



## SCHOOL OF CIVIL ENGINEERING

**Unit Outline Prepared by:** Dr. Martin H. Murray **Date.:** 22Apr02  
**UNIT TITLE:** Railway Management, Operation & Safety **UNIT CODE.:** CEP012  
**DISCIPLINE CODE:** 030909 **SEMESTER/YEAR.:** Sem 2, 2003  
**CREDIT POINTS** 12 **PREREQUISITES.:** Nil

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### 1. Rationale

Railways around the world are being privatised and are investing heavily in very advanced technology. These changes are set to revolutionise the industry in a short period of time. The environment in which railway personnel are currently functioning is changing in terms of the complexity of the rail transport system, the extent and sophistication of resources, progress in technology and increased competition in the transport market. This unit complements its companion unit CEP011 and is offered with support from and full collaboration with the Australian Railway Research Institute (ARRI).

### 2. Aims

The aims of this unit are to enable railway personnel to obtain a thorough knowledge and insight of four major facets of the rail transport system, to broaden their awareness of rail system operation beyond their own discipline and to enable them to see how management of the transport service occurs.

### 3. Objectives

The **technical** objectives of this unit are that upon completion of the study requirements, you should be able to:

1. Demonstrate an increased knowledge of the functions of the rail transport system.
2. Perceive and develop interactions between the various railway disciplines.
3. Achieve an improved understanding in decision-making.
4. Know how effective resource utilisation can be achieved.
5. Appreciate how the dissemination of information is crucial to management and operations.
6. Demonstrate improved judgement of what constitutes an efficient business operation.
7. Contribute positively to management of and innovation in railway operations.

By the completion of this unit, you should also have become aware of your current abilities in the following **generic** capabilities, and will have progressed in the development of them:

- a) *Communication* –written communication
- b) *Work practices* - innovation, planning and decision making, interacting with other professions
- c) *Problem solving* - problem identification, formulation and solution; reflective learning
- d) *Discipline knowledge* – competent in the skills and practice of at least one body of knowledge.

### 4. Content

The four modules in the Study Guide are described below. Each module follows a similar format: Introduction, Objectives, Textbook/s, References, and requires 4 weeks of study and work to complete.

- Module 1: *Railway Management*. Topics are: elements of management of the railway business, understanding why the business exists, business vision, and implementing the vision through strategy, policy and procedures, needs of the stakeholders who influence the manner in which

people, material, finance and services which are used to produce the product sold by the business. Different railways have different products.

- Module 2: *Railway Operation*. Topics are: planning required to determine the service specification and to deliver the specified service, coordination role performed by the operator, delivery of service and factors involved in optimising the service. A case study takes participants through the complete process; participants deliver a comprehensive plan for service delivery built up during the course of the module.
- Module 3: *Railway Safety Management*. This module of the unit addresses the broader aspects of rail safety issues, including safety awareness, with some across the board guidance for the inter-disciplinary manager. Specific aspects of safety will also be stressed in the individual modules on track, rolling stock, signalling and operations, etc.
- Module 4: *Railway Signalling & Telecommunications*. Railway signalling and telecommunications systems are important elements in ensuring safe and efficient railway operations. The selection and use of systems very much depends on the level of safety, operational flexibility and asset utilisation required by railway owners, operators and regulators. The underlying principles and the technology have largely evolved as a result of accidents.

WEEK of STUDY	Component	Relevant Objectives & Capabilities
1-4	Module 1: railway management. Submit assignment #1	1, 3, 5-7, (a) - (c)
5-8	Module 2: railway operation. Submit assignment #2	1-3, 4-7 (a) - (c)
9-12	Module 3: railway safety management. Submit assignment #3	1, 3, 4, 7, (a) - (d)
12-15	Module 4: signalling & telecommunications. Submit assignment #4	1, 3, (a), (c), (d)
16	UNIT COMPLETED	

## 5. Teaching & Learning Approaches

You will undertake this unit entirely in an external or distance education mode; therefore, the teaching approaches in this unit were developed through QUT's Open Learning Unit and are based on principles of adult learning, theory and practice. The study notes and part of the resource material you will need are contained within the folder you will receive from QUT. The authors of the modules that comprise the study materials in this unit are also those who will be interacting with you during your study of the unit, and will be assessing the assignments you submit. The authors are all highly experienced and senior personnel in the railway industry. They, and the academic staff at QUT together with support personnel at ARRI, are keen to provide you with assistance wherever possible, but communication will all be via remote means such as telephone, email, fax and mail.

Although the supplied study materials direct you to certain texts and standards for you to read, the external nature of the unit also requires you to draw on your own skills and other human and written resources at your disposal, for information to complete some assignments.

The study materials you will be supplied contain two major components.

- The *Unit Profile* introduces you to the unit, explains the administrative detail, includes a study plan to help you manage your time, provides contact details for student support and sets the expectations for the unit.
- The *Study Guide* contains four modules (1-4) to be studied sequentially. Each module is designed to help you structure your study in this unit. The presentation of the content for each module provides a written guide related to module topics. This design is intended to facilitate your learning by: identifying important concepts; presenting illustrations, case studies and worked examples; providing a commentary on the subject matter; and providing activities for reflection and problems for you to resolve. The activities presented within each module are not compulsory, but we highly recommend that you do attempt these as a self-development activity to assist your learning and to

prepare you for the compulsory assignment at the end of each module You will be provided with a grade for each assignment you submit and with written comment on your work.

## 6. Assessment

Component	Form- ative	Summ- ative	%	Generic Capabilities	Technical Objectives	Date given	Date due
Activity 1	X			(a) – (c)	1, 3, 5-7	Week 1	
Assignment 1		X	25	(a) – (c)	1, 3, 5-7	“	Week 5
Activity 2	X			(a) – (c)	1-3, 4-7	“	
Assignment 2		X	25	(a) – (c)	1-3, 4-7	“	Week 9
Activity 3	X			(a) – (d)	1, 3, 4-7	“	
Assignment 3		X	25	(a) – (d)	1, 3, 4-7	“	Week 13
Activity 4	X			(a), (c), (d)	1, 3	“	
Assignment 4		X	25	(a), (c), (d)	1, 3	“	Week 16

To pass this unit, students need to gain a passing grade in **each** of the four assignments. There is no final exam in the unit. Full details of these assessment tasks will be provided in the study guide which will be available in the first week of lectures and which is available electronically from the unit's OLT site.

## 7. Resource Materials

Required: Aside from the study materials supplied by QUT there is no set textbook for this unit.

There are extensive lists of references in each of the modules; many are available through QUT's library, others will be available through railway businesses' libraries and state libraries.

The following text may assist with the extensive writing required in the five assignments.

- Lewis, D. Ed. (1999) The Written Assignment: A guide to the writing and presentation of assignments. Brisbane: Queensland University of Technology. Available in QUT bookshop

Unit website address: <https://olt.qut.edu.au/bee/cep012>

## 8. Risk assessment

There are no out of the ordinary risks associated with the operation of this unit.