliability of any railway the people involved need to select the most appropriate approach in each set of circumstances. Setting out some clear plans around hard issues is an essential step to consistently delivering reliability, as is having a culture of people who work together for the best overall service delivery.



6. Delivering the Service

How engineering, operational, planning and retail functions work together to deliver the service is vital to day-to-day reliability and on-going reliability improvement. Sometimes these relationships span actual contractual boundaries, but whatever the organisational structure, the functions must still all pull together to deliver the service.

Three areas where there are often the greatest challenges and the greatest scope for reliability improvements in terms of numbers of incidents and operational impact (e.g. minutes lost) of each incident are:

1. Co-ordination of depot and train planning
2. Communications processes around faults and failures
3. Measures of fleet performance and how they are used to improve performance

For each area, we have shared experience and thoughts about:

- hard issues, like should there be contracts or internal contract-type relationships (e.g. interface rules set out in requirements documents); and
- soft issues, like culture (i.e. creating a culture of engineers and operators working together to optimise combined overall delivery)

We need to recognise everyone’s expertise and enhance understanding of the bigger picture for the sake of overall decision-making. As with every other area in ReFocus, we need to make the most of on-going experience, using effective feedback loops based on sound analysis of individual incidents and trends to develop and disseminate our overall learning.

If a train develops a fault at a remote location in a low traffic density on a regional railway, it is probably best for the driver to telephone a nominated depot maintenance person for advice, allowing the train to proceed, possibly in a controlled degraded mode. If, however, the same train develops the same fault on the approach to a busy station at a peak time, it is probably best to declare the train an operational failure and clear the line.

In summary, to optimise the reliability of any railway, the people involved need to select the most appropriate approach in each set of circumstances. Setting out some clear plans around hard issues is an essential step to consistently delivering reliability, as is having a culture of people who work together for optimum overall service delivery (e.g. departing from these plans in a controlled, mutually agreed way when this is the best thing to do).

6.1 **Co-ordination of depot and train planning** (timetable and resources)

TOCs should have a resilient, joined-up plan for reliable service delivery. A narrow approach to train planning may not take full account of either operational resourcing constraints (e.g. where on-train staff book on and off) or diagramming for maintenance requirements (e.g. where facilities, fitters and cleaners are, and the time they need to do their work). Some train operators resolve this by co-locating depot and train planning teams; others have an engineering planner who sits on the train planning group.

Train planners need to understand depot capacity (*see 7.2*) and the consistently deliverable availability of all fleets. This is a good example of hard and soft issue management: we need some hard plans which are owned by each area of expertise (e.g. the depot plan, the train plan, the drivers' rostering plan). However, everyone needs to remember that we all exist to deliver a service, so these plans must be flexible, which invokes the soft side of talking to each other and not making assumptions.

Train and depot planners should meet to discuss every timetable change and ideally more regularly, to review experience, discuss the frequent diagram changes necessary to accommodate track engineering possessions and maintain relationships.

Example: GWR has documented Rules of the Depot which set out minimum requirements, e.g. for how long and how many trains are required in the depot in order to maintain them effectively. The programme of delivery of units to the depot at Bristol to feed the relatively short, single-road fuelling shed has been carefully worked out. Delivery against this plan is closely monitored with feedback on a daily basis. Shortage of one driver, for instance, leading to coupling together too many units for an empty move to the depot, can cause havoc to the operation and impinge heavily on time available for maintenance.

Example: GWR ran a series of diagramming workshops involving engineers, diagrammers, operators and driver managers to enable all to understand the fuelling, cleaning and maintenance requirements of the different fleets of DMUs, along with operating constraints and the length of time units could be made available at depots for maintenance. The joint aim to optimise maintenance downtimes and on-depot slots resulted in a good working train plan.

Example: TfW Rail production manager emails a daily report direct to the Operations Director and Head of Drivers, as well as control and the engineers. This uses traffic lights to document the previous day compared to plan: no. of units to depot before 1800, 2200 and 0001; no. of A and B exams; no. of drivers provided; depot staffing levels. Any shortfalls highlighted in red are discussed and reviewed by the directors, daily if necessary.

Best practice TOCs evaluate the costs and risks associated with changes to service requirements (e.g. changing the timetable or the vehicle diagrams), as well as the benefits. Engineers should be clear about what is optimal in their area, and also about setting out any costs and risks associated with a proposed change.

For example, TOCs should conduct a risk assessment on any proposed timetable change in terms of their ability to ***reliably deliver the service*** (e.g. is the proposed rolling stock utilisation plan robust? Are turnaround times sufficient? Does the TOC really want to suffer the likely increase in unreliability from having another terminal station stabling point?). Risk assessments should also include issues like the ability to ***deliver service quality*** (e.g. turnaround times required for adequate cleaning, diagramming to enable adequate toilet maintenance).

Example: SWR minimise the coupling and uncoupling of units. This means that they run more 8-car than 4-car sets, which increases fleet mileage and hence the mileage-dependent maintenance requirement. However, the benefit is a reduced risk of failures with huge operational impact.

Example: C2C's costs and benefits mean that they cannot eliminate coupling from their service pattern and must take a different approach. They effectively justify an insurance position of having a station fitter at Shoeburyness who can reduce the risk of service impact, e.g. by supporting operational staff undertaking coupling and uncoupling and dealing with technical issues as they arise.

The plan is not just about setting the timetable and letting it run, **feedback loops** are crucial here, too. A good way to develop a more robust train plan is to monitor how the service degrades during the operational day. Traditional measures of availability of trains for traffic tend to centre upon a certain time of day (e.g. was the 6am stop position met?), but more frequent measures may be useful to identify risks to service performance, as well as actual service degradation. Then effort (and resources) can be directed where they will have most effect (e.g. where to put a stand-by set or a terminal station fitter).

6.2 Communications processes around faults and failures

Best practice for delivering the service is to go beyond the safety baseline required in a standard contingency plan. TOCs need a cut-and-run policy: how long (and indeed whether) to support the driver in fault finding and resolution will vary under different operational circumstances. What is important is that the driver knows what approach to take on each occasion; it is usually best for the driver to contact control as soon as possible to confirm the approach to be taken.

Example: FCC (now GTR) had prior agreement between depot/control/operators on how to react to various common faults, e.g. leave in service, swap out before bottleneck (central tunnel section). A specific problem on Meridian doors was managed through an instruction of "if in doubt, lock it out", much reducing service delays.

Even if train reliability is poor, in the life of any driver, train faults will actually be quite rare. Hence the driver may need support to work through something which maintenance staff might regard as a common fault that is easily mitigated.

Drivers may also be in a state of anxiety and require moral support to deal with incidents where they are on their own in the cab and under pressure.

Example: SWR has "Phone a Friend" (a dedicated helpline for defect reporting and support) which covers mandatory reporting (e.g. RT3185s) and quality issues (e.g. graffiti or blocked toilets). Southeastern specifically train drivers in fault reporting at driver training school, using simulators for drivers to practice fault rectification.

Example: A small handbook has been jointly developed for drivers by engineering and operations staff working together at C2C. It is carried by drivers as part of their essential kit with the threat of disciplinary action if they do not. The booklet is sub-divided by colour-coded pages into traction faults, door faults, brake faults, etc. for easy identification. It is updated to reflect experience; one recent change is to amend 'report as soon as possible' to 'report at terminal station', to save having to stop to report a fault.

Example: In some TOCs, the driver phones the maintenance control centre where the controller uses a computer-based fault chart. This ensures a consistent approach to on-train fault-finding and means that depot maintenance staff know what was done.

Timely and useful feedback from operational staff to the maintainer (e.g. what happened, what they tried to do to fix it) is notoriously difficult to obtain. This means that subsequent root cause identification is less efficient than it might be and there is a greater risk of repeat failures. Feedback can be enhanced by closing the loop. Some TOCs write to drivers thanking them for their report, explaining what was found and maybe suggesting a useful mitigation for them if it should occur again, or letting them know that a permanent technical fix will be developed. This positive feedback encourages better reporting.

Example: Service feedback can also be obtained automatically without having to wait for drivers' reports. Electronic condition monitoring systems (e.g. MITRAC on Bombardier's modern fleets) enable simultaneous fault information to be transmitted to depots so they can plan in advance the priorities and resources (e.g. expertise and materials) for maintenance that night.

Example: Use of condition monitoring systems and communications links between trains and depots to report the condition of the equipment. This data can be invaluable when it comes to interpreting drivers' reports. It is possible to dial up the train in real time to investigate and respond to specific reports.

It is vital that the different functions understand each other's expertise and issues. The fitter needs to know what it feels like to be at the front of a broken train full of hundreds of people wanting to get home; the driver needs to understand that it's very hard to find (let alone fix) a fault when the person who saw it hasn't taken the effort to describe what happened adequately. Some ways of enhancing understanding and empathy have been described above for dealing with specific failures, remembering that communication needs to be two-way to be effective: drivers fill in fault reports and get feedback on what was found.

Other good practices are:

- a newsletter for drivers to promote understanding, focusing on topics that are known to be of interest to drivers, e.g. defect reports, driver managers or after attending driver briefings
- an engineering slot in the drivers' safety update briefing enabling face-to-face, two-way discussion of current issues and future developments

Example: EMT has an operations manager who, as an ex-driver, acts as the interface between drivers and engineering staff. He attends reliability meetings and inserts relevant extracts in the magazine produced for operations staff. This includes information on significant incidents, what was found and what action was taken. There are other items that keep drivers in the loop, such as 'watch out for such and such a unit, it has a new design of cab window – please look and tell us what you think'. S/he facilitates regular driver surgeries with drivers and fleet staff, and e-mails engineering directly with any driver issues that arise, greatly speeding up the process of resolution and feedback.

Example: An EMT coupling video has been made using EMT-liveried trains (and staff with local accents!) to remind all of the standard procedure to be used during coupling and uncoupling sets – 'The Happy Coupler'. It was also identified how important it is to ensure that every regular couple and uncouple is shown in the driver's diagram to avoid last-minute problems.

6.3 **Measures of fleet performance** (and how they are used to improve performance)

Different functions within an operator or across a contractual boundary undertaking independent data analyses sometimes produce different results and discussing these differences takes up a lot of time and energy.

Consequently, a joint dataset should be agreed to focus on reducing both the likelihood of failures occurring as well as the impact of each failure. Sound analysis will direct efforts to the areas which will potentially deliver the greatest service reliability improvement per pound spent.

Example: VTEC reduce the likelihood of failures occurring (projects include increasing battery life if the static converter fails, visual indication of transformer gas detection rather than a power shutdown, improved sander nozzles to prevent spurious dragging brakes reports). They also work to reduce the impact of delays e.g. by upping the speed limit of the Class 67 thunderbird light engine running to a failed train from 75 to 100mph.

The ability to produce an agreed dataset is very much to do with the soft issues of building trust, relationships and understanding between different areas of expertise.

Examples: C2C produce common data which is summarised on a one-page document called Service Affecting Incidents. This is discussed at performance meetings where actions to improve reliability are agreed and reviewed. Key to the success of this process is that the actions taken by different parties are transparent: Operations know that Fleet is developing a long-term fix for fault z, so they are keen to help mitigate its effect by working round it using procedure y.

Once the dataset and root causes are agreed, different players can feel more comfortable about working together to minimise the impact of any fault. There are often short-term operational mitigations which can be very effective in improving reliability whilst a long-term engineering fix is developed and implemented.

Example: A new fleet had interlock problems with the exterior bodyside doors for cab access when changing ends. Whilst an engineering solution was being developed and implemented, the drivers agreed to use the saloon doors to access the cab to reduce the risk of cab exterior door interlock failure. This more holistic approach delivered a more reliable service even before the technical improvement could be rolled out.

It is also important to capture faults that do not yet affect the service but reduce operational flexibility.

Example: C2C measure degraded mode operations where one cab has to be buried inside a train (e.g. because of failed windscreen wipers or inoperative TPWS). They want to understand the nature and level of their operational inflexibility for splitting and turning trains round as it affects the overall resilience of their service delivery. C2C measure trends in these areas even where no delay is experienced in service, because it is a measure of a reduction in their capacity to mitigate any other event which occurs.

More is better: There are other examples of expanding the definition of faults in order to capture more issues to be resolved before they impact service delivery. Many operators treat a problem which causes a step up internally as seriously as if it had caused a cancellation. In other words, they acknowledge they are making use of the resilience they have built in to their diagramming and make the most of the learning experience. This attitude is also important in prioritising customer issues other than simply getting there on time, e.g. cleanliness, functional toilets, etc. Soft issues are critical here in creating a culture where people accept that different functions contribute to the whole.

Fewer is better too: At the other end of the scale, some TOCs have mechanisms which focus on the worst incidents in each period, e.g. those which cause the most delay minutes, or all incidents above a certain threshold of delay minutes. A full cross-functional review of the failure is carried out to identify real root cause(s) and more effective long-term mitigations. It often elicits other opportunities for improvement as actions are typically fed into cross-functional groups and progress is monitored by the performance manager.

Train service performance has been improved by:

- Focussing people on what is most important to themselves and their internal customers
- Creating indices by which progress can be monitored
- Providing more structure and formality around previously casual arrangements
- Improving cross-functional understanding and organisational learning
- Providing useful quantitative data to assist business cases to address root causes, improve resilience and make mitigations more effective

In summary, TOCs should take a holistic, structured approach to assessing the measures needed for improvement. This then requires robust analysis, checking for statistical significance of variations and identifying common cause issues where concentrating on the root cause can eliminate multiple failures.