

Office of Rail Regulation

**Review of European Renewal and Maintenance Methodologies
Technical Appendix Number 7**

Dedicated Teams

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Executive Summary

This report focuses on the use of dedicated teams undertaking specific activities, generally within the track renewals environment. However the principle of using dedicated, specialist teams is well established in other disciplines and activities.

In Britain these activities tend to be undertaken by teams of functional staff usually comprising a mix of in-house and sub contractors. In Europe much more focus is placed upon delivering an activity through the use of a dedicated team, covering all of the tasks required to deliver the activity. The main characteristics of this system are:

- Use of small highly productive teams;
- Contracting by activity rather than by region or even country;
- Well balanced and predictable work bank; and
- Investment in specialist rail plant.

As track renewal moves towards a standardised and modular delivery, the opportunity exists to develop the dedicated team concept already well proven in Europe. For example, in Switzerland the renewal of S&C is delivered this way and the work-bank is managed efficiently enough to provide continuous work. As a consequence, these teams continually optimise the plant and process that they use. The benefits identified through the use of this system include:

- Staff fully understand their roles, leading to productivity and safety improvements;
- Dedicated teams delivering specific tasks reduces manpower requirements;
- Reduction in errors and rework; and
- Rationalisation of management structures.

It is not possible to isolate the productivity savings resulting from the use of dedicated teams because they are often intertwined with use of specialist and high output plant. However it is clear that, as in other industries, production line methods deliver work to a higher standard in less time and with fewer people.

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Disclaimer

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Contents	Page
1.0 DEDICATED TEAMS	5
1.1 Activity Specific Teams	5
1.2 Extent of Methodology	5
1.3 Applicability	5
2.0 EUROPEAN APPROACH	5
2.1 Method Deployed	5
2.2 Management Approach	6
2.3 Technology Involved	6
3.0 CURRENT BRITISH APPROACH	6
3.1 Construction Methodology	6
3.2 Management Approach	6
3.3 Technology Involved	7
4.0 BENEFITS	7
4.1 Asset Management	7
4.2 Efficiency Savings	7
4.3 Life Cycle Costs	7
5.0 SAFETY ISSUES	8
6.0 IMPLEMENTATION INTO GREAT BRITAIN	8
6.1 Estimated Implementation Duration	8
6.2 Investment Requirements	8
7.0 RECOMMENDATIONS FOR FURTHER WORK	8

1.0 DEDICATED TEAMS

1.1 Activity Specific Teams

An essential element of infrastructure maintenance and renewal is the efficiency and effectiveness of the staff undertaking the operations. In Britain, these activities tend to be undertaken by teams of functional, staff usually comprising a mix of in-house and sub contract staff.

In Europe much more focus is given to the delivery of an activity through the use of a dedicated team of staff, covering all of the tasks required to deliver the activity.

1.2 Extent of Methodology

Dedicated teams for specific activities are used in many countries in Europe including Switzerland, Germany, Holland and Spain.

1.3 Applicability

This report covers track infrastructure renewal works. However, the concept is equally valid for maintenance activities and is also used for such purposes within Europe. Additionally, dedicated teams underpin the “gang” system common in North America.

2.0 EUROPEAN APPROACH

2.1 Method Deployed

The European track renewal industry has been foremost in the development of high output track renewal processes. It realised early in the development of the process that dedicated delivery teams were an essential part of successful production line delivery. Network Rail has already adopted this concept in their successful introduction of high output equipment to Britain.

In non-high output work activities, it is also noticeable that European organisations operate a higher degree of ‘production line work’ such as with switch and crossing renewal, rerailing and the replacement of sleepers. This has required suppliers to develop the equipment used, the process required and the dedicated teams that deliver the production line.

Many activities are undertaken by dedicated teams delivering a specific part of the overall work package. For example, dedicated teams undertake:

- Heater stressing;
- Mobile flash butt welding;
- Second life partial renewal processes;
- Use of vacuum technology to renew ballast;
- Rerailing as a track renewals activity; and
- Rerailing for defect replacement activities

These teams operate across national borders and have become acknowledged experts for their own activity. An example of the success of dedicated teams is that of the Swiss switch and crossing renewals where a ‘modular approach’ was introduced some years ago. One of the Swiss contractors, SERSA, employs only 21 staff (including 16 plant operators) to relay a turnout in 8 hours. This is successfully achieved on a regular basis.

Within this operation dedicated teams and the versatility of the staff are paramount. For example, a tamper crew will not only operate the machine but also assist other staff with their operations such as shovelling ballast.

2.2 Management Approach

The adoption of a production line driven process philosophy delivered with dedicated teams is encouraged by the manner in which the work is managed.

For example, SBB in Switzerland have recently let a contract for the delivery of re-railing operations throughout Switzerland. This has been awarded on the basis of price resulting from the efficient production process developed by the successful contractor. This process is supported by a dedicated team of staff, well trained and dedicated to delivery of this activity.

2.3 Technology Involved

Dedicated teams undertaking production line work activities use equipment and tools that are specifically developed to support them. This is often achieved through collaboration between plant supplier and contractor, to ensure that production line techniques are optimised. In most cases, it is the team who initiate production improvements to meet the required performance.

An example of where new plant has been developed as a result of process analysis by the dedicated teams involved with delivery is new rebalasting equipment being developed in Switzerland. This has been designed to speed up production and make the track renewal operation more efficient.

3.0 CURRENT BRITISH APPROACH

3.1 Construction Methodology

A typical non high output track renewal work site in Britain will have a mixture of in-house and sub contract staff working on it for each shift. Both groups of staff will have been briefed about the work and will have varying levels of experience and competency to undertake the activity they are assigned. Work will be very varied and they may have been employed on several types of work and on several different activities through any normal working week.

Thus, British staff can be categorised as a 'jack of all trades and master of none'. This will often lead to sub optimal productivity, although it provides a delivery mechanism that is able to accommodate a varying work-bank. In addition, jobs of the same work types are often delivered using different methods with different resource levels. Full standardisation of method and resource has yet to be obtained.

The concept of dedicated teams delivering production line techniques has been used in Britain. Network Rail has some dedicated specialist track maintenance teams including a rerailling team at Milton Keynes.

Another example is the 'caravan approach' used to managing the rail defect programme in the East Midlands. In the late 1990's a team was set up comprising a management structure, ultrasonic inspectors, welders and trackmen. The team was able to increase productivity, reduce emergency speed restrictions through the immediate replacement of serious rail defects and eliminate disruption to the maintenance programme for the track supervisors.

3.2 Management Approach

In Great Britain, track renewal work is split into three distinct areas:

- High output renewal;
- Conventional renewal; and
- Specialist services.

High output renewal accounts for approximately 13% of the total activity with conventional work at approximately 86%. This is planned to increase significantly

For conventional renewal activities, the contractors employ a mixture of their own staff and sub contractors to deliver the work they are allocated from Network Rail renewal programmes. This allocation is primarily on a geographical basis.

Some specialists exist, such as on track machine crews and welders. However, most of the contractors' staff will be asked to undertake any activity within some 15 different types of work ranging from complete renewal to drainage.

Both the Contractors themselves and Network Rail have realised the consequential sub-optimisation resulting from this approach and are attempting to improve operational practices through improved training, planning and production improvement programmes.

The four track renewal contractors' currently work within prescribed geographical contract areas to deliver track renewals. They have different challenges to cope with dependant on such factors as geological conditions, the complexity of the infrastructure, rail components and the available possession access regime. This means that work of the same category has a wide variance in methodology, with much discussion on the drivers of this variability. This variability is being addressed currently through the Network Rail 8-200 project

3.3 Technology Involved

In Britain, some collaboration exists between plant supplier and renewal contractor to develop plant that provides more efficient and enables faster production. However this collaboration is often at higher levels between process and plant engineers. In general, there is very little involvement of work teams in developing new plant and tools. Hence opportunities for potential benefits are not realised.

4.0 BENEFITS

4.1 Asset Management

Asset management benefits resulting from undertaking work with dedicated teams will include:

- A reduction in the level of rework as "team competency" is improved; and
- A reduction in track access time as productivity improves.

4.2 Efficiency Savings

Dedicated teams with increased versatility working in an industry and contractual environment that encourages such a concept would provide significant efficiency benefit to Britain. This efficiency would be seen in higher production performance, leading to shorter track access requirements and a lower staffing level overall.

The use of these teams would complement the modular approach being adopted by the industry within renewals and could also be used to challenge costs involving high volume, high value activities. Multi functional teams would also reduce the level of management overhead as depots and management structures could be rationalised.

A stable and extensive demand pattern will facilitate activity-dedicated contractors investing in specialist plant.

It is not possible to isolate the productivity savings resulting from the use of dedicated teams because they are often intertwined with use of specialist and high output plant. It is clear that, as in other industries, production line methods deliver work to a higher standard in less time and with fewer people.

However, an efficiency savings of 30% has been recently identified in Switzerland through the development of a new rerailling technique coupled to a dedicated team concept for delivery. Rerailling operations are currently being undertaken there at a cost of £30 per track metre. This excludes material costs (including delivery) and also does not include any allowance for overhead costs from the infrastructure manager for management of the works

4.3 Life Cycle Costs

High quality work is always likely to deliver improved asset life and therefore lower life cycle cost.

5.0 SAFETY ISSUES

The implication of the widespread introduction of dedicated work teams with greater versatility into Britain would be to ensure safer delivery of work operations. The teams would be delivering the same process day in and day out and, as such, would fully understand the nature of the operation and their part in its delivery.

6.0 IMPLEMENTATION INTO GREAT BRITAIN

6.1 Estimated Implementation Duration

Network Rail is currently leading the industry in attempting to bring in standardised renewal practices using modular approaches that will need dedicated teams to ensure its challenges are met.

The speed of implementation would be governed by industry analysis of the potential benefits, the change programme required to implement the concept, suitable trials to prove the concept and the roll out programme.

Some activities could be quickly transferred to dedicated teams, e.g. stressing techniques involving mobile flash butt welding and heater stressing. The existing contractors could easily adopt these within their own contract organisations.

Benefits might be realised in the short term were suitable high volume operations used to trial the relative efficiency of using specialist contractors against incumbent generalists. Based on European experience, activities suitable for such a trial include (re-railing, defect removal and switch component replacement.

In the longer term, the industry would need to work together to ensure work is packaged out by activity and to encourage full implementation of its modular concept.

6.2 Investment Requirements

It is anticipated that only normal levels of investment in training, competency and plant development will be required. A realignment of investment, rather than increased levels, will facilitate the change required.

7.0 RECOMMENDATIONS FOR FURTHER WORK

It is recommended that further research be undertaken into the use of dedicated teams used on maintenance activities in Europe. Financial analysis of the benefits would also be beneficial.

