

## 15 ROSCOs

ROSCOs are key suppliers to TOCs and fleet performance depends on the ROSCOs delivering their activity effectively. Generally:

- ROSCOs own the vehicles as assets and need to take a proactive lead on reliability issues with a whole life element;

**Example:** Auto-sanders which operate during braking only were fitted on Class 390s for performance reasons (not a safety need). The VTWC franchise only had 6 years to run, but Angel funded the installation over 12-15 years to reflect the design life of the equipment.

- ROSCOs procure most heavy maintenance which creates much of the capability of a train to be reliable (for the TOC to sustain over the rest of the maintenance cycle);
- ROSCOs manage critical spares pools for most fleets (these pools also create or destroy a TOC's ability to deliver its fleet reliably).

There are various ways that ROSCOs can facilitate reliability improvement at different stages and from different angles. These typically are:

- during procurement and build of new vehicles (see Section 13)
- during the operation of a particular fleet with a particular TOC (in Fleet Management Plans, see 15.1),
- by joining up thinking and making comparisons between different TOCs and different ROSCOs with the same/ similar vehicle Classes, see 15.2
- by taking a lead in the improvement of components/ systems and issues/ challenges which apply across several or even all fleets, see 15.3
- by working with the supply chain to resolve parts issues (see Section 12)
- by developing and implementing step change modification packages at key stages in the vehicle's life e.g. C6X near the end of a franchise (not detailed here).

ROSCO support can help prevent reliability deterioration:

- when fleets are transferred between franchisees, but continue doing the same duty (see Fleet Management Plans and aspirations around refranchising in 15.1);
- when fleets are moved between TOCs who have different duty cycle requirements (see 15.4); and
- when stock is transferred between TOCs at other times (see 15.5).

This Section takes the above specific issues and explores what they mean. We set out what is currently done (including some examples of good practice) and also state some aspirations for how things could be improved.

### 15.1 Each fleet with each TOC and ROSCO: Fleet Management Plans (FMPs)

Fleet Management Plans are one of the most important tools for ROSCOs to facilitate long term reliability improvement, provided that the TOC is engaged appropriately.

Fleet Plans were originally written by the ROSCOs without engaging the TOCs, and so did not reflect the performance of vehicles in service. They should now be jointly signed documents, with each TOC enabled to input to the process. They form the front end of the Technical File for each fleet. The common core information for FMPs was agreed between ROSCOs following FRA8 as follows:

- Exec Summary
- Purpose and Scope e.g. relationship plan
- Fleet Technical Data i.e. base Technical File data
- Operations and Maintenance Policy e.g. Overhaul documents history, concessions, VOs, Whole life maintenance and modification plan
- Regulatory compliance e.g. certification and limitations
- Materials supply and Obsolescence e.g. obsolescence plan (see 12.1 above), key spares
- Management of Safety e.g. live NIR matrix
- Fleet Performance e.g. Performance Improvement Plans
- Overview of Projects, Modifications and Enhancements e.g. 18 month unit plan, change control and configuration matrix

One of the explicit purposes of the FMP is to facilitate reliability growth. TOCs need to share emerging performance issues with ROSCOs, so the FMP Performance Improvement Plans can be re-evaluated and appropriate actions identified (Cost-Benefit-Analysis and Plan-Do-Review cycles).

FMPs are live working documents, which must be kept confidential to the TOC to reduce the risk of incumbent blight at re-franchising. They should be updated at least annually and signed off by functional Directors from both the TOC and the ROSCO. The detail should be reviewed regularly (e.g. at the 4-8 weekly technical review) and used as part of the lease review process.

Note: Ownership of the content of FMPs varies e.g. Dry lease FMPs are updated by TOCs with their suppliers, Wet lease FMPs are updated by ROSCOs/ their suppliers.

Example: ScotRail FMPs with Eversholt and Angel. Eversholt: The implementation of the joint ScotRailEversholt through-franchise FMPs was considered particularly successful because: 1. The FMP was constructed as a single overarching document that includes all Eversholt rolling stock on lease to ScotRail and clearly set out the high level objectives of the franchise. Separate Appendices address the specific aspects of each individual fleet, facilitating updating and day-to-day management. 2. The agenda for the regular ScotRail-Eversholt contract review meetings were constructed around the FMP template, and an action tracker was used to monitor progress and ensure comprehensive and timely follow-up. Thus makes the implementation of the FMP central to the relationship rather than a one-off activity.

Example: Angel and ScotRail FMPs worked well as the two businesses integrated their high level requirements and day to day interaction around the plan. Ongoing lease and technical reviews were focused around deliverables within the plan. This is due to a direct link between the ScotRail Reliability Action Plan (RAP) and the LPIP such that there is read across and buy-in between the TOC's and the ROSCO's long term reliability growth initiatives. The sharing and real-time use of the process, deliver a much greater alignment between the two businesses.

**ROSCOs would like FMPs to**

1. start sooner (engaging with DfT in refranchising process) and to;
2. develop more details (engaging more with TOC in reliability improvement). TOCs would like FMPs to contain explicit targets for reliability, availability and cost of operation.

### **Starting sooner during refranchising**

The following timeline for a Fleet Management Plan is desirable:

#### -24 to -12 months (i.e. up to 24 months before refranchising):

ROSCOs would like DfT to engage with them in optioneering, considering key issues to resolve or improve with specific fleets. Then DfT should make requirements visible to ROSCOs as soon as they are published. The “overview of franchise commitment” does not contain enough information - ROSCOs would like to understand the context and concept from DfT (rather than restricting them to preferred bidders) and in good time to get a full picture of what DfT wants to achieve.

This should enable ROSCOs to compete more effectively and provide better offers to TOCs. Perhaps 70% of the ROSCO offer would be common and 30% bespoke to bidder, whereas the current limited information and limited timescale process drives bland ROSCO inputs.

#### -6 months to 0 months (i.e. during the 6 months before refranchising):

ROSCOs would like any new franchise to be signed 6 months prior to franchise commencement (instead of the shorter timescales often available), so that they can:

Identify and elaborate franchise deliverables, working towards an outline FMP

Identify risks and agree how to manage them, fleshing out the FMP

Prime the supply chain, dealing with any set up and float control issues, exploiting repeat business leverage opportunities, etc

Although franchise requirements can change prior to the actual start date, more opportunity for set up work would increase the likelihood of a successful and reliable franchise start. It should also enable frontend deliverables to be better supported.

ROSCOs also believe the incoming franchisee should have access to existing franchisee staff to facilitate a smooth handover and effective start up.

#### 0 months to 12 months (i.e. during the first year of a new franchise):

Ratify the outline FMP (developed during the 18 months prior to franchise start, see above), i.e. what the plan is and what the agreed milestones are

Hold Technical/ Lease reviews on the detail and the mechanisms to achieve agreed milestones

Have an interim review at 6 months

Have a formal review at 12 months, including measurement data in a feedback loop to modifying the plan

This contrasts with spending the first year of a franchise putting an initial plan together, and would be facilitated by more time and more data sharing in DfT's re-franchising process.

#### Steady state (mid-franchise)

Develop and evolve the FMP to improve performance. Pick up more detailed issues – see b. below.

#### Last 12 months (to franchise end or stock transfer):

Take up the opportunity to avoid stop-start by continuing existing programmes, subject to support from DfT and new franchisee, once announced. A handover plan needs to be agreed, detailing arrangements to clarify configuration of vehicles and provide all support information e.g. NIR resolution status, see 15.5 below.

Sometimes FMPs have been written to maximise the effectiveness and smoothness of a relatively short TOC/ROSCO relationship.

Example: Eversholt agreed short-term (12 month duration) joint FMPs in 2005 with National Express London Lines, for the Silverlink and WAGN franchises on Class 313, 321 and 365 fleets. The well-established process was used successfully, with special care taken to ensure commercial confidentiality of potential improvements, given the ongoing franchise competitions. A joint Fleet Planning Workshop established stakeholder priorities and agreed joint targets and action plans for performance improvement. The limited timescale available for implementation meant that only 'quick wins' could realistically be taken forward.

#### **More details during the life of the FMP**

ROSCOs would like to have more details in FMPs, so they can better support TOC performance improvement. They would like to:

- Generally, improve interfaces for data transfer and communications (primarily from TOCs to ROSCOs)

Example: AGA has good data flows agreed with both Porterbrook and Eversholt including delay minutes, cancellations, miles-per-5-minute technical delay and trends every period. They also share with the ROSCOs their specific targets such as PPM during Challenge 90, which prioritised some service quality issues over reliability.

Example: EMT holds monthly performance meetings for all their fleets which Angel and Porterbrook engineers attend as full participants: they get all the data (warts and all) and participate in reviewing performance and determining actions.

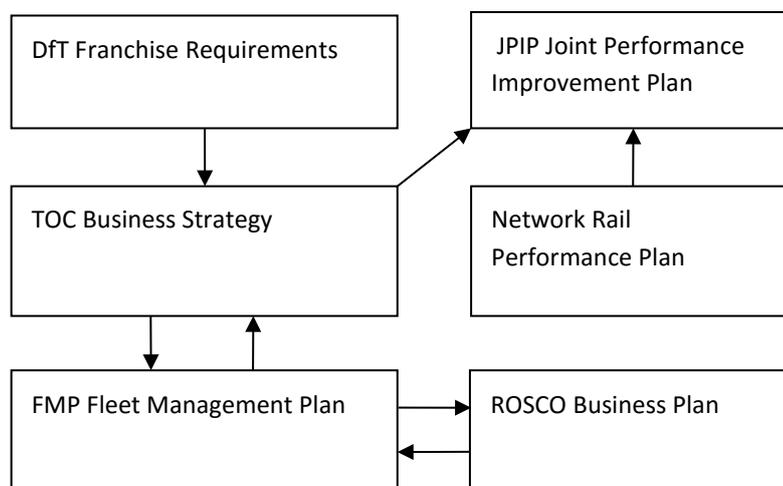
- Specifically, agree reliability targets with TOCs, based on aligned strategies so stakeholder priorities can be aligned. This would mean agreeing activities to do and resources required for them (people, training, depot improvements).

The heavy maintenance programmes delivered by the ROSCOs are fundamental to creating the capability for the rolling stock to perform reliability over the rest of the maintenance cycle. TOCs therefore often seek to establish Reliability targets for fleets undergoing Heavy Maintenance or other ROSCO-led programmes.

ROSCOs recognise that TOCs will want *optimum* reliability for their business model/ DfT requirement, not necessarily *maximum*. For example, TOC priorities might be their bigger fleets, longer term vehicles or perhaps even passenger environment and security (rather than reliability) in the first instance. DfT priorities might preclude TOC investment in depot improvement. The FMP should reflect these stakeholder priorities, but also note opportunities which exist for reliability improvement beyond the current plan – and ROSCOs should consider facilitating the work required.

It is important to note that changes to vehicles may be only a small part of a TOC’s reliability growth plan, for example, Northern plan for only 15% of their improvement from vehicle modifications.

Incorporating the TOC/ Network Rail relationship, the performance improvement model for TOCs is typically:



### 15.2 Vehicle level comparisons and User Groups

ROSCOs can help join up thinking and make constructive comparisons between different TOCs and different ROSCOs with the same/ similar vehicle Classes (on new/recent builds, this involves engaging the manufacturer in on-going issue resolution).

Specific comparisons can facilitate understanding which drives productive change.

Example: Eversholt holds joint technical reviews with TOCs from different owning groups on Classes 313 and 321. The review includes: discussion (and development of people/ relationships), comparing trends, identifying best practice, pre-empting issues on particular fleets, smoothing any fleet/ vehicle transfers. Variation in Class 313 performance across different TOCs was positively correlated with when successful compressor mods were implemented.

All User groups should be linked to the ReFocus web page, to facilitate the sharing of knowledge and engagement with and between the groups. They should have clear remits and agreed level of attendance from all invited stakeholders. They should all cover reliability improvement and risk mitigation issues as well as sharing safety concerns and advice.

Example: Northern led the setting up of a refreshed mid-life DMU User group in 2008, modelled on the new Electrostar User group. It is now more effective, with a pro-active approach to reliability issues and better engagement from key players.

Example: Eversholt led the setup of a new User Group for Electrostars in 2007, with the following terms of reference:

- To provide a forum for a periodic stakeholder high-level review of Electrostar fleet performance
- To identify emerging issues and trends and ensure that action plans are in place to address identified areas of concern
- To provide strategic direction and guidance on these common issues to the TOC, ROSCO and Bombardier teams responsible for delivering Electrostar fleet performance
- To identify and encourage the implementation of industry best practice and lessons learned from other fleet programmes to the benefit of overall Electrostar performance.

Example: Porterbrook coordinates the Turbostar User group which was re-launched in 2008. Each meeting now focuses on no more than two train systems, sharing best practice in maintenance, operations and reliability initiatives.

## 15.2 Common bits and issues

ROSCOs are in a unique position to take a lead in the improvement of components/ systems and issues/ challenges which apply across several or even all fleets.

Some of this will be most effectively done in an on-going User Group style (e.g. Cummins User group, Voith steering group). Other challenges are better addressed with a specific working party. The ROSCO role can be one of pump priming to resolve specific issues.

Example: Oil carry-over on Sprinters and Pacers – Angel and Porterbrook led the development of a design solution to this issue, setting up a project-based TOC/ROSCO group. They then progressed to installation designs for each vehicle Class, and trial fits, cooperating with candidate TOCs. Roll-out is progressing, although some delays have been caused by stock transfers between TOCs and refranchising, and some business cases may not be viable.

It would be much easier to make effective comparisons and spot trends sooner if we were able to collate data more consistently e.g. if we had agreed vehicle models and cause codes. This would facilitate the sharing of ReFocus data at a layer below the vehicle performance, and was recommended in NFRIP's January 2008 Pacer Benchmarking report as applicable to all fleets.

For more details and examples on Supplier Management, please see Section 12.

## 15.3 Optimising for Duty Cycle

ROSCOs facilitate the transfer of maintenance plans. If well-documented and understood, these can be particularly useful when fleets are moved to undertake different duty cycle requirements, whether within the same franchise, or TOC to TOC.

ROSCOs are in a good position to observe practical examples of Duty Cycle related maintenance and share best practice.

Example: Class 317 fleet maintained at Hornsey depot. Most of the fleet operated frequent stopping services, whilst a small, dedicated Stansted Airport fleet ran faster, longer distance services with

only limited intermediate stops. Door maintenance frequency of the Stansted fleet was reduced relative to miles run, to reflect the reduced number of door operations per unit mile; traction motor maintenance was also adjusted to reflect the higher speed running and the reduced number of high current starts. To help maximise DMU availability and avoid changing wheels between bogie overhauls, C4 mileages were related to wheel life. Where wheel life was driven by tread wear caused by braking, this related to stopping patterns in service. For example, at Newton Heath in the mid-1990s, Class 150 C4 mileage was 325,000, whilst Classes 153 and 156 were 350,000 miles, reflecting the different Duty Cycles.

Three recent examples of Duty Cycle-related maintenance are:

- NX East Coast Class 91 (Eversholt), • NX East Anglia Class 170 (Porterbrook),
- the Desiro fleets (Angel).

Example: Eversholt commissioned a Strategic Maintenance Review, to identify the theoretical maximum exam periodicity for each element. This involved extensive condition assessments, gathering lots of data and using Failure Modes and Effects Analysis (FMEA).

The output is an integrated maintenance regime, involving some time-based elements (e.g. things inside the vehicle such as contactors, relays), and some mileage-based elements (e.g. bogies, running gear, traction motors). This is all contained in one document including all Level 1-4 and Level 5 maintenance. The same document is used by Eversholt, Bounds Green, and Wabtec.

The result is that periodicities are optimised, based on the current duty cycle of the fleet. The TOC's "little and often" policy means a lot of exams, although, if two larger exams are due around the same time, they are combined to reduce downtime. If, in future, fewer larger exams were preferable for the service, or duty cycles were to change, the data is available to inform relevant maintenance plan adjustments.

VTEC agree that the result is good, but believe it could have been achieved more quickly if the ROSCO had engaged more with the TOC initially.

Angel have since supported Siemens' unified maintenance manual drive, where core maintenance requirements are identified, reflecting the various sub-fleet mileages and duty cycles. Condition assessments are being conducted, to increase knowledge of wear patterns and deterioration, to determine optimum life for different components. This is seen as a continuous process: SWT and Siemens are aiming to achieve 1 million miles between component overhauls.

Example: A Value Improvement Programme (VIP) was carried out on the Class 170 fleet at Norwich Crown Point, involving Porterbrook, Bombardier and Depot staff. The VIP brings a group of people in a room and, in a structured way, gets them to do the obvious things (which they haven't been doing!). The behaviour of the senior people from each company can make the difference. VIPs generally solve relationship and process problems; this one contributed to a maintenance regime review too. The review led to some reduction in planned workload, and releasing resource for fault finding. The refreshed Turbostar User group is now sharing duty cycle optimisation for 170/171 fleets, building on the work Bombardier, Porterbrook and AGA have been doing.

Example: The Desiro fleets include the Class 350 at London Midland and TPE, 360 at AGA, 380 at ScotRail, 185 at TPE as well as the SWT 444 and 450. Angel was particularly supportive in facilitating Siemens' performance on 360 introductions, providing powerful technical support, insisting on mods and escalating issues as appropriate.

## 15.4 Fleet Transfer / Cascade

### 15.4.1 Smooth transition of rolling stock transfer / cascade and introduction to service

When a transfer of rolling stock takes place from one TOC to another, there are many elements to consider, which, cross many business functions; including engineering, operations and commercial. Good management of these elements will lead to a successful transfer of rolling stock in either receiving or returning vehicles.

Whatever the reasons for transferring stock between TOCs, a handover plan should be agreed by all stakeholders. The following document shows some of the key areas which must be considered in order to manage the initial planning and introduction / transfer stages as well as introduction of units into service.

Required timescales vary depending on the type of cascade. For example introducing a fleet of unfamiliar units to the new TOC will require significant preparation time for training and possibly depot enhancements whilst a short term emergency hire of one unit can be arranged swiftly if it is a known unit to the receiving TOC and subject to a similar maintenance regime to those already carried out on other fleets. Even where the unit type is “known” by the receiving TOC it is important to recognise that there may be detailed differences with the specific unit(s) being transferred.

The purpose of this document is to provide guidance on aspects related to the preparation and planning of any stock transfer. It is not a complete plan. All stock transfers will have their own unique elements that must be considered and managed. Thorough and timely planning and preparation will lead to a smoother transfer. It should also be emphasised that good communication and working together with the delivering / receiving TOC and other key stakeholders is critical to a successful transfer.

### 15.4.2 Type of cascade:

- Small fleet versus whole fleet
- Short term versus long term

### 15.4.3 Initial planning phase of stock transfer (time prior to receiving / transferring rolling stock).

Outline plan development:

- Identify key milestones and the critical path to achieve the project timescales.
- Identify fleet compatibility and special requirements.
- Consider inclusion of TOCs, ROSCOS and OEMs e.g. Stock transfer support teams (small short term teams which have access to specific fleet experts).

Initial pre-delivery condition survey:

- Establish and agree with the leasing company the condition of the unit(s) being transferred including position in heavy maintenance cycle(s) and any non-standard equipment
- Establish what the impact on current fleets operated is:
  - Adequacy of spares.
  - Ownership of spares (split fleets and or different ROSCOS).
- Involve key stakeholders such as:

- TOCs (Sending and Receiving).
- Operations:
  - ✦ Simulators.
  - ✦ Driver / guard training.
  - ✦ Software (interactive / system).
  - ✦ Sanding system configuration.
  - ✦ Through gangways (operational safety and revenue protection implications).
- Commercial.
  - Lease type (Wet / Dry).
  - Hand-back condition.
- Seating configuration and passenger reservation requirements.
- Can current booking systems be changed to accommodate new fleets with different seating configuration?
- Train Planning ○ Sectional Running Times ○ Station dwell times (including door control configuration and method of door operation)
- Network Rail (Route / station suitability).
- Passenger Focus (Service expectations).
- ROSCO (Maintenance Plans and spares).
- Department for Transport (Are the trains suitable and timescales for stock transfer achievable?).
- RSSB (Derogations).
- RVAR (Derogations).
- Local Community (Short term increase in noise levels etc).
- Rolling Stock Library (Train configuration).
- Rebranding.
- Changing the livery of rolling stock can be a very time consuming process and will require considerable planning as a separate project. Consideration should be given to the length of time that the stock will be run, i.e. short term transfers vs. long term transfer. Rebranding of rolling stock can also have implications with regards to PRM TSI regulations (contrasting colours etc).

#### 15.4.4 Preparation of stock transfer and stock introduction:

- Service introduction path for new stock.
- Service level introduction of rolling stock (whole fleet or staggered introduction), even with the best planning and preparation it should be expected to suffer from some initial introduction failures.
- NIR resolution.
- Are there outstanding NIRs.
- Are there outstanding fleet checks to be completed prior to transfer?
- Maintenance support planning.
  - What maintenance support comes with the vehicles (OEM support, warranty support etc).
  - Are special tools required for maintenance of systems / components?

- Is special test equipment required to maintain systems / components?
- Maintenance documentation.
  - VMI, VMP, COI, VOI etc
  - Unit history files.
  - Exam and overhaul history.
- Materials planning and additional spares.
  - OEM support.
  - Second tier supplier support.
  - Modification levels of spares.
  - Special tools required to fit spares.
- Reliability growth plans. With the introduction of unfamiliar / new rolling stock it should not be expected for the units to work out of the box. With this in mind, reliability growth plans should be developed which will work towards steady growth in reliability.
  - Review process (regular and detailed reviews of defects).
  - Trend analysis (by system and by component).
  - The sharing of reliability data from the existing TOC to the new TOC is desirable and will only aid in developing reliability growth plans.
- Stabling of additional units and overnight berthing arrangements.
- Is sufficient capacity available? Passenger Information Systems.
  - Uploading new route information.
- Training programmes for staff to maintain unfamiliar rolling stock (consider where a limited number of initial units are available or where training must take place prior to stock transfer).
  - Conflict may become apparent between the requirements of engineering and operations where unit availability is required for engineering / driver training at the same time.
  - What training manuals and other training aids are available from the previous operator and can these transfers with / ahead of the stock?
- Rolling stock configuration.
  - Selective door opening.
  - Mandatory modifications.
  - GSM-R
  - Modifications for route compatibility.
  - Driver Operation Only (DOO) etc.
  - Driver cab configuration.
  - Defect log books.
  - Aide memoirs (fault rectification).
  - Other modifications, experiments and trials, specifically non-standard equipment
- Route compatibility.
  - Are stopping boards in the correct position.
  - Monitors / Mirrors for DOO.
  - Signalling distances.
  - Stepping heights and distances (raised platforms) may be greater for different stock.

#### 15.4.5 Rolling stock reconfiguration / reformation

There may be instances where the rolling stock being received by the TOC whilst suitable is not in the correct configuration to meet the company business need. For example, Northern Rail received 3 car class 150 units. This did not fit with the Northern Rail diagrams and planning requirements. The units

were therefore reconfigured to 2 car 150 units. This must be done with the full co-operation of the train owners (ROSCOS). Reconfiguration / reformation also introduces many other aspects which must be considered which have been previously mentioned. However, consideration must also be given to the introduction of systems which have not been enabled for an extended period of time. For instance, class 150's have a driving cab in the middle of a three car formation, when a reformation takes place to convert to a two car unit the middle vehicle will be used as a driving cab in a 2 car train. This will require all the cab functions and other systems to be enabled which had previously been isolated. There is also a requirement to inform 'Rolling Stock Library' of any reformations so unit numbers and mileages can be changed and tracked. Maintenance plans and documentation must also be aligned with the new train configuration.

#### 15.4.6 Facilities

In order to maintain the transferred rolling stock, it is critical that the maintenance facilities are suitable. A compatibility check against current stock maintained is an ideal position to start from. Where noncompatibility is identified further detailed assessment will be required with the possibility of maintenance facility changes taking place. This should cover:

- Space envelope.
  - Length of vehicle.
  - Maximum length of train set.
  - Height of vehicle.
  - Weight of vehicle.
- Lifting and jacking equipment.
- CET facilities.
- Wash plant / Roads.
- Primary power source.
  - AC Traction.
  - DC Traction.
  - Diesel.
    - ✦ Fuel station and rigging.
    - ✦ Extraction (exhaust fumes).

#### 15.4.7 ROSCO.

Arrangements to clarify configuration of vehicles should be detailed, including all supporting information for each vehicle, such as:

- NIR resolution status
- stage in maintenance plan e.g. last balanced B exam
- any deferred work
- any outstanding defects or open repairs
- any known problems or special control measures

The ROSCO is responsible for eliciting and transferring the above data from all maintenance providers. (In the past, 3<sup>rd</sup> party maintainers have not always been asked to supply the information they hold.) In practice, the ROSCO may actively arrange for direct dataflow between depots, but it retains responsibility for the completeness and quality of the data provided to the receiving TOC. Obviously,

with Dry leases, the outgoing TOC has a greater obligation to provide details compared with Wet or Soggy leases.

Negative examples exist to underline that an agreed TOC/ ROSCO FMP can be effective in preventing reliability drop-off as stock is transferred to another operator. Negative examples also headline the benefit of having “headroom” i.e. additional stock and/or time. There are also positive examples within TOCs such as First and NX, and also with Porterbrook and ATW. A risk workshop with appropriate people can be an effective tool to manage a smooth stock transfer and minimise potential impact on reliability.

#### **15.4.8 Check lists.**

Check lists can be a very useful tool to ensure all elements of the task have been completed. Northern Rail has developed several key check lists from experience gained from many fleet transfers. Appendix F contains examples of the checklists used. The following check lists are only to be used as guides and should be adapted for the individual TOC and type of rolling stock.