

**NOVEMBER 07**

**REPORTS OF SOCIETY MEETINGS  
ASSET PERFORMANCE**

**by Mark J. Cooper – Metronet Chief Operating Officer  
(responsible for delivery of all maintenance across BCV and SSR)**

**A report of the LURS meeting at All Souls Club House on 10 April 2007**

Mark started his talk by saying that despite daily interaction with senior LUL management this was his first opportunity to talk with the acknowledged experts on London Underground's operations and engineering – both past and present.

Mark's began his railway career in the Main Line railway industry, working for the last fifteen years for Bombardier in Derby, engaged in train manufacture, so coming to London Underground, and seeing the diversity of operations and sheer volume of activity was a new experience for him.

Mark enjoys working alongside London Underground and he is "looking forward to seeing the major capital investment programme through". He said with a background in accountancy, procurement, and as an Olympic athlete (competing in free-style wrestling at the 1988 Seoul Olympics) he was perhaps uniquely suited to being Metronet's Chief Operating Officer!

Mark compared media coverage of the two infracos and acknowledged that Metronet received a lot more negative press than Tube Lines. He said this was in part due to concerns that Metronet's shareholders [Balfour, Atkins, EDF, Bombardier and Thames Water] were also its suppliers. He said much has been done to address those concerns including the appointment of an independent Chairman (Graham Pimlott) and the opening up of the station refurbishment contracts to the market rather than the tied supply chain.

Over the last 18 months Metronet has also been in the process of streamlining its two infracos [BCV and SSL] to achieve better management focus and discipline. Modern business concepts like Balanced Scorecards and 'Six Sigma' problem solving have also been introduced to help drive improved performance by the engineering railway.

Within Mark's area, maintenance, one of the biggest priorities is to deliver 100% of programmed maintenance – something which had not been achieved even before the PPP. To deliver this another 550 frontline maintenance people are being employed, in depot and trackside engineering roles. This will avoid the need to prioritise, defer or seek concessions for temporary non-compliance on non-safety critical assets. With 100% maintenance being delivered on a daily basis it will allow more time to undertake root cause analysis on those assets prone to repeat failures; such as block joints, track wires, earth faults, traction motors, doors and hoses, some of which have been on the 'top ten failures list' for years. Sometimes root cause failures don't end with engineering – occasionally they are related to frequency of maintenance, periodicity, or cleaning. "We have to look at what we do differently, because what the engineering railway did before didn't always work".

Part of this recruitment drive will see the recruitment of a further 130 Technical Officers whose role is to respond to service affecting incidents. This will help bring response times to asset failures to within the critical 10-12 minutes threshold. The task, as Mark saw it, was to recover the lost 400,000 customer hours experienced each month, by getting things done on time, not having overdue deferred work, not having backlogs. He then moved on to explain the concept of intelligent maintenance: "Intelligence maintenance is where we want to be, doing more of what we should be doing and less of what we shouldn't. This means targeting maintenance in those areas where repeat failures occur, changing components proactively before they fail and in areas where failures are rare not over maintaining (but ensuring that safety critical work is always delivered)".

Mark said that track and signal failures nearly always take place in areas where a train is speeding up, or slowing down, in and out of stations. "Out of 46 linear Kilometres on the Central Line, 10km you want to hit hard every night with maintenance as that is where the failures are, where the wheel-rail interface demands much of the infrastructure". Three times as much ultrasonic testing should be done there as in areas where the train is coasting. "This is intelligent maintenance, let's look at risks, failures, wear and tear and devote more scarce resources where we need to and less where we don't".

Mark then expanded on his position and role within Metronet. Under Andrew Lezala, Chief Executive, there are 'two of us in pivotal positions'. Stephen Hall is Chief Programmes Officer, delivering £17 billion of upgrades. Those improvements are then handed over to Mark in Asset Performance (Metronet's maintenance division) who put them into service and ensure that London Underground has a reliable service every day. "That's the idea, but we are not quite there yet" he admitted. Tim O'Toole once used the analogy that Mark prepares the patient for the operation, making sure the patient does not go in for the operation before their blood pressure and weight are at a consistent level, so the patient is mentally and physically prepared. Mark sees his role as improving the health of the railway before the upgrades. As with the Victoria Line upgrade, things may get worse before they get better. Every day the signalling gets a day older, a day more worn, assets across the railway, many already life expired, will need attention on a day to day basis. Sometimes it may seem that it is one step forward and two steps back but huge investments in money and man-hours are going into the Underground, it's just sometimes a little difficult to see.

Metronet has created an operations centre, akin to the LUL Network Operations Centre, where key assets can be monitored 24 hours a day, seven days a week. [At this point Mark invited the LURS to visit the facility on 13 November). Mark then showed the audience pictures of 'Bomber Command' where incidents are tracked from occurrence through response to rectification. He explained the use of a traffic light system to keep track of the progress on jobs, and how meetings take place in front of Visualisation Boards showing Key Performance Indicators rather than by having half day meetings sat around a table ploughing through reams of paper.

Mark did concede that a certain number of asset failures are due to 'own goals', where someone is sent to fix a failure and fails to do so properly. Similarly with engineering overruns, which impact on the operational railway and its passengers the following day. Mark detailed how the level of track renewal has increased dramatically in recent months. Every night on the network, up to 700 groups of between one and sixteen people, are out replacing, testing, repairing and

maintaining so there are over 700 opportunities for someone to make a mistake. Every period there are between 8 and 10 late surrenders of protection, but most do not impact on the passengers because the delay is less than 15 minutes.

Last year Metronet had significant problems with rail stressing to prevent track buckling in the summer heat. This became a very public issue in May 2006 when it cost Metronet £22 million to fix. This year through better planning and making individual managers directly accountable for the Prevention of Buckling works, this problem has been over-come. This shows how Metronet is getting better at managing its assets. Another success area is point heaters for the winter months. These need checking, so Metronet deployed a thermal imaging helicopter and found that of 1,500 sets of points in the open section, 42 were unheated, and all but 16 were fixed before the onset of winter. "That" said Mark, summarising, "is my world, my interface with the operating Railway and LUL, and what I have to do: Ensure safety, spend money wisely, hire extra people in, maintain the assets, get to things quicker and fix them faster".

He then moved on to explain his colleague Stephen Hall's sphere of influence – Upgrades. He said that the first full line upgrade for Metronet is the Victoria Line, scheduled for completion in 2013. The first train is already built and is being tested on the line. Others will be tested near Derby at the Old Dalby test track recently bought specifically for this purpose (the 2009 Tube Stock will also be tested there). The first of the 47 new Victoria Line Upgrade (VLU) trains will be in service by 2010 and in the meantime signalling modernisation is nearing completion as is track. The proof of the pudding will be when it is all switched on to see that it functions correctly. The first new train will run as a test train in shadow running for about 18 months then return to Derby for internal fit out. The complete batch of new trains is set to provide a 35% increase in passenger capacity and a 16% reduction in journey time. Mark then showed the audience some pictures of the new train in action in Derby.

Mark then moved on to talk about the sub surface railway which will have £3.1 billion spent on new stock and signalling. All 190 subsurface trains will be fully air conditioned and will start arriving in 2009. All will be fully compliant with the Disability Discrimination Act and increase line capacity by 45% when all are in service by 2018. The audience were shown a computer generated artist's impression of how the generic sub-surface stock may appear. Whilst waiting for these trains to enter service, the District Line D stock has had a complete refurbishment from the solebar upwards, costing £1 million per train. Passengers are already experiencing the benefits of air cooling, CCTV, and new passenger information systems. All 75 trains will eventually be refurbished to this standard. The audience was shown pictures of the newly refurbished D stock.

Next, Mark mentioned the upgrade of track, and stated that Metronet, in partnership with GB Railfreight, had bought a fleet of five class 66 engineering locomotives, the first time this type of locomotive has been used on LUL. He also commented on the increased pace of track renewal, where 1km distances of renewal are now being achieved. Pictures of track replacement operations were shown.

Then there is the stations upgrade programme. At the date of the talk, 33 station projects were complete, whilst teams were on site at a further 26, with 48 more at the design stage. Mark mentioned that station modernisation contracts were now being awarded outside Metronet's own supply chain, following competitive tender. Mark then gave an example of the speed of the activity, saying that at Oxford Circus, for example, after the last trains have departed and the supervisor gives permission,

238 staff were booked on within 22 minutes and were working with 32 high level platforms on the station ceiling. Less than three hours later all were gone and the place was clean again ready for the first passengers. Mark mentioned some of the new security and passenger information equipment that has been fitted, and singled out King's Cross St. Pancras as a project which has received widespread praise. The quality of station upgrades is now high and getting better. The upgrades programme for stations is due to be completed by the end of the first contract period in 2010. Another task which is becoming more efficient is the replacement and renewal of escalators, and the first two lift replacements, Queensway and Regent's Park, have been undertaken. (Slides were shown of escalator replacement in progress).

The Waterloo & City line upgrade was originally planned to be 84 weekend possessions, but a three month blockade was decided upon instead, which proved highly successful. Mark felt that Metronet made a rod for its own back by providing a countdown clock on its website; the job thus inevitably overran by a few days. But the job was a thorough one, with complete track replacement, complete resignalling (with a basic system, not the new signalling planned for other lines) and a full train refurbishment in Doncaster. Trains were craned in and out at Waterloo, whilst up to four hundred staff worked underground on the upgrade in hot dusty conditions.

Mark then mentioned the findings of the PPP arbiter. Following the recent review, Metronet sought guidance on where it should improve, so that it could become an economic and efficient provider and prove this by the end of contract period one. LUL submitted their findings as well, and some 'exchanges of views' took place. The arbiter found that over the first three years Metronet was neither economic nor efficient overall. In some areas such as Fleet management, it scored highly whereas in others such as track replacement and station refurbishments the score was poor. The joint findings were that day to day operations are improving, with a month on month reduction in service affecting incidents. The stations programme is starting to deliver and major upgrades are either on schedule or ahead of it. There are still major challenges ahead but Mark felt that there is tangible evidence of progress if only from the sheer volume of work that is being achieved.

Mark then announced that Metronet were returning Metropolitan Railway No.12 "Sarah Siddons" to traffic. He said this showed how, despite the media noise, LUL and Metronet could work together. In particular Mark praised the work done by the London Underground Heritage Committee, chaired by Howard Collins, and the General Manager of the Metropolitan Line, Angela Back, both of whom gave approval for the special train to run. Mark also complimented the hard work of his own people led by Dave Brabham in Technical Services who restored the locomotive and her coaches to operational condition. The special run took place on 10 June and 10 members of the LURS joined the invited guests aboard the train.

Mark concluded by reiterating his willingness to allow the society to visit Metronet sites to see things mentioned in the talk, and he then thanked the audience for their warm welcome, and willingness to hear him present a different view of Metronet from that portrayed by the media, a Metronet which was exciting to work for, vibrant and forward looking and one 'up for the challenge'. Finally he invited questions from the audience.

Questions from the audience included the following:

Q – Isn't the fact that the Waterloo & City Line is signalled with a different signalling system going to become a maintenance issue in that you will need to train up staff for multiple systems and keep parts for multiple systems?

A – The Waterloo & City Line system is very basic but it was not felt necessary to use the 'Westinghouse Distance to Go' which will be installed elsewhere across the network. It is simple and reliable and uses far less components than before, but since installation, the line has gone three or four periods without one signal failure, which is not bad for a system that should still be bedding itself in.

Q – Whilst you have put a great deal of effort into making up for the fact that your first three years of performance wasn't that great, I understand there are reviews every seven and a half years and you are halfway through that period, and as you said yourself there are going to be difficult times ahead while the upgrades are delivered, and we read in the papers, Standard, whatever, that TFL and Ken Livingstone are not always your greatest fans, so its not impossible that one or both of your contracts may be reassigned, bearing in mind that you put a great deal of effort into combining both infracos to act as one and yet legally you are two separate infracos, if one of your contracts is reassigned, how easy is it going to be to extricate the other one. Hopefully that won't happen, but just if it did?

A – Legally we are two infracos. LUL doesn't recognise Metronet Holdings, only Metronet SSL and Metronet BCV, so any organisational change we make, all the way through, has to be pass the test of seperability – parts of the organisation involved with assurance have to prove seperability in front of Mike Strzelecki and the LUL safety team, but in areas such as Human Resources, it is less of an issue. Where we can we've taken the benefit of bringing it together to become Economic and Efficient whilst still delivering a service. We are breaking away from the public perception of Metronet – we do care about both London Underground and its passengers. Furthermore you have my personal assurance that I am committed to delivering a world leading metro for London – one that as a former Olympian I can be proud of in 2012!

Q – As a specifier and maintainer, I can see from your point of view the attraction of having one type of rolling stock for every subsurface line, but from a passenger's point of view, I think it's extremely unattractive. The Circle Line is a totally different railway than a journey to Uxbridge. Having the same body shell, doors, motors, gearing, seating? No thank you. You are putting capacity up but you can never say by what proportion you are reducing the number of seats.

A – I suppose we come from opposites. As a user there are reasons why you want to sit down to go to Uxbridge whereas on the Circle Line at 08.00 you accept that we try to get in as many people as possible per square inch. But new trains do have some flexibility. Some are different to others, and I've seen proposals where different seating configurations are used for high capacity Circle Line services to those which go out to the extremities of the District and Metropolitan lines. The trains which come out of Derby are built with a high degree of flexibility and in, for example, the Turbostar, seats are on bolted rails, and because of how the modular seating is organised, you can very quickly and easily reorganise the interior. I think some of that flexibility will be built into the new trains, but I will check. It is a very good point. (Mark subsequently came back to tell us that seat configuration on the S Stock serving the Metropolitan Line will differ from that for the District and H&C).

Q – You mentioned level access for wheelchairs on subsurface lines, what are you going to do when subsurface trains share tracks with Tube Lines such as the Uxbridge branch, Ealing Common and a few other places.

A – That has yet to be decided, and I can't comment as I am not an engineer. Level access is a mayoral aspiration to which we've agreed, but how that will happen in practice is yet to be discussed. We will have a workshop to deal with such problems, and courtesy of the LURS, we now have the first item for the agenda!

Q – I am concerned about the present ride quality and noise on the Victoria Line. Will faster trains make more noise?

A – Admittedly there are big rail-wheel interface problems on the Victoria Line – the harshness of metal, suspension, wheel and rail profile have all been modelled and we know how it will work. At the moment we have to replace track which was laid only four years ago. I don't have an answer other than that I recognise the same problems you do and to reassure you that some of our best technical people are currently working on a fix for this.

Q – 190 trains all in one go? Aren't you committing yourself to the same programme in thirty years time? Is there any benefit in replacing everything all in one go?

A – The benefits lie in the cost and speed of renewal. On a manufacturing line producing 190 trains, the first ten to fifteen will iron out all the problems and thus production costing and reliability issues will be sorted. The benefits are in performance on the railway and cost of manufacture. The PPP had already decided the business case for 'batch by batch' versus 'all in one go'. The decision for all in one go was made before Metronet came along, and in manufacturing terms, making close to 2,000 train cars in a continuous production line with no break is fantastic for any manufacturer and the best chance for the travelling public to get a reliable train out of a manufacturing facility is to do it this way.

The audience then showed their appreciation in the usual manner.

**Donald McGarr**