Diesel Locomotive Train Driver

Lesson Plan and WorkBook

(Generic Version)

Version 1

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IMPORTANT NOTICE

This booklet is one of a series of generic training and assessment templates developed by the Association of Tourist & Heritage Rail Australia Inc (ATHRA) as guides for heritage railway operators seeking to develop or upgrade their local training and assessment resources.

This booklet and others in the series are not intended to be training resources in their own right but rather to be suitably customised, embellished and adapted by railway operators to match the specific context of their own railway, e.g. types of locomotives, rollingstock and associated equipment, the track layout and infrastructure, the local standard procedures and rules, the safety management and safeworking systems, the railway organisational structure, and the roles and functions of personnel in the railway, etc.

Railway operators seeking to use this booklet and others in the series should initially refer to the ***ATHRA Customisation Guidelines Booklet*** which provides important information on how the generic templates should be used.

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1 HOW TO USE THIS WORKBOOK

This section of the workbook provides an overview of the contents of your workbook and how you should use it for your lessons.

The workbook is intended to provide you with a systematic approach to the learning of the skills, knowledge and understanding you need to fulfil the role and responsibilities of a diesel locomotive driver on your railway. A mentor who is already a qualified and highly experienced train driver has been appointed by your railway to assist you in this learning process.

The first part of the booklet includes a simple summary of the structure and contents and the learning activities contained in the booklet for the development of what you need to know and what you need to be able to do. It describes the mutual roles of you and your mentor and summarises other publications issued by your railway that you need to use such as safety management system, safeworking rules, safeworking requirements, operating and service manuals, checklists, standard procedures, timetables, route maps, etc.

There are five topic areas covered by the booklet. Each topic section outlines the theory and practical for a number of listed sub-topics. The outline gives a basic framework of what you need to know and be able to do in the topic area concerned. However, you will need to ***build your knowledge*** further by having discussions with your mentor and by reading the relevant sections of the publications issued by your railway to train drivers.

Each topic section also contains space for you to write your own notes on the various sub-topics based on discussions with your mentor and your own experiences during training and guided practice.

2 LIST OF REFERENCE MATERIAL

The following is a list of key reference material which will be available to you during the course of your learning activities for the lesson:

- Your railway's job description for a ***train driver on a diesel locomotive***, describing a train driver's role and responsibilities
- Rail Operator's Standard Operating Procedures (SOPs) for the operation of diesel locomotives
- Safety management system
- Safeworking requirements and practices
- Locomotive manuals and handbooks
- Pre-operational checklists
- Rail Operator's Rule book and General Instructions, including:
  - Safeworking forms
  - Special Notices / Train Notices
  - Route maps
  - Timetables
  - Yard and shed diagrams
  - etc.

3 OBJECTIVES OF THE LESSON PLAN

This Lesson Plan aims to provide a program of learning that will enable the learner to develop the theory (i.e. what you need to know and understand) and the practical requirements (i.e. what you need to be able to do) in a number of topic areas ...,,

- The role and responsibilities of a train driver on a diesel locomotive,
- Preparing and starting a diesel locomotive,
- Moving a diesel locomotive,
- Conducting train operations,
- Handling emergency and other abnormal situations, and
- Shutting down and stabling a diesel locomotive

Your **mentor** will work with you in the following ways:

- Help you to develop the required understanding and skills through interactive discussions and explanations,
- Demonstrate required tasks and equipment functions,
- Assist you to obtain, read and interpret your railway's documents and manuals as well as applicable regulatory requirements,
- Observe and comment on your practice of the required skills in real and simulated situations, and
- Periodically check of what you have learnt (i.e. your knowledge and understanding and what you are able to do).

At all times, if you are in doubt or need to clarify an issue, check with your mentor or other qualified and experienced diesel train drivers on your railway.

4 ROLE AND RESPONSIBILITIES OF A TRAIN DRIVER ON A DIESEL LOCOMOTIVE

4.1 FUNCTIONS AND DUTIES OF A TRAIN DRIVER ON A DIESEL LOCOMOTIVE

Theory

The job of a train driver on a diesel locomotive may involve a variety of tasks including (Note that the specific detail will depend on the local requirements of the rail operator concerned):

Duties prior to locomotive service

- Signing on and checking roster, notice boards, operational instructions, timetables, locomotive availability and other information needed to operate a locomotive
- Confirming that the Second Person has signed on
- Conducting all required pre-start checks
- Checking the locomotive brakes
- Recording, rectifying, isolating and/or tagging defects and deficiencies (as applicable) and/or reporting to relevant personnel
- Oiling, greasing and cleaning the locomotive
- Starting the locomotive
- Checking systems are operating correctly
- Checking that the tool kit, fire extinguisher, first aid kit and other locomotive equipment is on the locomotive and is in good working order
- Obtaining authority to move and position a diesel locomotive
- Adherence to yard instructions and safeworking rules when preparing and positioning a locomotive for service
- Operating the locomotive controls correctly as per standard operating procedures
- Moving the locomotive to required position prior to service
- Securing the locomotive in position
- Checking and confirming the safeworking requirements for the day
- Checking and preparing the locomotive data logger equipment

Duties during a journey

- Providing leadership and guidance to the second person and working collaboratively with the second person and other members of the train crew
- Handling a train safely and effectively during a journey
- Adhering to safeworking rules, including interpreting and applying:
  - *'Authority' to move a train, and*
  - a *'Cancellation of authority,*
- a 'Following standard operating procedures:
  - when shunting rollingstock
  - when coupling and uncoupling the locomotive to rollingstock
  - when conducting a train examination
  - when handling the locomotive and train during a journey
  - when there is a train broken down in a section
  - when there are worksites on track
  - for the protection of worksites on track
  - for the applicable safeworking system
- Taking required precautions and following standard operating procedures when approaching and traversing level crossings
- Adhering to all speed limits during a journey
- Giving and interpreting hand signals correctly
- Coupling a diesel locomotive to another diesel locomotive, or to a steam locomotive (if applicable)
- Observing all fixed signals, point stand indicators, check points, track side signs and level crossings. These are to be called by one locomotive crew member and acknowledged by the other
- Halting and securing a train in an emergency as per standard operating and emergency procedures
- Identifying faults and defects that may occur on the locomotive and it equipment and conducting associated trouble-shooting activities
- Dealing collaboratively with abnormal situations that may occur during train operations, including applicable emergency communication and evacuation procedures
- Winding, setting and signing the clock roll / data logger
- Monitoring the operation of the locomotive data logger system (where fitted)
- Handing over a diesel locomotive to a replacement crew

Duties after service

- Uncoupling a locomotive from rollingstock
- Moving a locomotive to its stabling position
- Oiling, greasing and cleaning the locomotive
- Carrying out all required post-operational checks on the locomotive
- Securing the locomotive
- Completing all required paperwork

> ***Practical***
>
> Obtain a copy of your railway's job description or duty statement for a train driver of a diesel locomotive. Describe to your mentor the various functions and duties you must perform when working as a train driver on a diesel locomotive in service. Travel with a diesel locomotive crew and observe the various functions as they are being performed by the train driver on the locomotive. Clarify with the train driver any aspects of these functions that are unclear.

4.2 STATUTORY RESPONSIBILITIES INCLUDING RAIL SAFETY AND SAFEWORKING REQUIREMENTS AND REGULATIONS RELATED TO THE DRIVING OF TRAINS

Theory

The role of a driver of a diesel locomotive is to work collaboratively with the second person to maintain the safe, effective and efficient operation of the locomotive and train before, during and after service. Train drivers must therefore be very familiar with the rail safety requirements related to the operation of diesel locomotives and trains on their railway and all pertinent safeworking rules and requirements. They must also have a good working knowledge of the basic regulatory requirements for the operation of diesel locomotives. Familiarity and expertise with regulatory requirements will increase as a driver becomes more experienced.

You need to make sure you are familiar with the railway and other documents that describe your statutory responsibilities and that you understand their contents and

the implications for your work as a train driver on the class(es) of diesel locomotive used on your railway.

A particularly important responsibility is to be aware of the hazards involved in working as a driver on a diesel locomotive and following the rail operator's strategies for minimising or eliminating the risks involved. Examples of hazards that exist on diesel locomotives include:

- Falling from heights
- Working in confined spaces
- Working under wires
- Chemicals
- Hot surfaces
- Moving work platform
- Moving parts in engine rooms
- Oil spills on floors
- Dehydration and fatigue
- Noise
- Working with high and low voltage electric circuits and electrical equipment within cabinets

Hazard management strategies may include:

- Taking required precautions when using oil as the locomotive fuel,
- Ensuring public safety,
- Using personal protective equipment or PPE,
- Undertaking the necessary electrical / mechanical equipment isolations before opening cabinets or entering engine rooms
- Using fire extinguishers and water hoses to control fire emergencies,
- Following the railway's established risk management procedures.

Practical

In conjunction with your mentor, make sure you have a copy of the relevant documents and understand the requirements and responsibilities described in them. If in doubt on any aspect of your statutory responsibilities, ask your mentor to clarify them with you and, if necessary, demonstrate how these responsibilities need to be fulfilled in practice. Demonstrate to your mentor your understanding of your responsibilities and how these are applied in your role as a driver of a diesel locomotive.

4.3 STANDARD PROCEDURES OF THE RAIL OPERATOR APPLICABLE TO A TRAIN DRIVER ON A DIESEL LOCOMOTIVE, INCLUDING RECORD KEEPING AND THE REPORTING OF DEFECTS AND INCIDENTS

Theory

Make sure you have a copy of those standard procedures of the operator of your railway that apply to the functions and duties of a driver of a diesel locomotive. You should read these procedures and make sure that you are thoroughly familiar with them and can apply them when performing the tasks of a train driver.

It is important that you not only can follow these procedures but also understand their significance and the reasons why following them is so important. These procedures will include record keeping and the required action to be taken in the event of an equipment defect or a safety incident.

Practical

In conjunction with your mentor, make sure you have a copy of the relevant standard procedures and understand how they must be applied as a driver of a diesel locomotive.

If in doubt on any aspect of the procedures, ask your mentor to clarify them with you and if necessary, demonstrate to you how the various procedures should be carried out.

In turn, you should learn how to apply these procedures yourself progressively through your training -- developing your expertise through guided practice, as instructed by your mentor.

4.4 ROLE AND RESPONSIBILITIES OF A TRAIN DRIVER ON A DIESEL LOCOMOTIVEON -- LEARNER'S NOTES

Insert your own notes here

5 PREPARING AND STARTING A DIESEL LOCOMOTIVE

5.1 IDENTIFYING AND DESCRIBING THE COMPONENTS OF A DIESEL LOCOMOTIVE AND ITS ASSOCIATED EQUIPMENT

Theory

As a driver of a diesel locomotive, it is important that you know and are able to identify the various components of the diesel locomotive concerned and its associated equipment. For the components and their equipment, you must be able to describe their:

- purpose
- principal parts
- functions and operation
- potential defects and related action required to isolate, repair and/or report the defects as per standard procedures

Across the heritage rail industry in Australia there are a range of different types of diesel locomotive in service. These can include:

- diesel locomotives with a **mechanical transmission,**
- diesel locomotives with a **hydraulic transmission,**
- diesel electric locomotives involving a diesel engine that drives an **electric generator**. This generator in turn supplies power to electric motors which directly drive the wheels of the locomotive.

While there are some components and associated equipment common across the various types of diesel locomotives, you need to be able to recognise the particular components and equipment that are specific to the diesel locomotive(s) used on your railway. You also need to understand their purpose their functions and how they operate.

In particular, you need to be able to work collaboratively with the second person on the locomotive to identify defects and deficiencies that could occur and be able to take appropriate action as per your railway's standard operating procedures.

Dependent on the railway concerned, this may include recording, rectifying, isolating and/or tagging defects and deficiencies and/or reporting to relevant personnel

Practical

1. In conjunction with your mentor and from the available railway reference documents, learn to how to locate and identify the various diesel locomotive components and the associated equipment. Learn how to describe to your mentor the purpose of each component and piece of associated equipment and its function.

2. Develop a list of typical defects that could occur to the diesel locomotive, its components and its associated equipment and the actions you would be required to take within the limits of your responsibilities as a driver of the diesel locomotive(s) concerned. This action may include isolation of the faulty component or piece of equipment, its repair, tagging the faulty component or piece of equipment, reporting to appropriate personnel and/or recording the defect and action taken in the appropriate log or record book.

3. Check the duties and responsibilities of a driver of a diesel locomotive and the standard procedures for the servicing and checking of diesel locomotives in your railway (as they relate to the duties of a train driver) and confirm your understanding with your mentor.

5.2 CONDUCTING PRE-START CHECKS

Theory

Prior to commencing your day's shift on a locomotive, you need to sign on, check the duty roster and read and interpret the notice boards, operation instructions, locomotive allocation and other information you need to determine your duties and those of the second person duties for the shift.

Each railway will have its own specific sign on procedures and ways of informing drivers of their operational instructions, notices, locomotive allocation and the other required information.

You need to be thoroughly familiar with the procedures and sources of information and how the information should be interpreted and used by you in the course of your duties.

When preparing a diesel locomotive for service, drivers and second persons will initially check the locomotive's log book to confirm that all previously identified problems have been rectified.

They will then conduct a series of pre-start checks as per the railway's standard operating procedures for the diesel locomotive concerned. This will usually include:

- Setting the locomotive in position for examination and lubrication as per standard operating procedures

- Conducting a visual examination of the locomotive using the railway's checklist for the type and class of diesel locomotive concerned

- Confirming with the second person that the levels of all consumable liquids on the locomotive have been appropriately topped up, including the levels of fuel, water and sand

- Confirming with the second person the operational readiness of the….
  - tool kit
  - fire extinguisher
  - first aid kit
  - communication equipment

The completion of these pre-start checks in collaboration with the second person on the locomotive ensures that the locomotive is fully ready for the planned operations and that the train crew will be suitably prepared for a range of possible emergencies and other abnormal situations that might occur en route.

Practical

Under the supervision of your mentor, observe and practice how to conduct the required checks of the log book and then the pre-start examination of a diesel locomotive and its associated equipment. Learn and demonstrate to your mentor how you can conduct the required inspection and checks in conjunction with the second person on the locomotive.

5.3 RECORDING, RECTIFYING, ISOLATING AND/OR TAGGING DEFECTS AND DEFICIENCIES (AS APPLICABLE) OR REPORTING TO RELEVANT PERSONNEL

Theory

Where defects and deficiencies are found in the course of the inspection and checks, they will be recorded and rectified, isolated, tagged (where applicable) and/or reported as per the railway's standard operating procedures and regulatory requirements.

Different railway operators will have their own policies and standard operating procedures as to what action should be taken by drivers when they discover defects and deficiencies in their locomotive and its associated components and equipment. Drivers therefore need to understand and be able to implement their own railway's policies and standard operating procedures concerning identified defects and deficiencies.

Practical

Under the supervision of your mentor, observe and practice how to take appropriate action in the event of a number of simulated typical defects or deficiencies on your diesel locomotive.

Learn and demonstrate to your mentor what action you would take if various simulated defects or deficiencies were identified on your diesel locomotive.

5.4 SWITCHING ON BATTERIES AND CONTROL CIRCUITS

Theory

Prior to starting the diesel locomotive the driver must engage the switch that connects the batteries to the control and starter circuits as per the railways standard procedures for that type and class of diesel concerned.

Following the standard operating procedures of the railway, the driver will then turn on in correct sequence a range of panel switches that control power to everything from lights to the fuel pump. *(**Note:** Some locomotives are primed by a hand pump)*.

> ### *Practical*
>
> Under the supervision of your mentor, observe and practice how to switch on the batteries and control circuits on a diesel locomotive. Learn and demonstrate to your mentor how you can switch on the batteries and control circuits and carry out any isolation procedures and checks required before opening cabinets.

5.5 PUMPING UP FUEL WITH PRIMING PUMP

Theory

If required on the class of diesel locomotive concerned, the driver will activate the switch controlling the pump used to prime the fuel system of the diesel engine on the locomotive. This ensures that the diesel engine is suitably primed – ready for start up.

> ### *Practical*
>
> If required on the class of diesel locomotive concerned, and under the supervision of your mentor, observe and practice how to pump up the fuel to prime the engine on the diesel locomotive. Learn and demonstrate to your mentor how you can pump up the fuel to prime the diesel engine on the locomotive.

5.6 STARTING ENGINE

Theory

Once the engine has been primed, the driver will start it as per the railway's standard operating procedures for the type and class of diesel locomotive concerned. If necessary, the driver may need to pre-heat the engine for a short time if the engine is cold. Drivers need to know and understand the standard operating procedures to be followed for the starting of the diesel locomotives they may be required to operate on their railway.

> ***Practical***
>
> Review the standard operating procedures for starting the diesel locomotive(s) on your railway. Under the supervision of your mentor, observe and practice how to start the engine(s) on the diesel locomotive(s) you may be required to operate. Learn and demonstrate to your mentor how you can start each of the diesel engine(s) on the locomotive(s) concerned. If an engine has already been running, you may need to explain to your mentor what steps you would take if the engine were to be started from cold.

5.7 SWITCHING ON MONITORING PANEL

Theory

After starting the engine, the driver will switch on the monitoring panel. The indicators and gauges on the monitoring panel provide the driver with information that allows confirmation that the locomotive is performing within specifications.

> ***Practical***
>
> In conjunction with your mentor and from the available railway reference documents, identify the indicators on the monitoring panel of the diesel locomotive(s) you may need to drive. Learn how to describe to your mentor the purpose and function of each of the indicators and demonstrate how you can read and interpret the readings on the various indicators.

5.8 CHECKING SYSTEMS ARE OPERATING CORRECTLY

Theory

Once the engine is operating, the driver will check the indicators and gauges on the monitoring panel to confirm that the locomotive is operating within specifications.

Once the engine is running, the driver will also conduct a number of other checks as per the standard operating procedures for the type(s) and class(es) of diesel locomotive concerned. These may include:

- oil pressure
- air pressure
- ammeter
- alternator
- brakes
- direction controller
- gear shift
- sanders
- head and marker lights
- data loggers

Where the indicators or other checks show performance is outside of specifications the driver will make appropriate adjustments or take other action as per the railway's standard operating procedures.

> ***Practical***
>
> Under the supervision of your mentor, observe and practice how to check that the systems on a diesel engine are operating correctly. Learn and demonstrate to your mentor how you can conduct the required checks in conjunction with the second person on the locomotive.

5.9 PREPARING AND STARTING A DIESEL LOCOMOTIVE - LEARNER'S NOTES

Insert your own notes here

6 MOVING A DIESEL LOCOMOTIVE

6.1 ADHERENCE TO YARD INSTRUCTIONS AND SAFEWORKING RULES

Theory

A critical aspect of a train driver's responsibilities is to follow the safeworking rules of the railway. This includes moving a locomotive in the yard during its preparation for service. You need to be thoroughly familiar with your railway's yard instructions and safeworking rules and be able to apply them when operating a diesel locomotive during both its preparation for service and stabling activities.

Practical

In conjunction with your mentor, make sure you have a copy of your railway's yard instructions and safeworking rules and understand the requirements and responsibilities described in them. If in doubt on any aspect of them, ask your mentor to clarify them with you and, if necessary, demonstrate how these responsibilities need to be fulfilled in practice. Demonstrate to your mentor your understanding of your responsibilities and how these are applied when moving a locomotive in the yard.

6.2 OBTAINING AUTHORITY TO MOVE AND POSITION A DIESEL LOCOMOTIVE

Theory

Prior to moving a locomotive when preparing it for service you must obtain authority to move and position the locomotive.

This is critical for the safeworking of the yard and personnel within it.

Practical

Learn and demonstrate to your mentor the standard operating procedures for obtaining an authority to move and position a locomotive prior to service.

6.3 OPERATING LOCOMOTIVE CONTROLS

Theory

It is important that you are thoroughly familiar with the various controls for the type and class of the locomotive(s) you will be driving. You must know the purpose and function of each of the controls and how and when you should use them.

Practical

Discuss with your mentor the various train controls for the type and class of the locomotive(s) you will be driving including their purposes and functions and how and when each should be used. Your mentor will demonstrate how each control should be used. Learn and demonstrate to your mentor how you can operate the various train controls in accordance with the standard operating procedures of your rail operator.

6.4 MOVING THE LOCOMOTIVE TO REQUIRED POSITION

Theory

The driver will follow the applicable standard operating procedures and safeworking rules when moving the locomotive to the designated position in the yard ready for shunting and coupling with rollingstock in preparation for service.

Practical

Learn and demonstrate to your mentor the standard operating procedures for moving the diesel locomotive to its required position prior to service.

6.5 SECURING THE LOCOMOTIVE IN POSITION

Theory

Once in position the driver will secure the locomotive in position in accordance with the rail operator's standard operating procedures of the rail operator for the type and class of diesel locomotive concerned.

Practical

Under the supervision of your mentor, learn and demonstrate how to secure the diesel locomotive in the designated position ready for service as per the rail operator's standard operating procedures.

6.7 MOVING A DIESEL LOCOMOTIVE - LEARNER'S NOTES

Insert your own notes here

7 CONDUCTING TRAIN OPERATIONS

7.1 FOLLOWING APPLICABLE SAFEWORKING PROCEDURES

Theory

All railways follow a system of **safeworking**, -- i.e. a system of rules and equipment used to prevent conflict between trains (and between trains and track workers).

In safeworking systems used on the tourism and heritage lines, the track is divided into sections within which only one train is permitted. The end points of these sections may be a place where trains may pass (such as a Station or Crossing Loop), a place where trains leave the main line (a Siding) or just a specially marked location (a Block Point). Permission for a train to enter a section is referred to as an Authority. Each form of safeworking goes about the granting of these Authorities to trains in a different way.

The two most common safeworking systems used by Tourist and Heritage Railways are:

1. STAFF AND TICKET (S&T)

S&T is a token system. It comprises the issue of a Proceed Authority in the form of a staff, or where there is to be a following train in the same direction, a ticket. The system generally allows for only one train to be in the section at one time. However, on sections where following movements are authorised within the section, tickets are kept in the staff box at each end of the section. The staff box can only be unlocked by the train staff for the particular section. The safety of the system depends upon the correct handling of the staff, and where required, the tickets.

The Authority to enter the section is the staff or ticket. Each train entering the section is required to be in possession of the staff or ticket for that section and when provided, comply with signal indications. When trains are proceeding on a ticket, the train crew is required to sight the staff for the relevant section prior to departure. The setting and verification of points is undertaken by the train crews themselves or by workers at attended locations.

2. TRAIN ORDER WORKING (TOW)

TOW is a communications-based system and comprises the issue of a Proceed Authority in the form of a Train Authority, which authorises a train to move between specified points and is issued by train control to the train crew or to workers who arrange delivery to the train crew. The train crew is required to comply with the instructions in the train order together with any additional signal indications. The route over which a train is authorised to move by a Train Authority is verified as clear either through manual procedures or with computer assistance. The setting and verification of points is undertaken by the train crew themselves at unattended block locations or by workers at attended locations and are required to comply with instructions contained with the train order or by rules which include the requirements for crossing or passing of trains.

You must be thoroughly familiar with the safeworking system used on your railway and be able to apply the rules and requirements of the safeworking system correctly when fulfilling your role on the railway. ***This is critical for the safety of the railway, personnel and passengers.***

Note that you will be trained separately in safeworking systems and procedures[1].

> ***Practical***
>
> Discuss with your mentor the safeworking system used on your railway.
>
> Learn and demonstrate to your mentor how to interpret and apply the rail operator's safeworking system when driving a train on the railway'.

7.2 INTERPRETING AND APPLYING 'AUTHORITY' TO MOVE A TRAIN'

Theory

Prior to moving a train you must obtain Authority to move a train' as per the rail operator's safeworking requirements and operational procedures. In heritage railways, this authority is usually approval from the guard to move within a yard

[1]See ***Safeworking Lesson Plan and WorkBook*** and related resources

where no formal proceed authority is required whilst within yard limits.
This is critical for the safety of the railway, personnel and passengers.

> ***Practical***
>
> Discuss with your mentor the standard operating procedures for obtaining 'authority' to move a train' within the safety management system of the railway. Discuss the reasons and importance for having to obtain 'authority' to move a locomotive or train. Learn and demonstrate to your mentor how to obtain and apply authority to move a train'

7.3 INTERPRETING AND APPLYING A 'CANCELLATION OF AUTHORITY'

Theory

If for some reason the operations of a train have been cancelled and an 'Authority' has already been issued, you must obtain a 'Cancellation of authority' as per the rail operator's safeworking requirements and operational procedures.
This is critical for the safety of the railway, personnel and passengers.

> ***Practical***
>
> Discuss with your mentor the standard operating procedures for obtaining a 'Cancellation of Authority' and its purpose within the safety management system of the railway. Learn and demonstrate to your mentor how to interpret and apply a 'Cancellation of authority'

7.4 FOLLOWING CORRECT PROCEDURES WHEN THERE IS A TRAIN BROKEN DOWN OR FAILED IN A SECTION

Theory

It is very important that a train driver understands the standard operating procedures that must be followed when there is a train broken down or failed in a section – as per the rail operator's safety management plan.
This is critical for the safety of the railway, personnel and passengers.

Practical

Learn and demonstrate to your mentor the standard operating procedures that must be followed when there is a train broken down or failed in a section.

7.5 FOLLOWING CORRECT PROCEDURES WHEN THERE ARE WORKSITES ON TRACK

Theory

A ‘track authority’ allows track work on running lines between train movements. Protection Officers manage the approach of rail traffic to worksites (See note below). Movements may be controlled using hand signallers and detonator protection or other means.

Train drivers need to be aware of the safeworking rules that need to be followed by drivers when operating in the vicinity of worksites on the track. In conjunction with the second person they must remain vigilant and respond correctly to warning devices and hand signals from protection officers. Track workers are only permitted to work with light hand tools when a train is approaching in a section. The track supervisor will signal “all right” to the locomotive driver when all workers and their tools are clear of the track.

Note that the *‘authority for track workers to be in a section when a train is present’* will vary from railway to railway and reference to protection officers does not apply, at this stage, across Australia. It is very important that all railway personnel need to be aware of the access rules for track workers for the railway or tramway concerned.

Practical

Discuss with your supervisor the safeworking requirements of your rail operator for operating a train in a section where there are worksites on the track including the procedures for the protection of the worksite.

Learn and demonstrate to your mentor the standard operating procedures and safeworking requirements of your rail operator for when there are worksites on track. This may involve the mentor posing a series of simulated situations or case studies.

7.6 SHUNTING

Theory

When shunting rollingstock to form a train, it is important that the driver follows the railway's standard operating procedures and safeworking rules as they apply to shunting.

You should be familiar with all shunting signals provided by the second person, guard or other qualified persons assisting in the shunting operations.

Practical

In conjunction with your mentor, make sure you have a copy of your railway's standard operating procedures and safeworking rules as they apply to shunting and understand the requirements and responsibilities described in them. If in doubt on any aspect of them, ask your mentor to demonstrate how shunting activities need to be carried out.

Demonstrate to your mentor your understanding of shunting procedures and related safety requirements and how these are applied when shunting rollingtock either in the yard, or at a station, or siding.

7.7 COUPLING LOCOMOTIVE TO ROLLINGSTOCK

Theory

When coupling a locomotive to rollingstock to form a train, the driver will initially position the locomotive a short distance from the leading vehicle of the train.

Before coupling the driver will make sure that the main air reservoir is fully charged. The shunter should stand in a position of safety and where they can be seen by the driver and signal the driver to ease up to the leading vehicle. The driver will slowly move the locomotive and bring it to a standstill and then apply the locomotive's brake.

The shunter then couples the locomotive to the leading vehicle as per the railway's standard operating procedures.

For example, in an air brake system:

> *'After coupling to the train, the driver will lap the brake valve handle until the air hoses have been coupled and the brake cocks opened. The driver will then shift the brake valve handle to the full release position to charge the brake pipe. The brake valve is then returned to the running position in sufficient time to prevent an overcharge of the brake pipe.'*

It is the shunter's responsibility to make sure that the locomotive is correctly coupled to the train and that the brake pipe cocks are in the open position between the locomotive and the leading vehicle of the train.

It is critically important that the driver is able to see the shunter at all times when the locomotive or train is being moved. If the driver cannot see the shunter, he/she must immediately stop and not move the locomotive.

Practical

Under the supervision of your mentor during a train journey, observe how driver works with his/her second person to safely couple a diesel locomotive to the leading vehicle of a train.

Learn and demonstrate to your mentor how you can work with a shunter to couple a diesel locomotive to the leading vehicle of a train as per your railway's standard operating procedures.

7.8 HANDLING OF TRAIN

Theory

The handling of the train requires detailed route knowledge including the location of grades, stations, sidings, crossings, fixed lineside signals, curves, speed limits, and other potential hazards such as lineside fires that may affect the running of the train. Consideration of these route features and potential hazards enables the driver to anticipate the running requirements of the train and adjust the handling of the train accordingly. This also requires collaboration with the second person to ensure that the management of the locomotive performance, power level and speed is appropriate for both the current track conditions and those ahead. The

driver needs to regulate the operation of the locomotive to ensure its safe operation.

Practical

Under the supervision of your mentor during a train journey, observe how the driver handles the train and works collaboratively with the second person to anticipate the road ahead and appropriately manage the performance, power level and speed of the locomotive.

Discuss with your mentor the routes of the trains you will be driving and the ways in which the features and hazards along the road need to be considered and taken into account when handling the locomotive and managing its performance.

During a test drive of a train, learn and demonstrate to your mentor how you can handle the train and work collaboratively with the second person to manage locomotive performance to ensure that the train operates smoothly at the required speed and power levels to achieve timetable requirements and to comply with the rail operator's standard operating procedures.

7.9 PRECAUTIONS AND PROCEDURES WHEN APPROACHING AND TRAVERSING FIXED LINESIDE SIGNALS, , POINT STAND INDICATORS, SIGNS AND LEVEL CROSSINGS

Theory

When operating a diesel locomotive during a train journey, its is crucial for effective safeworking that the driver ensures that correct procedures are followed when approaching and traversing fixed signals, point stand indicators, check points, track side signs and level crossings .

The driver and the second person work in partnership to observe the various signals, signs and indicators and to scrutinise for any abnormal situations that might occur at level crossings.

The driver is assisted by the second person who double checks the various situations at fixed signals, point stand indicators, check points, track side signs and

level crossings and aids the driver in taking all required action as per safeworking rules and standard procedures. All signs and signals must be called and acknowledged. Either one of the locomotive crew must call the indication which is then repeated by the other locomotive crew member.

Practical

1. Ride in the cab of a diesel locomotive for a train journey and observe the teamwork of the locomotive crew and the way that the driver and the second person work together in the observance of fixed signals, point stand indicators, check points and track side signs and the procedures for approaching and traversing level crossings.
2. Discuss with your mentor, the procedures for observance of fixed signals and level crossings and potential abnormal situations that can occur at level crossing and related action that needs to be taken should they occur.
3. Learn and demonstrate during a train journey the action you must take as a driver in the observance of fixed signals, point stand indicators, check points, track side signs and level crossings.

7.10 ADHERING TO SPEED LIMITS

Theory

The maximum speed for a railway is normally published by the Railway in its Working Timetable or similar document. This is “known as Normal Speed. Normal speed is the maximum speed permitted for that section of line or class of rollingstock:,e.g. In South Australia, a 930 class loco is permitted 95 Kph max speed whilst a 500 class loco is only permitted 65 Kph etc.

Where there are curves on a railway curve speed boards indicated the maximum permissible speed around that curve. Normal speed may be resumed when all of the train has cleared the curve. Curve speed boards are normally placed on the Driver’s left had side at the point on the railway where that speed commences.

Temporary speed restrictions are applied from time to time due to the condition of the track. A” Warning Board” is placed in advance of the restricted track to indicate to the driver the speed at which the movement is enquired to proceed over the affected track. A “Start Speed Restriction Board” is placed 50 metres in advance of

the point where the speed restriction is to start and drivers need to ensure their trains do not exceed that speed from the board until clear of the restricted area. A “Clearance Board” is located 50 metres beyond the point of the speed restriction and normal speed may be resumed when the last vehicle of the movement is clear of this board. In The design and placement of boards does vary from railway to railway and you need to become familiar with the boards in use on your railway. In most railways the maximum permitted over the speed restriction is shown on the Warning Board and Restriction Board but in most cases there is no speed on the resume normal speed board.

It is critically important that a driver is aware of the location of the various speed boards (including temporary speed restrictions) along a train’s route so that preparations can be made to reduce speed if the train is approaching a section with a lower speed limit.

Practical

Under the supervision of your mentor during a train journey, observe how a driver adjusts the speed of the train to comply with the speed limits indicated by the various speed boards en route, including curve speed boards where applicable.

Discuss with your mentor the location of the various speed boards on the various routes you will be driving trains.

During a test drive of a train, learn and demonstrate to your mentor how you can regulate the speed of the train to comply with the required speed limits.

7.11 GIVING AND INTERPRETING HAND SIGNALS

Theory

Drivers work directly with other members of the train crew and other qualified railway personnel in the safe and effective operation of locomotives and trains. A key skill required of all the railway personnel involved is being able to give and interpret the standard railway hand signals. In various circumstances, these hand signals may be complemented by the use of flags and lights (e.g. where night work is involved).

It is important therefore that you are proficient in giving and receiving such signals as per your railway's standard procedures. You must also be able to recognise and correctly interpret signals given by others.

Note: If a hand signal is not received when one is expected, or a hand signal cannot be interpreted, the movement must be brought to an immediate and smooth halt until the correct hand signal is again received.

Practical

In conjunction with your mentor obtain and study the signals you need to be able to give and interpret when working with other railway personnel during the driving of a diesel locomotive / train. In particular, identify and discuss with your mentor the various situations in which the signals are used during locomotive and train operations. Ride in the cab of a diesel locomotive for a train journey and observe the use of hand, flag and light signals by the train crew and other railway staff during the journey. Note how the crew watch for and observe the guard's hand signal when arriving at a platform. Where the platform is on the Second Person's side, the Second Person will relay the hand signals to the Driver.

Learn and demonstrate to your mentor the giving and interpretation of the various hand, flag and light signals used on your railway.

7.12 STOPPING AND SECURING A TRAIN IN AN EMERGENCY

Theory

When a train has been stopped such as in an emergency and has been brought to a stand and will remain stationary for a lengthy or unknown period and may be left unattended, the procedure for securing the train is as follows:

- Fully apply the train brake, and hand brake on the locomotive and all rollingstock,
- Secure the locomotive,
- Apply train protection in accordance with standard operating procedures.

Practical

During a test drive of a train in conjunction with the second person and under the supervision of your mentor, demonstrate the procedures you would follow as a driver during a simulated emergency halting of the train. In the simulation, take all required measures to secure the train.

7.13 IDENTIFYING FAULTS AND DEFECTS AND CONDUCTING ASSOCIATED TROUBLE-SHOOTING ACTIVITIES

Theory

It is the role of the driver on a diesel locomotive in conjunction with the second person to identify any faults and defects on the locomotive and its associated components and equipment and to undertake related trouble-shooting activities.

You need therefore to be familiar with the types of faults and defects that could occur on the type of diesel locomotive concerned and the trouble shooting processes typically used by drivers and second persons.

Practical

During a train journey under the supervision of your mentor and with the assistance of the second person, learn the types of faults and defects that could occur on the locomotive and the ways in which the driver can work in conjunction with the second person to identify typical faults and defects on the locomotive and its associated components and equipment and related trouble-shooting activities.

7.14 DEALING WITH ABNORMAL SITUATIONS DURING TRAIN OPERATIONS, INCLUDING APPLICABLE EMERGENCY COMMUNICATION AND EVACUATION PROCEDURES

Theory

There are a range of abnormal and emergency situations that may occur during a train journey. You should be aware of recognising abnormal and emergency situations and your railway's procedures for train crew to work collaboratively in the event that they occur. The following are some examples of potential abnormal and emergency situations. The handling of many of the abnormal and emergency situations listed usually falls to the guard who would call emergency services as required and may call on the driver to 'Stop'

- a track obstruction
- trespassers crossing the track
- equipment failure
- incorrect information or failure in communications
- a passenger emergency (e.g. illness or injury)
- an ill crew member (note that in the event of the driver becoming incapacitated, the second person may need to take over the driving of the locomotive on a temporary emergency basis)
- a passenger initiated alarm
- a false alarm
- a derailment
- a collision
- a chemical spill
- a fire and explosion on the locomotive or train
- a bomb threat
- head or marker light or whistle failure

Note that you should refer to your railway's policy and procedures for the action to be taken by train crew in the event of a **locomotive breakdown**.

Emergencies and Emergency Management Plans

Ensure you are familiar with your Railway's Emergency Management Plan and how it is applied in conjunction with the Emergency Services in your area. In the case of an emergency, confirm who is initially in charge of the site and when and how this responsibility changes to the Emergency Services and the Senior Combatant Agency at the site.

You need to be familiar with your responsibilities in the case of emergency and the requirement not to undertake any activity that is likely to destroy any evidence unless it is essential to do so in the treating of injured persons.

The incident site is controlled by the Senior Combatant Agency on site until such time as it is cleared and declared a wreck, then the Railway becomes responsibility for clearing of the track.

Prior to allowing work to commence on site, the Railway must ensure that it has undertaken an investigation to establish ensure and that all necessary evidence has been obtained.

Note: Emergency Services terminology varies from State to State, hence some terms will need to be changed to reflect the terminology of the State in which the training materials to be used. In all States, the Senior Combatant Agency is the Police except where a *Dangerous Goods Spill* occurs in which case the Emergency Services will take charge.

Notifiable Occurrences

Rail Safety Regulations require that all incidents which occur on a railway are deemed as either Category A or B. A category A incident must be reported by the railway to the Rail Safety Regulator immediately or at least within 2 hours of the incident by the person nominated by the railway concerned. A written notification is required on the appropriate form within 72 hours. Incidences deemed as Category B are to be reported within 48 hours on the appropriate form by the designated person from the railway. Each railway will have its own procedures for handling of the investigation and reporting or emergencies and all workers need to be aware of these requirements. In some instances, the Rail Safety Regulator may advise that an investigation will be conducted by that organisation and therefore nothing is permitted to be shifted until such time as the investigation has been undertaken.

If the incident occurs on a railway operated by another organisation, the railway concerned will have an operating agreement detailing the actions to be taken.

***(Note:** In some States, the time frame for reporting of Category B incidences may vary and customised training materials based on the generic Lesson Plans will need to reflect the requirements of the State in which they are to be used.)*

Practical

Check your railway's documentation regarding abnormal and emergency situations and what action should be taken when they occur. In particular identify the role of the train driver in these situations.

Discuss potential abnormal and emergency situations that could occur on your railway and the action you would need to take if they should occur.

Discuss also the *Emergency Management Plan* of your railway and the policy and procedures related to *Notifiable Occurrences*,

7.15 CONDUCTING TRAIN OPERATIONS - LEARNER'S NOTES

Insert your own notes here

Insert your own notes here

8 SHUTTING DOWN AND STABLING A DIESEL LOCOMOTIVE

8.1 UNCOUPLING LOCOMOTIVE FROM ROLLINGSTOCK

Theory

The driver will position the train in the location as required where the rollingstock is to be uncoupled.

The shunter will then commence the uncoupling process as per the railway's standard procedures. These will typically involve….

- Closing the end cocks,
- Disconnecting the hoses
- Applying the brake on the train and the hand brakes
- Moving out of the space between the locomotive and the rollingstock
- Then signalling the driver to ease up
- Uncouple the locomotive in accordance with standard operating procedures

On a train fitted with a **vacuum braking system**, the fireman would follow the standard operating procedures of the rail operator concerned for the uncoupling process.

It is important that the driver and the shunter (second person) work closely as a team and that the driver is vigilant as to the position of the shunter at all times and acts on the shunter's hand signals. The driver must ensure there is no movement of the locomotive while the shunter is engaged in activities between the locomotive and the rollingstock being uncoupled.

Practical

Under the supervision of your mentor during a train journey, observe how drivers work with shunters to uncouple a diesel locomotive from rollingstock. Learn and demonstrate to your mentor how you can work with a shunter to uncouple a diesel locomotive from its rollingstock.

8.2 MOVING LOCOMOTIVE TO ITS STABLING POSITION

Theory

Once a locomotive has been uncoupled from the rollingstock, it is either moved to its stabling point or initially moved to the location in the yard where all required cleaning, lubrication and post-operational checks will be conducted, before eventually moving it to its stabling position. Once in its stabling position, it will be secured as per the rail operator's standard operating procedures.

The procedures involved will vary dependant upon the railway concerned.

> ***Practical***
>
> Under the supervision of your mentor, learn and demonstrate how to move the locomotive to the required position's in the yard as per the rail operator's standard procedures for the type and class of locomotive concerned.

8.3 OILING, GREASING AND CLEANING THE LOCOMOTIVE

Theory

It is very important, that all bearings and other moving parts on the locomotive are well and constantly lubricated. When stabling a locomotive therefore, a driver will work collaboratively with the second person to complete the post-operational lubrication procedures and checklist issued by the rail operator for the type and class of diesel locomotive concerned.

> ***Practical***
>
> Under the supervision of your mentor, learn and demonstrate how to conduct all required post operational lubrication and greasing requirements in conjunction with the fireman as per the rail operator's standard procedures for the type and class of locomotive concerned.

8.4 CARRYING OUT POST-OPERATIONAL CHECKS

Theory

After service it is important that all required post-operational checks are undertaken as per the rail operator's checklist and standard operating procedures. Any identified problems should be recorded, reported and rectified (if possible and within scope of responsibilities).

> ***Practical***
>
> Under the supervision of your mentor, learn and demonstrate how to conduct a visual inspection and other post-operational checks of the diesel locomotive and its associated equipment.

8.5 SECURING LOCOMOTIVE

Theory

The locomotive should be secured in its stabling position as per the standard operating procedures of the rail operator for the type and class of diesel locomotive concerned.

> ***Practical***
>
> Under the supervision of your mentor, learn and demonstrate how to secure the diesel locomotive after service as per the rail operator's standard operating procedures.

8.6 COMPLETING PAPERWORK

Theory

Prior to signing off make sure that all necessary paperwork has been completed as per the rail operator's requirements. This may include:

- Time sheet,
- Log or record of locomotive operations,
- Reports of operational problems with locomotive operation and/or any defective components or equipment identified and details of any action taken or required,
- Reports of any safety incidents as per rail operator’s procedures and regulatory requirements, and
- Paper work related to the return of kit to store.

Practical

Under the supervision of your mentor, learn and demonstrate how to complete all require post-operational paperwork prior to signing off as per the rail operator’s requirements.

8.7 SHUTTING DOWN AND STABLING A DIESEL LOCOMOTIVE - LEARNER'S NOTES

Insert your own notes here

SEPARATE ATTACHMENT 1

DIESEL LOCOMOTIVE

TRAIN DRIVER

KNOWLEDGE

CHECKLIST

SEPARATE ATTACHMENT 2

DIESEL LOCOMOTIVE

TRAIN DRIVER

PERFORMANCE

CHECKLIST

SEPARATE ATTACHMENT 3

TRAIN EXAMINATION ADDENDUM

1. LESSON PLAN AND WORKBOOK

2. KNOWLEDGE CHECKLIST

3. MENTOR'S Q&A

4. PERFORMANCE CHECKLIST