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**Carriage of dangerous goods -
Emergency planning guidance for rail marshalling yards**

International Railway Solution to be classified in volumes of UIC

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All members of the International Union of Railways

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Update of the terms and definitions and of the references to the tools made available by various European and international organisations. Editorial changes were made in order to clarify the text. These will be different depending on the language version of IRS 20201.

January 2019

First issue

This IRS contains most of the text of UIC Leaflet 201, 2nd edition, September 2012. The bibliography was updated in 2018 to take account of the development of European regulations and technical documentation.

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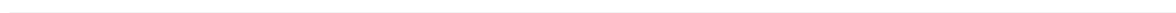
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IRS 20201



The International Railway Solution

The International Railway Solutions (IRS) are structured in a General Part and in some eventual Application Parts.

The General Part is valid worldwide, while the Application Parts are valid for a specific railway application, based on a geographical or on a service implementation.

The eventual Application Parts may thus be added according to the current needs of the Railway Community.

Structure of the International Railway Solution:

IRS 20201: Carriage of dangerous goods - Emergency planning guidance for rail marshalling yards

<h2>General Part</h2>

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Foreword

The original version of this guide was published as *UIC Leaflet 201*. Its contents were revised in 2012 and again in 2018, primarily to adapt the text to changes in European legislation relating to railway operations and environmental protection. As from 2019, *UIC Leaflet 201* is replaced with this new document, *IRS 20201* "Carriage of dangerous goods - Emergency planning guidance for rail marshalling yards". *IRS 20201* takes account of the amendments adopted in 2018 within the framework of the RID intergovernmental committee of experts.

Record of updates *UIC Leaflet 201*:

- 1st edition, March 2003: First issue
- 2nd edition, September 2012: Update of the Leaflet to take into account significant changes in rail legislation in the European Union to ensure coherence between the European and international legislation.

Summary

RID 1.11, introduced in 2003, stipulates that internal emergency planning be put in place for marshalling yards. The RID makes reference to this guide, the application of which is deemed to satisfy the regulatory requirements to which such plans should respond. The design and contents of this "best practice" guide are drawn from international experience in other areas of activity such as the chemical industry or the maritime port sector. The guide proposes a harmonised, consistent approach that takes account of railway operating requirements in general, with marshalling yards considered an integral part of rail networks. Within its field of application, this guide also aims to respond to the requirements of Article 9 (j) of Directive (EU) 2016/798, concerning the measures to be taken to implement action, warning, and information plans in the event of an emergency, adopted in agreement with the competent public authorities.



Bibliography

The following referenced documents are indispensable for the application of this document.

For dated references, only the edition cited applies.

For undated references, the latest edition of the referenced document (including any amendments) applies.

1. European legislation and documentation

European Union (EU)

Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC, OJ L 197, 24.7.2012

Directive (EU) 2016/797 of the European Parliament and of the Council of 11 May 2016 on the interoperability of the rail system within the European Union, OJ L 138, 26.5.2016

Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety, OJ L 138, 26.5.2016

Commission Directive (EU) 2016/2309 of 16 December 2016 adapting for the fourth time the Annexes to Directive 2008/68/EC of the European Parliament and of the Council on the inland transport of dangerous goods to scientific and technical progress, OJ L 345, 20.12.2016

Commission Implementing Regulation (EU) No 402/2013 of 30 April 2013 on the common safety method for risk evaluation and assessment and repealing Regulation (EC) No 352/2009, OJ L 121, 3.5.2013

Commission Regulation (EU) 2015/995 of 8 June 2015 amending Decision 2012/757/EU concerning the technical specification for interoperability relating to the 'operation and traffic management' subsystem of the rail system in the European Union, OJ L 165, 30.6.2015

Commission Delegated Regulation (EU) 2018/762 of 8 March 2018 establishing common safety methods on safety management system requirements pursuant to Directive (EU) 2016/798 of the European Parliament and of the Council and repealing Commission Regulations (EU) No 1158/2010 and (EU) No 1169/2010, OJ L 129/26, 25.5.2018

European Union Agency for Railways (ERA)

[Common Safety Method for Risk Evaluation and Assessment | European Union Agency for Railways \(europa.eu\)](#)

Guides of the [Common Safety Method for Risk Evaluation and Assessment](#)

Guide on Inland TDG Risk Management Framework

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2. International regulation and documentation

Organisation for Economic Co-operation and Development (OECD):

[Guiding Principles for Chemical Accident Prevention, Preparedness and Response - OECD](#). Third Edition Series on Chemical Accidents No. 35. 3rd edition, 2023

Intergovernmental Organisation for International Carriage by Rail (OTIF)

Convention concerning International Carriage by Rail - RID-Appendix C - Regulations concerning the International Carriage of Dangerous Goods by Rail

United Nations (UNEP - APELL Programme)

Awareness and preparedness for emergencies at local level (APELL) | UNEP - UN Environment Programme.

Terms and definitions

The terms and definitions used in this document can be found in general railway and RID regulations. Some of the terms used in the guide are not taken from the regulations. They were retained in the original version of the guide for educational purposes. The following definitions cover some of the key concepts in this field.

Accident (Directive 2016/798EU)

Accident means an unwanted or unintended sudden event or a specific chain of such events which have harmful consequences; accidents are divided into the following categories: collisions, derailments, level-crossing accidents, accidents to persons caused by rolling stock in motion, fires and others.

Serious accident (Directive 2016/798/EU)

Serious accident means any train collision or derailment of trains, resulting in the death of at least one person or serious injuries to five or more persons or extensive damage to rolling stock, the infrastructure or the environment, and any other similar accident with an obvious impact on railway safety regulation or the management of safety; "extensive damage" means damage that can immediately be assessed by the investigating body to cost at least EUR 2 million in total.

Consignor (RID 1.2)

means the enterprise which consigns dangerous goods on its own behalf or for a third party. If the transport is carried out under a contract of carriage, consignor means the consignor according to the contract for carriage.

Dangerous goods (RID 1.2)

The substances and articles the carriage of which is prohibited by RID or authorised only under the conditions prescribed therein.

Emergency

Current unforeseen or unplanned event which has life threatening or extreme loss implications and requires immediate action.

Emergency services

External organisations such as the police, fire or ambulance or civil safety services.

Environment

See the detailed description in [Appendix G - page 55](#).

Hazard (Regulation 2009/352/EC)

"Hazard" means a condition that could lead to an accident. In the specific field of the transport of dangerous goods and within the meaning of RID, the hazard is linked to the nature of the goods transported and therefore to the seriousness of an event likely to be triggered by an accident involving such goods.

Incident (Directive 2016/798/EU)

Any occurrence, other than an accident or serious accident, affecting the safety of railway operations.

In the context of this guide, the incident concerns or involves dangerous goods.

Infrastructure manager (Directive 2012/34/EU)

Any body or firm responsible in particular for establishing, managing and maintaining railway infrastructure, including traffic management and control-command and signalling; the functions of the infrastructure manager on a network or part of a network may be allocated to different bodies or firms.

Loader (RID 1.2)

means any enterprise which:

- (a) Loads packaged dangerous goods, small containers or portable tanks into or onto a wagon or a container; or
- (b) Loads a container, bulk-container, MEGC, tank-container, portable tank or road vehicle onto a wagon;

Marshalling yards

As places of transit and links in the transport chain, railway marshalling yards are a special sort of station. They have a number of sets of sidings for receiving and preparing freight trains and for sorting the wagons according to destination, with the aim of forming new trains and dispatching these to their destination.

Off-site plan

The emergency plan(s) prepared by those responsible for area/activities adjacent to, or that could be affected by an accident in a marshalling yard.

On-site plan

The emergency plan for the marshalling yard.

Railway undertaking (Directive 2016/798/EU)

"Railway undertaking" means railway undertaking as defined in Article 3, point 1) of Directive 2012/34/EU, and any other public or private undertaking, the activity of which is to provide transport of goods and/or passengers by rail on the basis that the undertaking must ensure traction; this also includes undertakings which provide traction only.

Railway vehicle (RID 1.2)

A vehicle suitable to circulate on its own wheels on railway lines with or without traction.

Risk (Regulation 2009/352/EC)

The rate of occurrence of accidents and incidents resulting in harm (caused by a hazard) and the degree of severity of that harm.

Serious accident (Directive 2016/798/EU)

Serious accident means any train collision or derailment of trains, resulting in the death of at least one person or serious injuries to five or more persons or extensive damage to rolling stock, the infrastructure or the environment, and any other similar accident with an obvious impact on railway safety regulation or the management of safety; "extensive damage" means damage that can immediately be assessed by the investigating body to cost at least EUR 2 million in total.

Yard operator

A railway undertaking or railway infrastructure manager operating a marshalling yard.

Wagon (RID 1.2)

A railway vehicle, not provided with means of traction, which is intended to carry goods.

List of abbreviations

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
APELL	Awareness and Planning for Emergencies at Local Level
CEFIC	European Chemical Industry Council
CER	Community of European Railway and Infrastructure Companies
COTIF	Convention concerning International Carriage by Rail
ECC	Emergency Control Centre
ERA	European Railway Agency
FMEA	Failure Modes and Effects Analysis
HAZOP	Hazard and Operability Studies
IBC	Intermediate Bulk Containers
ICHCA	International Cargo Handling Coordination Association
IMO	International Maritime Organisation
IRS	International Railway Solution
OECD	Organisation for Economic Cooperation & Development
QRA	Quantified Risk Assessment
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail (Appendix C to the COTIF)
UIC	International Union of Railways
UN	United Nations
UNEP	United Nations Environment Programme

Carriage of dangerous goods - Emergency planning guidance for rail marshalling yards

General Part

1 - Requirements and guidance

1.1 - Purpose

This guidance document can be used together with other guidance and national requirements, to establish a realistic and efficient common framework by all railway undertakings, railway infrastructure managers (see [Terms and definitions - page 5](#)) and yard operators (see [Terms and definitions](#)) for developing and implementing policies and practices for emergency planning for marshalling yards handling dangerous goods (see [Terms and definitions](#)). It is intended to complement existing legislative regulations and the detailed emergency planning arrangements of each railway undertaking, infrastructure manager or yard operator.

Although this document has a railway audience, for clarity of the overall requirement it does identify considerations and actions that are the responsibility of other external organisations such as the emergency services (see [Terms and definitions](#)) and local authorities. The precise allocations of responsibilities may vary between different countries.

The guide does not treat specific provisions concerning the safety which regulation RID provides in its chapter 1.10.

1.2 - Scope

This guidance is intended primarily for the implementation of emergency plans in marshalling yards.

It can also be applied to any aspect of rail operation e.g. for locations handling transhipments such as combined transport.

1.3 - European Union Directives

Within the EU, Directives *2016/798/EU* and *2016/797/EU* (see [Normative references - page 3](#)) define the general regulatory framework for the safety and interoperability of the Community rail system. In particular, this general framework requires railway undertakings to introduce safety management systems covering the preparation of emergency planning for the management of accident situations. Accidents involving the carriage of dangerous goods in marshalling yards must be considered within this general framework. The European Union Agency for Railways has published application guidelines for safety management systems, which also contain guidance for the preparation of emergency planning. These guides are available in various languages from the Agency's website.

www.era.europa.eu/Document-Register/Pages/application-guide-for-SMS.aspx

Additionally, Directive *2016/2309/UE* (see [Normative references](#)) also defines requirements specific to the inland carriage of dangerous goods, for various land transport modes. The directive *2008/68/CE* and its *Annex II* (see [Normative references](#)) corresponding to the RID (see [List of abbreviations - page 8](#)) (Appendix C to the COTIF - see [Normative references](#)), also applies to all rail transport within the European Union; in particular, point 1.11 clarifies the specific provisions relating to dangerous goods as regards the drawing-up of emergency planning for marshalling yards. This IRS, which

provides more precise information on dangerous goods and marshalling yards, thus complements the aforementioned general guidelines.

1.4 - Railways

1.4.1 - Organisation

This guidance recognises that railways in particular outside EU, are subject to different legal structures, organisations and cultures. For example a railway may be a public authority (see [Terms and definitions - page 5](#)), a private entity or some combination of the two. It may be managed as an integrated activity or divided into activities such as infrastructure provision, infrastructure management, rolling-stock maintenance and train operation.

1.4.2 - Carriage of dangerous goods

The rail carriage of dangerous goods takes place within a total rail operation subject to comprehensive safety management systems. These will set out the policy and principles for accident prevention, preparedness and response should accidents occur, review, feedback and safety improvement through system change. More specific safety management systems will address marshalling yard operation and the implication of dangerous goods that can be present. Senior management commitment is an essential input to the management systems for achieving high standards of control and safety in marshalling yards. See also [Appendix F - page 54](#).

In European rail transport, Directive 2008/68/EC on the Inland transport of dangerous goods renders application of RID obligatory in national and international transport. RID, in effect since 1 January 2004 states, that internal emergency plans shall be set up for the movement of dangerous goods in marshalling yards. The emergency plans shall ensure that in the case of accidents or incidents in marshalling yards, all the parties cooperate in a coordinated manner and that the consequences of an accident or incident on human life or on the environment (see [Terms and definitions](#)) are minimised to the greatest possible extent. This requirement shall be considered to have been fulfilled if the guidance in this IRS is applied.

This approach includes guidelines for common criteria for the various aspects of rail operation in the transport of dangerous goods, in particular in terms of expertises and skills. This can cover aspects such as identification of those dangerous goods, operational procedures, information sources, documentation, notification of movement, competency of personnel and reporting of incidents.

Railway undertakings and railway infrastructure managers must have sufficient appropriate expertise and competency in their area of responsibility relating to the acceptance and safe carriage of dangerous goods. These are aspects such as securing loads and labelling, the properties of dangerous goods, train operation and emergency response arrangements.

All parties in the transport chain should ensure the availability of easily accessible information and tracking systems, such that each dangerous goods consignment can be easily identified and located, and its risks (see [Terms and definitions - page 5](#)) known to enable the application of appropriate controls. These tracking systems may sensibly be a shared arrangement with rail and other organisations each providing some aspect of the necessary system and data.

The provision of dangerous goods safety advisers, in accordance with RID Section 1.8.3 provides an additional risk prevention safeguard.

1.4.3 - Economic implications

Rail operations represent an important economic asset. Any actions which reduce the competitive position of the rail mode can have considerable implications not only for the railway undertaking or infrastructure manager but also for the wider economic interest of the region and country where an accident occurs. There may also be implications for other countries. The circumstances of an accident may be such that it affects the ability of an organisation to continue in business either in part or totally.

Safety and environmental protection is a basic requirement for the management of the railways. Economic advantage must not be achieved at the cost of safety or in terms of poor preparation for accidents that may occur.

1.4.4 - Emergency plans

The measures identified in this guidance are those considered most effective and already largely implemented in European railways, e.g. safety management systems. In addition recommendations contained in documents listed in the [Normative references - page 3](#) have been considered.

It recognises the need for rail operators involved to work with each other and with the other organisations with whom they interface such as emergency services, public authorities and industry.

In addition the UNEP programme "Awareness and Planning for Emergencies at Local Level (APELL)" (see [Normative references](#) and [Terms and definitions - page 5](#)), also provides important guidance relative to the preparation of response plans for dealing with accidents involving dangerous goods. It stresses that appropriate preparedness should lead to a better understanding of the hazards involved and thus to preventative actions.

Assistance for improving the response to emergencies involving dangerous goods should, when required, be provided both nationally and internationally, recognising that for maximum effectiveness such assistance should include a long-term commitment.

1.5 - Wider responsibilities and involvement

This guidance focuses on emergency planning for marshalling yards. However, the contribution to safe operation by all organisations involved in the transport chain is important. Essential pre-requisites for the safe transport of dangerous goods are the proper identification of the dangers and hazards, as well as correct filling, proper containment, packaging, packing, segregation, and separation, securing, marking, labelling, placarding and documentation, in accordance with international and national regulations. These operations generally take place outside the control of railway undertakings, railway infrastructure managers and yard operators. For a safe, effective response to incidents and accidents and also to ensure environmental protection it is essential that every care be taken by those responsible for such actions and that arrangements exist for all relevant information to be passed to those involved in the transport chain of which rail forms one link.

Railway undertakings, railway infrastructure managers and yard operators should work together when drawing up emergency plans, particularly in order to factor in specific local circumstances. Cooperation and mutual assistance agreements can also reinforce the arrangement. Relationships with customers and industry can, if necessary, be organised to obtain specialist dangerous goods advice. The emergency services should also be involved in this cooperation.

1.6 - Background

[Appendix A - page 42](#) details the background to the development of this emergency planning guidance.

2 - General considerations

This point identifies the various considerations for effective emergency planning and relates these to marshalling yards involved with the carriage of dangerous goods. More specific considerations follow in [point 3 - page 21](#).

2.1 - Why?

2.1.1 - In all cases where an accident could occur which could result in serious harm to people or the environment, proper emergency planning will assist in minimising the consequences. Good planning will also optimise the use of resources.

2.1.2 - The emergency plan should principally address the response during the emergency phase, the first few hours after the accident occurs. This is the phase of an accident response, particularly the first hour when key decisions which will greatly affect the success of any mitigation measures, must be made quickly under considerable pressure. Therefore, a detailed understanding of the likely sequence of events and appropriate countermeasures is of great benefit for all those who, it is foreseeable, may have a role to play.

2.1.3 - In the event of an inquiry following a major accident, the emergency plan will be useful to demonstrate that the parties concerned had done all that was reasonable for them to do to prepare for such an event.

2.1.4 - Emergency planning is part of an overall strategy for preventing and minimising the effects to people and the environment of accidents in marshalling yards. There are three basic parts of the strategy:

- **Prevention and control:** Application of appropriate controls based on an identification of the hazards and an evaluation of the risks and possible consequences so as to minimise the likelihood of an accident ([see point 2.6.1 - page 19](#)).
- **Identification and location:** Knowledge of dangerous goods in marshalling yards.
- **Mitigation:** Even with the best controls, accidents will never be totally eliminated: so the effects of any that do occur should be minimised. Emergency planning is one of the principal steps to achieving this.

2.2 - Who?

2.2.1 - Marshalling yard emergency plans (on-site plans - see [Terms and definitions - page 5](#)) are the responsibility of the yard operator. Off-site emergency plans ([see Terms and definitions](#)) are the responsibility of the competent authority or organisation designated in that country. It is their duty to ensure that the plans are prepared and are adequate for the purposes. In both cases the exchange of information between the planner and all the other organisations with an interest is essential to the planning process. This calls for extensive consultation.

2.2.2 - Many organisations are likely to have a role in the emergency response or could be affected (e.g. railway undertakings or occupiers of adjacent premises) and should be involved in the preparation of the emergency plan. On occasions their interests will overlap or even conflict. Cooperation is essential and compromise may sometimes be necessary. Competent representatives of the principal organisations which could have a role to play in an emergency should meet as a strategic coordinating group to develop the plan and the testing regime.

2.2.3 - Those responsible for preparing marshalling-yard emergency plans should consult the following bodies:

- emergency services,
- local authorities,
- other responsible public and other authorities.

The exact consultation requirements depend on each country's structure for emergency planning and accident response. [Appendix C - page 48](#) identifies example consultees.

2.2.4 - Railway undertakings, railway infrastructure managers and yard operators should establish arrangements to ensure safe railway operation at the interfaces between them and facility ([see Terms and definitions](#)) operators. The interface arrangements should be agreed with all concerned. Arrangements should also be made to ensure safe and effective emergency management. The arrangements should be regularly checked for application and effectiveness.

2.3 - How?

2.3.1 - The mechanism for producing emergency plans needs to be structured to ensure that when activated the plan produces an adequate response to an accident.

2.3.2 - The principal objectives of emergency plans are:

- containing and controlling accidents so as to minimise the effects, and to limit damage to people, the environment and property;
- implementing the measures necessary to protect people and the environment from the effects of accidents;
- communicating the necessary information to the emergency services, local authorities and as necessary industry and the public concerned in the area.

The response arrangements contained in emergency plans will lead into any follow-up action necessary for the restoration and cleanup of the environment following an accident.

2.3.3 - Key components of the emergency planning process are:

- identification of the principal sources, types and scale of potential accidents (reference scenarios),
- establishment of the principal objectives of the emergency response measures,
- identification of the procedures, roles and resources (by the party responsible for their use) required to achieve the response,
- identification of the organisations and key post holders involved,
- identification of the expertise, arrangements and capabilities of the organisations and individuals that are relevant to the procedures and the roles needed,
- determination of how all the responses will be coordinated including any sub-plans, e.g. any standing arrangements with the emergency services and local authorities,
- allocation of the responsibilities for the response and associated components (may be required by legislation),
- identification of the means to ensure the plans will be put into effect as intended.

2.3.4 - Emergency plans should be based on the local situation at each marshalling yard, the foreseeable emergencies that may arise and the arrangements for dealing with those emergencies. Emergency plans should be based on the significant accidents foreseen as reference scenarios for the activity concerned. The degree of planning should be proportional to the likelihood of the accident occurring. The on-site emergency plan will include details of arrangements for dealing with the reference scenarios. The requirements will vary according to circumstances and will take account of the size and complexity of the marshalling-yard operation, the number of people employed, the availability of resources, the location of the site and the dangerous

goods involved. The types and quantities of dangerous goods involved can vary on a day-by-day basis but annual data can be used to inform the planning process.

2.3.5 - The emergency plan should be an aspect of the overall safety management system which comprises suitable and coordinated arrangements that will ensure that all the necessary people, resources and information will be available and brought into action to deal in an appropriate manner with the foreseen accidents.

2.3.6 - The various parts of the overall emergency plan may be regarded as sub-plans. They need to be effectively coordinated during the planning process.

2.3.7 - Some components are primarily about the response, for example:

- initial rail safety responses - protection and initial rail countermeasures,
- when and how to call the emergency services,
- who will take charge at each stage of the response and what they will be responsible for,
- relevant procedures for the response,
- availability of resources including specialised equipment (see [Appendix H - page 60](#) for examples of equipment),
- where and how to get information,
- how the emergency responders will be identifiable, where they will rendezvous and how they will communicate with the yard operator.

2.3.8 - Other components will be primarily about making the plan work, for example:

- training for emergency planners,
- training for people with roles to play in connection with the plan,
- how plan components will be tested,
- how plan components will be updated,
- how plan components will be reviewed and revised to take account of changes or lessons learned.

2.3.9 - Emergency plans should be documented. The documentation should be a record of agreements and procedures which cover all the appropriate people and organisations, necessary resources and the accident scenarios considered.

2.3.10 - Plans should be as concise as possible but not at the expense of essential detail.

2.3.11 - A large part of the emergency plan preparation is about the exchange of information and ideas between people and organisations. Serious consideration should be given to the most effective way of carrying this out for the circumstances of a particular emergency plan. There are numerous possible approaches. In addition to the use of telephone, letter, e-mail and fax there are:

- steering and working groups,
- emergency planning working groups,
- meetings of a selection of the organisations involved,
- discussion or focus groups,
- briefing/review meetings.

2.4 - When?

2.4.1 - For a new marshalling yard the emergency plans should be prepared before operation starts. Sufficient time should be allowed for consultation with all involved both on the railway and with external agencies such as the emergency services and the local authority. This will enable any necessary off-site plans ([see Terms and definitions - page 5](#)), i.e. those prepared by local authorities/emergency services, to be drawn-up in parallel and the plans to properly interface.

2.4.2 - Many marshalling yards already exist and this guidance is intended to enable a consistent approach by railway undertakings, railway infrastructure managers and yard operators when reviewing and updating their emergency plans.

2.5 - Use

2.5.1 - Emergency plans are live documents. They should be kept up-to-date and put into effect without delay whenever needed and all those with agreed roles and responsibilities should carry them out when, where and how agreed.

2.5.2 - The principles outlined in the plan should be followed during training, testing and in the event of an actual accident. It is helpful to include checklists in the plan as a guide to rapid informed decision-making and as a series of reminders for individuals.

2.5.3 - The plan should contain or identify the means of access to all the information that may reasonably be expected to be required by those responding to an emergency. The procedures that it contains for individual jobholders should be simple and straightforward, not be contradictory, and enable maximum flexibility of response. A plan for a large or complex marshalling yard will contain a great deal of information and procedures and will, therefore, contain considerable complexity to ensure that there is appropriate flexibility.

2.5.4 - The plan should include arrangements for:

- alerting and warning those involved:
 - alerting and contacts both in and outside working hours,
- ensuring provision of information to the public who might be affected by an accident,
- operational response:
 - bringing together the people who would have to deal with accidents to assess the possible consequences and manage a coordinated response,
 - identifying site-specific data needed to enable decisions to be made in responding to an accidents, e.g. access, fire fighting.

2.6 - Information

2.6.1 - In developing an effective emergency plan it is necessary to obtain considerable information.

The key pieces of information that will be required are:

- What hazards are present in each marshalling yard?

The dangerous goods, the potential, their location, their properties and their potential effects on people and the environment. If feasible information on the reactions of dangerous goods released, their interaction with other dangerous goods which may be present in the marshalling yard and their behaviour in fires should be included, or sources of specialist assistance and reference provided.

Given the potential range of dangerous goods that may be present in a rail marshalling yard, it is appropriate to concentrate on those representing a major hazard e.g. Class 1 Explosives, Class 2 Gases and Class 3 Flammable Liquids. Considering these on single wagon basis for flammable goods will give a credible reference scenario as it will for toxics where one wagon ([see Terms and definitions - page 5](#)) is unlikely to impact on others.

[Appendix B - page 47](#) gives examples of particular risks in marshalling yards including mechanisms for release.

[Appendix E - page 51](#) outlines methods of hazard analysis.

- Recognition that the number of dangerous goods consignments on hand can vary. Recognition that the basis for planning may not be the actual situation when an accident occurs.
- What events could lead to a release of dangerous goods?
- What are the sources of accidents?
- How likely and how potentially serious are the events?

- What are the possible extent and consequences of a release of dangerous goods to personnel, other people and the environment?
- How far from the source will these releases be harmful to personnel, other people and the environment; what level of harm and under what circumstances?
- What are the probabilities of these consequences being realised?

2.6.2 - In addition, the emergency planners will need information on:

- how the hazards are already controlled - availability of specialist staff and special equipment,
- how the initial rail response is implemented, what is controlled and what resources including initial response deployed,
- any special characteristics which may require a response different from the routine,
- what systems and resources are already in place for dealing with different circumstances, and how far they go towards satisfying the response needed (see [Appendix H - page 60](#)),
- what further capabilities are available from other organisations potentially involved in the response or who could be called.

2.6.3 - The fire service requires specific information for the development of its arrangements for dealing with an accident. Yard operators need to cooperate as much as possible with the fire service in the collection of this information. Some aspects are identified in [point 6 - page 30](#).

3 - Emergency plan production

3.1 - Plan preparation

It is necessary to identify the name of the person or position responsible for preparation of the emergency plan. The plan needs to recognise the process that will involve the yard operator for:

- preparation of the plan,
- coordination of the planning process, planning meetings and review arrangements,
- liaison with local authority emergency planners and those of other agencies and neighbours,
- recognition within plans of any legal obligations,
- confirmation of responsibilities to those concerned, in writing,
- controlled distribution of plans or suitable extracts to all those involved,
- ensuring that the date and source of the plan with responsibility for preparation, updating and issue, is identified.

3.2 - Contents of the plan

3.2.1 - Scope and purpose of plan

The plan should identify:

- the physical area covered by the plan,
- the purpose - the yard operator's complete response to an accident involving dangerous goods in the marshalling yard.

3.2.2 - Planning scenarios

The plan should identify:

- the significant possible accidents foreseen (as reference scenarios),
- the intended strategy for dealing with these accidents to control the circumstances and limit the consequences. The response strategy and associated considerations are developed in more detail in the following points.

3.2.3 - Initiation of the plan

There needs to be a robust arrangement in place for ensuring identification of an incident or accident, and initiation of the response plan.

The emergency plan should identify who (and deputies) has the responsibility for initiating the plan, who should be told and how this is done. The plan should also identify:

- the arrangements for alerting the emergency services and local authorities and when this should be done,
- the type of information they will require with the initial advice, in what form, to whom and by whom,
- how subsequent liaison and more detailed information will be handled as it becomes available,
- any arrangements agreed with local authorities and emergency services for public warning.

3.2.4 - Support personnel

The plan should identify personnel by name and position with roles to play in the emergency response together with their responsibilities.

3.2.5 - Accident site management - Overall command and control

The plan must clearly identify who has the lead responsibility for overall management of the circumstances of the rail site e.g. whether the yard operator or the emergency services. This lead overall responsibility may change as the response develops and the process for change must clearly be stated and agreed by those agencies with and identified involvement in the planned response. Round-the-clock appropriate management arrangements should be established to carry out the necessary functions.

3.2.6 - Rail aspects of control and coordination

Overall responsibility for managing and coordinating the rail aspects of the accident will need to be identified with roles, responsibilities and relationships with external agencies clearly specified. The means of discharging their responsibility, e.g. through a site incident controller leading a strategic coordinating group should be clearly set out. The person selected to carry out this role will need to have a thorough knowledge of the overall situation.

A clearly documented system for deputising should be established.

3.2.7 - Response considerations

The following are aspects that will need addressing at a senior level in a predetermined order. The responsibility for taking these actions needs to be clearly understood and identified in plans. Not all will be undertaken by the yard operator:

1. Ensuring that rail immediate operational safety controls have been applied; confirming that the emergency services have been summoned and, if appropriate, that the off-site emergency plan has been initiated.
2. Depending upon circumstances hence the level of response needed:
 - ensuring that the key personnel have been mobilised,
 - ensuring that operational control continues to be available for those parts of the site outside the areas directly affected including continued operation of the marshalling yard,
 - reviewing and assessing developments, as appropriate, to assist prediction of the most likely development of the accident, hence the appropriate response,
 - seeking specialist advice/assistance on the hazards presented by the dangerous goods involved,
 - ensuring, in liaison with the emergency services, that casualties are located and are receiving adequate attention ; ensuring arrangements are being made to look after relatives of those missing, dead or injured,
 - establishing contacts as appropriate with agencies able to give prior information on impending changes in weather conditions,
 - liaising with appropriate external agencies, senior officers of fire, ambulance and police services and with the appropriate environment and regulatory agencies to provide appropriate advice on possible effects on areas outside the site.
3. Other responsibilities that need to be managed are:
 - ensuring that emergency services have been alerted,
 - ensuring that appropriate site alarms have been sounded and, where this is a plan requirement, the public has been informed,
 - closing down and evacuation of areas of the marshalling yard that are likely to be affected,
 - evacuation of the injured and non-essential personnel to assembly/shelter areas,
 - taking initial measures for rescue, until the arrival of the emergency services, when control will normally be passed over to a senior fire officer,
 - setting up a communication point with appropriate communications equipment for contact with the emergency services or other established control centres,
 - ensuring that all personnel are accounted for,
 - managing site and personnel safety in liaison with other agencies,
 - organising relief for personnel involved as the response progresses,
 - identifying all rail vehicles, their location and, for dangerous goods, UN Number (see [List of abbreviations - page 8](#)), hazard identification and class,
 - providing, as necessary, details of the infrastructure involved e.g. culvert, drains. etc.,
 - giving advice and information, as requested, to the emergency services at the scene (primarily fire service),

- keeping the emergency services/other established control centres informed of all significant developments,
- seeking mutual aid or support,
- controlling rail and road movements within the establishment,
- arranging for an on-going record to be kept of the emergency and the responses undertaken to mitigate its effects to provide evidence of the decisions made, the mitigating action taken and to ensure that lessons can be learned from the response to the emergency,
- ensuring that full consideration is given to the preservation of evidence and initiation of investigation,
- catering to the welfare needs of site personnel, for example, through provision of food and drinks, relief and the ability to keep relatives informed,
- establishing liaison with the media and issue information and statements as appropriate in conjunction with the emergency services (see also [point 9 - page 40](#)),
- controlling the rehabilitation of affected areas after the emergency,
- caring for those involved during and after the emergency.

3.2.8 - Emergency Control Centre

The principal facility that should be considered in the on-site emergency plan is the emergency control centre (ECC - see [List of abbreviations - page 8](#)), the place from which operations to manage the response to the emergency are directed and coordinated. The ECC should have good communication links with the site incident controller, all other installations on the site as well as communication to appropriate points off-site, e.g. emergency services headquarters. This centre will require facilities to record the development of the incident, to assist management and decision-making on the appropriate method of control. The equipment involved may be on-site or off-site. The responsibility for provision of facilities, equipment and maintenance needs to be determined by the yard operator in conjunction with the other organisations who will be involved in the response.

Emergency control centres will generally have to contain:

1. equipment for adequate external (off-site) communications. This will include telephones and fax machines; at least one of each should be an ex-directory number or should only allow out-going calls and faxes, to avoid overloading with communications from concerned neighbours, relatives and the media. PCs with e-mail should also be provided;
2. equipment for adequate internal (on-site) communications. This may be via an internal telephone system, radio links, mobile telephones or some other means;
3. site plans, maps and records to show clearly the location of:
 - rail layout, sidings and main lines, and rail equipment risks e.g. traction current supplies,
 - the areas where hazardous materials for maintenance, etc. are stored e.g. fuel tanks (volume),
 - safety equipment,
 - fire water supplies, the routing of fire water mains and the location of any additional sources of water,

- drains and outfalls to watercourses,
 - any other fire fighting equipment,
 - access points to the site and the on-site road system,
 - rendezvous points and locations for casualty treatment centres,
 - area of marshalling-yard control i.e. scope of plan,
 - the site relative to the surrounding community, identifying any vulnerable populations, developments (for example, hospitals, nurseries and schools) or environmental features to assist external planning,
 - vehicle parks,
 - site plans which can be marked up to show the development of the response and the deployment of emergency response resources, areas evacuated and other related information to assist the emergency services,
4. facilities to ensure that a record is kept of all messages sent and received;
 5. access to data on all those present on the site at the time of the incident;
 6. contact numbers (home phone, mobile or pager numbers) for all personnel with a role to play in the response to the incident. Use of automated phone call systems.

Careful consideration should be given to the location of the ECC, taking into account the location of the sources of major accidents in the marshalling yard. Consideration should be given to designing the ECC to remain operational in all but the most severe circumstances. For large marshalling yards or where a toxic release is a reasonably foreseeable accident scenario it may be appropriate to set up two control centres to ensure that, under most circumstances, one will be available should the other be disabled.

3.2.9 - Equipment

In addition to equipment needs already identified the plan should also identify the availability and function of special emergency equipment including fire-fighting materials, damage control and repair items together with other resources necessary for the planned response. How the yard operators can assist the emergency services with use of yard equipment, facilities and expertise should also be identified (see also [Appendix H - page 60](#)).

3.2.10 - Conclusion of planned response

To properly manage the circumstances when the emergency is concluded the plan should identify:

- the decision-making process for determining when it is safe to enter the site and the basis and responsibilities for taking that decision,
- priorities for re-entry e.g. rail control facilities first,
- how organisations and people are advised the emergency has concluded and are controlled for re-entry.

3.3 - Checklist for Emergency Plans

The following questions may be useful in assessing the adequacy of an on-site emergency plan:

- Does the plan cover the response to the range of accidents that can realistically be anticipated (see Appendix B - page 47)?

The accidents considered should range from small events that can be dealt with by those who work on-site without any outside help, to major accidents, e.g.:

- the events considered, and why they were included or excluded,
- the typical defects and failures leading to these events,
- the timescales involved,
- the size of lesser events if the development is interrupted, and
- the likelihood of events, so far as can reasonably be assessed.

The specific response actions needed may differ depending on how the dangerous goods are handled and contained e.g. in packages or in tank wagons or containers, and also the seriousness of the situation. The response will also need to recognise the chemical properties and associated hazards; whether a gas, solid or liquid.

- Have the consequences of the various incidents considered been adequately addressed?

For example, each incident should be assessed in terms of the quantity of dangerous goods that could be released as a result of an accident (including smoke effluent from fires), the rate of release, the effects of explosions, the effects of thermal radiation from fires and the properties of dangerous goods that could be released.

- Are there sufficient resources in terms of personnel and equipment on the site, available at all times, to carry out the emergency plan for the planned scenarios in conjunction with the emergency services?

For example, is there sufficient water for extinguishing or cooling, and if this water is applied by hoses?

- Have the timescales been assessed adequately?

Consideration should be given in the development of the emergency plan to the time that will elapse between the start of an emergency and the arrival of the emergency services, and the additional time that emergency services need to deploy resources. Those who work on the site will have to be able to deal with the developing emergency until the off-site agencies can provide appropriate support or relief.

- Is there a logical sequence of actions for the key personnel identified and given a role in the emergency plan? The use of checklists identifying the necessary actions to be performed by individuals helps to ensure an appropriate response.
- Has suitable consultation taken place with those who work on the site?
- Are arrangements in place for round-the-clock cover in the marshalling-yard control centre?

For example, is account taken of silent hours, holidays and sickness, shift hand-over, marshalling-yard shutdowns, etc.?

- Has there been an adequate level of consultation with the local authority emergency planning officer with responsibility for the development of the off-site emergency plan and the emergency services, to ensure adequate 'dove-tailing' between each agency's plans?
- Are the arrangements in the on-site emergency plan for initiating the off-site emergency plan clear and are they adequate?

Appendix D - page 49 contains a list of aspects that need considering in the development of the content of emergency plan for a marshalling yard. **Appendix J - page 64** gives a model of site emergency plan content.

4 - Environmental aspects of emergency planning

Accidents in marshalling yards can lead to environmental damage, temporary or permanent, due primarily to airborne or waterborne pollutants. In parallel to planning emergency response arrangements it is appropriate for the planning process to:

- assist in the identification of potential environmental impact,
- identify and plan for any immediate measures that can be taken to mitigate/contain potential pollution,
- identify the appropriate priorities for dealing with these risks,
- liaise with external agencies to provide an appropriate coordinated response.

More detail is contained in [Appendix G - page 55](#). This appendix provides an understanding of the implications by giving details of the considerations that may need addressing after the emergency response has been concluded. Many of the environmental considerations are the responsibility of external agencies who will liaise with the railway undertaking, railway infrastructure manager or yard operator as necessary.

5 - Preparedness - Emergency services

In addressing the aspects identified in [point 3 - page 21](#), key aspects which amongst others will ensure an effective interface with the emergency services are:

- identification of roles and responsibilities of each emergency service and who holds the lead role in specified circumstances,
- identification of the rail organisation which will liaise with the emergency services to implement the planned arrangements and initiate the response when required,
- the need to ensure a clear understanding by the emergency services of the responsibilities of the railway undertakings, infrastructure manager and yard operators and how these will change during a response to an accident,
- identification to emergency services of rail contact arrangements (in an agreed form) ideally on the basis of emergency service control facility to rail control facility. The emergency services must be able to identify the rail control responsible and location of the site emergency control centre(s),
- making arrangements to ensure the communication links between rail controls and the emergency services are agreed and kept up-to-date, allowing sufficient time for the changes to be made and notified to those involved,
- identification of the information needed by the emergency services from/and by the rail industry,
- testing of contact arrangements,
- involvement of emergency services in exercises and accidents simulation.

An effective response to accidents, incidents and emergencies will be helped by encouraging emergency services personnel to visit marshalling yards to better understand the particular problems they might face such as:

- general yard geography - access points, possibility of steep slopes and undergrowth,
- ground surface conditions - difficulty for road vehicle movement because of rails and ballast,
- positioning of trains - the various positions for wagons and trains and their length,
- water supply - availability and location of stand pipes,
- permeability of soil if leakages occur.

6 - Training and testing

6.1 - Training

An effective response to incidents and accidents necessitates an understanding of the roles and responsibilities of organisations in the rail industry and public authorities, in particular the emergency services.

All staff involved should be competent to undertake their role.

Individual personnel should be given simple instructions outlining their actions and responsibilities.

Effective plans require that those involved have a good up-to-date knowledge of the emergency equipment available, the plan requirements, general and individual responsibilities.

The degree of training necessary to achieve competency will depend on the nature of the plan, the complexity of the location or the potential accident involved. Simple plans based on obvious actions should limit the amount of formal training needed whilst some locations may involve staff in more extensive formal training.

The person responsible for the plan should identify training requirements and objectives, such as briefing and practical exercises. The person responsible for the plan must ensure, in conjunction with the manager(s) responsible for the location(s) covered by the plan, that the frequency of briefings and exercises is determined with all those involved with the planning process.

The yard operator should ensure that:

- personnel are familiar with safety and alarm actions to be taken in a fire or other emergency at the site,
- personnel with specific emergency or evacuation responsibilities have been involved in briefings; training and joint exercises with others involved in the plan e.g. the emergency services,
- personnel have knowledge of the identification and properties of dangerous goods and personal protection appropriate to the tasks on which they are employed,
- means of identifying planned individual/location responsibilities and actions are always readily available for first-aid training,
- emergency information and equipment is readily available for use e.g. maps and plans of the area, emergency contact checklists, log sheets for keeping a record of actions taken,
- an appropriate knowledge of safety and environmental issues.

Education and training should be continuous and, in particular, should be provided to personnel when entering a work environment, at a change of jobs, when there is use of new materials or methods, when new hazards are identified e.g. new rail traffic, and when there is a new or updated emergency plan.

International, national and related references

Education and training programmes should take into account applicable international guidance, the work of relevant international organisations and relevant operational requirements of e.g. railway undertakings, infrastructure managers and facility operators. The Bibliography gives details of relevant documentation.

6.2 - Testing

6.2.1 - It is recommended that emergency plans are tested annually but as a minimum at least once every three years. This would also apply to planned interfaces with emergency service and local authority plans.

6.2.2 - Testing is carried out to give confidence in the ability of the plans and those involved to reliably cope with the range of accidents that could occur. It should give an indication of the conditions that may exist on and off the site in the event of an emergency. It should also show that the plan could:

- reliably work as planned to control and mitigate the effects of an accident,
- communicate the necessary information,
- lead to an adequate restoration of the marshalling-yard operation.

6.2.3 - Tests should primarily address the response during the emergency phase, the first few hours after the accident occurs. This is the phase of an accident response when key decisions must be made under considerable pressure and within a short period of time, and therefore a detailed understanding of the likely sequence of events and appropriate countermeasures is of particular benefit. It is important that the simple issues of the emergency response are not overlooked by over-concentration on the more complex areas.

6.2.4 - Objectives of testing - The objective of testing the emergency plan should be to give confidence in the following constituents of the plan:

- the completeness, consistency and accuracy of the emergency plan and other documentation used by organisations responding to an emergency,
- the adequacy of the equipment and facilities, and their operability, especially under emergency conditions, and
- the competence of staff to carry out the duties identified for them in the plan, and their use of the equipment and facilities.

Exercises are an essential input to ensuring effective emergency plans by controlled testing of:

- communication arrangements between all parties involved,
- knowledge of planned response,
- strengths and weaknesses (plans and individuals),
- the understanding of roles and responsibilities of rail industry and other organisations involved,
- working relationships,
- support availability,
- effectiveness/suitability of the equipment provided,
- effectiveness/suitability of the precautions taken.

6.2.5 - The overall testing regime for on-site emergency plans would be expected to examine the following aspects of the emergency response:

- Activation of the emergency plan and notification of the participants:
 - alerting emergency services,
 - sounding alarms,
 - mobilising site personnel identified in the emergency plan as having a role to play in the event of an emergency.
- Establishment of the Emergency Control Centre (ECC)

Establish a suitable place from where the response to the emergency can be directed and coordinated as required by the emergency plan, within a suitable time (also consider the establishment of an alternative ECC to demonstrate the ability to operate when the designated ECC is not available).

- Supply of information to the ECC

Demonstrate that information from the participating organisations can be supplied promptly and accurately to the ECC, so that those at the Centre have access to an up-to-date picture of the emergency and the response to properly inform their decision-making.

- Communication within the ECC

Demonstrate that the necessary information is exchanged and disseminated among all the parties with a role to play at the ECC, in a form that can be understood and assimilated.

- Team Working

Demonstrate the ability of participating organisations to work together using the available information to develop the response to the emergency.

- Decision Making

Demonstrate that contributions are made by all participating organisations to allow rational decisions to be made, and implemented.

- Communication and public information.

Demonstrate that information on the emergency and the response to it is passed to all involved organisations and to appropriate media.

(The demonstration should include preparing briefs for the media and should sometimes include establishing a media briefing. In addition, consideration should be given to the impact of the media in the event of an emergency, and the ability of the ECC to make information available to handle their enquiries).

- Equipment and facilities

Demonstrate that the equipment identified as needed in the response to an emergency is operational and that participants are able to use it. Demonstrate the operability of the ECC and the equipment associated with it.

6.2.6 - Methods of training and testing - Exercises to test emergency plans, and to train key personnel in preparation for dealing with an emergency can take a number of forms, fulfilling different functions within the overall requirements. These may usefully involve other-than-rail responders and also walk-through exercises.

- Drills

To test a specific and relatively simple aspect of an emergency plan in isolation. Examples are fire drills; alarm testing; evacuation; roll calls; cascade telephone calls; spillage control and recovery.

- Seminar exercises

Used for staff training and development of emergency plans. They facilitate discussion about different organisations' response in particular circumstances during an emergency.

- Walk-through exercises

Used for training or development of the emergency plan. The emergency response is "walked-through" or simulated, including visiting appropriate facilities.

- Table-top exercises

These allow information exchange and dissemination between involved organisations and decision-making to be tested. They are carried out in relation to a model, plans or photographs to depict the site.

- Control post exercises

These test the communication arrangements during an emergency with participating organisations locating themselves as they would during an emergency.

- Live exercises

These are full tests of some or all aspects of the emergency plan for the on-site and off-site response (for Detailed guidance on the organisation of an exercise, see [Appendix I - page 61](#)).

6.2.7 - The aspects of emergency plans to be tested can be addressed in many different ways with many different combinations of the types of test detailed above. Confidence in the ability of an emergency plan to function adequately would be given by carrying out a live exercise of one of the identified reference scenarios. However this is not the only way in which emergency plans can be tested. It is important to derive a programme of emergency plan tests to give a high level of confidence in the plan without overburdening the operator and the other responders. There can be considerable economies of scale in the testing that is carried out, when a single test can address aspects for more than one part of a marshalling yard.

6.2.8 - The lessons learnt from the testing of emergency plans should be passed to all the stakeholders involved; this is especially important in the case where a single test is being used to demonstrate the effectiveness of the emergency plan for more than one part of a marshalling yard. If this approach is adopted there may be the need for additional testing of site-specific aspects of the plans. It is recommended that records are kept of the testing. This gives an audit trails to show that all the relevant components of the emergency plan have been tested during the established review period.

6.2.9 - Evaluation - For organisations to get the most out of their participation in emergency plan tests it is important to evaluate the lessons learnt, to determine whether modifications are required to the emergency plan and to promote good practice. With many organisations becoming involved in the emergency plan tests, there will not be one single method for evaluating the effectiveness of the emergency plan. Each organisation may want to establish its own self-evaluation criteria relevant to its own response. For example, organisations may want to set quantitative measures like timeliness of response, or subjective measures for quality of performance.

Effective evaluation will give assurance to operators and to participating organisations that the arrangements that they have in place for dealing with an emergency are effective and will work adequately in the event of an accident.

Techniques are available to record the response of key players during an exercise to allow some comparison of the effectiveness of emergency plans. These techniques can also be used to study the effectiveness of the training of the decision-makers in emergency response.

6.3 - Consultation

In some circumstances it may be appropriate for a local emergency planning consultative group to be informed of the results of evaluations and to be kept informed of progress on actions to amend emergency plan responses.

Information for residents/media - When alarms are being tested, or when exercises of the on-site or off-site emergency response are being carried out, there could be understandable concern from those in the vicinity of the site. They may hear alarms and be aware of the movement of emergency service vehicles. It is good practice to inform to the necessary extent those in the vicinity of the marshalling yard, also the emergency services call centres, that such testing or exercising is taking place. This will help them field calls from concerned neighbours, and hopefully allay any unnecessary fears. It may be appropriate to prepare a briefing for the media to handle press enquiries when tests or exercises are to be carried out, so that they will be able to respond in a proactive and informative manner.

7 - Review, update, reporting and records

7.1 - Review

7.1.1 - Point **6.2.1 - page 31** identifies the need for, and frequency of, testing of emergency plans which will lead to revision, where necessary, of the plans.

In this context, reviewing of the emergency plan is considered to be a fundamental process, examining the adequacy and the effectiveness of the components of the emergency plan and how they function together. The review process should take into account:

- all material changes in the activity,
- any changes in the emergency services arrangements relevant to the operation of the plan,
- advances in technical knowledge, for example new, more effective means of mitigation,
- knowledge gained as a result of accidents either at the marshalling yard or elsewhere,
- lessons learned during testing of emergency plans,
- any changes necessary in the planning process or planning team.

7.1.2 - For this to take place effectively, any implementation of the emergency plan or exercise of the plan should be reported to the person responsible for producing the plan. There also has to be open two-way communication between the yard operator, the local authority and emergency services. All appropriate changes that may affect the emergency response should be communicated to the other parties.

7.1.3 - A review of the emergency plan should also take place following any significant modifications to the marshalling yard infrastructure, organisation or traffic movements or any other noteworthy changes. Under these circumstances yard operators and the local authority should not wait until the three-year review.

7.1.4 - Reviewing and revising are considered to be a separate requirement from updating of the emergency plans which is an on-going process. This is carried out to reflect any changes in the practical details of the emergency response arrangements, for example changes in the responding organisations, communication arrangements or in the mitigation equipment to be mobilised. Where personnel with responsibility for initiating the emergency response or for liaison with the local authority are named in the emergency plan then the updating should include changing the names when this happens.

7.1.5 - One of the principal inputs to the process of reviewing the emergency plans will come from the results of tests of the emergency plans, as considered in [point 6.2 - page 31](#). Before testing, objectives should be set for all aspects of the emergency plan. After the test, the review should concentrate on areas where the objectives were not met. Recommendations from reviews and tests of the emergency plans should be logged, and action taken to address each recommendation.

7.2 - Reporting

When an accident occurs, to initiate the planned response all incidents and accidents should be reported in accordance with legislation and also to the involved railway undertakings, railway infrastructure managers, yard operators and other organisations involved. The local authority will need to be advised as well as regulatory bodies.

7.3 - Investigation

Arrangements should be in place to investigate incidents and accidents involving dangerous goods to identify the immediate and root causes. The circumstances of any accident should be recorded and subject to the appropriate degree of investigation and inquiry to ensure that the immediate and underlying causes are determined.

These investigations and inquiries should, where appropriate, involve liaison both within rail organisations and with others such as the emergency services and public authority representatives.

7.4 - Exchange of information

Railway undertakings, infrastructure managers, yard operators and other organisations with whom they interface in the course of their operation both in normal operation and in an emergency (e.g. public authorities, other railways, their customers and industry) should establish arrangements with the objective of improving the management of safety, accident prevention, preparedness and response:

- for regular review of the safe transport of dangerous goods and arrangements at interfaces with others, such as manufacturers and facility operators. The degree of review necessary will depend on the risks involved with the particular activity,
- to ensure that information and experience relating to safe operation and emergency response are readily exchanged. Information on aspects relating to inspections and procedures should be exchanged. Specific information should be made available when an incident or accident occurs,
- to provide input to information databases and systems enabling the exchange/sharing of information.

7.5 - International systems

International cooperation should be reinforced to share information, lessons learned and improvements in health and safety arrangements involving dangerous goods. To help ensure such a system works effectively, efforts should be made to determine common definitions in reporting systems.

7.6 - Records

Written records should be maintained of accidents, incidents, plan implementation and exercises as well as the formal review of the plan. This provides a necessary trail for audit purposes. The date of issue of controlled amendments to the plan should also be recorded.

7.7 - Audit

Railway undertakings, railway infrastructure managers and yard operators should establish arrangements to audit the emergency plan arrangements, as part of their safety management system. They should also, along with others involved in emergency plans, ensure that the necessary support and assistance are given to enable access for inspection and audit.

8 - Public authority and community awareness

8.1 - Need

Railway undertakings, railway infrastructure managers, yard operators and other organisations involved in the transport chain should seek to ensure that public authorities and other organisations interfacing with their activities have sufficient information to:

- develop awareness of what to do should an accident occur in a marshalling yard that could affect them,
- identify actions necessary when accidents occur to ensure the continued safety of the public in those areas in these circumstances. This could involve advice to them on what to do in certain circumstances when advised to do so. It could also involve controls on the development of land adjacent to marshalling yards in particular areas.

8.2 - Consultation

When drafting emergency plans, consultation needs to be undertaken with local authorities to determine:

- what information they need and to whom it will apply e.g. emergency services, adjacent factory operations and public. This will vary from marshalling yard to marshalling yard in amounts and detail necessary. In all cases it needs to be straightforward and use simple terms as much as possible. Technical language should be explained,
- how and to whom this information is to be presented (format/language(s)/distribution),
- review frequency for content (in parallel with plan review - see [point 7 - page 36](#)),
- what, if any, real-time warning arrangements and actions are necessary and how and by whom these will be applied.

Taking these actions will make information available to those likely to be involved should an accident occur. The off-site plans and actions involved are in general not a rail responsibility.

9 - Working with the media

9.1 - In the event of an accident there are two functions that are carried out by the media:

- they gather information for news stories, and
- they act as a route to broadcast important information to those who may be affected, in the vicinity of the accident or elsewhere.

9.2 - The first role of the media cannot be ignored in emergency planning, and if the needs of the media to collect information are not met, then it may be more difficult to use them to inform the public. Plans should identify an appropriate person to act as a coordinator for working with the media. This person should be a representative of one of the key responding organisations and should be appropriately trained to be able to work closely with the media. Clear roles and responsibilities need to be established.

9.3 - It will often be appropriate to establish a media briefing centre, where information agreed, e.g. by a strategic coordinating group, can be released, and where representatives of the marshalling yard and the responding organisations can be made available to give interviews and press conferences. Those who may be required to attend a press conference or to be interviewed should be trained appropriately to work with the media, and should be adequately briefed on the development of the accident. Press officers from all the responding agencies may be required at the media briefing centre along with representatives of the operator of the marshalling yard. Information released by the operator or any of the responding organisations to the media should be copied to the press officers of all the other organisations to ensure all those dealing with the media are aware of what other information has been made available.

9.4 - It is recommended that information is available in advance for distribution in the event of an emergency on the work carried out in the marshalling yard, background information on the railway undertaking, railway infrastructure manager, yard operator and on the local area. Such information will be required rapidly by media representatives. Television journalists will welcome appropriate footage of the site and work being carried out, to be made available on broadcast quality video. This will give the yard operator background from which to provide accident-specific information.

9.5 - It is important that all the information passed to the media during an accident is accurate and consistent, and not based on speculation. If possible, a steady stream of appropriate information should be released to the media; this may be up-to-date information on the developing accident supported by background briefing on the nature of the dangerous goods released (if known), on the yard operator and on the marshalling yard itself. This is particularly important in relation to responsibilities for an accident, accident caused or releasing details of casualties.

9.6 - If it is safe and practicable to do so, it may be appropriate to establish a media point within sight of the site to enable appropriate footage and photographs of the response to the accident to be taken. This may reduce the risks of photographers and camera operators attempting to get close to the developing incident, thereby putting them at risk and hindering the response.

9.7 - Potential for misunderstanding between the media and yard operator can be reduced if steps are taken to establish some mutual understanding. If this can be done in advance of any accident occurring, the media will be better informed. They will have an appreciation of the work carried out in the marshalling yard, the risks associated with the work, the controls in place to manage those risks and the existence of appropriate emergency response arrangements. The yard operator should in return understand the needs of the media to gather information so that the accident can be reported rapidly and accurately to the public together with its implications.

Appendix A - Historic Background

A.1 - Review

This guidance has been developed in response to EU concerns relating to the exclusion of some rail operations from the requirements of Council *Directive 96/82/EC* (Seveso II) (see Normative references - page 3). The circumstances have been reviewed during four workshops, the first held under EU Commission (EC) auspices at Livorno in May 1996 and the following ones by stakeholders of the railway sector at Barcelona in April 1997, Dijon in April 2000 and Ispra in October 2001.

At the Livorno workshop the concept of broad equivalence (see Summary - page 2) was introduced by the EC. The controls provided by rail safety management systems were compared with controls required by the Seveso Directive. This broad equivalence concept was developed in more detail at the Barcelona workshop where two main areas were addressed:

- exclusion of ports and marshalling yards from Article 4 (c) of the Seveso Directive (with the exception of locations covered by the Directive),
- the Council Declaration requiring a follow up and, if necessary, a Commission proposal regarding ports and marshalling yards. It is in this context that the May 1996 Livorno Seminar must be seen; it was at this Seminar that the concept was introduced of "broad equivalence" i.e. the quality of results with regard to safety between the Seveso measures and the transport measures, and that of Barcelona for which a more in-depth approach to this "broad equivalence" concept had been required.

The review was undertaken for both rail and ports. Although in line with the Commission's wishes this guidance concentrates on rail, in particular rail marshalling yards. Point A.4 - page 44 contains the Broad Equivalence summary detailing how international rail requirements in marshalling yards are broadly equivalent to the Seveso Directive requirements.

There was general agreement at the Barcelona workshop over the adequacy of existing rail measures for the prevention of major accidents. A seminar organised by the UIC with EC support, and participation of Member States, was held at Dijon in April 2000. An initial draft of the guidance developed for emergency planning for marshalling yards handling dangerous goods was presented. An updated version was considered at Ispra.

The *Seveso Directive* was since revised but the new version (Seveso III) 2012/18/EU does not question the decisions taken in this context.

A.2 - Stops during transport

In considering what is excluded from the *Seveso Directive* it was noted that Council *Directive 96/49EC* identified intermediate temporary storage as "stops necessitated by the circumstances of transport". The definition of this term is incorporated within the definition of carriage in the text for the RID as follows:

"Carriage means the change of place of dangerous goods, including stops made necessary by the conditions of carriage and including any period spent by the dangerous goods in wagons, tanks and containers made necessary by traffic conditions before, during and after the change of place".

This definition also covers intermediate temporary storage of dangerous goods in order to change the mode or means of transport (transshipment). This shall apply provided that consignment notes showing the place of dispatch and the place of reception are presented on request and provided that packages and tanks are not opened during intermediate storage, except to be checked by the competent authorities.

Within this definition intermediate temporary storage means stops necessitated by the circumstances of transport, during the transfer of hazardous substances from the point of origin to the point of destination stipulated in the transport document. Intermediate temporary storage does not include warehousing for distribution purposes.

A.3 - Preparation and application

The Barcelona workshop recognised the need for further review of measures aimed at limiting the consequence of any major accident which may occur. Further attention was considered necessary in the area of planning for rail emergencies.

This emergency planning guidance document was therefore prepared by the UIC Dangerous Goods Coordination Group, recognising similar work for transport and fixed installations (see [Terms and definitions - page 5](#)) undertaken by other organisations such as the International Maritime Organization (IMO), the Organisation for Economic Cooperation and Development (OECD) and the European Chemical Industry Council (CEFIC). The seminar at Dijon was generally appreciative of the UIC/CER (see [List of abbreviations - page 8](#)) initiative and considered that the draft guidance represented an important step in the right direction. They also considered that further work on the guidance was needed in the following areas:

- distinction between general considerations and specific measures for emergency plans,
- risk identification as part of the emergency planning process,
- issue of information to the public living in the vicinity of marshalling yards,

- interaction between internal emergency plans (marshalling yard operators) and external emergency plans (local authorities responsible for civil protection), interaction between internal emergency plans (marshalling yard operators) and external emergency plans (local authorities responsible for civil protection),
- preparation of case studies to give a better understanding of the entire emergency planning process.

The further seminar at Ispra concluded with the EC recognising that, subject to some amendments based on additional comments received, the guidance contained the essential provisions for setting up emergency plans. Broad equivalence with the Seveso concept was largely accepted for marshalling yards by railways applying the guidance contained in this document to marshalling yards where a major accident involving dangerous goods may happen. At the same time the EC identified the need for member states to consider the broad equivalence concept in relation to other aspects such as information to the public, inspections, external emergency planning and land-use planning in the context of marshalling yards. Meanwhile the EC would be seeking application of the guidance to marshalling yards identified by member states as falling within the scope of the document. This will be followed by a wider application of the guidance to other marshalling yards.

A.4 - Marshalling yards. Broad equivalence between Seveso Directive and international legislation in the railway sector

The broad equivalence paper was prepared by the UIC Dangerous Goods Coordination Group. It compares the requirements of the Seveso Directive with those imposed by the railways. In so doing it identifies:

- where the intentions of the Seveso Directive requirements can be related to rail activities,
- how railways address these intentions in their own requirements.

The broad equivalence paper covers the following aspects:

- scope of application
 - presence of dangerous goods in marshalling yards,
 - quantity/threshold arrangements,
- definitions
 - production and handling,
 - storage,
 - containment,
 - hazards,
 - safety and risk,

- general obligations
 - general safe operation,
 - safe carriage of dangerous goods,
- prior notification
 - movements in transit,
 - major accident prevention,
 - safety requirements,
- safety management systems,
- risk identification and assessment
 - management of rail risks,
 - dangerous goods identification,
 - risk assessment arrangements,
- safety report
 - rail reporting requirements,
 - Dangerous Goods Safety Adviser European Directive 2008/68/EC and *chapter 1.8.3 of RID (see Normative references - page 3)*,
- modification to installations
 - maintaining safety standards,
- emergency plans
 - planning requirements,
 - national aspects,
 - dangerous goods specific requirements,
- public information
 - release and control,
- information following accidents
 - investigating,
 - reporting,
 - responsibilities.

A.5 - Rail

Emergency plans for marshalling yards need to take specific account of the carriage of dangerous goods. This guidance identifies the many aspects that need to be considered. Examples are as follows:

- the rail mode of transport interfaces with fixed installations subject to various/other legislation and regulatory requirements, safety management systems and controls. These installations will have their own emergency planning needs. Their plans may impact on adjacent rail operations,
- marshalling yards may involve rail infrastructure which can make access difficult e.g. cuttings and embankments. The movement of road vehicles within the marshalling yard can also be difficult,
- for historical reasons marshalling yards may be located within densely-populated urban areas as well as sensitive environments,
- rail carries dangerous goods in various physical states, with a variety of containment systems, e.g. packages including IBC's (see [List of abbreviations - page 8](#)) and tanks, both within countries and to/from international destinations,
- rail may be only one transport mode used within a carriage movement involving the coordination of other modes of transport,
- dangerous goods form only a part of the total rail traffic moved within a marshalling yard,
- the inventory of dangerous goods in marshalling yards changes according to transport and customer driven needs,
- the individual wagons loaded with goods are held at varying times and locations within marshalling yards,
- RID is applied as an important control of risks in the acceptance and carriage of dangerous goods,
- the need to take account of the many rail and other organisations involved in rail transport e.g. infrastructure manager, railway undertaking and yard operator.

Appendix B - Examples of particular risks in marshalling yards

This appendix identifies examples of circumstances which may need to be considered in the planning process. They are grouped for presentation purposes but the risks may overlap between one group and another.

1. Trains and Shunting Operations

- derailment and/or collision,
- use of hump shunting, retarders,
- impact locations and speeds.

2. Rolling Stock/Packaging

- wagons containing dangerous goods standing next to each other (can lead to potential domino effect),
- loss of containment integrity - wagon or package defect or failure e.g. as a result of collision, derailment or inherent defect,
- fire and/or explosion,
- leakage/release of toxic gases,
- on-site transshipment of dangerous goods from wagons/containers that are defective or damaged and cannot be moved forward,
- the potential interaction of various types of dangerous goods possibly held in a marshalling yard,
- placing defective wagons in a safe place.

3. General

- fire,
- evacuation,
- trespass/vandalism/security,
- flood - river/coastal,
- storm/damage,
- road crash onto railway,
- accidents in adjacent manufacturing/industrial facilities,
- pipelines on/under/adjacent to the railway which may contain dangerous goods,
- pollution land/air/water,
- failures, e.g. of track, equipment, structures, embankment, landslide.

Appendix C - Organisations to be consulted

This appendix identifies examples of internal and external organisations that need to be consulted in the planning process, as follows:

- public and other authorities
 - police, fire brigade, ambulance, coastguard,
 - local authority planners,
 - government agencies,
 - environmental agencies,
 - health authorities,
 - rail regulatory bodies,
- public,
- railway undertakings, their agents and contractors,
- railway infrastructure managers,
- rail police authority,
- other transport undertakings, e.g. bus, metro,
- dangerous goods (see Terms and definitions - page 5) specialists,
- freight equipment operators (see Terms and definitions),
- facility operators,
- port authorities,
- consignors (see Terms and definitions)/consignees (who may involve specialist industry and dangerous goods information sources),
- utilities - gas, water, electricity, drainage,
- communication providers,
- managers of location(s) covered by plan,
- managers responsible for fire prevention arrangements in area covered by plan,
- tenants,
- organisations which control or operate facilities or other fixed installations which have potential to affect rail operations, including pipelines.

Appendix D - Emergency plan - Summary of aspects to be considered

Accidents and incidents can take many forms and the following aspects should be considered in the development of plans:

- arrangements needed to make and maintain a safe site taking account of the area/ activity covered by the plan,
- ensuring continued rail operational safety e.g. full traction-current isolation and earthing for site protection,
- advising the emergency services with information on the location,
- notification of a rendezvous point with a member of staff to meet the emergency services on arrival,
- informing marshalling yard tenants and other participants in the plan that the emergency services have been called,
- informing tenants and other participants in the plan, with details of actions to be taken when an accident occurs,
- maintaining access for the emergency services, including ensuring that roads are not obstructed,
- identification of marshalling-yard emergency control location, access and rendezvous points on an up-to-date plan for use as required by the emergency services,
- organisation, command structure, coordination arrangements, alerting system, contact details, implementation procedures, emergency control centre,
- appointment of key managers (on site and off site), in particular the rail person who would take the lead, and relationship to the emergency services command system/ responsibilities,
- identifying other hazardous materials present e.g. materials contained in rolling stock construction,
- communication arrangements, procedures and equipment.

In addition the plan should:

- clearly identify the circumstances in which the plan will be implemented,
- clearly identify the person who would take the lead for rail aspects of the accident,
- provide an effective response with competent staff designated for on-site and off-site management and investigation,
- clearly identify the response and support provided by those with a specified involvement in responding in accordance with the plan,
- determine the response and support that need to be provided by each organisation whether rail or external,
- enable effective, coordinated and comprehensive structured response initiation, command and control, recovery, public awareness and conclusion,
- identify arrangements for reporting the response state during the emergency,
- ensure arrangements which take account of health and safety requirements for all personnel of railway undertakings, railway infrastructure managers, yard operators, their agents and contractors, the emergency services and also the public - including casualties,
- identify arrangements for dealing with first aid, casualties, evacuation and emergency services interface,
- identify special support contacts and equipment needed including recovery equipment, pollution control,
- identify train operating arrangements,
- identify sources of weather information,
- process for identifying details of dangerous goods present and other risks associated with the rail equipment involved,
- detail the evidence-gathering and investigation arrangements and relationship to police and other emergency services investigation requirements,
- identify media management arrangements,
- show how control of re-entry and restart is managed,
- identify how work that continued after the immediate response and restart is specified and responsibilities allocated, e.g. environmental clear up,
- detail availability of voluntary organisations to support,
- identify arrangements for landing helicopters and dealing with specialised road equipment.

Appendix E - Hazard identification and risk assessment

E.1 - Introduction

There are four main aspects of a hazard analysis. These are:

- identification of the various aspects of the marshalling yard that have particular or major accident potential,
- identification of sources of hazards which could cause an accident (see also [Appendix B - page 47](#)),
- assessing the consequence of potential accident scenarios,
- assessing the prevention, control and mitigation measures required. Whilst these can concentrate on accident scenarios with major hazard potential, the need for safety attention to continue to be given to the remainder of the marshalling yard should not be ignored.

The hazard analysis should consider potential harm to persons, society and the environment. The degree of analysis should be proportional to the extent of potential damage. Nevertheless the detail necessary can be limited by taking account of the likelihood of some scenarios being very unlikely or the potential consequence relatively minor.

Examples of formal methods of undertaking hazard identification and risk assessment are HAZOP checklists, FMEA fault trees and QRA (see [List of abbreviations - page 8](#)).

The rail transport risk assessment may be based on the guidelines developed by the Joint Meeting (RID/ADR/ADN). These guidelines, intended for the different modes of inland transport, are available on the European Union Agency for Railways website (see bibliography).

E.2 - Identification of activities with accident potential

This aspect of the hazard analysis seeks to identify where, within the total marshalling yard operation, dangerous goods are moved or held during transport. The yard could be divided into sections each likely to have a known quantity of particular dangerous goods (especially those with major hazard properties and potential). This should be identified whether or not these dangerous goods arrive or leave on one particular train or are likely to be held for varying periods then remarshalled into other trains.

This detail, from records, or assessed for new traffic (taking account of existing throughput) will identify those parts of the marshalling yard which might require more detailed safety analysis.

Historic incident data and operating experience at the marshalling yard involved or at other similar facilities can also be used to help this analysis.

E.3 - Identification of hazard sources

Hazard sources exist in circumstances where the normal safe operation of the marshalling yard can be disrupted. Normally hazards would arise from movement of wagons, although a wagon defect or external influence could also give rise to a hazard. However caused, the principal hazard would arise from loss of containment of the dangerous goods.

Hazard sources arise from, for example:

- a possibility of release from one wagon affecting others possibly involving different types of dangerous goods,
- external influences, e.g. natural hazards such as lightning or extreme weather conditions, and also the impact of adjacent manufacturing facilities or rail loading/unloading installations,
- security - unauthorised interference,
- design/maintenance/safety systems, e.g. inadequacies in design, operation, maintenance, temporary operating systems, maintenance of track, safety management, fire prevention.

The use of accident records, hence lessons learned from these accidents, is invaluable.

This review is best undertaken by those knowledgeable both in marshalling yard operation and with competencies in the equipment/design involved.

E.4 - Assessment of consequences

Assessment of the consequences is an essential input to establishing means of safeguarding the operation of the marshalling yard whether through technical or organisational means of prevention and mitigation.

Again the assessment should be proportional to the risk involved - whether judgmental, qualitative or simple modelling.

Consequence assessments identify the outcome of particular accident scenarios and help ensure that not only the general accident controls are in place but also effective emergency plans. The latter can involve both the marshalling yard (on site) and off-site plans together with any controls local authorities wish to apply outside a marshalling yard.

Recording decision-making processes in consequence assessment is important.

E.5 - Prevention control and mitigation

Accidents should where possible be avoided or reduced at source by the application of safe working practices. Residual risk should be managed on an as low as reasonably practicable basis, by application of appropriate measures.

These measures should seek to:

- prevent malfunction,
- prevent operations, which could lead to accidents,
- mitigate the effects of an accident on persons or the environment.

Typical prevention, control and mitigation measures for marshalling yards are:

- ensuring adherence to railway operating safety rules,
- ensuring shunting speeds are appropriate to the type of wagon and loads involved,
- ensuring the track is maintained to appropriate standards,
- planning and managing repairs and modifications to equipment,
- ensuring the availability of appropriate specialist advice relating to the dangerous goods involved,
- reviewing marshalling yard safety performance,
- ensuring prompt and effective emergency procedures.

Appendix F - Safety management

Key elements of a safety management system are:

- Organisation and personnel

Roles and responsibilities of all involved in the management system (including contractors), identification of training needs and provision of training. Identification of the areas of control involved.

- Roles and responsibilities of those involved in safety management

Awareness of hazards, managing abnormal situations.

- Identification and evaluation of hazards

For normal and abnormal operation. Assessment of likelihood and severity (see [Appendix E - page 51](#)).

- Operational control

Safe operation, maintenance and emergency operation, together with appropriate equipment.

- Management of change

Change to management arrangements and also permanent, temporary and urgent operational change.

- Planning for emergencies

Identification of foreseeable events by systematic analysis. Preparation and review of emergency plan.

- Monitoring performance

Adopting and implementing an on-going assessment of compliance with the objectives of the accident prevention policy and safety management system. System for reporting accidents and near misses. Investigation and follow up.

- Audit and review

Periodic systematic assessment of accident prevention policy. Suitability of safety management system. Documented review of policy and safety management system and its update.

Appendix G - Environmental considerations

This appendix details the considerations that need addressing in the environmental aspects of prevention, emergency planning and response. Many of these considerations relate to actions taken by agencies external to the railway undertaking, railway infrastructure manager or yard operator.

General Principles

G.1 - What is the environment?

The "environment" includes protected sites and the general wider environment comprising built features, air, water, soil, flora and fauna. An accident is considered to be major if it causes permanent or long-term damage to a particular unique, rare or otherwise valued component of the man-made or natural environment, or if there is widespread environmental loss, contamination or damage. The effect of an accident on the natural environment may be direct or indirect, immediate or delayed, temporary or persistent. Consequently, the indirect effects of an accident need to be considered as well as the more obvious ones. Food and agriculture as well as other features such as sewage and water-treatment works need to be considered.

G.2 - Assessing the environmental effects of accidents

The effects of an accident involving dangerous goods on the environment will depend on a number of factors particular to the accident. These can be considered by an environmental risk assessment, The aim of the environmental risk assessment is to show which hazards and events contribute to the risks to the environment from an accident. This allows prioritisation of effort in managing these risks. The depth of each assessment should be proportional to the potential hazard.

Risk assessments considerations are:

- the dangerous goods and operations involved,
- the pathways of contamination from the marshalling yard to the environment, and
- the location in relation to environmental features.

These considerations are expanded below.

G.3 - Nature of the pollution

When accidents occur, the nature of any pollution will be determined by the marshalling yard activities and by the dangerous goods present or released in the event of an accident. Assessments and plans should concentrate on those events and substances most likely to cause damage to the environment.

Not all emissions to the environment will cause damage. Knowledge of the toxicity and the behaviour of the dangerous goods that might be released into the environment are important. Some apparently harmless substances can have a damaging effect on the environment e.g. milk can damage watercourses by its very high oxygen demand. The degree of persistence of any material that reaches the environment is also of significance. A material that degrades very rapidly to harmless chemicals is less likely to have a serious effect than one that is persistent and has toxic characteristics. Ecotoxicological information on substances can be obtained. This will help highlight those dangerous goods that would pose higher risks to the environment should there be an accident.

G.4 - Pathways to the environment

To assess which areas which might be affected in the event of an accident, all possible pathways by which contaminants can reach the environment should be examined. The two main pathways for environmental contamination are by air and water. Contaminants may also percolate through the soil.

Effects caused by pollutants transported by air can cover a wide area and are more difficult to predict and control than those released to water. Precipitation may be in dry ash form, or dissolved in rain, snow, etc. The affected area will depend on weather conditions e.g. wind speed and direction.

Surface run-off into sewers (foul and surface-water), drains, discharge pipes and watercourses will cause downstream effects, potentially carrying contaminants a long way from the immediate area, and possibly reaching groundwater. The importance of this route for pollution will depend on the speed and flow of nearby watercourses and on the nature of the local drainage system.

G.5 - The local environment

In preparing an emergency plan to protect the environment, it is most important to characterise the features of the environment around the site. Determination of particularly important or sensitive areas will identify those areas for which particular protective measures may have to be implemented.

This does not necessarily require a detailed ecological audit. A preliminary study could be used to categorise broad features of land-use in the area, for example, residential, agricultural, fisheries, water bodies, or woodland. Local nature conservation agencies should hold most of this information. Nevertheless some form of environmental survey may be needed.

Any environmentally sensitive areas within range of the potential accident site need to be identified. In the case of rivers, sensitive areas put at risk by an accident may be some distance from the site. Environmentally sensitive areas might include those with statutory protection such as:

- sites of special scientific interest,
- areas of outstanding natural beauty,
- listed buildings,
- ancient monuments,
- protected trees,
- groundwater protection zones,
- water abstraction points or other areas of environmental importance,
- parks, zoological gardens and recreational areas.

The specific sensitivity of each site of special scientific interest will need to be determined. A site of special scientific interest might support a particular habitat type or species that is especially susceptible to some forms of pollution. Proactive protection may be the only realistic precaution.

Information on the location of important features relative to the water industry also needs to be obtained. Other nearby areas may be of importance to the local community, and information can be obtained from the local authority and from local conservation or special interest groups.

G.6 - Identification of measures to protect human health and life

Plans should identify specific actions and measures needed to prevent and to mitigate the impact to the environment from an accident. By considering the need for specific actions and measures in advance, informed decisions can be made that will help maximise the level of protection afforded to the environment by the plans. Some level of environmental damage may be inevitable, but it is vital to think through which, of a range of possible actions and measures to control an accident, will cause the least harm to the environment, and also protect especially vulnerable components. All planned decisions and actions need to be agreed and rehearsed in advance with relevant organisations. Obviously it is important to recognise that options considered should not conflict with measures to protect human health.

G. 7 - Li ai son

It is important that environmental protection aspects of plans are agreed with all parties involved in the response to an accident or with responsibility for any area, habitat, species or building likely to be affected.

A key accident response need is likely to be an adequate water supply. This would help avoid emergency services using sensitive water sources. For that reason the fire service will need to know where sensitive water supplies are, both to if possible avoid drawing excessively from them in putting out any fire, and to help avoid pollution of water through run-off contaminated water. If there are any specific mitigation measures in place on the site for the containment of this water, the fire service should be aware of them so that they can be used effectively. The fire service may also have antipollution equipment which might be available for deployment.

Liaison with agencies responsible for the environment is needed to establish the water quality in local watercourses, water abstraction points, the presence of aquifers and vulnerability of these features to pollution. These agencies may have emergency response arrangements to prevent contamination dispersion, although the drainage provided in railway infrastructure can make this difficult. Measures in their plans may include booming-off oil slicks, soaking up contaminants and diverting watercourses. They will also liaise with the water companies and operators to avoid damage to water and sewerage installations. In the event of a very toxic release, the public health or environmental protection specialist should be contacted.

As with other parts of any plan, liaison between those involved such as railway undertakings, railway infrastructure managers, yard operators, local authorities and neighbouring landowners and tenants, is also crucial.

G. 8 - Environmental cleanup and restoration

Provision will be needed for the cleanup and restoration of the environment after an accident. Plans may consider and identify initiating procedures, contractors and where appropriate, arrangements for:

- removing contaminated soil and debris,
- withholding foodstuffs (including those grown at home),
- restricting access to areas,
- restocking watercourses, lakes, woods, etc. and
- remediation of surface and groundwater supplies.

These are examples. Consideration should be given to removing contaminated soil and debris, whereas off-site plans may need to consider many more areas. Whilst the potential for particular pollution may be known it is only when an accident has occurred that the precise problem is known. Particularly important is the need to identify lead agencies, experts and specialist testing facilities.

Some remediation and restoration arrangements may be needed urgently after the accident (for example, access restriction), whereas others can wait until an environmental impact assessment has been carried out (for example, crops grown at home).

Contaminated areas can pose a continuing threat to the environment after an accident. Cleanup could require removal or cleansing of soil, ashes may need to be contained to ensure that they cannot blow away, drums of dangerous goods may need to be labelled and disposed of by licensed disposal contractors. Contaminated water held in bunds or storage may need to be removed and processed to make safe and non-toxic.

Remedial work may involve the replacement of contaminated soil with clean soil, along with replanting of vegetation. Fish populations in rivers and watercourses may require restocking. In severe cases, long-term projects may be required to rehabilitate areas and restore habitats.

A list of specialist contacts can be prepared for both cleanup and remediation, but it may be more appropriate to ensure that the administrative structures and arrangements are in place to facilitate rapid cleanup in case this is needed after an accident.

Where agricultural land has become contaminated by a dangerous goods release and a long-term risk to food grown in the area is identified, the affected farmers would undoubtedly claim compensation from those responsible. Depending upon the properties of the dangerous goods and technologies available, remediation costs might form part of the compensation claim.

G.9 - Food and agricultural products

The immediate actions to safeguard the public food supply following an accident rest with various government departments.

A release of dangerous goods during an accident may lead to local contamination of the food chain, usually through direct deposition onto pasture or crops from aerial releases. In some cases, this may occur from uptake into plants through contaminated water. When food or food animals become contaminated and there is a potential risk to people, that will need assessing.

Information on the extent and nature of the problem is gathered through government departments' local contacts. Investigation may involve the taking of blood samples where animals have been exposed, or the sampling of suspect food for laboratory analysis. Representatives of local agricultural department officials and environmental health officers will generally obtain information on an accident from the emergency services, rather than from yard operators directly.

Appendix H - Equipment

To be effective, plans need careful attention to be given to hardware and resources provided for emergencies, for example fire safety, signing and lighting. Plans should consider the following aspects and identify agreed equipment needs or improvements.

These aspects are as follows:

- first aid, emergency and rescue equipment (and availability of sufficient qualified staff),
- arrangements for immediate repair of equipment,
- emergency lighting provision and location,
- records of tests and maintenance of all equipment,
- specialist equipment for dealing with dangerous goods,
- arrangements for obtaining specialist equipment (location/contact arrangements),
- plans of equipment and systems (drainage, water, electricity, gas),
- recovery and breakdown equipment, e.g. cranes (road or rail), road/rail recovery equipment, lifting gear for all types of locomotives and rolling stock,
- equipment for dealing with environmental problems and spills e.g. use of containment booms, suction and bonding materials, also mopping up equipment,
- equipment necessary for site and personal safety,
- provision of refreshments,
- provision of care facilities,
- an effective fire warning system,
- sufficient suitable means, either portable or fixed, for fighting fires,
- control panel location(s),
- arrangements for communication between different control locations,
- adequate arrangements for the labelling, colour coding and operation of master control valves, switches, shut off controls.

This appendix has necessarily identified examples of equipment. Other specialist equipment may be necessary, should be considered and if appropriate referenced in the plan.

Appendix I - Exercise organisation

This appendix identifies aspects that should be considered when organising an exercise of an emergency plan. Those aspects involving more than one organisation should be agreed by all organisations involved.

In all cases a person should be appointed with overall responsibility for coordinating the planning, management and debrief of the exercise.

I.1 - Objectives

These should be identified both for the overall exercise and for each participant. Objectives must be matched to the resources each organisation is prepared to make available.

I.2 - Costs

Participants should identify who will be bearing costs involved.

I.3 - Legal issues

Consider the need for written agreements with:

- identification of responsibility for liabilities,
- indemnities.

I.4 - Assets to be used

With the site or rolling stock involved:

- agreement should be reached with the owner of any asset regarding its supply, physical condition before and after use, conditions attached to use whatever its nature,
- the identification of any inherent risks e.g. condition of rolling stock, with the identification and application of appropriate safety controls,
- how the site will be cleared after the exercise,
- the impact on infrastructure and normal rail operation assessed and agreed with other organisations actually or potentially involved.

I.5 - Other exercises

The organisation with overall responsibility for organising an exercise should seek to identify other exercises being held which could impact on or be affected by that exercise. This has the objective of ensuring resources are available and avoiding unnecessary duplication.

I.6 - Release of information

To ensure the effectiveness of exercises:

- appropriate constraints should be established on the prior release of information about an exercise (e.g. location, objectives, dates and times) both within participating organisations, externally and to individuals,
- arrangements should be identified for involvement of, or the release of information to, the media both for exercise and real time.

I.7 - Safety

A written safety plan should be prepared for all exercises involving full-size equipment or the operational railway. Plans may be of a generic nature, subject only to date and time changes, for exercises of a regular nature, e.g. evacuation exercises.

Safety plans should identify:

- a person with overall responsibility for all safety aspects involved in an exercise,
- the physical limitations of exercises both for players and those attending but not directly involved in the exercise,
- site access controls,
- responsibilities and arrangements for line possessions and operational safety,
- traction current isolation and earthing arrangements,
- the interface between real-time operation, the exercise site, exercise play and exercise control,
- the interface between exercise control and off-site controls,
- first aid and emergency medical arrangements,
- controls on hours of duty, rest and refreshment arrangements,

- arrangements for terminating an exercise for safety reasons before its planned conclusion,
- how the site safety arrangements are briefed to all those involved before the exercise commences.

I.8 - Exercise real-time control

Exercise control arrangements should identify:

- the roles and responsibilities of the person with overall site control,
- how that person will be supported by an exercise control team,
- the relationship between the exercise control arrangements, umpires and observers,
- the relationship between the person with overall site-control responsibilities and the person with the responsibility for site safety,
- interaction between exercise control and exercise play,
- how umpires (who can influence play) and observers are deployed, directed and managed,
- how an exercise will be concluded (early if necessary or if required for safety reasons) before it has run its planned course e.g. by use of an agreed code word.

I.9 - Debrief and feedback

A debrief should be held for all exercises involving all the participating organisations. The timescale for the debrief should ideally be set before the exercise. Large-scale exercises may necessitate a number of individual organisations debriefs followed by an overall debrief.

Lessons learned should be documented.

Appendix J - Model on-site emergency plan content

A suggested content of an emergency plan is as follows:

1. General information

- Marshalling yard and other rail operations and facilities involved
- Issuing organisation and contact
- Distribution/content/amendment record
- Introduction
- Objective of plan
- Area covered by plan/operational activities/site plan
- Organisation and Responsibilities
- References - other source information/other organisations plans
- Definitions

2. Initiation of plan and advices

- Type of emergency
- Alerting arrangements
- Emergency services and public authorities
- Advice to tenants and staff
- Rail operational protection of site
- Rail specialist response, instructions and action

3. Control arrangements

- Incident control arrangements
- Lead rail person
- Control point/location
- Emergency team arrangements
- Other agencies
- Communications
- Managing on-site equipment
- Checklist of actions
- Systematic checking
- Documented requirements
- Each scenario addressed e.g. fire, leakage, and gas release Traitement de chaque scénario, par exemple incendie, fuite de matière, fuite de gaz
- Managing site safety

4. Systems and equipment

- Systems and equipment
- Emergency service and equipment access
- Rendezvous points
- Equipment and resources
- Fire fighting
- First aid equipment
- Other services
- Other items of use
- Communications equipment

5. Evacuation and re-entry

- Evacuation and re-entry
- Maintaining evacuated areas
- Re-entry

6. Train operation

- Train operation
- Local
- Overview/route operation
- Resumption

7. Contact arrangements

- Contacts and telephone numbers
- Emergency services
- Rail organisations, their agents and contractors
- Tenants

8. Media arrangements

4. Care of those involved

- On/off site
- Casualties

10. Resumption of operation

5. Ongoing recovery

- Environment

12. Other issues

- Training and testing
- Review requirements.

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