BRPS AGM 13 May 2006

Bluebell's locomotive problems

Members may be aware from a number of sources that we are in some difficulty with the number of operational locomotives. Here is an explanation of the problem and some proposed solutions.

Current situation

Locomotives with a boiler ticket:

The accompanying diagram "Progress through boiler tickets" illustrates the shortfall in locomotives we are experiencing. In a normal situation half of the diagram would be showing the green "time remaining" area, whereas only a quarter actually is, and this is falling.

Loco	Boiler ticket	Condition
1638	Jan 2016	Newly in service with no significant problems. Owing to shortage of locomotives over the next few years is expected to work more annual mileage than desirable, and will probably run for about 6 years.
9017	Sep 2013	2 ½ years service completed, in service with no significant problems. Is unlikely to complete its 10 year ticket – expected to end service around 2010.
80151	Jul 2011	Currently out of service having all tubes and flues replaced owing to chronic leakage from flue tubes. Expected to end service in 2008-9.
672	Jan 2011	In service with no significant problems. Inner firebox fitted in 1980 is likely to be end-of-life at end of this ticket. Expected to end service about 2009.
21C123	Jul 2010	Currently under test following a repair to a corrosion hole in the firehole ring. Poor reliability over the last year, but is now needed in regular service to make up the numbers. Unlikely to run for whole of ticket.
65	Jul 2009	Currently in service, but with failing springs. Expected service will end near to end of ticket.
55	May 2008	Still able to do light duties, but in very poor mechanical condition, with cylinders patched over holes. Firebox condition may lead to end of service next year.
32473	May 2008	Out of service awaiting delivery of new springs. Boiler in good condition, but mechanically poor, especially life-expired cylinders with numerous patches.
75027	Oct 2007	In service, but boiler condition is such that service is likely to end late this year.
96	Jul 2006	Expected to run until expiry of ticket

Locos on hire

41312 will be on hire during June to August this year, just prior to the end of its boiler ticket.

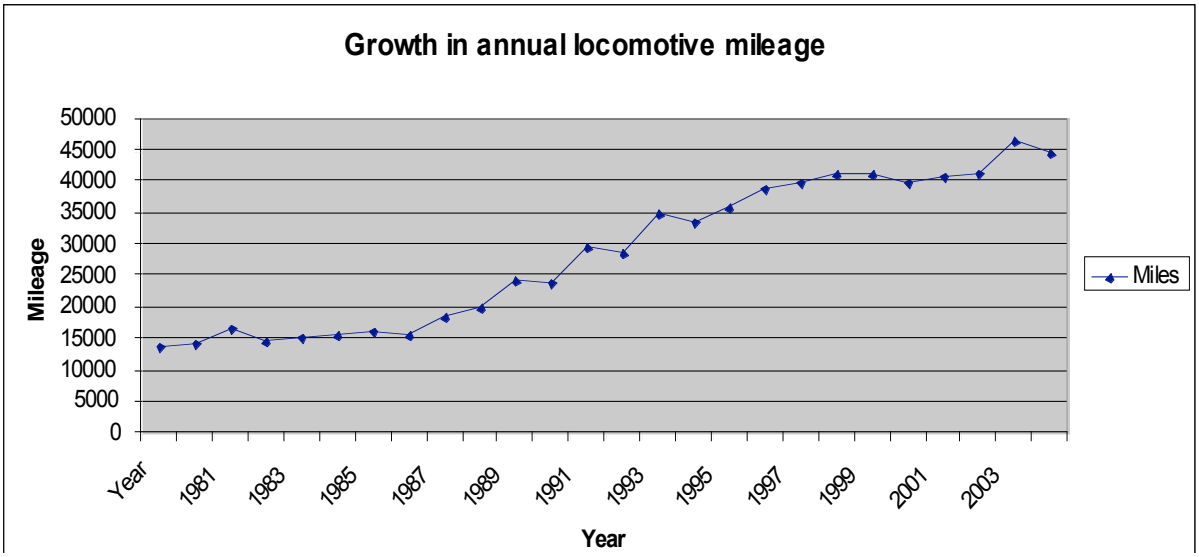
A class 4 locomotive is available for hire from September to March 2007. This is being considered so that there are sufficient locomotives to cover the Santa service (4 large locos required).

D3023 is on hire for the duration of the East Grinstead extension works. This has been taken on hire principally to avoid over-working of the steam locos, so that they remain available for service on public trains. With 96 out of ticket this year, if D3023 had not been hired, then 65 and 32473 would have worked the extension trains and shunting, with likely earlier end of service.

How did we get here ?

There are two principal factors:

Resources available to repair locomotives relative to use made of them
The diagram below shows how usage of locomotives has increased since the railway extended north of Horsted Keynes. In this same period the resources available to overhaul locomotives (paid and volunteer staff, workshop and outdoor space, budget for materials and services) has increased by a smaller extent.



Extent of work required at each major overhaul
Although there is variation in the condition of the locos when Bluebell acquired them (e.g. 30064 good condition, 32473 very poor condition), most had significant life left in them. Parts of the locomotive wear at varying rates – for example piston rings might need changing every two years, tyres every 40 years (at our rate of usage).

At each major overhaul sufficient work is done to enable the loco to run for its 10-year boiler ticket. We do not aim to produce an “as new” loco each time. Locomotives which have been with us for a long time, and have been through several cycles of major overhaul and boiler ticket, therefore tend to require a greater amount of repair work at each major overhaul, until sufficient work is done to make the loco (or a major component) “as new”, for example 32473’s boiler.

Works Programme

The state of all loco overhauls in progress:

Loco	State	Service date
592	Replacement boiler needs minor repairs, and fitting of main steam pipe etc. Dismantling of loco has commenced. Axleboxes to re-metal	Summer 2007
34059	Boiler repairs less than half done. Rest of loco is mechanically almost complete, sheeting and pipework to do.	Autumn 2007
3	Boiler work half done. Nearly ready for re-wheeling.	2007 ?
957	Mechanically tested, needs permanent fitting of gas fuel system and other details	2006 ?
847	Awaiting space in loco yard for dismantling	2009
27505	Work not yet started	2008 ?
73082	Awaiting space for dismantling	2011 ?
31178	Slow progress being made	unknown
84030	Slow progress being made	unknown
32424	Good progress being made but lots to do	unknown
323	Work stopped for lack of staff	
27	Work not yet resumed from 1983 dismantling	

Service Requirements

The service currently operated, and initially to be operated to East Grinstead, requires the following numbers of locomotives:

- 5 “large” locos (large is class 3 or above)
- 4 “medium” locos (class 1 or 2)
- 2 “small” locos (class 0)
- 1 shunting loco (the bigger the better)

The number of locomotives in the first three categories needs to be greater than the minimum which can run the service to allow for:

- Boiler washouts
- Planned maintenance
- Annual and 5-yearly boiler examinations
- Unexpected failures
- Unexpected maintenance requirements
- Unexpected extra service requirements
- Hire to other railways

Having 12 locomotives in operating condition requires the Loco Works to overhaul a locomotive on average every 10 months. This in turn requires the capacity to have two boilers under repair at a time

Works Output Actually Achieved

The two most recent overhauls have each taken over two years. The principal reasons were the extent of the work required in each case, but exacerbated by the need for staff also to undertake repair work on the diminishing and less reliable operating fleet.

The accompanying diagram "Locomotive Availability Projection" shows how the number of serviceable locos is expected to change over the next few years if the current level of resources in the Loco Works does not change. By the summer of 2008 there will be too few working locos to operate the current service.

Ways Forward

There are a number of ways of increasing the stock of working locomotives:

- Purchase working locomotives. One was considered early this year for the extension works trains, but its condition was too poor to obtain sufficient work from it. Large locomotives tend to command prices beyond Bluebell's means.
- Hire locomotives. We already have two locos on hire, but the cost of hiring steam locos is too great to this to be a sustainable long-term policy.
- Encourage other loco owners to come to Bluebell. The opportunities for this are rare. We were fortunate to be able to make agreement with the owners of 65 and 80151, without which we would already be in trouble. We already have more than enough locomotives, we just need to repair them.
- Reduce the work required of the locos. The locos would last longer in service, and be more reliable, if we could reduce the work they have to do, in terms of days steamed and/or miles run
    - Cut out days of operation. The whole service could be cut out on certain days. Would the visitors come on another day ?
    - Cut services on some days. A 2-train service could be changed to a 1-train service to save one locomotive a boiler heat-cycle and the mileage run.
    - Cut the lengths of trains. Smaller locomotives are cheaper to operate overall, so cutting a 5-carriage train to 4 could save costs if done often enough to alter the balance of locomotives sizes required.
    - Increase the capacity of trains. The older carriages are popular with visitors, and give a good seating capacity for their weight, but this depends on the Carriage and Wagon Works's ability to put them into traffic, and our collective ability to prolong their life with proper care.
- Employ contractors to repair locos. Having a contractor repair a loco, or just a major component such as the boiler, could give us a working loco with little disruption to the Loco Works programme. The downsides to this are:
    - Monitoring the quality of work done is time-consuming if not local
    - The UK's principal boiler contractor has a long waiting list
    - It will be more expensive than employing our own staff to do the work
- Have new boilers made. Having a contractor make a new boiler may be less costly than a repair to an old one, especially for smaller boilers. However, only time in service will prove the quality of a new boiler compared with the old.
- Increase the Loco Works output rate. For the majority of the work, other than specialist work we are not equipped to do, or not in quantity, this will be cheaper than employing contractors.

Increasing the Loco Works Output Rate

There are three factors which can contribute to increasing the output rate:

1. More staff. The works is currently not working to capacity.
    a. Paid staff. Employing additional skilled staff could immediately increase the works output rate. However, the company does not have sufficient income to do this.

   b. Volunteer staff. Much of the skilled work is done by volunteer staff, and there is plenty of work for unskilled staff to help the throughput. A recruitment drive is under way, but the numbers come forward so far are far below the requirement.
   c. Apprentices. A third apprentice is to be taken on soon, making three, which is about the maximum which can be accommodated. Apprentices are a mixed blessing – they tend to be keen and good at their work, but take staff time to teach, and many leave afterwards for better-paid employment.
2. More space.
   a. Indoors. Despite the statement above, space in the works is cramped in certain areas, sometimes restricting the work which can be done. We have the unsatisfactory situation that the machine shop is subject to the dirt and noise of boilerwork and platework etc. A new machine shop would improve production. More workshop space for volunteer groups would also improve production.
   b. Outdoors. The outdoor space available to the Loco Works has shrunk as the requirement for that space has increased – hence the current situation where work on 847 is held up for lack of space. Ultimately at least some of the space known as the "top car park" will need to become Loco Works space – cars can be parked anywhere.

The most urgent need is to increase the rate of boiler repairs. We estimate that three additional full-time staff could be accommodated within the existing works.

This, however, should enable us to just avoid being unable to operate the timetable in 2008. To increase the production rate to 1 loco every 10 months will need 7 full-time staff above the current number.

If we were able to take on this number of extra staff we would then need additional workshop space, in particular boiler repair space. This would best be achieved by a new machine shop, and extending the works northwards.

Alternatives

With the lack of sufficient income to pay for these additional full-time staff we will need to look hard at ways of saving costs on the operation of the service, or to put it another way to maximise the cost-effectiveness of every train and every loco steaming.

Does it make sense to run a long train and large loco when only one journey in the day needs so many seats?