

## 5. Train Preparation

A ReFocus sub-group agreed that train preparation (TP) activities are primarily undertaken for three reasons:

- ✦ Safety
- ✦ Reliability
- ✦ Cleanliness / Train Presentation

Train preparation is currently undertaken by the industry in a wide variety of ways, using a variety of personnel. This chapter follows a Plan, Do, Review format.

In many cases, TP is more appropriately performed by drivers. In essence, the message is that each train type and each location dictates who is best placed to carry out TP.

There is a lot of evidence that TP activities are frequently duplicated by maintenance staff and then the train preparer. Two examples are featured below. It is good practice to identify activity duplication activity and eliminate it as far as possible.

Example: In relation to Thameslink Units, GTR undertake a “Berth Check” - a pre-driver check that is undertaken to pre-empt any start time failures. Activities are therefore undertaken for reliability reasons as opposed to meeting a safety requirement.

Example: Two extremes of TP duplication were reported by London Midland:  
On one fleet, fuel point exams were enhanced to protect the depot from conductors finding faults. On this fleet there are 3 checks undertaken:

- ✦ Check 1: Maintenance Staff undertake a daily exam.
- ✦ Check 2: The shunters undertake the conductor prep. ✦ Check 3:  
Depot Driver undertakes Driver Prep.

It was reported that these checks were additionally implemented on Class 323 units, with the introduction of Check 1 improving the reported reliability performance by 25%!  
Conversely, on another fleet, manufacturer’s maintenance staff undertake train preparation and hand over a piece of paper to the driver to confirm train is in a fully fit state. The train driver then simply takes the train into service.

N.B. items marked **[KTR]** are to be considered for inclusion in a future version the Key Train Requirements

(KTRs) so as to improve the train preparation process (both in time and ease). The latest edition of the KTRs can be accessed from this link: <http://www.rssb.co.uk/library/groups-and-committees/2014-09report-key-train-requirements.pdf>

### 5.1 Plan

Planning for train preparation is as equally critical an exercise as the undertaking of the preparation itself. The following points focus on good practice when considering train preparation, arrangements and examples of current industry practice.

Consideration should be made as to the reasoning behind performing train preparation postmaintenance. Ideally, train preparation should not be used as a catch-all to identify maintenance or cleaning process deficiencies.

The periodicity of train preparation should be kept to a minimum. Good practice would be for a train's preparation to be valid for at least 24 hours. Some instances occur where units are stabled for extended periods of time, during which two preparations are undertaken. Consideration should be made as to whether the TP periodicity can be extended so as to better utilise staff.

Example: East Midlands Trains' (EMT) Meridian fleets are prepared by Bombardier as a result of their Train Supply Agreement. This preparation does not have an expiry, therefore once prepared can be left as long as necessary and taken into service without necessity for a second preparation. Conversely, EMT's 15x units (maintained in house but on the same depot) need to be prepared every 2 hours. This is justified as protecting the depot from start time failures as a result of "drivers arriving late" to report defective cab heat – since the unit has cooled down since the original TP was undertaken.

Example: Virgin Trains West Coast's (VTWC) Class 390 fleet have a TP validity of 24 hours.

Example: When meeting to discuss this good practice, members discussed that some fleets require physical attention every 24 hours otherwise they shut down. The example cited was a LIM reset on Electrostar Units. This functionality was not considered appropriate [KTR].

On the other hand, some TOCs have instigated depot TP activities to address an "epidemic" of start time failures reported by traincrew. This reduced failures to two in 18 months.

The introduction of new rolling stock has been an initiator of change for TOCs in relation to TP. This can be taken as a good opportunity for TOCs to review TP processes and have a "blank slate" for TP as the adage "this is how it has always been done" becomes irrelevant.

Where trains are frequently prepared on depot, consideration should be made in the event that access to the depot becomes restricted/impossible. Where this occurs, contingency plans should be put in place to ensure early identification of faults and minimise any potential reduction in reliability.

Example: In normal operation, the VTWC Class 390 fleet return to a depot every day. In 2015, the West Coast Main Line was severed as a result of a damaged viaduct. This resulting in a noticeable number of outstanding defects arising across the fleet; a symptom of accessing the fleeting being more difficult.

Preparation can be further complicated at outstations such as Nottingham Station where it is not possible to walk around the exterior of the train. A different TP regime is therefore followed not involving the underframe of the unit. Consideration should be made as to where units are prepared to ensure that units are not consistently prepared at locations without access below the solebar.

Example: Bombardier report that it is not possible to walk around the Class 378 units whilst in their stabling points, therefore below-solebar TP activity is not undertaken at these locations.

## 5.2 Do

Good practice is considered to be that the preparation of the train is performed by maintenance staff (since they are best able to effect a repair) and is provided in a “fit for service” state to the driver who, upon receipt of formal documentation, will take the train into service. It is accepted that this arrangement is not possible at all locations.

At Gatwick Express (Stewarts Lane), the depot staff produce paper TP Certificates that are left in the driving cabs. GX fitters are also depot drivers for optimisation of resources.

At GTR’s Hornsey depot, their depot staff (including the shunters) undertake TP. At their outstations the traincrew undertake TP.

Where possible, the Train Management System of modern stock could be used to get around the need for a “piece of paper” to demonstrate TP validity, thus reducing the need for physical transport of documentation to the vehicles and any potential loss/damage. **[KTR]**.

Similarly, where possible, the TMS should be used to monitor the status of systems on the train which require preparation, particularly at locations such as outstations.

Example: Govia Thameslink Railway Class 455 Units are on exam more often than the more recent design of Electrostar Units. Therefore, as the Electrostars are more frequently prepared at outstations, the Train Management System Intelligent Display Unit is used by fitting staff during TP.

Example: SWT’s Siemens Northam Depot is not big enough to accommodate their entire fleet. As a result, they make use of remote diagnostics to identify faults; details of which are then used to inform the activities of a “man in a van” repairer.

Where units frequently run through Automatic Vehicle Inspection Systems (AVIS), the case could be made for a reduction in TP activities. These systems are able to report on the state of various external systems on the train (i.e. brake disc and pad presence and thickness, fire bottle level, whether side skirts are left open etc.) and thus if the unit is run via this system on a regular basis, TP can be minimised. It is important to note when the inspection is done i.e. on the way into the depot or on the way out of the depot.

Where possible, keep train preparation uniform between depots. At the time of writing, different depots undertake different TP activities. There is a disparity not just between TOCs but also between depots within TOCs. A significant barrier to this is Industrial Relations (IR), whereby a major change to TP would be difficult to achieve without the support of staff. This issue primarily occurs between staff grades within TOCs.

Train Management systems should, where possible, be used to complete as much of the TP as is practicable. When considering future trains, it is worth investing considerable time and effort thinking about how the system will work and streamlining the TP process. I.e. can the TMS report system status (Healthy / Faulty)? If so, can physical checks be removed from the TP inspection? **[KTR]**

The reliability of self-tests should be kept at a maximum to ensure that upon start-up, spurious fault messages are not generated which can result in a conflict with diagnostics.

On Siemens Desiro units, the TMS features different pages of information that are presented to the user on the TMS display. It is crucial to ensure that the level of information presented to the driver in relation to faults is sufficient such that they can provide a value added action to rectify the fault. There is a view in this application that there can be such a thing as too much information.

Faults can be classified major or minor. Major faults are those that the driver is aware of and can undertake a timely response to once the fault has been reported. E.g. fault in relation to safety of train. Minor faults are those which do not require the immediate attention of the driver and can be addressed at a later stage during the day.

There is a danger that additions to TP activities over the years have been to ensure drivers cannot fail trains in order to protect fleet reliability performance reporting.

Different staff can be responsible for TP activities within a TOC. An ideal approach would be for consistency across all depots within the TOC.

Example: East Midlands Trains has a wide variety of combinations of TP staff just within their Etches Park Depot:

- ✦ 22X fleet – manufacturer prep (Bombardier).
- ✦ 15x – depot driver preparation.
- ✦ HST – depot staff prepare power cars; shunters prepare trailer car interiors.

There is little to no requirement for depots or TP to test horns, head, tail and marker lights. This functionality is tested by drivers routinely when vehicles are in service. Members believe that there will be little chance that these components will fail between service and re-preparation.

Due to the increased importance of Service Quality (SQ) and the minimum standard expected by passengers, there may be a requirement for a different type of TP post cleaning. In more recently let franchises, SQ levels are specified measured requirements.

Point of Interest: When comparing the railway to the automotive industry, upon completion of a car service, it is not typical for the customer to walk around the car undertaking an inspection. If this is the case with cars, why should it be accepted in rail? It should be noted, however that aircraft pilots still perform a walk around of their aircraft prior to flight.

Where systems display an analogue dial featuring any potential dubiety, it should be clear as to whether the reading is a clear pass or fail.

Example: Class 15x fire systems feature a dial reading “red, green, red”, i.e. low pressure, medium pressure, high pressure. What it does not tell, however, is that high pressure is not considered a problem when compared to low pressure. Train preparers may, upon seeing a needle in the “red” zone, fail the train without having knowledge on this. [KTR]

As was mentioned at the start of this section, train preparation activities are often restricted at sidings/outstations, therefore below solebar TP is not undertaken. Whilst this is accepted at outstations, depot train preparation features below solebar TP. Those undertaking this TP activity should consider whether, as this is accepted at outstations, whether it is a necessity to perform at depots.

Good practice when preparing coupled multiple units is seen to involve keeping units in their consist rather than separate to prepare individually. Splitting units is seen to introduce risk and therefore should not be necessary.

Example: Some TOCs reported that units running in multiple are split upon train preparation. This is done to check the functionality of the couplers. This is the only reason for splitting the units and therefore was deemed to be unnecessary and inserting undue risk to the process.

Whilst it may be considered by some to be a belt and braces approach to TP every cab in a train consist, it does represent good practice since it prevents defects subsequently being identified by traincrew.

### 5.3 Review

Analysis should be performed on the causes of TP failures both at a TOC level but also, where possible, at a national level. Both of these will help to understand the systemic issues and, via a pareto based approach, begin to tackle the most frequently recurring failures. This analysis can be broken down further to look at the failures which occur on depot comparing to those which occur at outstations.

Reviews should be held of any incidents which have occurred as a result of improper train preparation. Caution should, however, be taken as if new checks are initiated as a result of every incident then TP shall become ungainly and unwieldy.

TP activities should be routinely reviewed (ideally on an annual basis) to ensure that they are relevant and whether modern practice can enhance the process.

As mentioned in section X.B, in some instances extra checks are being carried out on fuel point exams. To best understand the current state of train preparation, a look into what is being done (and for what reason) on fuel point exams for TP reasons should be undertaken.

Care should be taken to ensure that TP occurs only when it is necessary. Post control jumper change is an example of when TP should not take place. A proper test post repair is what is required, however instances such as NIRs can instigate the implementation of these sorts of checks which can, in less time than one may realise, become embedded in the maintenance plan.