

Oil spill training

Good practice guidelines on the development of training programmes for incident management and emergency response personnel



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Preface

This publication is part of the IPIECA-IOGP Good Practice Guide Series which summarizes current views on good practice for a range of oil spill preparedness and response topics. The series aims to help align industry practices and activities, inform stakeholders, and serve as a communication tool to promote awareness and education.

The series updates and replaces the well-established IPIECA 'Oil Spill Report Series' published between 1990 and 2008. It covers topics that are broadly applicable both to exploration and production, as well as shipping and transportation activities.

The revisions are being undertaken by the IOGP-IPIECA Oil Spill Response Joint Industry Project (JIP). The JIP was established in 2011 to implement learning opportunities in respect of oil spill preparedness and response following the April 2010 well control incident in the Gulf of Mexico.

Note on good practice

'Good practice' in this context is a statement of internationally-recognized guidelines, practices and procedures that will enable the oil and gas industry to deliver acceptable health, safety and environmental performance.

Good practice for a particular subject will change over time in the light of advances in technology, practical experience and scientific understanding, as well as changes in the political and social environment.

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Introduction

Effective oil spill preparedness requires personnel who understand, and can perform, a variety of emergency response and incident management functions. The purpose of oil spill training is to ensure that these personnel are identified and given appropriate opportunities to learn and maintain relevant knowledge and skills.

For the large majority of personnel, their role in oil spill preparedness will be an additional duty to their normal or daily job. Some of the skills applicable to a person's normal job may be directly relevant to their allocated role during an emergency, for example:

- managerial or supervisory capabilities;
- general logistical, procurement or administrative knowledge; and
- specialist knowledge on safety, legal or government and public affairs.



However, in all cases the unique and varied challenges posed by an oil spill response will require an understanding that extends beyond the normal experiences of a person's job. All personnel will therefore require some level of oil spill training to enable them to perform safely and effectively in the case of an emergency.

A training programme has its roots and genesis in the oil spill contingency planning process and its related oil spill risk assessment (for further information on contingency planning see IPIECA-IOGP, 2015). Programmes should be matched to the needs determined within contingency plans and be fit for purpose in both their content and delivery methods. This guide presents a stepwise process, herein referred to as the 'training cycle', to assist organizations and individuals in achieving this aim.

Terminology used in this document

The following definitions are provided to clarify some of the key terminology used within the context of this document:

- Training:** The process of imparting specific skills and understanding to undertake defined tasks.
- Knowledge:** To comprehend the theoretical or practical details of the subject.
- Understanding:** The ability to perceive or predict, or make judgement on the outcome of actions; it goes deeper than knowledge and recognizes a greater scope for problem solving and decision making.
- Skill:** The practised and expert ability to carry out an action.
- Competence:** The ability to perform a particular job in compliance with performance standards. This encompasses the technical requirements and skill to perform the job as well as having the relevant knowledge and understanding to enable the job to be carried out successfully under different and changing conditions.

The training cycle

The implementation of a training programme can be illustrated using the training cycle shown in Figure 1. The four elements of the training cycle follow a logical stepwise process of (1) assessing and identifying the training needs, (2) designing and developing a programme of training solutions to meet the needs, (3) delivery of the training to appropriate personnel and (4) evaluating the training to ensure the needs were met. This process is repeated periodically to ensure that the training programme remains relevant and suitable.

Figure 1 Elements of the training cycle



Needs assessment

The first step in the training cycle is the assessment and identification of needs. The extent and complexity of a Training Needs Assessment (TNA) will stem directly from the overall context within which it is conceived. The group or person responsible for undertaking the TNA for oil spill preparedness and response will vary according to organizational and management structures, but typically falls within an oil company's function or department covering health, safety, environment and security. In some organizations there may be a training department/function that will take an active and coordinating role during the TNA. This may include the integration of the oil spill preparedness TNA into a broader assessment of overall training needs. The training department may denote assessment tools and procedures with which the oil spill elements will need to be integrated.

The drivers of the TNA can be external, such as government guidance or legislation mandating training requirements. They may also stem from internal company commitments made with regard to approved standards, policies and expectations. Many companies in the oil and gas industry have developed internal training standards in order to drive consistency by providing a guideline or definition that represents a minimum requirement.



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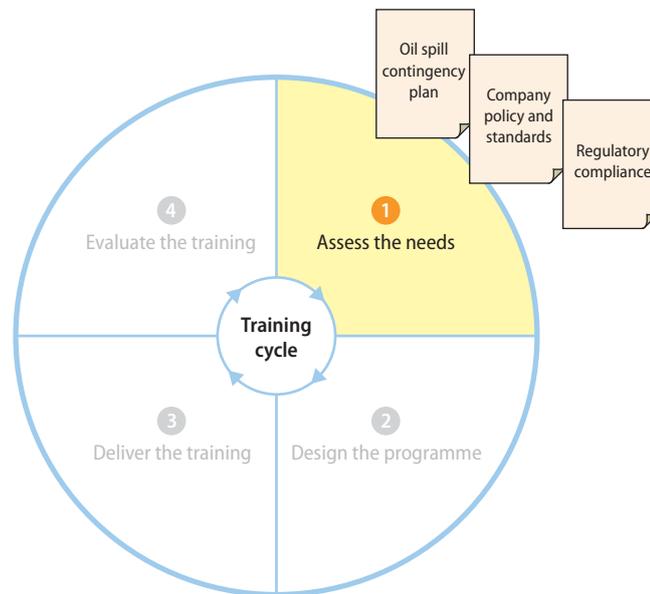
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The overall objective of an organization’s oil spill preparedness and response is relatively straightforward. It will be to ensure that, in the event of an incident, the capability is in place to mobilize, deploy and coordinate resources capable of mounting and sustaining an effective response commensurate with the operation’s risk. While the geographic, environmental and operational setting and risk profile will vary between facilities, it is likely that a significant number of roles and tasks for incident management and emergency response teams will require the same skills, irrespective of location. This simplifies TNA’s between facilities and indicates that many of an oil spill responders’ skills are transferable between sites and operations. It also allows for development of generalized training courses.

Figure 2 Step 1 of the training cycle—assessment of training needs



The training needs assessment should take into account the risks of the operation.

An oil spill contingency plan usually provides the starting point and bedrock for the TNA and consideration of learning requirements. A contingency plan should specify any mandated training requirements and include an organizational and geographic scope, as well as the relevant oil spill response methods and operational procedures to be employed. These contingency plan elements underpin and determine the skill and knowledge requirements for the incident management and emergency response teams that will implement a response.

The purpose of the TNA is to:

- identify knowledge and skills that already exist within an organization;
- provide an analysis of the necessary roles within a response organization;
- assess whether personnel are able to fulfil their allocated roles;
- identify gaps; and
- provide the basis for establishing the best learning methods and building a training programme based on needs.

The TNA should address both existing personnel and new members of the teams, taking into account likely staff turnover. The person(s) undertaking the TNA should have the full support and endorsement of an organization's senior management. This will empower them to investigate the current situation. No assumptions should be made concerning the existing situation; interviews with appropriate staff and reference to past training records are recommended.

Organizational needs

A company's organizational needs may be identified at corporate, regional, affiliate or facility levels, depending on the context of the TNA. This typically forms part of the tiered preparedness and response approach utilized in the contingency planning process.

At the corporate and regional levels the TNA's focus is typically on building a group of personnel capable of being mobilized rapidly from various locations to support affiliates and facility incident management teams, and to facilitate their interface with crisis management and business continuity functions. It may also involve the development and coordination of specialized regional or international response teams, which include subject matter experts and which are able to support ongoing response to incidents by providing detailed technical advice. The subject matter experts may be in-house personnel, or drawn from specialized contractors and spill response cooperatives.

Company affiliates and facilities are likely to focus on ensuring that their local personnel receive suitable training to enable them to fulfil specific roles in the functions associated with the staffing and mobilization of incident management and emergency response teams.

Within the context of the TNA, a list or matrix of skills (or competencies) may be constructed, detailing the skills required to enable the appropriate personnel to fulfil their role during an incident response. The extent of these skills and the numbers of personnel necessary to ensure that a suitable team is available can be determined by reference to the oil spill contingency plan. Determining the number of personnel trained in each role should take into account rotation (for a sustained response) and stand-by requirements for on-call primary responders, as well as secondary staff to support an ongoing response. An example of a detailed matrix mandated by the regulatory authority for a UK Offshore Installation Manager is provided in Table 1 (opposite). In this case, 15 modules identify the knowledge and skills required by the role and each is given a 'training level' which must be attained.

Individual needs

It is likely that large companies will have existing processes in place to identify the training needs of individuals, as an integral part of their performance review and career development programmes. These procedures should take their context from the organizational needs and provide an opportunity to establish and clarify the role a person may be expected to perform during incident response and management. This provides the framework for identifying the extent and level of existing skills or competencies of that individual and whether there are gaps to be addressed through targeted training.



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Table 1 Training requirement for UK offshore installation managers

Module	Knowledge	Skills	Training level*
Assess situation			
A1	Basic offshore reporting procedures required under MARPOL and OPRC Conventions and UK legislation	Use of PON 1 (Petroleum Operations Notice 1) report form, and compile required information	2
A2	Quantification of spillage	Find matrix for use with visual observation	1
A3	Potential sources on rig/platform or vessels	Quantify possible amounts of spillage from each source	1
A4	Properties of oil types present	Identify flash points and chance of ignition	1
Activate Oil Pollution Emergency Plan (oil spill contingency plan)			
B1	Use of Oil Pollution Emergency Plan (OPEP); understand the role of the Secretary of State's Representative (SOSREP) and the Operations Control Unit (OCU) and how it interfaces with the company response procedures	Skilled use of reporting section	3
B2	Knowledge of Company Shore Emergency Response Structure	Assess, quantify and report	2
Develop response action plan			
C1	Response options stated in OPEP	Use decision trees in OPEP	1
Establish and organize a response structure			
D1	Offshore field training and exercise programme	Risk assessment of incident	3
Activate operational response			
E1	Offshore emergency procedures	Mobilize offshore response teams	1
E2	Offshore Installation Manager's (OIM's) right to use in-field dispersant stock	Principles of dispersant spraying and use of standard dispersant use decision tree	3
Manage and control ongoing response			
F1	Oil spill behaviour and characteristics	Identify oil type, weather and sea conditions	1
F2	Basic prediction of movement of spills	Vectorial plotting	2
F3	Field safety procedures	Response safety management	3
Deactivate response			
G1	Assess further release potential and quantify risk of ignition	Risk assessment of further spill potentials	2
Debrief and report			
H1	Finalize details of reason for spill size, actions taken, etc.	Quantify spill size, identify reason for spillage, and prevent future spills; assess steps to be taken to stop recurrence; collect samples and evidence	2

* 1 = Description of requirement mentioned in module

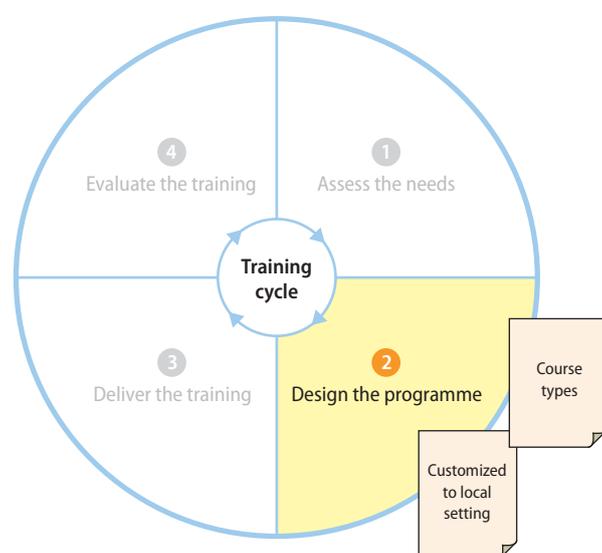
2 = Basic ability to undertake task described and tested in course exercise scenario

3 = Course module undertaken and exercised, capable of controlling task competently

Designing a training programme

When the TNA is complete, its findings and outcomes should provide a clear basis for establishing an appropriate training programme. It will have identified the number of personnel the programme will cover and the specific skill sets required. The programme may comprise a series of courses encompassing a variety of different activities but the key to success is ensuring a direct linkage to the outcomes of the TNA.

Figure 3 Step 2 of the training cycle—designing the training programme



Setting learning objectives

To ensure that a training programme is fit for purpose, it is necessary to set relevant learning objectives for all its elements. These should link to the skills and knowledge identified during the TNA. The learning objectives should be transparent and clearly stated, adhering to the SMART principles, i.e. **S**pecific, **M**easurable, **A**chievable, **R**ealistic and **T**ime bound. They should capture what personnel will be able to do when they have completed training. This may include the competencies they will be able to display and evidence that the learning has been successful. An example of two typical learning objectives relating to oil spill response methods is given in Table 2.

Table 2 Example learning objectives

Learning objective	Evidence of learning success (by the close of the relevant session)
Understand the main response methods, their advantages and disadvantages.	Person can list four response methods, and list three relevant advantages and limitations/disadvantages for each.
Understand the concept of net benefit and trade-off when authorizing or agreeing response methods.	Person can provide a coherent analysis of net environmental benefit, and can support this with an example scenario where this is used to make decisions concerning response.

Many organizations make use of oil spill training courses run as published events by professional oil spill responders. Alternatively they may commission in-house courses adapted from published courses. Well-designed published training courses or their adaptations will typically include the learning objectives associated with their various elements. This greatly facilitates the process of designing a training programme.

Language issues

Consideration should be given to the language in which training courses are to be developed and delivered. The language skills of both the trainees and instructors should be factored into the decision. If external training providers are going to be used, this may limit the availability of instructors.

Different approaches may be adopted for varying categories of personnel. Training for operational staff, who will largely be involved in equipment deployment, may require instruction in their first language. However, at the management level it may be feasible to deliver the courses in a second language. For maritime personnel it is often viable for courses to be delivered in English, due to their professional backgrounds. Many international oil company personnel are also likely to have English language skills.

Those designing and delivering courses should be sensitive to language issues and ensure that materials incorporate as much graphical and pictorial content as possible to aid understanding. Instructors should modify their delivery when a course includes persons who are not listening in their first language. Delivery should be slowed down and the use of vernacular or colloquial terms avoided.

Occasionally it may be necessary to consider using translated course materials and either simultaneous or consecutive interpretation of instructors. However, such a requirement for translation and interpretation services is likely to extend the duration of the course and can lead to significant additional costs.



Course types

IMO Model Courses

The International Maritime Organization (IMO) developed the International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC Convention) in 1990. This convention is now ratified by the governments of many countries and is the primary international instrument for the implementation of effective national response systems and international cooperation mechanisms in cases of major oil spills. The OPRC Convention obliges governments to establish a programme of exercises for organizations involved in oil pollution response and the training of relevant personnel. It also calls on the IMO to develop a comprehensive training programme in cooperation with interested governments and industry. The core of this programme is the delivery of IMO Model Courses on Oil Pollution Preparedness and Response; see Table 3, which includes courses at three levels, targeting:

1. operational staff;
2. supervisors/on-scene commanders; and
3. senior managers and decision makers.

IMO's approach is to have the Model Courses available for use in developing countries, bearing in mind the necessity to consider national and regional needs. Where required, the IMO has been prepared to assist countries that need advisory services or custom designed training in addition to the Model Courses. The Model Courses have formed an important tool for delivery of the Global Initiative, which is a joint effort between the IMO and industry to promote oil spill preparedness.



Table 3 Outline of the IMO OPRC Model Courses

Learning objective	Duration	Objectives
Level 1: First Responder	5 days	To provide operator-level personnel, responsible for undertaking on-site clean-up operations, with a complete overview of the various methods available for recovering spilled oil and cleaning polluted shorelines so that they can become effective members of an oil spill response team and be aware of other issues that are occurring during a spill.
Level 2: Supervisor/On-Scene Commander	5 days	To provide trained and experienced personnel, having significant management responsibilities under the relevant oil spill contingency plan to coordinate and supervise response operations, and be able to deliver a timely, organized and effective response.
Level 3: Administrators and Senior Managers	2 days	To provide an awareness of the roles and responsibilities of senior personnel in the management of oil spills of national significance, and the many, often competing challenges presented to them during a major spill. Senior representatives of all groups mentioned in the national oil spill contingency plan, or who could be involved in a Tier 3 response, need to be brought together to learn about issues through discussions with specialists and to develop a national coordinated/integrated response process for the management of major spills.

The Model Courses address oil spill planning, response and management. The courses were designed and developed by an international group of experts from governments and industry. They were originally developed in 1997 and are updated periodically. The courses are available in three of the IMO's working languages, English, French and Spanish.

The courses are meant to be presented to groups of various sizes to meet local needs, and incorporate both classroom and practical elements. Adapting the courses to the specific geographic, cultural and operational factors of a nation or region is encouraged.

Some governments make direct reference to IMO Courses as part of their mandated training requirements. Others have developed more detailed training requirements or guidance within the framework of the IMO courses. For example, the UK government has detailed courses for both the offshore oil industry and the ports and shipping industry. Where applicable, these UK courses can be matched to the equivalent IMO level.

Oil industry courses

The oil industry contributed to the development of the IMO Model Courses and has supported their delivery in many locations. Complementary to this involvement, oil companies have for many years utilized training courses developed to meet the needs of their oil spill contingency plans. This includes a suite of courses developed and delivered by oil industry-owned cooperatives, such as the members of the Global Response Network. Most of these courses are now matched to their equivalent IMO Model Course level.

A significant number of international oil companies have adopted emergency response organizations and procedures based on the Incident Management System (IMS). This has led to TNAs identifying an increased demand for courses in the use and implementation of IMS or similar incident management approaches. Training providers are developing courses to meet this demand from industry, including the suite of courses stipulated under the US National Incident Management System (NIMS) (see Table 4).

Specialized courses



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Various courses have been developed to provide specific training in specialized aspects of oil spill response. These courses may be aimed at professional responders and personnel retained by oil spill service providers. They may also target specific key aspects of site response or incident management and be aimed at the personnel allocated within the respective teams. By definition these courses have more detailed and focused subject matter content, compared to general courses.

Examining beach grain size during an environmental advisor's course

Examples of specialized courses include, but are not limited to:

- aerial observation and surveillance;
- clean-up site supervision;
- Shoreline Clean-up and Assessment Techniques (SCAT);
- environmental advisor;
- inland and terrestrial response;
- IMS training focused on the responsibilities of specific sections or positions.

Table 4 Examples of Incident Command System (ICS) courses that meet the requirements of the US National Incident Management System (NIMS)

Name	Description
ICS 100	<p>Introduction to ICS</p> <ul style="list-style-type: none"> • Purpose of ICS: identify requirements to use ICS, the three purposes of ICS, and common incident tasks. • Basic features of ICS: describe the basic features of ICS. • Incident Commander and command staff functions: describe the role and function of the Incident Commander and command staff. • General staff functions: describe the role and function of the Operations, Planning, Logistics and Finance/Administration sections. • Facilities: describe the six basic ICS facilities; identify facilities that may be located together; and identify facility map symbols. • Common responsibilities: describe common mobilization responsibilities and common responsibilities at an incident; list individual accountability responsibilities; and describe common demobilization responsibilities.
ICS 200	<p>ICS for Single Resources and Initial Action Incidents</p> <ul style="list-style-type: none"> • Leadership and management: describe chain of command and formal communication relationships; identify common leadership responsibilities; describe span of control and modular development; and describe the use of position titles. • Delegation of authority and management by objectives: describe scope of authority and the process by which authority is delegated. Management by objectives must be described and explained. • Functional areas and positions: identify the ICS tools to manage an incident; demonstrate the function of organizational positions within ICS; and demonstrate the use of an ICS 201 form. • Briefings: give an operational briefing and describe components of field, staff and section briefings/meetings. • Organizational flexibility: explain how the modular organization expands and contracts; complete a complexity analysis given a specific scenario; define the five types of incidents; and describe the importance of preparedness plans and agreements. • Transfer of command: list the essential elements of information involved in transfer of command; and describe a transfer of command process.
ICS 300	<p>Intermediate ICS for Expanding Incidents</p> <ul style="list-style-type: none"> • ICS staffing and organization: include reporting and working relationships and information flow. • Transfer of command • Unified command functions in a multi-jurisdictional or multi-agency incident • ICS forms • Resource management • Interagency mission planning and procurement

Specialized courses usually require a trainer with a higher level of experience in the subject matter than would be the case for broader-based courses. The attendance numbers are typically kept smaller, generating a lower trainee-to-instructor ratio, thereby facilitating detailed discussions and engagement.

Where specialized courses are being provided for a single facility or location on site, it may be viable to limit the course duration to one or two days. In some cases, half-day sessions spread over shift periods may be possible, if the availability of the instructors can fit this pattern.

Customizing courses

Customizing course content invariably enhances the relevance, focus and usefulness for trainees. Courses may be adapted to the local setting and context in various ways, which may include:

- ensuring relevant geographic, environmental and climatic references;
- introducing specific oil types in the context of their fate and behaviour when spilled;
- focusing on specific response methods, tactics and equipment types;
- integrating details and procedures from relevant organizations' oil spill contingency plans;
- incorporating national regulations, policies and contingency plans; and
- making reference to relevant regional agreements.

Identifying local shoreline sensitivities during a training course



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The extent of adaptations will depend on the course participants and the time available for preparation. If the participants are from different countries and organizations, the level of customization is likely to be limited compared to a course designed for personnel from the same facility or organization.

Relatively simple amendments may include changes to text, pictures and maps in presentations, and ensuring that group discussions and exercises reference the local setting. An experienced and informed presenter can make generic training materials relevant to the participants, using verbal references and encouraging discussion of local issues.

Refresher courses

For the large majority of responders, there will be no or very few opportunities to put into practice their skills and knowledge during a real incident. This is a positive reflection of successful oil spill prevention measures but does highlight the need to consider repeat or refresher courses, to ensure sustainable oil spill preparedness. It is possible that regular participation in an oil spill exercise programme will provide adequate opportunity to enable personnel to retain their skills and knowledge. This will depend on an individual's role and the frequency of their exercising. An individual assessment of possible refresher needs can be usefully incorporated into a person's annual appraisal.

National regulations may mandate the type and frequency of refresher training. Typically, three years is considered the maximum period between training; beyond this it is likely that personnel will lose a significant amount of their detailed knowledge. Regulations may accept participation in live exercises as a substitute for attending a refresher course. Accurate records of training course or exercise attendance are required to verify previous courses taken or exercises attended, allowing appropriate scheduling of repeat or refresher activity.

Refresher courses involve undertaking the same training as previously received. This brings administrative simplicity, as it does not require any new courses to be developed. A person can attend alongside new trainees. A refresher course can be developed to take into account the higher baseline knowledge of a person having received previous training. Such courses can achieve shorter durations by quickly covering fundamentals; this can also allow a focus on new developments. However, it can be challenging for an organization to populate refresher courses with viable numbers; personnel may have received initial training at different times and there may be attrition in numbers requiring refresher training, as personnel leave the organization.



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Group exercises can be an effective tool to check and reinforce learning objectives during refresher courses.

Course administration and session planning

Delivering a training course requires significant preparation both for the smooth administration of the event and the development of detailed content for each session.

Administrative planning

Training courses should be planned and scheduled well in advance of their delivery; typically, a training event will take a number of months to organize. Some organizations may have the resources to deliver a course using in-house personnel and resources. However, in the majority of cases, an external training provider will be needed; this will require a scoping, procurement and contracting process to identify a provider. In these cases, at least six months' lead time is recommended. Where published courses are offered by training providers, the administrative planning is carried out by them, and reservations on a course may be possible at relatively short notice.

The administration must include a process to ensure that potential participants are made aware of the course, whom the course is targeting, the course dates and location, overall aims and objectives, fees (if appropriate) and the practical details of how to register for attendance. For registered participants, information should be provided on whether any pre-reading is required and whether any personal protective equipment is needed (e.g. work boots, gloves, coveralls).

An example course description, used to assist potential participants considering attendance, is given in Annex 1 on page 30.



Session planning

A course programme should be developed to incorporate the elements of the course, allowing for suitable refreshment breaks and lunches. The course programme's content may follow a well-established and prescribed structure, if relating to IMO Model Courses or similar. More specialized courses require greater consideration of which elements need to be covered as discrete sessions and how time should be allocated amongst them.

Each course session should have a clear structure and purpose. The course organizer should consider and document the following aspects of each session:

- overall aim;
- specific learning objectives, i.e. the key pieces of knowledge or competence that participants should gain;
- duration;
- facilities and materials required, e.g. classroom, breakout areas, blackout, computer projection, speakers for video etc.;
- safety issues, particularly in relation to practical deployments and site visits; and
- transport, logistics and equipment for non-classroom activities.

An example of a session plan is provided in Annex 2 on page 31.

Safety issues, particularly in relation to site visits and practical deployments, are an important consideration when developing each course session.

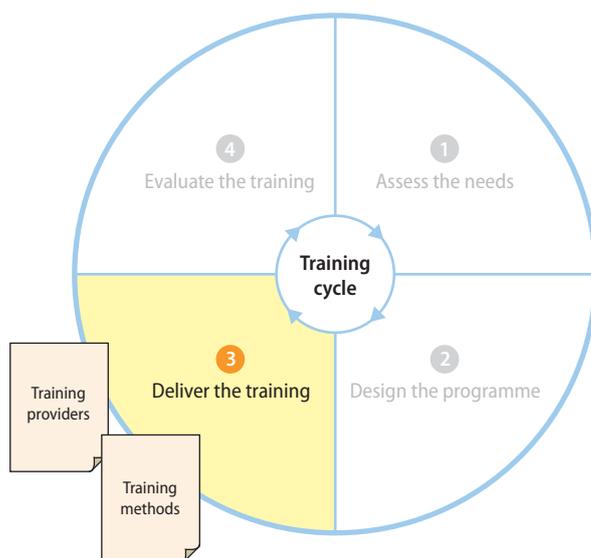


Training methods

'Tell me and I'll forget; show me and I may remember; involve me and I'll understand'
Ancient proverb

There are a number of methods and techniques which may be used to deliver training. In most cases a training course will involve a variety of these methods, with the aim of helping to retain the attention and interest of trainees. As a general principle the use of methods that actively engage the trainees is encouraged. Although a training course is likely to involve some degree of traditional presentation and explanation by an instructor, significant benefits in understanding, learning and information retention are gained when trainees are challenged to become involved in discussions, attempt table-top exercises and carry out practical deployments.

Figure 4 Step 3 of the training cycle—delivering the training programme



Presentations

Classroom presentations typically involve an instructor imparting his or her knowledge and experience to a group of trainees, often with the support of visual aids. The large majority of instructors use Microsoft® PowerPoint™ as the backbone of presentations, incorporating slides with a mixture of text, graphics, photographs and videos.

Each presentation should be structured to include a title slide, an introduction to the presentation's content, and a series of slides containing the main content and information, concluding with a summary slide to review the key points. Although presenters may encourage questions and discussion during the presentation, this method of training is relatively passive for many trainees. In order to prevent disengagement and loss of attention by the trainees, the following guidelines are recommended:



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- keep each presentation to a maximum of 45 minutes;
- use a relatively basic and simple slide design that does not distract;
- use a consistent, easy-to-read font and avoid small font sizes (generally no smaller than 24 point);
- restrict text bullets on slides to a maximum of six—also minimize the use of text animations;
- text slides should contain key words and avoid sentences;
- mixing pictures and text on a slide can be effective, but they should be complementary.

The instructor should be well-prepared and demonstrate enthusiasm for the presentation's subject matter. This will help to engage the audience and will ultimately improve their retention of information. Key techniques used by effective presenters include knowing the presentational materials thoroughly, speaking freely and with confidence, speaking loudly and clearly, and maintaining eye contact with the audience. The presenter should know their trainees' backgrounds and existing level of knowledge and experience—this will help the presenter to pitch the presentation correctly.

Where presentations are developed for use by different instructors, the use of slide notes is recommended. These notes should briefly explain the key message(s) of the slide and describe the relevance and purpose of any graphics, photographs and video.

Case studies

The presentation of case studies outlining salient aspects of an actual oil spill incident can be an effective method of demonstrating the realities of oil spill response. Trainees may have a particular interest in hearing about incidents that have occurred in their country or region; they may also be interested to hear the instructor's view of high profile incidents, in comparison to media coverage. However, caution needs to be observed when considering the use of case histories, as it may not be appropriate for an instructor to voice opinions concerning the aspects of an oil spill response and the competence of involved organizations. Using cases where official reports have been produced and facts are not disputed is recommended. In some cases professional videos have been commissioned covering incidents and these may be appropriate to include in some courses.

As a general rule, case histories should be used sparingly; typically only one would be incorporated during a course. An experienced instructor may use references to real incidents, of

which they have direct knowledge, throughout a variety of presentations. Caution should still be maintained to ensure only undisputed factual statements are made and controversial interpretations of spill events avoided.

Group discussions and exercises

Allocating time within a training course for group discussions and exercises can be extremely valuable. This is an excellent way to engage the trainees in the learning process. Group sessions can be organized in a wide spectrum of ways from simple facilitated discussions led by the instructor through table-top exercises to oil spill simulation exercises.

Facilitated discussions

Group discussions can take the form of facilitated sessions where the instructor leads the group, usually posing a question and asking for information or viewpoints from the trainees. These discussions may be used to uncover trainees' existing knowledge or perceptions; focus on details of an organization's oil spill preparedness or their specific geographic or cultural setting; and challenge the trainees to think about certain aspects of an oil spill incident and subsequent response.

A class may be split into small groups and asked to consider set questions for a short period before providing feedback to the entire class, with the instructor taking on the facilitation role at this point. Smaller groups allow more opportunities for all the trainees to contribute their views and thereby broaden the engagement.

Group sessions are typically of short duration, lasting for around 15–30 minutes. The main benefit of these discussions is to allow the trainees to feel involved in the courses and to allow the instructor to understand the trainees' perspectives of key issues.

Table-top exercises

Table-top exercises can be an excellent way for trainees to utilize and practice their learning. These types of exercises will typically be carried out in smaller groups of up to a maximum of five persons. An exercise will normally link to previous presentations and involve some background information to allow the trainees to answer a variety of questions. Typical exercises include but are not limited to:

- making manual predictions of oil slick's trajectory;
- estimating the quantity of oil from a simulated overflight;
- developing a situation display;
- proposing a response strategy for given spill scenarios; and
- developing shoreline clean-up and protection techniques for given oil spill scenarios.

Instructors need to ensure that trainees are provided with adequate background information and materials (maps, nautical charts, briefing materials and stationery) to enable them to undertake the allocated task, without being overloaded.

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A facilitated discussion provides opportunities for trainees to share experiences, and for the instructor to better understand his or her current knowledge.

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Table-top exercises allow trainees to practice skills developed during the course.

Time should be allowed for a full debrief of the exercise. A typical exercise takes around 45 to 60 minutes. Where appropriate, a worked example should be developed and handed out to trainees, as a take-away from the exercise.

Oil spill simulation exercises

Simulation exercises can help to bring a sense of the challenges faced by management and response teams during an incident. While an organization should have a full exercise programme linked to the training programme, it can also be valuable to integrate simulation exercises within a training course.

Usually a simulation exercise is scheduled near the close of a training course, allowing the trainees to experience issues and utilize knowledge obtained through the course. The extent and length of the simulation will be constrained by time, logistics, and the availability of instructors and support. Simulations can last for a number of hours, including the briefing, preparation and debriefing. A well-designed training course running over a number of days presents the opportunity to prepare for a final simulation using a series of table-top exercises throughout the course. Such table-top exercises can help the trainees gain familiarity with the geographical, organizational and operational setting of the simulation. This builds confidence and competence in the trainees and adds realism.



A simulation normally takes the form of the trainees being allocated roles within an incident management or response team. All key functions within a management team are normally required (command, planning, operations, logistics and finance). The team is required to respond to an oil spill incident, as directed and controlled by the instructor(s). The scenario should be simple and credible and usually runs in real time; typically the scale of the incident is pitched at Tier 2 (requiring consideration of response issues extending beyond the fence of a facility) and often incorporates the potential for Tier 3 support.

Testing decision-making capability should be integral to simulation exercises.

The instructor(s) take on the role of exercise coordinators and are required to drive the exercise through a series of scenario inputs (or 'injects'), to which the participants need to respond. The instructor(s) also need to observe the trainees and role-play a variety of organizations to provide inputs on weather, aerial assessments, casualty details, claims, media attention, public or interest group concerns, logistical problems and operational constraints. The availability of instructors is likely to constrain the extent of role play; however, where a number of instructors are available, care should be taken not to overwhelm the trainees with information or inputs.

Ideally, the facility used for the simulation should allow the incident management team to set up in their functional sections and make use of wall space to create a situation unit or information centre. The team should be provided with suitable maps, charts, proformas and a variety of stationery.

If the training is being delivered for a specific organization, it should be possible to use their oil spill contingency plan during the simulation. This will help to reinforce familiarity with the plan. If the trainees are from disparate organizations, it may be necessary to provide a generic oil spill contingency plan for simulation purposes. In both cases it is important that the participants are

provided with the basic procedures and key elements of an oil spill contingency plan, and that time is allocated to allow them to familiarize themselves with the plan prior to commencing the simulation.

If resources allow, a simulation can extend to the physical deployment of equipment and communications, and coordination between command and the field. It is also possible to add an element of public relations and media response. However, this level of simulation requires significant planning and preparation involving response equipment, logistics and staff, both to support the trainees and ensure safety.



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The allocation of trainees into required roles during the simulation limits the exposure of each individual to specific issues arising during the simulation. The debriefing therefore provides an important opportunity for lessons learned to be shared across the whole group, and should allow time for the trainees to be self-critical and share their feedback. The instructors should also provide feedback and ensure that the group takes away a positive experience from the event.

An incident management team exercise used as the conclusion of a training course

Site visits

Site visits can include viewing equipment stockpiles and familiarization with local environments, usually a variety of shoreline types and vulnerable habitats.

Equipment stockpile viewing

Where feasible, a visit to an equipment stockpile can be beneficial in building operational and logistical awareness. Depending on the location and transport time, a stockpile viewing is likely to take at least two to three hours. A stockpile may contain a variety of equipment items including containment booms, recovery devices, sorbents, temporary storage and dispersant application systems. Although the majority of equipment may be packaged and stored, it is usually possible to show the trainees examples of this equipment unpackaged, thereby enhancing and reinforcing explanations which may have been given in the classroom. The trainees should ideally be split into groups of a maximum of ten persons, with an instructor chaperoning each group around the equipment. Operational staff at the stockpile may be able to assist and help to chaperone the groups.



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Far left: equipment stockpile ready for deployment; near left: first-hand viewing of response equipment can reinforce key learning objectives.

Shoreline visits can incorporate familiarization and practice with shoreline assessment procedures.

In some cases the personnel maintaining a stockpile may be able to demonstrate some of the equipment, e.g. inflating or deploying short sections of booms or deploying recovery devices either from a quay or in a storage tank filled with sea water. First-hand viewing of equipment helps to emphasize its capabilities, limitations and safety factors. This is important for all trainees, even if they will not be allocated an operational role during an incident. Appreciation of what is realistic for each response option is fundamental for all team members. If the stockpile is part of the trainee's response organization, seeing the specific equipment available to them is also extremely useful.

Shoreline visits

Visits to local shoreline(s) can be used for a number of purposes, including explanation of differing environmental sensitivity, discussion of viable clean-up techniques, consideration of clean-up site control issues and procedures for shoreline assessment. In each case, group sizes should be a

maximum of ten persons for each instructor and a typical visit will take a morning or afternoon within a course programme.



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Ideally the chosen coastal area will contain a variety of typical shoreline types. The visit allows emphasis of issues which have been introduced in the classroom, from practical issues of possible tidal and current movements, through site access and safety concerns, to consideration of the abundance, diversity and sensitivity of different habitats. Active engagement of trainees can be achieved by incorporating a shoreline assessment exercise into the visit. Trainees can be provided with briefing and guidance on Shoreline Clean-up Assessment Technique (SCAT) procedures and asked to complete relevant SCAT forms.

Practical equipment deployments

Practical deployment of equipment is an extremely useful way for all response staff to gain an understanding of the associated capability, limitations, safety issues and logistical needs. For training courses targeting operational and supervisory staff, equipment deployments may be regarded as vital. If deployments cannot be incorporated into a training course, those staff who will take on operational and supervisory roles should have practical deployment experience built into their overall training and exercise programme. Personnel who are allocated a management team role will also derive great benefit from participating in at least one equipment deployment; this will provide them with a first-hand perspective of the challenges of deploying equipment and a realistic understanding of how long deployments take.

Significant planning and support is required to incorporate hands-on deployments into a training programme. Safety is the paramount concern. Each planned deployment should be subject to a



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risk assessment and all involved personnel should receive a thorough briefing on the specific tasks to be undertaken. Deployments should not be carried out in adverse conditions, such as bad weather, high seas or fast currents, unless such conditions are the specific reason for the training. Care should be taken with the equipment used to avoid its abuse or damage.



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Deployment activities typically require consideration of the following:

- equipment availability;
- possible vessel support for on-water activities;
- support staff;
- a suitable deployment site;
- transport to site;
- appropriate personal protective equipment for trainees;
- refreshments for trainees; and
- allowance of up to four hours within the course programme.

Supervision and control of deployments are essential. An instructor should have a maximum of ten trainees under his or her supervision to ensure safety, and should provide a clear briefing and explanation of the deployments. Deployments should not be rushed, and a controlled step-wise approach is recommended, first showing the trainees the tasks, and then allowing them to undertake and practice the activity. Support staff from the organization providing the equipment may be able to assist in supervising trainees. Typical deployments involve inshore booms, recovery devices and storage tanks which can be manually handled; though care should be taken with any manual lifting.

Online courses and computer-based tools

The widespread availability of Internet access and broadband connectivity is leading to increasing use of online/electronic training tools and e-learning courses. Courses offered online have the advantage of allowing trainees to access them remotely and at their convenience. However, the absence of an instructor, and the potential lack of motivation either to undertake or complete online courses may restrict take-up. Available courses tend to be relatively short, taking a few hours to complete. Developing engaging and interactive online courses requires a significant investment of time and effort.

A number of electronic tools have been produced to aid responders. These can be utilized effectively as part of training courses, either through demonstration by the instructor or, where feasible, by allowing trainees to access the tools directly. They may be also be used as further sources of information for trainees to access after the training course. Examples include simple tools to aid conversions between units commonly encountered by responders, models for



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estimating the fate and trajectory of spilled oil, and interactive websites that provide a primer on key aspects of oil spill response.

Manuals, workbooks and references

A wide range of published materials is available on the subject of oil spill preparedness and response, including a number of IPIECA-IOGP Good Practice Guides. The quantity of reading materials is likely to be far greater than can be viewed by the large majority of trainees and this should be borne in mind when providing references. Many publications are freely available for downloading online; a list of suitable websites can be provided to trainees at the end of the course. The type of course will determine which publications are recommended or highlighted. The majority are available in English, but a number have also been produced or translated into other languages.

Consideration should be given to providing a course workbook to the trainees, usually containing copies of the presentational materials used. The workbook may also contain summary text about subjects covered and other supporting materials. Workbooks can provide space for trainees to make key notes during presentations but should prevent the need for copious note taking.

Various manuals and guides on the subject of oil spill clean-up are also available, and these may be highlighted to trainees as useful tools to support spill response or simulation exercises, especially when used in conjunction with their oil spill contingency plans.

All workbooks, manuals and other reference materials can be handed out electronically to each trainee. Although this can provide each trainee with large amounts of materials, it must be accepted that many trainees may not access parts of this material. Again care needs to be taken not to overwhelm the trainees with too much material.

Instructor requirements and experience

An effective instructor is a critical element for a successful training course. In addition to thorough lesson planning, the instructor should have a suitable background, experience and presentational skills. The minimum requirements for an instructor will vary with the type of course. In cases where more than one instructor is delivering a course, it is viable to have less experienced tutors under the control and supervision of an experienced senior instructor. A senior instructor should have a minimum of five years' experience in the field of oil spill response.

Typical instructors have practical experience responding to oil spill incidents, covering both Tier 2 and Tier 3 events. Where a course's focus is on operational issues and includes practical deployments, the instructor should have hands-on knowledge and experience of the equipment to be used.

The instructor should have familiarity with the content of relevant oil spill contingency plans, at facility, regional and national levels as appropriate.

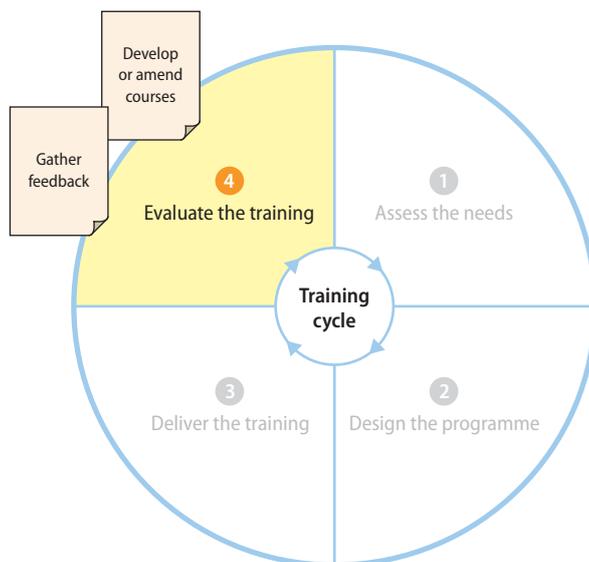


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Evaluation of training

Evaluation of the delivered training is necessary to verify that learning objectives are appropriate and being met, and that instructors are achieving acceptable standards; it also enables the identification of potential areas for improvement in the training content or experience.

Figure 5 Step 4 of the training cycle—evaluation of the delivered training



Gathering feedback

Trainees

Participants in training should be given various opportunities to provide feedback on their experience. At the informal level, this can be a one-to-one dialogue or group discussion with the instructor(s), either during course breaks or at the end of a course. Such dialogue has the advantage of allowing the instructor to interact directly and thereby fully understand any suggestions; however, some trainees may be reluctant to make comments face to face, in case they are perceived as being critical of the instructors.

Written feedback provides a more formal and structured method to capture trainees' feedback. An evaluation form may incorporate the opportunity for trainees to rate course sessions and express their overall views on the course delivery and structure, e.g. administrative arrangements, the balance of teaching methods, and quality of presentational materials. Rating or scoring techniques may provide information on strong or weak points in a course but written text should also be encouraged on feedback forms, as this will clarify and specify any issues. Trainees should be allowed adequate time to complete feedback forms; if feedback on individual sessions is either



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Ensuring that trainees remain involved and have an enjoyable experience will help them to retain more information.

required or requested, it is useful to hand out feedback forms at the commencement of a course. While the learning process is at its most effective when trainees are engaged, care should be taken not to place too much reliance on subjective feedback concerning the level enjoyment of trainees. Focusing on measures that address whether the trainees have met the identified learning objectives is encouraged.

If a training provider has specific needs for feedback, e.g. if they have developed a new course or a significantly revised one, there may be occasions where a call to a trainee a short time after the course may be useful. This call would typically be made by a person other than the course instructor, to encourage unbiased verbal feedback from the trainee.

Peer review

Instructors will benefit from periodic peer review. This involves a second instructor observing the delivery of either a session or presentation, and who will subsequently provide constructive comments. Typically, a peer review is used by senior trainers in a mentoring role for junior training staff. The emphasis should not be on finding fault, but rather on highlighting areas of strength prior to making suggestions concerning areas for potential improvement in style and delivery.

Learning retention

It is important to assess trainees' retention of knowledge during the course; however, many organizations will not have the resources available to undertake comprehensive follow-up assessments after completion of the course.

During the delivery of course, the instructor can gauge the level at which trainees are building knowledge and retaining information. This may be achieved by simple techniques such as asking the trainees occasional questions and through the use of short table-top exercises. Assessing the retention of knowledge beyond the training course is much more challenging. Most organizations do not have the resources available to undertake comprehensive follow-up assessment of trainees. The primary method for checking and ensuring that trainees have retained key information is through the integration of training and exercise programmes.



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Putting skills and knowledge into practice through structured oil spill simulation exercises is a very effective way to ensure that learning is retained. Therefore, the joint planning or integration of training and exercising programmes is highly beneficial and ultimately complementary.

Course amendments

A training course should be reviewed using the evaluation mechanisms, to ensure it continues to meet the needs for which it is designed. Amendments to a course's content and delivery methods may be triggered by a variety of considerations, including:

- a systematic review of the participants' feedback, identifying consistent comments that an aspect of the course either did not meet expectations or could be improved;
- the availability of new training materials, such as photographs or video from recent incidents, which are better able to illustrate course content or provide a more relevant context;
- the availability of new technical information on oil spill research or equipment development, or from practical experiences during incidents or exercises; and
- amendments to a relevant oil spill contingency plan, requiring potential updates to course materials where they include references to the relevant plan.

The frequency of the review process will depend on how often the course is being delivered, the availability of personnel to revise materials, and the ad hoc nature of some of the items listed above. It is recommended that a course is formally reviewed annually and that this process is documented.

Assessing competencies

A training programme should provide the opportunity for participants to build knowledge and skills relevant to their assigned roles, as established during the TNA. Some organizations may require evidence that the training has enabled the trainees to achieve clearly-stated learning objectives and specific competencies. Competencies should be defined in the context of a particular skill or activity and assessed against stated performance standards. Box 1 provides an example.

Assessment can be a formal or informal process. Tools to assess competence may include question and answer sessions, quizzes, short table-top exercises and 'fill in the blanks' hand-outs. In all cases appropriate documentation of the assessment is required and should be maintained for reference. Such documentation could include:

- products of work
- witness testimonies
- records of questioning
- reflective accounts
- technical discussions
- observations.

Box 1 Assessing competence to plan a protection boom deployment

The following key elements should be included in a boom protection plan. The brackets indicate the competency objective:

1. Constraints on deployment (identify suitable access point and likely currents).
2. The type of boom (identify compatible shore-sealing and skirted boom).
3. Calculate angle of boom deployment (identify maximum angle to 10% accuracy for assumed current).
4. The length of boom (identify length to 20% accuracy).
5. The number of anchor points needed (identify to 10% accuracy for chosen boom length).
6. Generate equipment list (list should be appropriate to site and typically include workboat, ancillaries, communications and personal protective equipment).



OSRL

New response technologies, such as the subsea dispersant injection system illustrated above, should be incorporated into courses as they are developed.

Certification and accreditation

Organizations should keep records of courses delivered for their staff, including the dates of courses and details of personnel attending. These records often form part of oil spill contingency plans and are required to demonstrate that suitable trained personnel are available in the case of an incident.

Course certification

As part of a course's administration and record keeping, it is usual to issue certificates to trainees upon completion of a course. The certificate normally includes the name of the course, the date(s) held, the name of the trainee and their organization. It is common for the lead course instructor or another senior person to sign the certificate.

Certificates provide evidence of completion of a course, usually through attendance. Some organizations may stipulate a minimum attendance time (e.g. 90%) and maintain a register through the course. In cases where competency-based training is being certified, there may be a requirement to take a test or other form of assessment prior to issuance of a certificate, to demonstrate that a performance standard has been achieved.

Course accreditation

There is no international scheme for the accreditation of oil spill training courses. Whilst the IMO has developed the OPRC Model Courses, schemes to approve or accredit oil spill training providers are left to national administrations, although the IMO may recognize national schemes. The most developed and recognized scheme is the Nautical Institute's accreditation scheme, based in the UK (see Box 2).

In some countries there is a statutory requirement for health and safety training prior to participation in oil spill clean-up operations and related activities. For example, in order to protect workers, the USA has established the Hazardous Waste Operations and Emergency Response (HAZWOPER) standard. This mandates responders to receive specified training and periodic refreshers from certified instructors.

Box 2 *The Nautical Institute's accreditation scheme*

The Nautical Institute accredits oil spill training, on behalf of the UK Maritime and Coastguard Agency, as required by Article 6(2)(b) of the OPRC Convention. The accreditation scheme has been in place since 1996 and it has expanded through demand to include training organizations outside the UK. Accreditation involves an assessment of a training provider offering a particular course where The Nautical Institute verifies the standard, approves the training provider and issues a certificate. The training provider is re-assessed at regular intervals and has to maintain specified standards and records. Under this scheme there are five maritime courses and four offshore oil industry courses, with identified equivalencies to IMO OPRC Model Courses where appropriate.



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References and further reading

API (2014). *Guidelines for Oil Spill Response Training and Exercise Programs*. American Petroleum Institute (API) Training and Exercise Workgroup, Joint Industry Oil Spill Preparedness and Response Task Force (OSPR JITF).

IMO (2006). *Oil Pollution Preparedness, Response and Co-operation (OPRC) Model Courses, Levels 1, 2 and 3*. Available as a CD.

IPIECA-IOGP (2015). *Contingency planning for oil spills on water*. IPIECA-IOGP Good Practice Guide Series, Oil Spill Response Joint Industry Project (OSR-JIP). IOGP Report 519.

<http://oilspillresponseproject.org>

Acknowledgement

The assistance of Petronia Consulting Limited in the production of this document is gratefully acknowledged.

Annex 1: Example course description

IMO Model Course, Level 2

Benefits

- Effective coordination of response
- Correct decisions on response options and prioritized actions
- Effective monitoring and reporting
- Efficient use of field resources

Who should attend?

- Any personnel designated to coordinate field activities
- Members of an incident management team
- Personnel responsible for coordinating the work of other agencies involved in a response
- Personnel who have already undertaken a Level 1 course and have increased supervisory responsibilities

Course duration and dates

4 days: 16–19 June 20XX,

Course location

Singapore

Topics covered

- Oil spill behaviour, fate and effects
- Spill assessment
- The use of dispersants
- Containment and protection
- Recovery of oil
- Controlled in-situ burning
- Bioremediation
- Shoreline clean-up
- Contingency planning
- Response management
- Site safety
- Transfer, storage and disposal
- Operations planning
- Liability, claims and compensation
- Evidence gathering and documentation
- Response deactivation
- Media relations
- Post-incident briefing

Annex 2: Example session plan

Section 1: Organization and administration

Course: Shoreline Supervisor

Session title:	Sensitivity mapping
Aim:	At the end of the lesson, the students will be able to understand the advantages of sensitivity mapping in contingency planning and in guiding oil spill response operations.
Assessment:	Maps will used during table-top exercise at close of the course.
Prepared by:	A. Smith
Review date:	19 June 20XX

Administration

Duration:	45 minutes
Location:	Facility training centre
Risk Assessment:	Ensure all trainees are aware of fire drill etc. ... and that there are no trailing cables.

Resources

Presentation:	Add hyperlink to file location.
Equipment:	Projector for presentation Whiteboard / flipchart and pens (optional)
Additional support personnel required:	None
Transport:	None
References:	IPIECA/IMO/IOPG publication, <i>Sensitivity mapping for oil spill response</i> (2012) NOAA website information and downloads concerning Environmental Sensitivity Index Maps: http://response.restoration.noaa.gov/maps-and-spatial-data/environmental-sensitivity-index-esi-maps.html

Session outcomes

1.	Describe sensitive resources.
2.	Describe the benefits and uses of sensitivity maps.
3.	Understand about priority ranking of sensitive resources.
4.	Know how to develop a sensitivity map.
5.	Identify map requirements and how to meet them.

continued ...

Section 2: Execution

Interest:	Link the session to the environmental effects of spills, contingency planning and the need to identify sensitive areas in advance of a spill.
Need:	<p>Sensitivity maps provide incident management teams with essential information on where ecologically sensitive areas and economically important resources are located and the priority areas for protection and clean-up.</p> <p>Highlight the need for all planning and operational personnel to have an understanding of the importance of knowing the environmental sensitivities of a threatened or affected area.</p>
Objectives:	By the end of the session, delegates will be able to ... (state session outcomes, listed above).
Summary:	Should be clear and concise. Recap the aim and objectives of the session.
Assessment:	Trainees will be using sensitivity maps during the table-top exercise at the close of the course.
Look forward:	Look forward to discussions on NEBA (Net Environmental Benefit Analysis) and the choice of response options to minimize damage; this will draw on the information contained in sensitivity maps.

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IPIECA

IPIECA is the global oil and gas industry association for environmental and social issues. It develops, shares and promotes good practices and knowledge to help the industry improve its environmental and social performance; and is the industry's principal channel of communication with the United Nations. Through its member led working groups and executive leadership, IPIECA brings together the collective expertise of oil and gas companies and associations. Its unique position within the industry enables its members to respond effectively to key environmental and social issues.

www.ipieca.org



IOGP represents the upstream oil and gas industry before international organizations including the International Maritime Organization, the United Nations Environment Programme (UNEP) Regional Seas Conventions and other groups under the UN umbrella. At the regional level, IOGP is the industry representative to the European Commission and Parliament and the OSPAR Commission for the North East Atlantic. Equally important is IOGP's role in promulgating best practices, particularly in the areas of health, safety, the environment and social responsibility.

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