

PETRONAS TECHNICAL STANDARDS
HEALTH, SAFETY AND ENVIRONMENT

LOGISTICS
(GUIDELINES)

PTS 60.0110

JUNE 2006



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AMENDMENTS RECORD SHEET

Chap No.	Sect No.	Description	Issue No.	Date	Rev No.	Date	Appr by: (initial)
All	All	Renumbering to PTS 60.0110 Logistics	1	June 06	1	June 06	IGA

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SUMMARY

This section identifies the principal issues of HSE that are involved in logistics. It examines land, air and marine transport, and the handling of goods and materials as separate subjects and describes the various HSE issues that are associated with each topic.

Anyone who is responsible at manager or supervisor level needs to be aware of the responsibility to manage the logistics aspects of their operations as well as their core business responsibilities. The text and checklists in this section of the HSE Manual are designed to identify the practical requirements of any PETRONAS logistics operation. The chapters and paragraphs within **Logistics** are applicable to the following personnel:

All personnel involved in logistics	1. Introduction	This is a basic introductory chapter of importance for all personnel
	2. Overview	Overview of this document
Senior management	3. Logistics HSE Management	General chapter analysing generic issues of HSE management in logistics
Senior management Line managers and supervisors	4.1 Introduction to Chapter 4	Introduces the topic of land transport
	4.2 Drivers	Discusses selection and competence, training, driving permits, driver improvement and responsibilities of the individual
	4.3 Vehicles	Discusses correct selection, specification, passengers, freight and maintenance
	4.4 Operations Management	Discusses need and approval, journey routing and scheduling, journey logging, roles and responsibilities, contracting, procedures, performance measurement and emergency services
Senior management Line managers and supervisors	5.1 Introduction	Introduces the topic of marine transport
	5.2 Marine personnel	Discusses selection, competence, training for marine crew
	5.3 Vessels	Discusses correct selection, specification and vessel performance including cargo handling capacity, anchoring and towing
	5.4 Operations management	Discusses need and approval, journey routing, scheduling and logging, contracting, procedures
Senior management: Line managers and supervisors	6.1 Introduction	Introduces the topic of air transport
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Senior management Line managers and supervisors	6.4 Aircraft	Discusses correct selection, specification and aircraft performance including cargo handling capacity, maintenance
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	6.7 Support facilities	Discusses the ground support requirements including technical and personnel accommodation, fuel storage/delivery, communications and navigation, meteorological services, emergency and security services
	6.8 Operations management	Discusses need and approval, journey routing, scheduling and logging, roles, refuelling, contracting, procedures and audit
	7.1 Introduction	Introduces the topic of materials handling
	7.2 Personnel	Discusses selection, competence and training of drivers/operators of equipment
	7.3 Materials handling personnel	Discusses the specification, selection of equipment of equipment and handling accessories
	7.4 Materials handling principles	Discusses the principles in lifting/landing of loads, packing containers and container movements, bulk materials handling, freight securing and manual handling
	7.5 Materials storage	Discuss the key issues of layout, routes, lighting, telephones/PA, fire protection, drainage, first-aid, ventilation and storage systems
	7.6 Operations management	Discusses the planning and execution of materials handling operations

1 INTRODUCTION

1.1 OBJECTIVES OF THIS DOCUMENT

The overall objectives of this document are to:

- ☐ identify the principal HSE aspects associated with logistics
- ☐ establish effective pointers to the management of logistics HSE
- ☐ encourage the application of an effective proactive approach to logistics HSE based on Group policy and industry standards.

1.2 OBJECTIVES OF LOGISTICS HSE MANAGEMENT

There are two main objectives of logistics HSE management.

The first is to ensure that all hazards and long term effects associated with logistics are formally identified, the risk and consequences to people, the environment and assets are fully evaluated, and action taken to reduce those risks and consequences to a level acceptable to the management, and consistent with group standards and targets for risk management.

The second is to actively manage the activities so that all personnel understand the risks and consequences, provide effective controls to reduce the incidence of any hazard to a level as low as reasonably practicable (ALARP) and to ensure that the consequences of any hazard can be controlled.

1.3 BACKGROUND

Statistical analysis of HSE performance in Petronas group activities in recent years shows that the majority of serious accidents, resulting in fatalities, have occurred in logistics operations, most notably in road and aircraft transport. Further analysis also shows that the mode of transport usually exhibits fundamental differences in the frequency of accidents and the numbers of injuries or fatalities. Road accidents, which may have a high frequency rate, usually involve one or only few fatalities or injuries, whereas marine or air accidents, with a lower frequency rate, often result in many more fatalities or injuries in a single occurrence – the low frequency high consequence and high frequency relatively lower consequence paradox.

Logistics is an essential and extensive part of the business activities and carried out under a wide variety of prevailing weather and operational conditions. Some aspects of logistics activities, for example traffic conditions external to OPU/JV premises, are not under the direct control of OPU/JV staff. Such aspects can combine to give a significant degree of exposure to logistics-related hazards for both OPU/JV and contractor staff.

A high proportion of the recorded fatal accidents has involved contractor and third-party staff. It is recognised that this will only be reduced through the application of proactive HSE management as part of the contracting process. It is also essential that

equivalent standards and controls are applied by contractors as by the OPU/JVs, and that this process is also extended to include subcontractors that may also be employed. The importance of the provision of adequate supervision by both PETRONAS staff and the contractors, and the commitment to working together in partnership, are key issues in the aim of reducing accidents. Such supervision also must emphasise the importance of the individual's attitude, awareness and the proper application of acquired skills.

Particular emphasis should be applied to journey planning, which involves both logistics professionals and staff from the other functions involved in the logistics operation. It should include the identification of all potential hazards, finding ways of eliminating them wherever possible and providing clear plans for managing the remaining hazards, including provision for possible emergencies. Other notable factors are the need to train personnel, to hold regular HSE briefings, to maintain and reinforce the awareness of the potential hazards and to provide adequate inspection and maintenance of vehicles and materials-handling equipment.

1.4 SCOPE

1.4.1 Definition

Logistics is the series of processes involved in the movement of materials, equipment and people from one location to another by land, water or air and the storage, handling and physical disposal of materials and equipment.

1.4.2 Modes of transport and materials handling

This document covers logistics under the following main headings:

- | | |
|-------------------------|--|
| Land transport | <p>The use of wheeled (and tracked) vehicles:</p> <ul style="list-style-type: none"> - by individual company personnel and contractors and vehicles of third parties brought onto company sites - on tarmac roads, graded roads and on other surfaces encountered in off-road travel within both OPU/JV and contractor-controlled premises. |
| Marine transport | <p>Marine activities offshore and for inshore waterways:</p> <ul style="list-style-type: none"> ☐ in support of offshore field operations ☐ to transport personnel and materials by sea between ports ☐ on rivers, including tidal estuaries ☐ canals ☐ on lakes and swamps ☐ on protected inshore waters that are unlikely to be affected by severe weather conditions ☐ hovercraft operations (air cushion vehicles - ACVs). |
| Air Transport | <p>Both fixed and rotary-wing aircraft, covering:</p> <ul style="list-style-type: none"> ☐ charter flights ☐ company-owned aircraft |

Materials handling

- ☐ contract flight services.
- Using the above forms of transport and materials handling equipment:
 - ☐ the correct use and maintenance of lifting equipment and materials handling accessories
 - ☐ the handling, storage and disposal of hazardous materials
 - ☐ warehouse and yard handling operations associated with storage and transportation activities
 - ☐ load handling associated with land, marine and air transport operations.

1.4.2 Range of transport operations

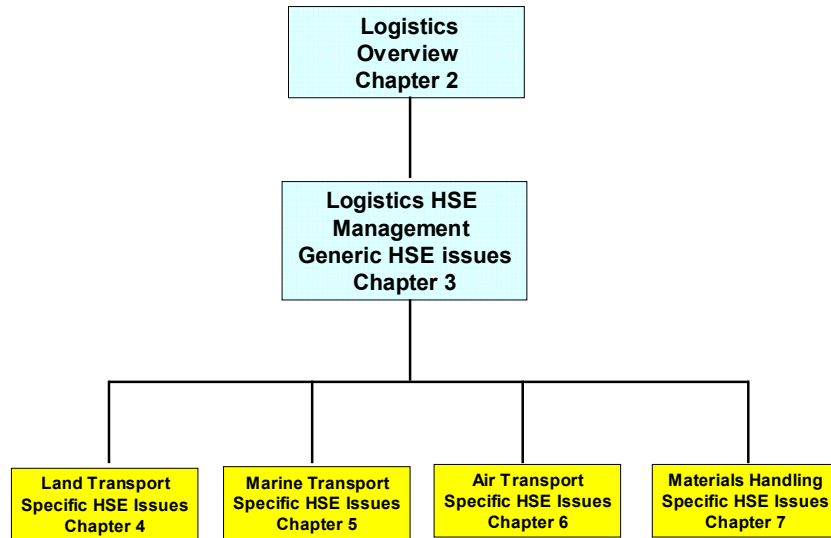
Guidelines for HSE management of transportation cover the following range of operations:

- | | |
|-----------------|---|
| Contract | Transport operations carried out by contractors (including subcontractors) as part of an OPU/JV contract and for the provision of vehicles, craft and equipment for transport operations carried out by OPU/JV personnel. |
| OPU/JV | Transport operations carried out by OPU/JV personnel using own vehicles, craft and equipment. |

2. OVERVIEW

2.1 RELATIONSHIP BETWEEN THE CHAPTERS

The remaining chapters of this document are defined in Figure 2.1.



2.2 KEY ELEMENTS OF INDIVIDUAL TRANSPORT MODE CHAPTERS

Each of the chapters devoted to the individual modes of transport have the following elements:

Introduction	a description of the special problems applicable to that area, the most frequently encountered accidents and the key issues to target in order to effect improvement
Human operator	a breakdown of the key issues that affect the selection, training and performance of the individual responsible for operation of the particular mode of transport
Vehicles/craft	a breakdown of the critical factors essential for the selection, use and continuing integrity of the vehicles/craft in question
Operations	definition of the essential elements of management for the improvement of HSE performance, targeted principally at:

- ☐ need, justification and approval
- ☐ routing and scheduling
- ☐ roles, responsibilities and authorities
- ☐ procedures and standards
- ☐ performance measurement.

3. **LOGISTICS HSE MANAGEMENT**

This chapter provides guidance on specific aspects of HSE management that are applicable to land, marine, air transport and materials handling. It utilises the standard HSE management system headings from PTS 60.0101 as the framework. HSE Cases should be considered for logistics operations in the same way as for the other business processes in the petroleum resource life cycle.

Appendix I provides an example checklist for self-assessment by OPU/JVs of their logistics HSE Management System and its implementation. PTS 60.2402 Road Transportation Safety Management Guidelines for Heavy Goods Vehicles (Ref. 1) also provides some additional guidance for the development of a HSE Management System for Heavy Goods Vehicles.

3.1 **LEADERSHIP AND COMMITMENT**

Key actions needed to demonstrate leadership and commitment in logistics operations are linked to creation of the right attitudes throughout the workforce.

- ☐ ensure correct attitude of management

Attitude is a significant ingredient and if logistics is treated as a side issue to core activities rather than an essential activity itself, it will develop secondary HSE importance. It is important to recognise that logistics is used by everyone and that it should be given equal weight to core activities in such aspects as coverage in corporate standards, 'visibility' of management, etc.

- ☐ improve group and individual attitudes

Utilise workshops, role models, etc to create climate of peer pressure throughout the OPU/JV.

3.2 **POLICY AND STRATEGIC OBJECTIVES**

In deriving policies for logistics HSE, OPU/JVs should make sure that they:

- ☐ establish and maintain an HSE Management System in line with Group policies and recommendations
- ☐ use the hazards and effects management process to identify all HSE-critical activities, assess the hazards and develop control procedures
- ☐ challenge the need for transport and plan to reduce exposure at corporate level
- ☐ develop emergency response procedures covering all envisaged emergency situations relating to logistical activities, including search and rescue, ensuring that these are in place prior to execution of operations
- ☐ ensure that departmental line responsibility for HSE in logistics is clearly defined within the system
- ☐ ensure that contractors have a compatible HSE Management System in place which includes implementation and feedback mechanisms and that the system is assessed by OPU/JVs before contractor mobilisation.

3.3 ORGANISATION, RESPONSIBILITIES, RESOURCES, STANDARDS AND DOCUMENTS

3.3.1 Organisational structure and responsibilities

It is especially important to recognise the need to determine organisation and responsibilities when there is no logistics department and the provision and operation of logistics is the responsibility of another function. The logistics element should not be viewed as a subsidiary and less important issue than the main function. The principles of HSE Management as described in PTS 60.0101 should be applied just as rigorously, in particular by:

- ☐ establishing corporate single point accountability for logistics and co-ordinators for functional units
- ☐ ensuring departmental line responsibility for HSE in logistics is clearly defined at all levels in the organisation.

The basic business process can be summarised by the steps shown in Figure 3.1, which shows the key components of the steps together with the corresponding HSE management objectives.

3.3.2 Management representative(s)

The accountabilities of the Management Representative for the HSE MS should include those of logistics.

3.3.3 Resources

Sufficient resources should be allocated to ensure effective operation of HSE management in logistics and consideration should be given to resource sharing in the following:

- ☐ other OPU/JVs, business units or departments
This includes such areas as warehousing, supply bases, delivery services, airfields, security, communications systems, training establishments
- ☐ contractors with whom there are long-term partnerships
- ☐ other OPU/JV in the area.

3.3.4 Competence

Key actions in ensuring adequate competency include the need to:

- ☐ establish minimum competence levels for all staff engaged in logistics
- ☐ ensure competence of Contract Holders for contracts involving logistics
- ☐ examine staff interchanging to widen experience in logistics
- ☐ examine recruitment of mature staff to avoid full dependency on third-party know-how (e.g. in awareness of new technology).

Determination of competence levels should include:

- ☐ educational background sufficiency (particularly for drivers in road transport)
- ☐ location of operations, multi-national participation and problems of language
- ☐ culture of local personnel employed
- ☐ maturity of driving staff

Competence should make reference to health issues, including:

- ☐ medical fitness to operate vehicles/craft/equipment
- ☐ protection of the health of personnel operating vehicles/craft/equipment
- ☐ capability in medical emergency response.

The relative importance of these issues will vary according to the mode of transport.

Training requirements should examine the need for:

- ☐ associated job skills
Operators of vehicles/craft/aircraft frequently have to carry out duties other than that of driving/piloting etc (e.g. loading operations, tying down loads, basic day-to-day maintenance, etc). Training should encompass these associated job skills as well as basic vehicle/craft/aircraft operation.
- ☐ past experience
Personnel with seemingly adequate experience in the logistics activities planned may nevertheless need to complete training/induction because of local circumstances (e.g. expatriates required to drive on local roads, pilots unfamiliar with local terrain /extreme weather conditions, mariners exposed to increased security requirements, etc).
- ☐ passenger HSE awareness
Where logistics activities involve the carrying of passengers, training/induction in the particular HSE hazards of the operation should be provided.

3.3.5 **Contractors**

There is a heavy reliance on the use of contractors in logistics and the operations themselves are frequently conducted away from OPU/JV and contractor base or control centre. There are a number of issues that require particular attention:

- ☐ logistics issues in other business activity contracts
Identify specifically the logistics elements in contracts and give equal emphasis to them especially where they are not the primary element of the contract. Ensure that contractor prequalification on logistics HSE is given equal prominence.
- ☐ long-term contracts
Examine ways of using a limited number of long-term contracts whilst maintaining a healthy number of competitive, quality contractors.
- ☐ HSE Management System

Ensure contractors have a compatible HSE management system and assess it before mobilisation.

- ☐ supervision
Determine how the OPU/JV supervision of the contractor is to be fully effected.
- ☐ duty hours
Ensure there is an effective system for monitoring the duty hours imposed on contractor's personnel (particularly where these may become excessive as a result of being on standby duty).
- ☐ technical aspects in logistics roles that require specialist skills.
Generic details on Contractor HSE Management are given in PTS 60.0305

3.3.6 **Communication**

A general issue of crucial importance is to establish and monitor the interface between top and bottom of the organisation (this is especially important in land transport). The supervisor's knowledge of the organisation is also important along with his participation in and choice of topics for tool-box meetings. The separation of the logistics activities from the point of control also means that communications are vitally important. This needs to be reflected in:

- ☐ use of current technology
- ☐ selection of appropriate equipment
- ☐ high standards of maintenance
- ☐ communications procedures that emphasise **positive** reporting and feedback.

3.3.7 **Documentation and its control**

The documentation of the logistics HSE management process is as important as other business activities which the logistics process serves. Guidance on the preparation of HSE Management Systems and HSE Cases is provided in PTS 60.0303. Specific guidance on the preparation of a Road Transportation Safety Management Guideline for Heavy Goods Vehicles is provided in PTS 60.2402, Ref. 1.

3.4 **HAZARDS AND EFFECTS MANAGEMENT PROCESS**

3.4.1 **Identification of hazards and effects**

Logistics activities should be evaluated in the same structured way as those of core business by using the Hazards and Effects Management Process (HEMP). Because of the risks involved in logistics operations, constant attention should be given, at all levels, to the identification and control of hazards.

3.4.2 **Evaluation**

QRA techniques should be considered when evaluating risks. When utilising QRA, care should be taken to set the boundaries, examine all options and run sensitivity calculations.

3.4.3 Recording of hazards and effects

See PTS 60.0101 HSE Management Systems.

3.4.4 Objectives and performance criteria

Performance indicators should be established. The following are suggested examples for transport:

- ☐ exposure (hours flown, kilometres driven/steamed)
- ☐ remedial action lists for HSE Cases - progress against plan
- ☐ number of staff vacancies (against approved establishment)
- ☐ percentage staff turnover
- ☐ percentage staff absence (sickness, etc)
- ☐ emergency response exercises - results against objectives
- ☐ contractor pre-mobilisation action items - close-out against plan
- ☐ number of times unable to meet transport requests
- ☐ number of times journey management plan not completely closed out
- ☐ number of unscheduled maintenance occurrences
- ☐ number of reports that activity (journey) not completed satisfactorily
- ☐ exception reports on personnel and equipment status
- ☐ assurance recommendations close-out - actual against plan.

3.4.5 Risk reduction measures

Logistics activities take place largely outside the controlled areas of plant or base facilities and are therefore subject to a significant proportion of uncontrollable factors (e.g. weather, traffic conditions, activities of people unconnected with OPU/JVs). It is particularly important:

- ☐ to specify how the need and justification for logistics will be challenged on a continual basis at corporate level
- ☐ to incorporate periodic reviews to ensure that risk exposure is not escalating and that demands for logistics are still subject to justification
- ☐ to examine the significant proportion of uncontrollable factors in logistics and the need to counteract these with additional risk reduction measures.

The application of risk reduction should examine such measures as:

- ☐ scheduling restrictions
- ☐ routing restrictions
- ☐ higher reliability standards of vehicles/craft/aircraft
- ☐ waste management (e.g. engine oil, expended batteries, tyres, etc).

3.5 PLANNING AND PROCEDURES

3.5.1 General

Planning of logistics activities should:

- ☐ focus early on logistics needs in projects and contracts
- ☐ include a system of effective controls and timely, positive reporting in journey management.

Basic elements of planning should include the following:

- ☐ knowledge of the requirements of work load, distances, vehicle/craft, etc availability
- ☐ use of appropriate vehicles, craft, aircraft, etc
- ☐ any necessary upgrading of the basic specification of vehicles with additional HSE requirements to match local circumstances (or any additional procedural controls because upgrading cannot be acquired)
- ☐ segregation of personnel/cargo.

3.5.2 Asset integrity

Asset Holders should be appointed with responsibility for maintaining an asset inventory and the integrity of logistics assets.

3.5.3 Procedures and work instructions

It is especially important to cover such topics as adverse weather and concurrent operations when compiling a Manual of Permitted Operations (MOPO).
See PTS 60.0101 HSE Management Systems.

3.5.4 Management of change

Establish a formal system to advise relevant personnel of changes in the operational environment.

3.5.5 Contingency and emergency planning

Emergency response procedures should be developed for all envisaged emergency situations relating to logistics activities including search and rescue (SAR). They should cover those situations where logistics is involved in the mobilisation phase of a contract. Contingency and emergency planning should consider the needs of self-sufficiency as a result of the problems of distance from the OPU/JV management centre. Where the necessary emergency facilities are not part of a proven, mature service they should be in place and tested before operations are permitted to start. Periodic exercises to simulate logistics incident emergencies should be conducted.

3.6 IMPLEMENTATION AND MONITORING

3.6.1 **Activities and tasks**

See PTS 60.0102 HSE Management Systems.

3.6.2 **Monitoring**

Implementation and performance monitoring should:

- ☐ encourage reporting of vehicle defects, unsafe loads, unknown dangerous road conditions, missing buoys, non-functioning beacons, etc
- ☐ establish a method for ensuring that weather forecasts are received and acted upon for short and medium term operational plans
- ☐ measure the coverage of weather forecasts and ensure they are adequate for the transport operation concerned
- ☐ ensure that work cycles and rest periods adhere to operational plans
- ☐ use only those personnel who comply with medical fitness standards and perform medical checks in accordance with planned requirements
- ☐ check vehicles/craft, equipment and storage/handling systems in line with preplanned checklists
- ☐ establish a system to monitor the results of performance indicators, audits and benchmarking
- ☐ check on the **need** for logistics.

3.6.3 **Records**

Establish and maintain comprehensive operational reports that are compiled on a regular basis (ie daily, weekly, etc).

3.6.4 **Non-compliance and corrective action**

See PTS 60.0101 HSE Management Systems.

3.6.5 **Incident reporting**

Incident reporting, including near misses, captures data and allows corrective action to be taken either from identification of root causes or from the analysis of data and the recognition of trends.

3.6.6 **Incident follow-up**

Any corrective action system is only as good as its close-out. Effective close-out should be monitored at the highest practical level.

3.7 **ASSURANCE**

OPU/JVs should ensure that a structural assurance programme for logistics across all functions is in place. Remedial actions should be set out in the corporate close-out

system which should be monitored at the highest management level.
Logistics incidents should be reviewed at corporate level.

3.8 MANAGEMENT REVIEW

The review process should periodically challenge the overall logistics strategy and its implementation. Part of the review process should include review of the logistics planning cycle.

Figure 3.1 BUSINESS PROCESS ACTIVITIES AND HAZARD MANAGEMENT OBJECTIVES

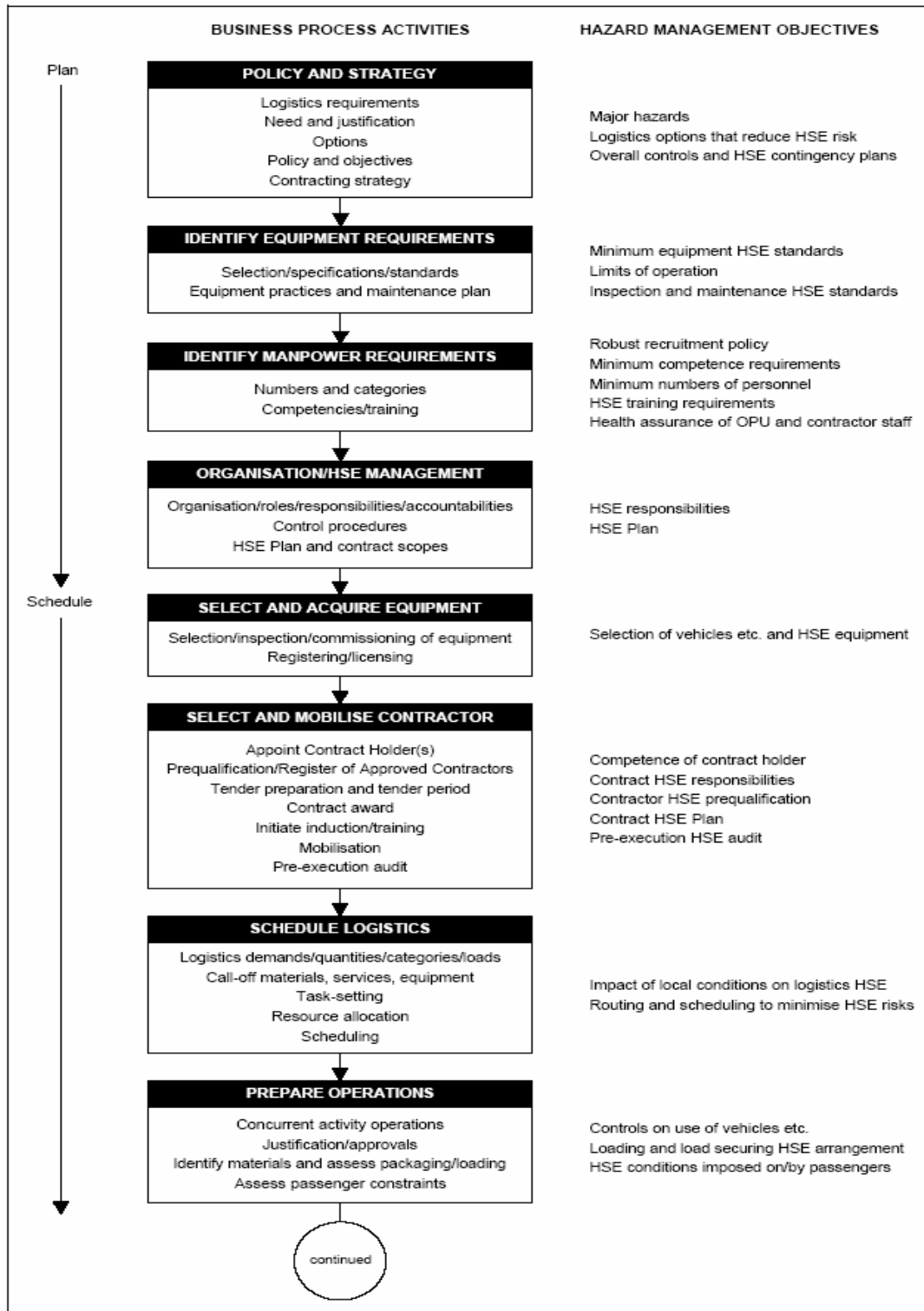
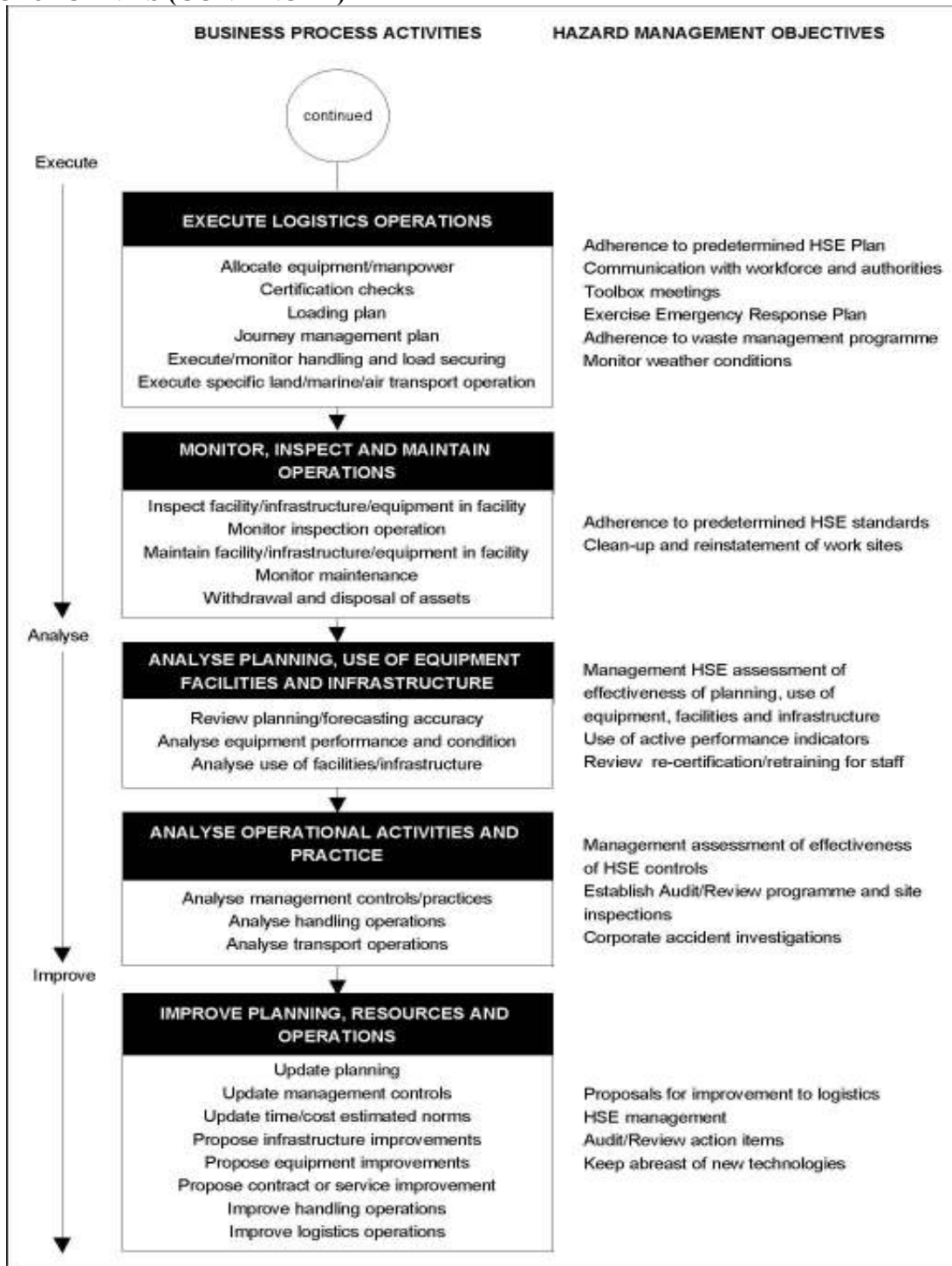


Figure 3.1 BUSINESS PROCESS ACTIVITIES AND HAZARD MANAGEMENT OBJECTIVES (CONTINUED)



4 **LAND TRANSPORT**

In addition to the guidance provided below, specific guidance on the development of a Road Transport Safety Management System for Heavy Goods Vehicles is given in Ref.1.

4.1 **INTRODUCTION**

4.1.1 **Key land transport issues**

Controls for managing HSE issues in land transport must consider many different elements, including:

Road and operating conditions	- quality and variability of road surfaces and gradients, including imposed limits variety of driving locations and road systems - uncontrollable factors such as the weather - presence, experience, behaviour and standards of other road users - degree to which traffic regulations are imposed and enforced.
Vehicles	- range, quality, and availability of vehicle types - specification of vehicles and equipment - specification of inspection and maintenance requirements. - mechanical failure
Driver	- driver age, attitude, medical fitness and impact, competence/ experience and training health, - state of mind/stress - prequalifications - application of alcohol and drugs and drugs policy
Common driving mistakes	- failing to notice pedestrians and cyclists on the road - misjudging speed of oncoming vehicles in overtaking manoeuvres - failing to check mirror prior to manoeuvre - braking too quickly or steering over-reaction - being unaware of potentially dangerous road conditions until too late - not attending sufficiently to the vehicle ahead - changing lanes without indicating driving in excess of the speed limit
Common driving violations	- driving on the crown of the road unnecessarily - driving too close to the vehicle ahead - not adhering to traffic or pedestrian lights - improper use of equipment.
Driving operation	- failure to inspect vehicle before use, e.g. to ensure vehicle is roadworthy or to check underneath vehicle for personnel / obstructions

Support services and guidance	- adequate garaging, offices, rest areas and workshops availability of maintenance procedures.
Government controls/restrictions	- control of land transport in some areas by government agencies restrictions and rules imposed by government
Operations management	- control of working hours (e.g. night work, shift work, etc).

4.1.2 Targets for improving HSE performance

Specific issues to be considered in establishing HSE targets include:

Conditions that promote safe driving behaviour	- constant management commitment - setting and maintaining driver expectations - provision of enforced supervision - provision of two-way communication between management, supervisors and drivers - individual driver accountability - recognition and feedback of performance - agreed driver hours and working conditions - emphasis on driving initiatives on quality and pride rather than financial reward - procedures for rehabilitation of injured drivers
Critical proactive analysis of driving exposures	- appraisal and justification of journey needs - structured and rigorous hazard assessment of road and driving conditions/weather conditions and possible hazards from other road users and pedestrians
Reinforcement of safe driving behaviour	- adequate supervision - road safety programmes - awareness of new equipment/instruments that may promote safer driving behaviour - increased sense of 'ownership' by drivers of their vehicles - adequate refresher and advanced driver training.
Critical analysis of LTIF and other Reactive Statistics	- vehicle incidence frequencies (e.g. against index of defects) - driver appraisal (e.g. against incidents, near-misses, good performance)
Human factors mistakes and violations	In the context of safe driving behaviour, driving mistakes and violations have different psychological origins and require different means of remediation. These distinctions are summarised as follows:
Special skills	handling and transportation of hazardous materials

Mistakes	Violations
Stem mainly from informational factors: incorrect or incomplete knowledge, either in the head or in the world.	Stem mainly from motivational factors, Shaped by attitudes, beliefs, social norms and organisational culture.
They are unintended .	Violations usually involve deliberate deviations from rules regulations and safe operating procedures.
They can be explained by reference to how individuals handle information.	Violations can only be understood in a social context .
The likelihood of mistakes occurring can be reduced by improving the relevant information : training, roadside signs, the driver-vehicle interface, etc.	Violations can only be reduced by changing attitudes, beliefs and social norms or organisational cultures condoning non-compliance.

The formation of quality circles amongst drivers to produce peer pressure for performance improvement has proved successful (see Ref. 4).

4.2 DRIVERS

4.2.1 Competence and selection

Before appointment driver candidates should be assessed to determine their suitability for the job. Such evaluations should include:

Medical fitness Medical standards for fitness, including demonstrating basic visual acuity, will vary according to the type of vehicle (Refs. 5, 6, 7, 8). Medical examination should include the application of the OPU/JV drugs and alcohol policies and follow-up tests - repeated at regular intervals (say every two years).

Mental ability The ability to perceive hazards in traffic situations, apply safe driving practices and observe traffic laws and regulations. It may be necessary to tie this ability to the achievement of a minimum education level.

Psychological The ability to react rationally in normal driving circumstances and in **capability** emergency situations.

Mental and psychological aspects may be examined by such methods as interactive video sessions, use of a questionnaire as part of interview, onboard driving observation, etc.

In addition, assessments should also include the following points:

Character and background	Attitude must be positive to, and show an understanding of, road safety Minimum/maximum age Any choice involving selection of personnel for driving duties with ages at either end of the age spectrum should be done with care. Selection on the basis of a minimum number of years' experience with the specific type of vehicle concerned is often appropriate. Upper age limits should be determined by OPU/JVs according to their own local circumstances. Integrity Driving experience, commensurate with anticipated duties Minimum educational requirements should be met in line with that specified by the OPU/JV interviews, to determine qualities and experience document checks
Verification of driver suitability	These are needed to verify proven driving record and possession of locally recognised licence or driving permit; a proven driving record implies, for example, an accident-free driving record and no driving offences for the last three years. driving tests These may be needed to confirm driving skills. The extent of such tests will depend inter alia on local circumstances, anticipated driving duties and vehicle type; OPU/JVs should conduct their own driving tests if the driving task is considered to need a higher standard than that required for a statutory licence. Further guidance on such tests is given in Appendix II.
Special skills	Detailed information on driver training can be seen in Ref. 9 ('The Driving Manual', HMSO, UK). ☐ defensive driving ☐ cold weather driving (ice and snow conditions) ☐ desert driving ☐ transportation of hazardous materials ☐ first-aid knowledge (Refs. 10, 11 and 12) ☐ heavy goods vehicles (HGV) ☐ vacuum-brake trucks or similar equipment operating skills

4.2.2 Driving permits

After completion of the process of selection and competence, the candidates should be formally issued with a driving permit.

The driving permit should, as a minimum, list the following details:

Personal details	Name, age and photograph of driver
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Employment details	Department name/station and working hours
Permit validity	Date of issue and date of expiry
Type(s) of	The type(s) of vehicle that the driver is eligible to drive. This may include weight of vehicle, engine size, passenger carrying restrictions
Cargo	The type(s) of cargo that the driver is eligible to carry; this must include any reference to hazardous materials.

4.2.3 **Induction**

Induction training should be given to drivers new to an area, e.g. expatriates. Such training should include briefing on:

- ☐ local traffic regulations
- ☐ requirements for vehicles and driver documents
- ☐ actions to be taken in the event of a vehicle accident
- ☐ road signs and markings
- ☐ give way rules at intersections, junctions and traffic islands
- ☐ OPU/JV rules on road safety
- ☐ characteristics of local driving culture
- ☐ limitations imposed by public order conditions (such as community strikes, security problems, sabotage)
- ☐ known accident blackspots
- ☐ government regulations/restrictions (e.g. in transport of hazardous cargo).

Information should also be provided on current driving programmes, site driving conditions, local policies and procedures, supervisor's expectations, and feedback mechanisms. Wherever possible induction briefings should be supported by a familiarisation drive accompanied by an experienced instructor. Briefing videos illustrating local conditions can be useful in this respect.

4.2.3 **Training**

Provision of the necessary training for drivers is one of the primary responsibilities of management. Training should be considered for the following categories:

- | | |
|-----------------------------------|--|
| Basic operation of vehicle | ☐ essential elements of vehicle operation such as location and operation of all the controls and the operating principles
☐ basic movements such as starting and stopping, shifting gears, reversing and turning. |
|-----------------------------------|--|

These steps are important even if the operator has previous experience on similar vehicles as vehicle types can differ in ways that crucially affect their safe operation.

- | | |
|-----------------------|--|
| Associated job | ☐ load securing (including checks to be made during journeys) |
|-----------------------|--|

- ☐ off-loading (including use of hydraulically operated tipping controls)
- ☐ positioning at dockside, quarry-side and other site-specific locations; special skills such as these must be taught and certified prior to the driver starting work

Defensive driving

- ☐ recognising the hazards
- ☐ improving the awareness through formal and informal training (such as newsletters, meeting discussions, local bulletins, etc)
- ☐ understanding the defences (by seeing and being seen, avoiding the hazard)
- ☐ acting in time
- ☐ controlling the vehicle

It is recommended that all personnel authorised to drive on company business are trained in defensive driving with refresher courses at prescribed intervals as defined by the OPU's individual circumstances (typically 2-3 years).

Special driving skills

- ☐ special road conditions, such as gravel or off-road driving
- ☐ terrain, such as desert, jungle or mountain
- ☐ weather conditions, such as the impact of ice, snow, strong winds, floods
- ☐ vehicle type, e.g. the use of four-wheeled drive vehicles
- ☐ night driving
- ☐ fuel hazards, e.g. storing in jerrycans, fuelling with engine running
- ☐ moving parts in engines
- ☐ first-aid training
- ☐ overhead electrical cables

Emergency actions

Drivers should be trained on how to handle possible emergency situations, such as:

- ☐ skids
- ☐ tyre blowouts
- ☐ mechanical failures
- ☐ aquaplaning
- ☐ hazardous material spillage
- ☐ vehicle fires

Servicing and

Training should be provided for basic vehicle self- **inspection**

inspection and routine checks, such as:

- ☐ general vehicle condition
- ☐ fluid levels (e.g. water, oil, fuel, hydraulic fluid, etc)
- ☐ tyre pressures and condition
- ☐ vehicle lights
- ☐ brake condition (on driving off)

Vehicle abuse Training should include driver familiarisation with **avoidance** common forms of vehicle abuse, hazards arising and ways of avoiding such abuse. Examples include:

- ☐ incorrect or overloading of vehicle
- ☐ pushing with another vehicle or towing vehicles to start engines
- ☐ running over kerbs to take shortcuts
- ☐ unauthorised carrying of hazardous materials.

4.2.4 Driver improvement

The implementation of basic training is unlikely on its own to be entirely adequate. A failure to learn certain points and the resulting lack of knowledge may result in driver errors. Driver improvement techniques, therefore, are intended to identify and correct these problems before they can lead to accidents. The basic elements are:

Identify driver deficiencies	Deficiencies may be identified from job observation, near-accident reports, traffic offences, commentary drives or onboard monitoring devices.
Analyse basic causes	Analysis of driver actions should include personal and job factors, inadequacies of training or non-compliance with procedures.
Select appropriate	Failure to learn or understand elements of a training course may indicate the need for different or special presentation of those elements.
Retraining	The retraining should educate and motivate rather than punish.
Use temporary controls	Where problem areas are identified it may be necessary to implement temporary control measures, such as restrictions on driving or redeployment in non-driving work or closer supervision.
Use incentive schemes	The use of incentive schemes should be considered with great care. Driver incentive schemes linked to performance and non-involvement in preventable accidents (e.g. by introducing

bonus payments linked to agreed target performance figures for a group of drivers) can have marked effects on driver behaviour.

Follow-up and feedback

In order for training to be effective, attention must be given to follow-up and feedback in order to identify and address any training deficiencies. Only by maintaining a flexible, planned approach to training can continuing HSE problems be addressed. New problems can arise for the following reasons:

- ☐ training requirements not understood: either in terms of the requirements of a particular job or the levels of skill in the trainees
- ☐ training requirements compromised/over-ruled: this can happen when it is necessary to hire local staff for political reasons, and can require additional training, greater supervision or changes in job design
- ☐ wrong training given: training results must be assessed before the award of any certificate to individuals in order to ensure that they have acquired a particular skill or understanding
- ☐ training requirement not imposed: without management commitment to a regular and comprehensive programme for both OPU/JV and contractor personnel, training cannot be effective
- ☐ training obstructed: this can occur when organisational changes have an impact on previous training, e.g. if contractor staff take over particular functions or working practices bring in untrained personnel.

4.2.6 Responsibilities of the individual

Personal health

The individual is responsible for informing his health adviser about any change in his medical condition, any medication that may affect his performance (examples include sedatives, anti-depressants, antihistamines, anti-inflammatory drugs, anti-diabetic drugs, muscle relaxants, etc). For further details see Ref. 6. They are also responsible for observing OPU/JV policy on alcohol and drugs. .

Awareness

An essential element in decreasing the frequency and severity of accidents is an awareness of the hazards and risks involved. Awareness can be summarised under a number of

- ☐ Knowledge of the hazards involved
e.g. from other road users/pedestrians/animals,
weather-related conditions, night-driving obstructions

- ☐ driving habits/skills (good and bad) and the potential results of hazardous vehicle manoeuvres
Frequently, attitudes of an individual to driving are not of the same standard as safe work habits in other work activities
- ☐ time management and planned driving
e.g. to avoid fatigue and resulting inattention at the wheel, speeding as a result of starting journey late or insufficient time allocation
- ☐ driver vehicle self-inspection
This is an essential supplement to normal routine workshop inspection and maintenance. It also reinforces the importance of the driver's involvement in ensuring good vehicle condition in overall road safety

Such inspections are listed in Appendix III and are particularly important where vehicles are in multi-driver use. Drivers should be encouraged to report vehicle condition defects so that prompt repair action can be taken.

Performance targets and accountability

Realistic and achievable goals should be set for each individual and reporting group. These goals should include safe-driving programmes as well as specific targets for reduced accident frequency. Driving performance should be included in an individual's annual performance review.

4.3 VEHICLES

4.3.1 Correct selection

Reduction of the exposure to road hazards can be enhanced by using the correct vehicle for the job. Vehicle selection should consider the following factors:

Correct type

- ☐ passenger vehicles will not tolerate repeated cargo loading
- ☐ cargo vehicles are not suitable for transporting personnel
- ☐ off-road vehicles will wear out more rapidly if used at higher roadway speeds
- ☐ highway vehicles will wear out rapidly if used excessively off-road
- ☐ certain hazardous goods will require the use of purpose-built vehicles

Correct capacity

- ☐ insufficient capacity may cause abnormal wear of axles and suspension, of brakes when slowing or stopping and engines when accelerating

	☐ excess capacity may lead to speeding and inadequate contact with road surface
Correct size for facilities	☐ cargo should not have to be transferred or double-handled to load or unload oversized vehicles may damage road or plant facilities when manoeuvring ☐ use of small vehicles for a given duty results in more journey movements at any one time than for larger vehicles
Good manoeuvrability	Any limitations on manoeuvrability should be determined before vehicle selection is made. Failure to do this may result in drivers attempting unnecessary manoeuvres. Note, for example, that reversing accidents are one of the more frequent types of vehicle accident
Visibility	Good visibility to front, side and rear should be considered together with good mirror systems
Good serviceability	Vehicles should be kept in a reliable, safe condition throughout their service life. At selection, this means attention to: ☐ knowledge of the manufacturer's recommendations on maintenance ☐ availability of spares ☐ availability of local maintenance facilities and personnel.

4.3.2 Specification

The main factors affecting HSE that should be considered for purchase specification can be summarised under the following headings:

Work load	Determine the numbers of personnel and/or the nature, unit parameters and weight of freight to be moved, the freight handling and load security requirements. All vehicles selected for OPU/JV use should comply with the national vehicle regulations on road worthiness, licensing, insurance and, where applicable, the carriage of dangerous goods.
Travel distance	Specify distances for normal journeys and include details of and conditions the driving conditions, e.g. journeys over rough roads or where narrow clearances are encountered. Heavier duty vehicles may be safer for longer distances. Vehicle selection will be influenced by use for on-site, normal highway or off-road driving. Light vehicles should operate

only within a specified distance limit. Extreme conditions may necessitate special provisions, e.g. road conditions requiring special tyres (snow, sand) or use of chains, oil-sump protection, large radiators for hot desert conditions, etc.

**Movement
required**

Define the expected driving operations, ie frequencies of starting/stopping, uphill and downhill grades, requirements to negotiate turns. Traffic densities may influence considerations.

Daily use time

Specify the percentage of time the vehicle will be in use. Heavy-duty vehicles or vehicle equipment may be needed if there is frequent engine starting, long periods of idling or in low gears or lengthy daily use.

**Physiological
factors**

Special operating conditions may influence the choice of vehicle specification, e.g. the selection of vehicle air-conditioning for use in high temperature/humidity conditions where its use is an important feature in reducing driver stress, good vehicle heaters in cold conditions, measures to reduce noise and vibration, etc. Ergonomic considerations of seating, cabin dimensions (e.g. reach, head space, etc should be included).

Safety equipment

In addition to seat belts, vehicles should be fitted with the appropriate safety equipment for the intended type of operation, e.g. anti-locking brake system (ABS), air bags for driver and front seat passenger, sump guards. Appendix III includes items that should be considered.

Windscreen type (shatter resistance and post-accident breaking characteristics) should also be included as a factor in the choice of vehicle specification. To ensure driver remains alert on long journeys, consider fitting radio/tape deck to driver instrumentation panel where possible.

Entry/exit provision should be considered to minimise the risk of slipping when entering/leaving the vehicle.

Wherever possible the fitted additional equipment should be installed by the vehicle manufacturer to ensure that the equipment is fit for purpose and that the design safety of the original vehicle is not inadvertently reduced.

**Converted
vehicles**

Modifications to vehicles should only be undertaken such that the overall specification of the vehicle is not adversely affected. Wherever possible such modifications should be endorsed or carried out by the original manufacturer, e.g.

strong points for seat-belt securing in minibuses.

Communication and computers	Fitting of computers onboard, radios or cellular phones may be important, e.g. for the use on journeys remote from base or where regular communication is needed to monitor conditions. Communications are particularly important on vehicles transporting hazardous materials.
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A well-specified vehicle, maintained in good condition can often help to attract and retain a high-calibre driver.

4.3.3 Passengers

Passengers should only be carried in vehicles that were originally designed and constructed for that purpose, or have been converted with consideration being given to passenger safety.

In circumstances where vehicles are intended for the transportation of both personnel and materials, specific care should be taken to ensure that passenger safety is not compromised by freight-related hazards.

Body shells Light commercial vehicles that have been equipped to carry passengers should have body shells of sufficient strength to protect the passengers, E.g. metal sheeting not canvas or glass fibre-reinforced plastic (GRP). However, purpose-built passenger vehicles should be used to carry passengers wherever possible.

Barriers Adequate barriers should be provided to segregate freight and passenger compartments.

Seating All seating should be securely fixed and wherever possible have head restraints.

Roll-cage protection There should be adequate roll-cage protection where appropriate. The design of roll cages should, as a minimum, conform with Federation Internationale Automobile (FIA) standards for cross-country rally vehicles (see Ref. 13).

Fitting of roll cages should be considered for the following operations:

- ☐ off-road driving
- ☐ the driving of open-top vehicles
- ☐ the driving of vehicles with roofs constructed of canvas or similar material.

Access Safe means of transferring in and out of the vehicle.

Passenger limit	This should be clearly indicated on the vehicle and the number never exceeded.
Seated	Passengers should be seated whilst travelling and passengers use seat belts when provided.
Seat belts	Mandatory use of seat belts by all drivers and passengers should always be the target. The correct type of seat belt should be worn (i.e. pretensioned inertia belts preferred). Single lap strap seat belts should only be used if the two-strap belt cannot be fitted. For further information on seat belts see Ref. 14.
Accessories	Safety accessories should also be considered, e.g. sun visor for driver and front seat passenger.
Driver observation	The driver should have the means to observe all passengers being carried in the vehicle.

4.3.4 Freight

Principal requirements	The transport of freight should only be undertaken after considering the following points: ☐ purpose design : freight should only be carried on vehicles that are properly designed for the purpose ☐ segregation : freight should be segregated from the vehicle occupants ☐ overloading : vehicles should not be overloaded ☐ positioning : attention should be given to positioning of heavy or dense loads so as not to overload or damage any part of the vehicle or to affect its stability during journeys ☐ sequencing : loads should be placed onboard in a planned sequence that avoids/minimises double handling ☐ securing : freight should be securely fixed before movement and proper use made of pallets and dunnage where appropriate. All freight vehicles should be equipped with securing equipment (including lashings, chains, binders, nets as necessary) and there should be clear instructions as to its use (see Ref. 15)
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Load securing arrangements should, as a minimum, have an aggregate strength of:

- the load weight applied in a forward direction
- half the load weight applied in a reverse direction
- half the load weight applied transversely

- one-fifth of the load weight applied vertically

Load restraint equipment should be registered and subjected to a similar inspection and test regime as for wire rope slings.

- ☐ **special provisions** : special provisions should be made for the transport of hazardous goods
- ☐ **protection and security** : the vehicle should have adequate locking and security, particularly for the transportation of hazardous materials

Hazardous marking : the vehicle or the goods should be clearly marked with materials information regarding the hazardous nature of the materials and (see PTS 60.1502, Chemicals Management Program) precautions and remedial measures to be taken in the event of an accident; emergency telephone numbers should be clearly marked

- ☐ **driver awareness** : drivers should be briefed on the special provisions applicable to the load and their understanding of those provisions checked before movement. Consideration should be given to the need for the driver to carry transport cards containing action guidance in emergency situations
- ☐ **driver training** : drivers should be fully trained to deal with any emergencies that might arise due to the nature of the hazardous goods being carried
- ☐ **emergency response planning** : an emergency response plan should be in place to deal with any incident involving the materials being transported; for further information on emergency management plan see PTS 60.2306
- ☐ **segregation** : potentially reactive chemicals or materials should be segregated so that they cannot be brought into contact with each other by accident
- ☐ **local regulations/restrictions** : OPU/JV should be aware of government or other local regulations and restrictions including such aspects as route restrictions, requirements for police escort, action in event of obstructions, etc. This may be equally applicable to wide/high loads
- ☐ **international journeys** : where journeys by road are part of an international journey by road or other transport modes (rail, sea, air) the requirements for substance classification packaging and labelling may need to comply with the requirements of internationally based recommendations / regulations (e.g. ADR, CIM, IMDG, ICAO, UN).

4.3.5 **Maintenance**

Inspection and maintenance may be required for a number of purposes, e.g. compliance with specifications or national legislation, determining classifications, determining maintenance requirements or roadworthiness. The following points apply to the latter two requirements:

Driver inspection	Driver inspection of his vehicle should be an integral part of driving duties. The period between inspections may vary from daily to weekly depending on the extent to which the vehicle is used, characteristics of use and the number of different people driving the vehicle. Such inspections should be structured around a checklist of regular tasks listed in Appendix III
Scheduled	Each vehicle should be inspected periodically by a competent mechanic.
Maintenance	Maintenance intervals will normally be set by the vehicle manufacturers but may be reduced by the conditions of use. Maintenance routines require clear guidance at the outset and should include the replacement of spare parts before these items fail and trigger breakdowns or accidents
Prompt repair	Damage and defects on vehicles should be repaired promptly with due consideration being given to priority tasks. Vehicle use may need to be restricted or even suspended and replacement vehicles used
Special inspections	Vehicles that have been subject to heavy use, overloaded or been involved in an accident may need to be subject to special inspection. Stress can weaken parts so that they wear more rapidly than normal and this may result in premature failure. Electrical inspections should also be undertaken, to ensure all lights, indicators and other electrical devices are safe and in correct working order. Vehicles that have been involved in accidents should also undergo special inspection, to establish the cause of the accident or to assess resistance to impact Vehicles with catalytic converters should be inspected in accordance with the manufacturer's instructions.
Supervisor spot checks	Such checks should be carried out to ensure that vehicles are being serviced correctly and that preventative maintenance and repairs are in accordance with the standards.

4.4 **OPERATIONS MANAGEMENT**

A checklist for land transport is provided in Appendix IV.

4.4.1 **Need and approval**

Establishment of the necessity for a journey should be a fundamental prerequisite. A series of steps need to be examined before the journey takes place:

- ☐ definition of requirements
- ☐ consideration of alternatives
- ☐ justification
- ☐ minimisation of risk exposure
- ☐ authorisation.

The first four of these steps should be determined by reference to the HEMP process. This should cover a systematic review of:

- ☐ the hazards involved
- ☐ the assessment and reduction of risk exposure, as far as is practicable. This will require a knowledge of local circumstances, such as crime-prone areas
- ☐ the identification of the controls needed to minimise the risk
e.g. rules on the use of designated roads only, allocating vehicle types suited specifically to the task.
- ☐ the necessary contingency plans.

A formal authorisation procedure may not always be required but where one applies it must be rigorously enforced.

4.4.2 **Journey routing and scheduling**

Background condition

Routing and scheduling should be made with due reference to knowledge of the following:

- ☐ local transport culture and appreciation of local conditions
- ☐ road surface conditions and known hazardous areas
- ☐ weather.

Routing

Routes should always be surveyed, including knowing the fixed characteristics of vehicles, size/weight and axle loadings, to confirm such details as:

- ☐ traffic densities en route
- ☐ clearances from such features as bridges, buildings, power and telephone lines, narrow roadways/entrances and exits
- ☐ load ratings of bridges, culverts, etc
- ☐ contacts to be established with local authorities (in the

- ☐ case of abnormal or heavy loads)
- ☐ pedestrian densities, avoidance of residential areas
- ☐ proper consideration of fall-back scenarios
- ☐ provision for off-road overnight parking
- ☐ crime-prone routes and times.

Scheduling This should pay particular attention to:

- ☐ use of realistic schedules and provision for driver rest periods
- ☐ avoidance of night driving and evaluating alternative schedules
- ☐ impact of potential traffic congestion on/by the transport in question
- ☐ travelling in convoy and considerations of vehicle separation
- ☐ considerations of the operation of any shift systems
- ☐ government or local authority regulations for restricted driving hours and routes.

4.4.3 **Journey management**

Throughout the journey, a logging of actions should be followed. Control measures should be in place to ensure entries in the log book are correct (e.g. endorsement of log by despatcher and receiver at both ends or the use of electronic recorders and data loggers).

The following details should be reported sector by sector in the log book:

- ☐ driver
- ☐ point of departure and destination
- ☐ route
- ☐ passengers
- ☐ start/finish times
- ☐ start and finish kilometre readings
- ☐ material carried
- ☐ weight of load
- ☐ fuel provided
- ☐ hazards/problems encountered during the journey.

4.4.4 **Roles and responsibilities**

Management

The following are the key points for management:

- ☐ understanding HSE hazards and risks
- ☐ defining job descriptions, setting competence requirements and selecting key personnel

- ☐ defining vehicle specifications
- ☐ defining organisation requirements
- ☐ setting authorisation levels
- ☐ defining, implementing and enforcing training
- ☐ defining performance indicators
- ☐ setting performance standards (short, medium and long term)
- ☐ encouraging and stimulating a two-way dialogue
- ☐ developing and implementing HSE programmes
- ☐ communicating the HSE message to the organisation
- ☐ being involved in the organisation
- ☐ visibly demonstrating commitment.

Supervisors

The following are the key points for supervisors:

- ☐ fully understanding the HSE programmes and targets
- ☐ setting out expectations
- ☐ ensuring drivers' needs are provided
- ☐ checking the availability of vehicles
- ☐ checking the authorisation and release of vehicle keys
- ☐ providing day-to-day reinforcement of good driving behaviour
- ☐ monitoring the performance of drivers
- ☐ enforcing driver compliance with limits on driving, breaks between shifts/overtime/night work, not driving when fatigued
- ☐ monitoring journey movements daily
- ☐ organising and attending toolbox and safety meetings
- Ensure that minutes of all safety meetings are recorded and the action items closed out.
- ☐ providing the first line of feedback
- ☐ providing recognition of the achievement of good driving standards
- ☐ monitoring health of staff.

Drivers

The following are the key points for drivers:

- ☐ being aware of the hazards
- ☐ not driving when fatigued
- ☐ being aware of other road users/pedestrians
- ☐ taking responsibility for their vehicles and passengers/loads carried
- ☐ being aware of management and supervisors' expectations
- ☐ attending toolbox and safety meetings
- ☐ providing feedback to supervisors.

Passengers

The following are key points for passengers:

- ☐ enhancing the awareness of driving hazards

- ☐ engendering increased accountability for driving performance
- ☐ assisting the driver in safe transportation (e.g. backing the vehicle safely).

4.4.4 **Contracting**

PTS 60.0305 Contractor HSE **Management** provides guidelines on this subject including responsibilities of the Contract Holder, contracting strategy, definition of an HSE Plan, prequalification of contractors, tender preparation and evaluation, job execution and audit. Refs. 16 and 17 provide guidelines on road transport contractor prequalification.

OPU/JV's standards for vehicles, driver training and road safety should be included in all contracts which have an element of vehicle support.

4.4.5 **Procedures**

Clear and concise procedures should be in place and used for the following:

Driving duties and hours	A summary of the basic requirements is given in Appendix V Consideration should be given to the use of a permit-to-drive system, rotating schedules and compulsory leave periods. It is important to recognise actual driving time and on-duty time. Drivers may not be driving for long periods, but the length of their duty time may affect their driving abilities.
Seat belts	See Ref. 14.
Speed limits	Aspects to be covered include: ☐ setting OPU/JV limits bearing in mind traffic flows ☐ encouraging drivers to respect speed limits ☐ defining speed limiter usage.
Vehicle usage	Consideration should be given to assigning vehicles to individuals to encourage responsibility. Specific policies should be developed for key aspects of defensive driving and driving techniques, e.g. use of dipped headlights for daytime driving.
Vehicle occupant safety	Including the use of seat belts, head rests and sun visors and inspection of vehicles for access, design suitability and safe segregation of personnel and loads.
Freight handling	Including hazardous materials, insecure loads and spot checks of load and load securing security securing during the journey.

Journey briefings

The principal aims of journey briefings should be to think ahead and think about others. Aspects to be covered include:

- ☐ hazardous features of the journey
- ☐ weather forecasts
- ☐ pre-driving checks
- ☐ special vehicle equipment
- ☐ emergency response facilities
- ☐ position reporting during journey.

Pre-journey inspections of vehicle and surrounding area

Pre-journey inspection checklist guidelines are given in Appendix III.

Vehicle defect and unsafe load reporting

Including encouraging such reporting, inspection and repair follow-up.

Scheduled and unscheduled breaks

As well as defining breaks that drivers are required to take, procedures should also highlight the potential hazards that can arise from unscheduled roadside stops where personnel and vehicles may be vulnerable to the actions of other road users.

Further information can be found in Appendix V.

4.4.7 Performance measurement

Performance measurement can be determined from a number of sources:

Vehicle usage and driver work period statistics - These can be important for both personnel supervision and the planning of vehicle requirements.

Vehicle inspection and condition reports - By recording inspection results and condition/repairs throughout a vehicle's life, assurance of fit of purpose can be maintained together with advanced warning of potential problems.

Specific incentive and recognition programmes - The effectiveness of programmes that are in place should be monitored in order to provide adequate recognition to drivers who meet targets and/or to address deficiencies through supervision or training changes.

Analysis of data from black box (where fitted) - This is important in the identification of avoidable risks, e.g. associated with:

- ☐ time management and planned versus actual driving (e.g. frequent long trips)
- ☐ driving at times of enhanced risk (e.g. during hours of poor light)
- ☐ the circumstances surrounding accidents
- ☐ driving signatures.

Near-miss reporting and traffic citations - These are important sources of data as to how, why and where incidents occur.

Accident reports and statistics

Accidents should be reported, investigated and reviewed promptly to identify the necessary learning points. Both reports and statistics can offer useful information about HSE performance including the indication of trends and comparison with other OPU/JVs/contractors. To be most effective, accident reports should uncover the underlying causes of the accident. Vehicle accident review panels (VARP) can be useful in applying corrective actions uniformly across business units.

Data from such sources of measurement can be reviewed to determine feedback to such areas as:

- ☐ modification of driving policies
- ☐ time management analysis
- ☐ improvement of vehicle specification and maintenance, training effectiveness, vehicle authorisation and allocation policies
- ☐ discussion of accidents with drivers.

4.4.8 Emergency services

Emergency services should be in place and tested before any operations commence. The scope of the services available should be known in detail, particularly for off-site facilities, and liaison with these parties should be well established. Emergency response planning must also be defined for the circumstances requiring services beyond the scope of the on-site or local facilities. Communications are a vital element in emergency response planning. Guidelines on emergency response planning are given in PTS 60.2306 and IAGC manual (Ref. 18).

5 MARINE TRANSPORT

5.1 INTRODUCTION

5.1.1 Key marine transport issues

Controls for managing HSE in marine transport must consider many different elements including:

- ☐ experience levels of vessel owners and their crews
- ☐ use of multinational crews with varying degrees of competence and language skills
- ☐ vessels registered under different flag states with varying degrees of standards for vessels and equipment
- ☐ traffic densities
- ☐ types of offshore structures serviced and their location
- ☐ vessel availability
- ☐ uncontrollable factors such as weather
- ☐ vessel technical specification (e.g. manoeuvrability, station-keeping ability) modifications, theoretical specification vs actual capability
- ☐ personnel movements and cargo handling on open decks at sea
- ☐ crew work/leave cycles, duty hours, work exposure/challenges, continuity of employment
- ☐ alcohol and drugs abuse.

5.1.2 Targets for improving HSE performance

Specific issues to be considered in establishing HSE targets include:

- ☐ appraisal and justification of journey needs
- ☐ journey management and hazard identification
- ☐ establishment and enforcement of standards of competence
- ☐ establishment and enforcement of training needs and control of training programmes
- ☐ use of vessels of proven standards appropriate for the task
- ☐ determination and enforcement of inspection and maintenance schedules
- ☐ preplanning of onboard operations
- ☐ knowledge and use of safe working practices and provision of safe working conditions
- ☐ adequate manning for all operations
- ☐ communications between OPU/JV, owner, charterer and master.

5.2 MARINE PERSONNEL

5.2.1 Competence and selection

OPU/JVs should devise and maintain a procedure for the determination of competence and selection requirements for marine personnel or a procedure to

monitor this process where it is the responsibility of the Contract Holder. It should include evaluations of:

General considerations

- ☐ health and medical fitness (particularly mobility, sight and hearing, immunisation status)
- ☐ mental ability (including: numeric and ability to understand key instructions and for senior officers and masters, situation awareness, recognising abnormal patterns and symptoms; for crew ability to comprehend and act on instructions)
- ☐ psychological characteristics (for masters and others in senior positions: self-confidence to act, stability, decision-making under stress, leadership skills at and below master level, reasoning skills, ability to give clear instructions)
- ☐ language ability (in English and language of country of operations English language fluency is a definite requirement for senior officers)
- ☐ age restrictions (minimum and maximum)
- ☐ level and validity of the individual training
- ☐ previous experience and career history (including lengths of periods of employment)
- ☐ HSE attitude and awareness

Vessel-related

- ☐ crew categories
- ☐ job analysis, task descriptions and definition of competencies for each crew category should be stated (Ref. 19)

Cargo-related

- ☐ awareness of the hazards and knowledge of handling of hazardous materials (requirements increase with increasing seniority)
- ☐ handling of cargo on deck
- ☐ knowledge of the arrangement and stowage of cargo

Personal survival

swimming proficiency

- ☐ first-aid skills
- ☐ life jackets/vests
- ☐ emergency preparedness
- ☐ general survival principles
- ☐ survival craft
- ☐ firefighting
- ☐ other specialist skills (e.g. H2S awareness / precautions).

5.2.2 Certification

Certification details for individual crew members should include the following:

- Personal details**
- ☐ name
 - ☐ age
 - ☐ medical fitness status
 - ☐ language proficiency
 - ☐ next of kin
- Employment details**
- ☐ crew category
 - ☐ operational base

Certificate validity and coverage

- ☐ date of issue and expiry
- ☐ ship size and categories
- ☐ endorsements for special hazards qualifications (e.g. firefighting, oil spill response)
- ☐ swimming and survival proficiency.

Checking of certification should be from original documents or an officially verified copy. Consideration should be given to maintaining a computerised database for the above information. Individual's certification should be reviewed in conjunction with their depth of industry experience.

5.2.2 Induction

Areas that should be considered in determining induction programmes should include:

For marine personnel on OPU/JV or contracted vessels

- on-board familiarisation with lifesaving appliances vessel's machinery, equipment and systems (e.g. for rigs and barges known operating limits for cranes such as position, radius, SWL reception rates for dry and bulk transfers)
- OPU/JV marine organisation and interfaces between OPU/JV and contractor and local marine code of practice
- contractor to contractor interfaces (e.g. rig to supply vessel)
- controlled marine and shore areas (OPU/JV and national/local authority)
- communications with vessel owner
- OPU/JV control centre and services available
- emergency services and SARSAR procedures
- access at harbours / jetties
- known hazardous marine or loading/off-loading locations
- local marine conditions (e.g. currents, tides, etc)
- ☐ sailing and shore restrictions
- ☐ precautions against endemic diseases (e.g. malaria)