



**INSTITUTION OF RAILWAY SIGNAL ENGINEERS
MINOR RAILWAYS SECTION**

GUIDELINE

ON

**THE BASICS OF
SCHEDULING S & T
MAINTENANCE
FOR MINOR RAILWAYS**

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Anyone who wishes to contribute additional items; or correct / amend any of the entries; or wants further information may contact the IRSE Minor Railways Section Document Co-ordinator at mrsdc@irse.org or via the IRSE Headquarters.

Any railway seeking to follow the guidelines in this document should ensure that it is suitable for their particular railway concern. Duty holders are reminded that they must be satisfied that they are doing all that is needed under health and safety duties to control risks. Compliance with this guideline issued by the IRSE is not mandatory as it provides advice on how an issue may be addressed.

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1 INTRODUCTION

The changes to railway legislation have imposed far more responsibility on those running, operating and maintaining any railway to do so in a structured professional manner.

This document has been produced an introduction to those in the minor railway field who do not have a background in the S & T profession or industry, the concepts of setting up schedules for the maintenance regime to meet the present day requirements of the rail regulator and safety authorities.

This document does not provide details of what, how and when maintenance should be carried out.

The IRSE Minor Railways Section has used its best endeavours to ensure that the contents of this document are factually and technically correct and is suitable for its stated purpose but the IRSE Minor Railways Section cannot be liable for any subsequent use to which the document may be put.

2 DEFINITIONS

The following is a list of the more common definitions, a fuller description may be found in subsequent sections.

In this document terms relating to gender equally apply to the opposite.

Brush	Bruch all loose dirty from apparatus and foundations
Check	Visually inspect for alignment, obstructions, breakages, decay and obvious damage
Clean	Remove moisture, dirt, corrosion or roughness
Dust	Dust lightly with a brush or duster
Examine	Closely inspect apparatus and connections for wear, security, deterioration, decay and damage
Is (are) required	Used to indicate choices where firmer guidance might be indicated.
Lubricate	Oil or grease parts to reduce friction or provide protection and wipe off grease

May	Used where guidance suggests optional choice.
Measure	Apply a measuring instrument or gauge, then read and record the result. Ideally the instrument or gauge should be calibrated.
Must	Used only where there is a legal or statutory requirement to the measures being described.
Observe	Look at the equipment in use to make sure it is working correctly and is not faulty
Protect	Apply an approved protecting agent
Record	Enter the obtained measurement reading or observation on the chosen method of record keeping
Rectify	Make good any faults discovered
RSPG	Railway Safety Principles & Guidance by HSE (now ORR) most of these documents are now obsolete and some have been replaced by the ORR Railway Safety Publications.
S & T	Signal and Telecommunications
Scrape	Scrape all dirt and surplus grease off apparatus and foundations
Should	Used as the primary verb for statements of guidance.
Test or Gauge	Examine apparatus and run (or use the appropriate tool, gauge or instrument) it to make sure it is working correctly and is adjusted within the specification
Wash	Remove contaminated oils, greases and dirt by applying a cleaning agent, or by using a detergent and water and then drying
Wipe	Rub apparatus with a cloth to remove dirt, grease etc.

3 SAFETY CONSIDERATIONS

3.1 Staff Safety

Full details of PPE requirements and safe methods of work to complete the task should be included in all task related information.

4 INTRODUCTION TO SCHEDULING

No matter how well it is initially installed, all S & T equipment will need maintaining throughout its life to keep it operating in a safe and efficient manner. Maintenance will extend the useful life span of the equipment and conserve heritage assets.

How often and how much maintenance is needed to keep equipment operational depends on many factors some of which are explained in the paragraphs below.

Maintenance activities on signalling and telecommunications equipment were traditionally based on a regular time interval system, often based around the shift pattern of the maintenance staff; thus on a three week shift rotation, jobs were often arranged on a three weekly cycle such that external work was carried out in the day and internal work on the evening and night shift. Longer length periods were fitted in to this pattern. For instance, say a three month signal lamp

change cycle, then 6 monthly duties and annual inspections all based on so much activity each week to complete the cycle. Thus by the end of the cycle all tasks were carried out. This system may keep the equipment in peak condition but it does not take into consideration the differences in usage and location and thus may provide too much maintenance and is thus wasteful of resources and materials.

Modern thinking on maintenance frequencies is based on providing just enough of the right activity at the right time to keep the equipment operational and economise on resources and materials. To do this a risk analysis method based on records of the on going maintenance is often used.

Heritage and minor railways often have a closed season through the winter, a period traditionally used by the volunteers to undertake the bigger tasks and major maintenance whilst not impinging on the public running activities on the line. Therefore a regime involving an initial inspection and comprehensive test at the start of the running season with interval inspections when running is underway could be the starting point for the maintenance programme.

S & T records are therefore an important part of the process and these have been described elsewhere in the Guideline series.

5 THE ROLE OF MAINTENANCE

Maintenance is often defined as "the preservation of the equipment in a safe operational state and the prevention of failure, having regard to likely rates of wear or vibration, damage, corrosion and the like and the testing of equipment to determine its operational state to identify imperfect or deteriorating conditions which might not otherwise have been known".

Proper maintenance is an essential part of the safety system for the railway and conservation of heritage S & T assets.

6 STARTING FROM THE BEGINNING

6.1 A New installation

6.1.1 Starting with a New System

With a new installation there is no history or records to base a maintenance regime on. So where do you start?

The objective is to prevent failure in service and to extend the life of the equipment so it is advisable to seek advice from a maintainer of an existing installation of the same or similar equipment. To read the maintenance manual, does the device need testing regularly, a visual check or some active works such as cleaning and lubrication? Some items, like lineside telephones, may require only regular cleaning, testing and inspection.

Do you have an Asset Register of all the equipment installed, if not this is the place to start.

Next, decide what needs to be done on each piece of equipment and prepare a list of all the activities, which are needed on each maintenance visit. This is the basis of the Task Schedules.

When starting your maintenance regime from scratch you will have no history on which to base your future maintenance requirements so decide how often you are able to carry out maintenance on each piece of equipment and prepare a chart or spreadsheet detailing each activity and the frequency/dates for doing the work. This is the Work Schedule.

The next thing is the record of all maintenance activity and the condition of the equipment. Over a period of time good records will enable you to determine the correct minimum frequency for all your activities.

6.2 Asset Register

6.2.1 What is an Asset Register?

An asset register is just a list of all the equipment comprised in the system with details of the origin, use and documentation. It is not necessary to record every nut and bolt but all equipment that will need maintaining should be included.

6.2.2 Format

The asset register can be kept on any convenient format.

It can be on record cards (one per item), a loose leaf book or on a PC using a spreadsheet or database.

6.2.2.1 What goes on the Asset Register

A list of all maintainable items of equipment. Other assets can be recorded at the compilers discretion but we are considering maintenance issues here.

List would contain but not be limited to all:

- Point Machines
- Signals and structures
- Signalling Frames
- Block Instruments
- Lever Locks and controllers
- Telephones
- PABX's
- Telephone Concentrators
- Relays
- Batteries
- Chargers/ Power Supplies

6.2.2.2 Contents of each Record

Details of the equipment:

- An item record or identification Number
- Manufacturer
- Model and/or Type Number
- Serial Number
- Date of Manufacturer
- History (If second user)
- Installation Date (This use)

- Associated Documentation
- Other useful or local information

6.2.2.3 Finally

The Asset Register does not need to be a complicated document but a useable and flexible record of what is contained in the S & T system needed to operate the railway safely.

If a computer is used to store permanent or long term records consideration should be given to the storage medium and the software used to read it and a paper copy may still be the simplest backup.

6.2.3 Task Schedules or Sheets or Cards or Lists

6.2.3.1 What are Task Schedules etc

What we are calling Task Schedules are a written list of the activities needed to carry out a maintenance/test activity on a particular asset. They would describe what is needed to be done on a visit to the asset and would contain both the activities and the test and adjustment parameters needed by the visiting maintainer to carry out the task. They should also contain the list of tools and materials needed to carry out the work described and the skills or training requirements for the staff member carrying out the work.

The activities might include

- Clean
- Lubricate
- Check
- Adjust
- Test
- Update records
- Etc

6.2.4 The Schedule

6.2.4.1 Why do you need a Maintenance Schedule

To effectively use the rarest of commodities which is the labour available. It should simplify the control of activity and ensure that assets get maintained as and when they need attention and allow prioritisation of the available work force.

The schedule can be arranged to suit the situation. It might be that particular volunteers maintain a particular item or that volunteers are available on an irregular basis, this should be included.

Maintaining a simple schedule will simplify the use of the available personnel to the tasks required.

A formal maintenance schedule will demonstrate to an auditor that a proper planned system of work is in place should such proof ever be needed in the event of an inquiry.

6.2.4.2 What will the Schedule look like

In its simplest form a maintenance schedule could be a white board, ruled with a grid, with dates down one axis and tasks along the other with tick boxes or signatures to indicate completion. Once complete a permanent record will be required of work completed.

Alternatives are an index card or a loose leaf book pages, perhaps provided one for each type of equipment or location such as a signal box or level crossing. These can be kept on site or at a central base depending on the organisation in the railway.

Where skills and equipment are available a personal computer can be used with a list or spreadsheet.

The methodology should be developed to suit the situation of the operating railway.

6.2.4.3 What goes on the Schedule

When there is no existing history or experience help will be needed perhaps from other users of similar equipment in providing their maintenance frequency details until the experience can be built up using the records obtained from your own activities.

The schedule needs to indicate when each maintenance task is required and provide space for the sign off by the maintainer concerned.

6.2.5 Maintenance and Fault Records

There is an IRSE Minor Railways Section Guideline on "Records" (ref PO 01, Basic's), which should be consulted.

6.3 An Existing Installation

Where there is an existing installation already receiving maintenance on a regular or irregular basis there should be a body of knowledge on which to build the requirements for maintenance.

The existing maintenance documentation should be examined and the methods outlined above used to update the systems in use to bring them in line with current thinking and legislation. These plans should contain details of the asset, the activities and the frequency required for each activity.

7 REFERENCES

- RSSB Railway Group Standards see www.rgsonline.co.uk
- RSPGs and RSPs Issued by the Office of Rail Regulation see www.rail-reg.gov.uk
- [Railway safety principles and guidance Part 1 \(1996\)](#) (HSE 1996)
- [RSPG Part 2B - Guidance on stations \(1996\)](#)
- [RSPG Part 2D - Guidance on signalling \(1996\)](#)
- Railway Safety Publication No 3; [Safe movement of trains](#)
- Railway Safety Publication 4; [Safety critical tasks - Clarification of ROGS regulations requirements](#), (ORR 2007)
- Railway Safety Publication 5; [Guidance on minor railways](#), (ORR 2007)

8 APPENDICES

None

End of document