



# Working safely in the shipbreaking industry

Train the trainer manual



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# Preface

The first visit of one of FNV's shop stewards to a shipbreaking yard in India is already a decade ago: it was in 2010 that Joop van Oord participated in a large gathering of Mumbai's shipbreakers and without any hesitation he addressed the crowd. He told the workers that when working in a shipyard, it is very important to always look up, instead of looking down. Danger always comes from above where heavy metals are swinging around, and scrap is falling from the ships to be dismantled. For the mostly migrant shipbreakers, coming from a rural agricultural background, and used to look down to the earth, this knowledge could be lifesaving. Who better could be a trainer than a former worker on a shipbuilding yard in the Netherlands: building a ship gives insight in how to dismantle a ship in a safe and sustainable way. It was for this reason that IndustriALL and its affiliates asked FNV Metal sector and Mondiaal FNV to support OHS training. In the years there after, the shop stewards Joop van Oord and Martijn van de Beurcht and trade union official Ruud van den Bergh from FNV developed an instruction film and gave six Train the Trainer courses on Occupational Health and Safety to 141 shipbreakers and safety officers from India, Bangladesh and Pakistan. Shipbreakers were trained in a participatory way to grasp often complicated technical subjects. A moment never to forget came when one of the participants told the FNV trainers that when a fire broke out on one of their ships, it was only because of the OHS training that they knew how to act, and several lives were saved.

Early this year the COVID 19 pandemic hit south Asia. Because of travel restrictions, OHS training by FNV shop stewards was not possible anymore. It was then that the idea was born to compose a Train the Trainer manual that was based on the many OHS trainings already given. Facilitated by Pauline van Norel from MDF Training & Consultancy, Joop van Oord and Martijn van de Beurcht worked relentlessly in writing the various modules and made an easy-to-use training manual that can be applied by trainers in India, Bangladesh and Pakistan. The manual will be translated in the three main languages used: Hindi, Urdu and Bengali.

With these activities a valuable and lasting bond was forged between shipbreaking unions in South Asia and the FNV Metal sector, now facilitated by FNV trade union official Carl Kraijenoord. Herewith we would like to thank the FNV metal sector for their valuable input in these trainings and in this manual, and we wish all users a life-saving training.

Karen Brouwer  
Managing Director Mondiaal FNV

# How to use this manual

The Shipbreaking sector deals with the gigantic challenge to work in a safe and healthy manner. OHS trainings are an important element to make this happen. This manual is written to enable the participants of the 'Train the Trainer courses on Occupational Health and Safety' to deliver the OHS training on their own. This will spread the message faster and will enable a far bigger group to benefit from these trainings.

This manual consists of 2 parts, Part A is to equip future trainers with some background information on how to deliver a training. It focuses on how people learn and how to organise an effective training. Part B consists of all the different subjects that are part of a training on safe shipbreaking.

This manual is not a recipe book but a guide to get you started in developing your own training. Mastering the subject is the first requirement and with new technologies, new rules and regulations things are changing and what is written today needs to be checked tomorrow. Therefore, as user check the information, work together, contact Joop or Martijn, have fun trying out new training methods and make a training that sticks and save people's lives!

ENJOY READING!!!



# Part A Trainers skills

# 1 How do people learn

## Summary

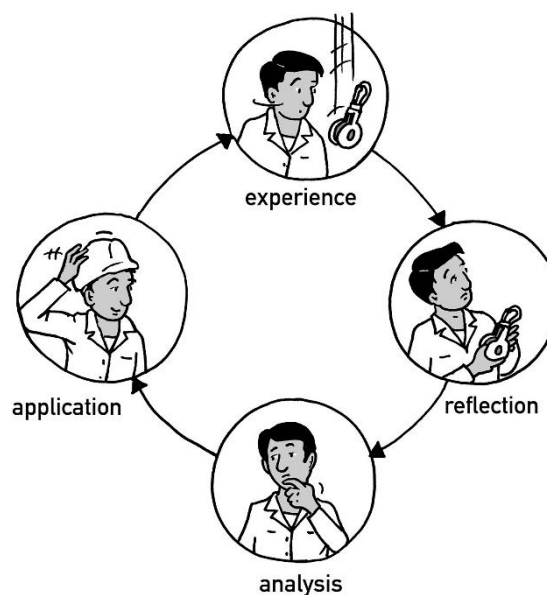
People learn best with concrete experiences and when the learning relates to how our brain works. The experiential learning theory shows that a concrete experience, with reflection and analysis can lead to new behaviour. The Brain Based theory adds to this and states that building on existing knowledge, focus, repetition, creation and involving all our senses and emotions makes the learning stick.

## 1.1. Experiential learning cycle

In general, you can say that adults learn different from children. In schools the children repeat and rehearse what the teacher says. For most adults their natural way of learning is that they learn from positive or negative experiences, we call this learning by experience or **experiential learning**. This natural way of learning you can use in the set-up of a training.

David A. Kolb described this experiential learning in a 4-step cycle:

1. **Experience** - Something happens to someone, something good, bad or unexpected.
2. **Reflection** - You reflect and think about this experience, you wonder what happened and why.
3. **Analysis** – You analyse your observations and compare them with other experiences and information. You start to see a pattern; you invent a model or recognize a theory.
4. **Application** - Finally, you put the new thinking into new ways of working. You try it out and actively experiment with it to see it makes sense in the real world.





When you translate this model to the classroom, you realise that teachers often start with step 3. They teach new models and theories through large presentations and after class students are supposed to know what to do. In reality only a few students will know, and the majority will not. As a trainer you should lead your participants through all four steps. That way everyone will learn and know what to do after the training. The proof of the pudding is in the eating. Only when people change their behaviour after the training in everyday life, your training has been successful.

To follow all four steps of the learning cycle is also important because not everyone learns the same way, **people have different learning styles.**

Different learning styles become visible when we look at how people approach a new task or activity. Let's take the use of a new smart phone.

1. Some people like to press immediately the buttons on the screen to discover how it functions (active experimentation)
2. Some people might prefer to first see other people using the smart phone (reflective observation)
3. Some people might first want to read the user instructions before pressing any button at all (abstract conceptualisation).

This all depends on your personal learning style. We all want to be able to use our new smart phone (active experimentation), but we get there in different ways.

As trainer you have to be aware of the different steps of the experiential learning cycle and the different learning styles that people have. By going through all the steps, you make sure you include everyone. This does not mean that you always start the same way. You have to look for variation, sometimes you start with a real-life example, another time you start with a model or theory. In the chapter on training methods this is worked out in more detail.

**The learning cycle is a continuous cycle, and the key is for your trainees to undergo all four steps actively during the training. This will make the difference between a good and bad trainings.**



## 1.2 Brain Based Learning

Since the last decennia there has been a lot of research on the functioning of the brain. This new knowledge has resulted in significant changes in the field of education and training. Based on the knowledge and function of the brain, the learning theory called 'Brain Based learning' has been developed.

The challenge is how to link up best with the natural functioning of the brain in order for the learning to stick.

In our brain we have nerve cells that we call neurons. These neurons receive and send information to each other. When new information and experiences come into our brain, the neuron grows branches and form neural networks in our brain. Every time we speak, move or think, communication is taking place between tens of thousands of neurons.

A pattern of neurons communicating to each other only remains shortly in our memory. But when we can strengthen this pattern it becomes a more permanent network in our brain, and we will remember more. **This is what learning is all about, to make our neural networks strong.**

This working of the brain can be translated into six brain-based learning principles, formulated by Dirksen (2010) and help us to design courses that make our training stick in people's mind. These six principles are very practical and take the perspective from a trainer.

### Principle 1: build on existing knowledge

It is important to activate what people already know. Our brain always looks for how it can relate new knowledge to existing experiences. If you find those hooks it is easier to remember the new knowledge. When new learning is clearly linked to the old one, it will be easier to recall them for a trainee.

**This means for the training:** reflect regularly on the experiences on the yard and what trainees know already on certain topics. Make sure you make the connections and build bridges between new and old knowledge.

In some cases, you might find out that old and new insights are conflicting, this makes it even more difficult to make new ideas stick. As trainer you have to make these differences explicit in order to be able to dissolve any resistance.



## Principle 2: Focus

A trainer should make sure that the course has a clear focus; what is the desired result and what is the context. When it is clear for the trainee why and what they are going to learn, their mind will pay more attention to the subject. And the more attention our brain gives to an experience the better it will be processed and remembered.

**This means for the training:** use examples that are closely linked to the context of the trainees. Talk about their yards, their country and give examples how they are going to use the new skills in their daily life. Visualisation of the desired result (for example how looks a safe shipbreaking yard) can be very helpful to let trainees imagine themselves how to use new skills or knowledge. Use and be a role model, setting of a good example will help to make things real and concrete, this is very powerful.

## Principle 3: Repetition

Repetition and practice are crucial to create new and strong neural networks in our brain. Many of us know the small path in mountains or pastures created by goats or sheep, when frequently used; this turns into a lane and finally becomes a road due to such intensive use. The brain works in the same way; every time the same message is repeated you remember it more easily.

**This means for the training:** spreading the same message over time is more effective than presenting everything at the same moment in time. Give the brain some time to process information, otherwise it might get saturated. So, make sure that trainee's recall a new message a few times during the day or the week. Additionally, it is important to not 'just' repeat exactly the same message but to use variation in the way you (make them) recall a message to avoid boring trainings.

## Principle 4: Use of emotions

Learning and remembering are easier when emotions are involved. As a trainer you should make learning something new and exciting. When people are a bit aroused and enthusiastic the neural networks become stronger. People learn best when the challenge is big and the stress is not too high. If there is not enough challenge people will be bored and lean backwards, if the stress is too high people will go back to instinctive behaviour of feeling helpless instead of paying attention to the learning.

**This means for the training:** as trainer you want to avoid real stress and rather provide unexpected elements and trigger the curiosity of your trainees. When people experience different emotions (fun, sadness, empathy) this will reinforce the learning.

### **Principle 5: Make it sensory rich**

One image says more than a thousand words....

Images are often better remembered than words, especially faces. To process information the brain uses different locations. By offering information through different senses you activate several neural networks at the same time. This means you create more 'entrances' to the information, more possibilities to store the information and more associations to recall it afterwards.

**This means for the training:** you should use as many images or films as possible. Do not only think of You-tube videos, why not let trainees make drawings or paintings (or do it yourself). Also do not forget about music, smell and gestures.



### **Principle 6: Encourage creation instead of consumption**

The brain likes to create rather than consume. The brain is formed to order information itself and to recognise meaningful patterns. It permits trainees to use their own existing associations based on former experiences and knowledge what will again help to make new insights sink in better.

**This means for the training:** you should assure and encourage participants to discover things themselves, exchange experiences and work actively. Use active exercises and assignments. There is always room for a certain amount of 'lecturing', but only to provide basic knowledge to get started.

**The Brain based principles serve as a checklist to verify whether you have done everything to make new learning stick into the trainees' mind.**

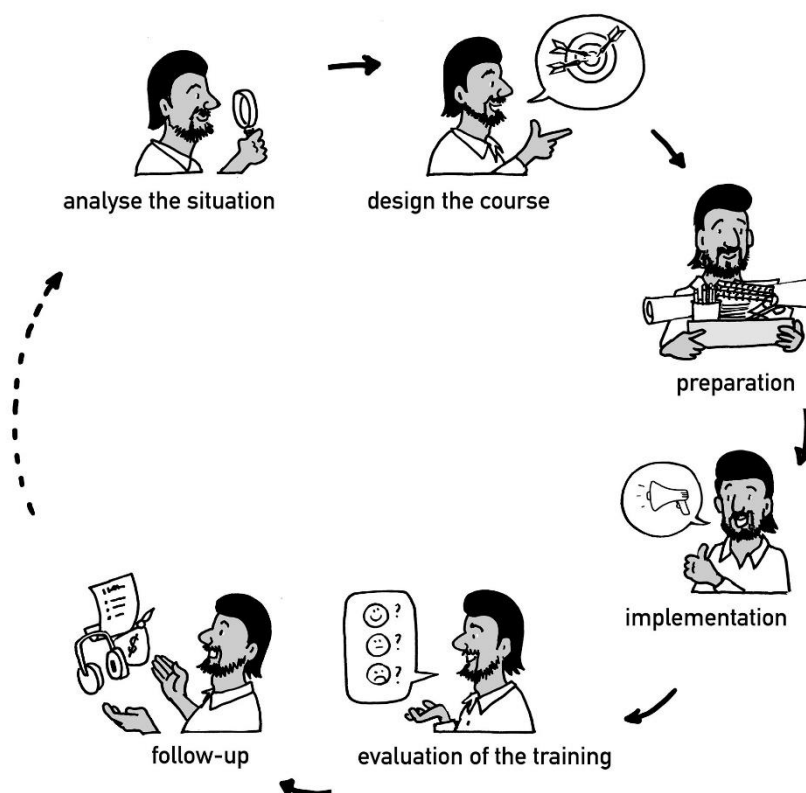
# 2 How to organise a training

## Summary

A training needs proper preparation, the training cycle shows the different steps that need to be taken: analysis of the situation, course design, preparation, implementation, evaluation and follow up. In each training the learning objectives and the key messages are the heart of the training and influence the choice of training methods. Each training delivery consists of different elements from opening to closure that need attention.

## 2.1 Training Cycle

When you organise a training, we can divide six steps on the cycle to a successful training. For trainers all six steps are equally important, but some will take more time than others. Below you find an explanation of the different steps. In attachment 1 you will find a checklist for each step what to do.



### Step 1: Analyse the situation

Before you start a training, it is important to investigate if a training is really needed. As a trainer you should first collect information on what are the most important problems and for who. After you have a **clear view of the problem(s)** you can decide if a training is the right thing to do or if something else needs to be done first. For example, if there is no PPE at the yard, you may wonder if a PPE training is a useful thing to do. First there need to be equipment that people can use before you can do the training.

Included in this step is to see whether you have the finances, materials and the right people to deliver a proper training. The trainer can make or break the course, make sure the trainer is an expert on the matter, if not, strengthen your team and do it together.

### Step 2: Design the course

When it is clear that a training is needed, the trainer makes a general design of how the training will look like. In this step the most important element is to **formulate learning objectives**. What is it that you want to achieve with your training? What does your participant know, do or feel differently after the training? In the next paragraph this will be explored in more detail.

### Step 3: Preparation

Preparation means that the trainer fills in all the details of the design. **Selection of the training methods and preparation of the training materials** are the core of this part. It is time consuming but necessary to ensure a smooth implementation of the training.

During the step you also include the logistics of the training like the venue, the food and timetable.

### Step 4: Implementation of the training

This is for most trainers the most exciting step, here you actually **deliver the training!** During this step you check regularly (each day) if the course is according to the objectives and expectations of the trainees. Make sure you are on track and if necessary, you adapt your sessions.

### Step 5: Evaluation of the training

The evaluation of a course is necessary for different reasons. To improve your performance as a trainer, to assess if participants did learn something and to improve the course itself. Evaluations should be done during and after a training event. Evaluation is the **quality control** part of training and can be done in different ways.

It is important to take the results of the evaluation to the next training session and improve the design. Without a proper evaluation it is very difficult to learn and to grow as a trainer.

## Step 6: Follow-up

A training lasts usually a few days, people get inspired, but as trainer you want to make sure that after the training the safety on the yard actually increases. You want the participants to change their habits and behaviour. To monitor this, you have to visualise with the participants how the **post-course reality** will look like, what they want to be different, what needs to be done to get there and what support they need.



## 2.2 Learning objectives

It should be very clear what the desired result is from the training. We call this the learning objective: a brief, clear statement of what the participant:

- Should do (skills)
- Should know (knowledge)
- Should feel (attitude)

These changes should be the result of the training. That means that you have to design the training in such a way, that after the training participant have obtained this knowledge, skill or attitude.

**A well-defined learning objective is specific and measurable. It forms the basis for the design and evaluation of the training.**

It is important to share the learning objectives at the beginning of the training, to allow participants an opportunity to ask clarifying questions and to make necessary changes.

We distinguish three different sets of learning:

**Knowledge:** is about specific content including concepts, theories and all types of information. The focus is to understand this information. For example, a knowledge learning objective can be: participants can mention all the different colours codes of pipes and the related content.

**Skills:** is about the application of theory, hands-on practical tasks. Repeated practice and repetition create permanent connections in the brain that allow us to do things automatically. The focus is on the ability to do something. For example, a skill learning objective can be: participants are able to remove the pipes in a safe way.

**Attitude:** is the motivation to do something, including the quality of doing something. The focus is on personal perspectives and values and the change of attitude. For example, an attitude learning objective can be: the participants are motivated to remove the pipes in a safe way.

Prior to every training session you are advised to develop at least one learning objective in each of the above categories since they are integrated in an important way. The process of learning often involves all three: the acquisition of knowledge, the application of knowledge into skills, and the integration of skills with attitudes and values.

A learning objective should be specific, short-range, and relatively concrete. Define objectives from the viewpoint of the participants. One good way to state learning objectives is to begin with the phrase “At the end of this session, participants will be able to...”. This phrase is followed by an “action” verb that describes what participants will be able to do differently. Be as specific as possible.

For the evaluation the learning objectives are your guides as well. In a very simple way you can test if your participants can mention all the colour codes and you can observe at the yard if indeed they remove the pipes in a safe way.





## 2.3 Key messages

Key messages are closely related to the learning objectives. They describe what message you want to deliver to the participants. **Key messages make the learning objectives concrete.** Imagine your participant walking out of the classroom and you ask him or her what s/he has learned. That is when you want to hear the key message. This means that in the training design these key messages have a central role.

For example, the above-mentioned learning objective:  
Participants can mention all the different colours codes of pipes and the related content.



Key messages can be:

- all pipes have different colour codes, you need to know them for your own safety
- the colour codes refer to the former content of the pipes
- the colour code tells you what tool you have to use to remove the pipes safely
- you should always check your colour code handout before you start cutting the pipes.

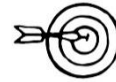
**In this manual learning objectives are formulated for each module. This will give you immediately the information about the objectives of the training and the intended results. This information is crucial for the design of the course. Everything you plan should be geared towards achieving these goals. They are your compass, the polar star.**

**In each module the key messages are given as well. They are the crucial messages in your training. You have to make sure that you mention them in different ways to the participants, in order to make the message stick.**

## 2.4 Trainer notes

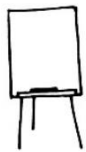
When you start preparing your training session, it is important to write down in detail what activities you intend to do during the training session. This will give you focus as a trainer and prevent you from forgetting things. You can also more easily repeat the same training or share it with other trainers. A detailed description of the training you call **Trainer notes**. They involve:

**Learning objectives** – describe what a participant or trainee should be able to do, feel or know at the end of a training session or a training course (see also previous paragraph on learning objectives).



**Content and key messages** – explain what you will do or say. This includes the information you want to transfer, what your key messages are, what presentation you will give, what questions you will ask and how you will give a specific assignment to the participants.

**Training methods** – show how you want to convey the information to the group of participants. For example, is it a lecture, a discussion, a brainstorm, group work or a role play.



**Materials** – that are needed to conduct (that part) of the training, like handouts, visual aids (whiteboard, flip charts, posters, slides, and video), and equipment: paper, pens, projector, screen, video camera, cards.

**Detailed timing** - gives you an overview of the time during the session and enables you to manage time properly.



In Attachment 2, you will find a format for Trainer Notes.

**In this manual we will provide you in each module with the learning objectives, a general overview what the module is about and the key messages that are the core of your training. In the training flow there are some suggestions what training methods that you could use during the training, but feel free to change the method as long as the message stays the same. The manual does NOT include detailed trainer notes. You have to make them yourself in order to make sure the training is yours and not a copy of someone else. Make sure you make YOUR OWN TRAINING, based on your experience, with training methods that you feel comfortable with and never be afraid to ask for help.**

## 2.5 Training elements

Each training consists of a set of fixed elements:

- the introduction
- the content of the training
- the closure

## The introduction

*During the introduction you familiarise yourself as trainer with the participants and you allow the participants to familiarise themselves with each other, the trainer and the objectives of the training.*

### Ready when the participants arrive

Make sure you are ready before the participants arrive. The set-up of the classroom the way you want it, the PowerPoint ready to be used, drinks and snacks to welcome the participants, etc. So, when the participants arrive you are free to welcome them, show them where they can sit, have a drink and make some small talk to let everybody feel comfortable. In this way you create a favourable environment for learning.

### Official start and programme

When everyone has arrived you (or someone else, like an official) officially open the course. This is the start and welcome. Then you introduce the programme and the learning objectives to the participants. This way people will know what to expect and what the expected outcome of the course will be. Always check if people understand and agree with the programme and objectives. If there are questions, you can still amend the programme.



### Logistics and rules

Part of the programme is also the logistics, when are the breaks, at what time do we finish. But also include some rules on how we would like to deal with telephone calls, taking pictures, behaviour towards each other, etc. If possible, make these rules together.

### Check in

Finally, is the 'check in' of the participants. Who are they and how do they feel right now? There are many ways to let the participants introduce themselves.

**The introduction is the foundation of the training, as trainer you set the tone and make people feel comfortable and ready to start with the real learning.**

## Body of the training

*The body of the training is the sharing of content. This is where the actual learning takes place. By using Kolb's experiential learning cycle, Brain Based Principles and different training methods the training will stick in people's mind.*

### Energisers

Energisers are short activities to re-energize people. Energisers can take many different forms, from physical exercises, brain crackers, funny videos to music and dance. You can use them at any time when you feel that the energy level of the participants is dropping.

### Icebreakers

Icebreakers are related to the content and are often used to introduce or emphasize a certain topic. This can also be done in a wide variety of ways. In module 2 you will find some examples.

### Recaps

A Recap is an activity to recapitulate what has been learned in a previous session, usually at the beginning of a new day. A recap repeats the key messages in a different form.

### Breaks

It seems obvious but the breaks are an essential part of the training. Your brain needs drinks, food and rest to be able to process new insights. It gives you time to relax and relate to your fellow participants in a more informal way. Make sure you respect the breaks and timetable of the training.

**The body of the training consists of the transfer of knowledge and skills to your participants. Breaks, energisers, icebreakers and recaps are essential parts to prevent lack of energy and stimulate the learning experience.**

## Closure

*At the end of the training, it is important to wrap up the training, summarize what has been done and show the way forward.*

### Follow up

As part of the learning cycle it is important to make participants think about the future. How are they going to use the learning in their everyday life on the yard? Make this as concrete as possible. An action plan can help to operationalise what was learned. This should include questions like what you are going to do different, do you need help to do this different, how will your colleagues and superior react, etc.

The follow up can also include a follow up course or training.

### Evaluation

When a training consists of several days you should wrap up every day with a short evaluation of the day. Important for you as trainer to see if you are still on the right track.

At the very end you carry out the final evaluation. This can be done in a questionnaire online or on paper. This questionnaire should include questions connected to the learning objectives, the training and the logistics.

### Check out

The 'check out' is on a personal level saying goodbye to people. This can be done for example by the one who also opened the course. It is important to refer to the learning objectives and what has been done in the past days. It can involve the handing out of certificates and some personal words for each participant.

**The closure of the course is the last contact between you as trainer and your participants. This is the feeling they will go home with. Make sure you take your time to reflect on the learning, look forward and to say goodbye to the participants.**







## 2.6 Choosing training methods

A training method is the way in which you transfer your message to your participants. A common training method is giving a presentation. But there are numerous other ways to make people learn. You can think of role plays, assignments, quizzes, group work, discussion, videos, etc. The key question is what method fits best with your learning objectives. What do you want people to learn? If they have to learn how to observe, you can show them pictures with hidden objects they have to find. If they have to learn how to do a toolbox, you can give them an assignment to practice in small groups. It all depends on what you want to achieve in your training. Usually, a variety of methods will have the desired results, this way participants with different learning styles will all learn during your training.

### Training methods and the experiential learning cycle

Besides the learning objectives you have to take into consideration the Experiential learning cycle. Which phase would you like to start with? If you want to start with concrete experience you can stage a drama. Ask participants to act out something that happens on the yard. This drama is the start for the next steps with reflection, analyses and applying. If you want to start with analysis, you can show them a model and then ask them to do an exercise and reflect on the results. You can start wherever you want in the cycle and continue with the next steps.

Below you will find some examples of specific training methods that can be used in different phases of the learning cycle.

<p><b>Experience</b></p> <p><i>Main objective: participants experience a real-life situation</i></p>  <ul style="list-style-type: none"> <li>• Learning by doing - Concrete practical assignments</li> <li>• Show a video film</li> <li>• Painting, drawing</li> <li>• Role-play, simulation</li> <li>• "Imagine you are in the following situation...., what will you do?"</li> <li>• The worst experience I can remember</li> </ul>	<p><b>Reflection</b></p> <p><i>Main objective: observe, brainstorm, and reflect about an experience</i></p>  <ul style="list-style-type: none"> <li>• Incident method: what went well, what went wrong?</li> <li>• Debating a statement; agree or disagree</li> <li>• Stand on a line to show if you are against or in favour of a statement</li> <li>• Stepping in the shoes of...</li> <li>• Brainstorming</li> <li>• Mind map</li> </ul>
<p><b>Analysis</b></p> <p><i>Main objective: participants are able to generalise the experience, using available theory</i></p>  <ul style="list-style-type: none"> <li>• Lecture (by trainer or participants)</li> <li>• Sorting assignment for constructing a model</li> <li>• Explanation</li> <li>• Quiz</li> <li>• Reading</li> <li>• Research</li> </ul>	<p><b>Application</b></p> <p><i>Main objective: apply and test the new way of doing</i></p>  <ul style="list-style-type: none"> <li>• Make a Do's and Don'ts list</li> <li>• Develop a personal (or group) action plan: what will be applied and how?</li> <li>• Prepare a demonstration</li> <li>• Your best tip</li> <li>• Search for the mistakes; based on a demonstration prepared by participants</li> </ul>

### Learning of knowledge, skills or attitude?

Training usually aims for a change of people's behaviour by developing skills, gaining knowledge or changing the attitude. Some training methods are specifically effective for learning new knowledge, other methods are more appropriate for learning skills or changing attitude. A PowerPoint presentation might be good for knowledge transfer, but to learn a skill you need practical assignments in which people can practice. For an attitude change you might think of discussions or demonstrations. As a trainer you have to look for the right cocktail of methods!



### Choosing methods: some tips

Apart from what is mentioned above here are some tips that help you to select the best training method for your training.

1. Start with the phase of the Experiential Learning Cycle and the focus of the learning objectives.
2. Strive for variation. Using different methods increases the group's attention span and you cater for all preferences (different learning styles) within the group.
3. Be sure your programme is flexible. Provide some uncertainty, some competition, and some entertainment.
4. We learn best when we enjoy our learning.
5. Experiment with different training methods; there are many ways to realize the training objectives.
6. Compose your own personal training toolkit including the methods you find most appropriate and that work best for you.
7. Be inclusive: what methods are acceptable in terms of culture and gender? Make sure also timid and shy people participate.
8. Collaborate with other trainers who are more competent than you in certain methods; seek complementarity in training styles and knowledge.
9. Consider groups size, available time and what is feasible and available in the training facility.

Last, but not least, try out and practice different training methods till you are familiar with them and you can use them according to the need of your audience. By adding new training methods to your trainer's kit, you will improve yourself and keep it interesting for all.

# 3 How to facilitate a group

## Summary

Training is an interaction between trainer and participants. To stimulate interaction facilitation skills are most important. The main skills are giving clear and concise instructions, guiding a meaningful discussion through preparation of questions and methods, keeping the time and dealing with difficult situations. If you master these skills the participants will feel safe, relaxed and encouraged to learn.

A training is not about giving a presentation, it is about interaction. Participants will not primarily learn for your beautiful presentation; they will learn from the discussion after the presentation and the questions that you raise to make people reflect on what is done. People learn most from doing things themselves, in subgroups, discussing with each other and receiving feedback from the trainer and from each other. To train means to guide and to stimulate interaction and that requires a specific set of trainers' skills, we call these **facilitation skills**.

The most important facilitation skills are:

- Giving instructions
- Facilitating the discussion after an assignment and in general
- Time keeping
- Dealing with difficult dynamics in the group
- 





## 3.1 Instruction of assignments

Assignments are a core element of a training. During an assignment participants usually work in groups and as trainer it is not possible to be with them all the time. Therefore, it is very important that you give clear instructions.

Important ingredients for clear instructions are:

- Provide participants an overview of the set-up of the assignment and how it is part of the session. For example: we will first do this assignment then we will discuss it afterwards.
- Provide information (preferably written) on what exactly are they going to do in the subgroup and what kind of contribution is expected from the subgroups back in plenary
- Use and write down in clear and plain language: for example: “discuss three statements”
- With complex exercises: demonstrate in plenary first
- Indicate how much time is dedicated to the assignment. Give an end time
- Check if the assignment is clear. Always give participants the opportunity to ask questions for clarification before they break into small groups.
- Give starting signal for the assignment. Give a short summary of the assignment, repeat end time, repeat instruction first step of assignment
- Walk past all groups during the first 10 minutes to check if they are doing what you had expected them to do



## 3.2 Facilitation of discussion

### Discussion after an assignment

The plenary discussion after an assignment in small groups often takes a lot of time. It easily becomes repetitive and boring. Your role as trainer is to make sure that this time is used for **further thinking**, not for mere reporting and making inventories of what each group has done.

This ‘thinking further’ can happen if people think individually about the others’ results, or because they learn something from your feedback. Also, an in-depth discussion can serve for further thinking. To achieve this, you can think of three ways: 1) the way you structure the reporting, 2) how you can activate the group and 3) how you prepare yourself for a few interesting remarks and feedback.

### Structure the reporting

Think beforehand how you are going to ask the groups to report to the plenary. You can do this in different ways:

- It is not always needed for all groups to present. Ask one group to present, the other groups can add what hasn’t been said yet
- After the presentations ask for reactions, some people can react, but not everybody
- Ask the subgroups to bring forward one question that they would like to be answered (by you or by the group) or ask them one statement or one conclusion or cartoon in which they grasp the essence

- For large groups: organise the flipchart market. Each group shows results on a flipchart and one person from each group remains available for 10 minutes to give a clarification. People walk around and add post-it's with their comments. You do that too. In plenary you touch upon 2 or 3 essential points

### **Activate the group**

When a group is reporting, decide if you can give a specific assignment to the listeners, this way you activate the whole group.

- Ask the group to judge results on several points. For instance, a team gives a presentation of a toolbox on the yard, you could ask one group to give feedback on the content of the toolbox and another group to give feedback on the communication style during the toolbox.
- You can ask subgroups to give advice, to ask a question that should make others think, etc.
- You can also ask people to compare the results presented by the groups. Possible comparing questions might be: What are the differences in approaches that you saw? Which approach did you like best? What is most risky? Why?

### **Prepare yourself for interesting points**

Generally, a discussion after group work becomes interesting if you deal with issues that were done very well, or on the contrary didn't go well, or if people mention problems that they were facing. So as trainer listen to discussions in subgroups and be attentive for issues that they are dealing with. Do not resolve everything in subgroups because then you lose issues for the plenary discussion. Do not discuss everything, ask to bring in plenary the interesting points and questions. This way everybody will learn and gets the opportunity for further thinking.



## Discussions in general

After a presentation you want a fruitful discussion. This can be done in different ways. As trainer you often start to stimulate the group with a think question. You can prepare these questions by reflecting about which issues you want to make them think. When the discussion is there you also want to stimulate the group to discuss with each other, rather than with you. This can be done in different ways.

- Participants often look at you when they make their contributions. Don't look back but look at others; probably the participant will do this as well
- Sit down: it shows there is time for discussion, ('I am one of the group')
- Give several persons the chance to react
- Ask people to react to one another. Use questions like: 'What is striking?' or 'What do you think?'
- Assure the discussion has sufficient concrete examples and conclusions
- If it's time to sum up, ask somebody from the group their conclusions, for example: 'What are the three best tips?'

To guide a valuable discussion is very hard. It is a complex didactical skill. Most important is to practice. Never pretend that you know everything, there is no need to understand everything and participants will not think less of you if you have to admit that you are not perfect either. It lowers the bar for the participants. In the end we are all learners!

## 3.3 Dealing with time

For starting trainers planning is often an urgent question. How do I know how long certain parts of the programme will take? Dealing well with time and a flexible approach to the session as you planned it, is something that comes with experience. But here some basics tips that will help.

### Basic tips for time planning

- Do not plan the days too full; one topic for half a day is a good guideline
- Plan breaks
- Keep to the set time, certainly during explanations or discussions
- Dare to cut off a discussion if it does not add to your learning objectives. Not everything that is said is relevant. Cut short irrelevant remarks in a nice and respectful manner
- Give the end time to subgroups; 'be back at...'
- Warn people when they have 10 minutes left
- If you are running out of time choose with the participants what they want to tackle most, don't do it alone






Do not promise too much in the programme. Better promising less and then doing something extra, than participants going home unsatisfied because you could only tackle half of the programme topics.



### 3.4 Difficult Group Dynamics

Some training groups are smooth running and pleasant, but as trainer you will also come across groups that are more dysfunctional. The challenges can be different, but they often include personalities that clash within the group, aggressive or unacceptable behaviour by one or several participants, and overly talkative participants who may even seek to gain control of the conversation. No matter what the hurdle, you should handle the problem with calm professionalism and be prepared to take a step away from what is happening to assess the situation and choose the best way to steer the training back on course.

Below we present some tips for dealing with difficult dynamics, based on *The Facilitators Toolkit: tools, techniques and tips for effective facilitation*, NHS Institute for Innovation and Improvement (2009).

Challenge	Typical facilitators mistake	Effective response
<p>Domination by a highly vocal member of the group</p> 	<p>Inexperienced facilitators often try to control this person. “Excuse me X, do you mind if I let someone else take a turn?” Or, even worse, “Excuse me X, you are taking up a lot of the group’s time.”</p>	<p>When one person is over-contributing, everyone else is under-participating. To resolve this, focus your efforts on the passive majority – encouraging them to participate more. Trying to change the dominant person merely gives that person all the more attention.</p>
<p>Distraction in the middle of a discussion</p> 	<p>It’s tempting to try to ‘organize’ people by using your hierarchy (power) as trainer. “OK everyone, let’s get refocused.” This only works when the problem isn’t very serious.</p>	<p>Aim for a break as soon as possible. People are likely to have become undisciplined because they are overloaded or worn out. After a breather, they will be able to focus much better.</p>
<p>Low participation by the entire group</p> 	<p>Low participation can create the impression that training is progressing well on schedule (a lot of work is getting done!). This leads to one of the worst errors a facilitator can make – that is, assuming that silence means consent and doing nothing to encourage greater participation.</p>	<p>Switch from large-group open discussion to a different format that lowers anxiety levels. If feeling safe and secure is a major concern, small group activities are very important. Ideas-listing can also work very well when participation is low.</p>
<p>Two people ‘fighting’</p> 	<p>A lot of time can be wasted trying to resolve a conflict between two people who have no intention of reaching agreement. People often use each other as sparring partners in order to clarify their own ideas.</p>	<p>Reach out to other people in the group by asking, “Who else has an opinion on this issue?” or “Let’s step back for a minute and see if there are other issues that need to be discussed.” Remember not to focus your attention on the dominant minority but spend your energies encouraging the passive majority.</p>
<p>One or two silent members in a group of otherwise active participants</p> 	<p>Asking “X, you haven’t said much today, is there anything you’d like to add?” may work when a shy member of the group has non-verbally indicated a desire to speak. However, all too often the quiet person feels put on the spot and withdraws even further.</p>	<p>You could say, “I’d like to get opinions from those who haven’t talked for a while.” Breaking into small groups works even better as small groups allow shy people to speak up without having to compete for ‘air time.’</p>

## Further reading and watching

Kolb experiential learning cycle

<https://www.youtube.com/watch?v=Rp-gaV-uSlo>

How does our brain work

<https://www.youtube.com/watch?v=cgLYkV689s4>

Brain based principles

[https://www.youtube.com/watch?v=9jf2BB\\_N4rA&t=8s](https://www.youtube.com/watch?v=9jf2BB_N4rA&t=8s)

Facilitation methods, icebreakers and energisers

<https://www.sessionlab.com/library>

Energisers

<https://www.youtube.com/watch?v=5N5Gb0ONLSk>

# Part B Technical modules



## Introduction to the modules

In this part of the manual you will find the different technical modules. They all follow a similar pattern.

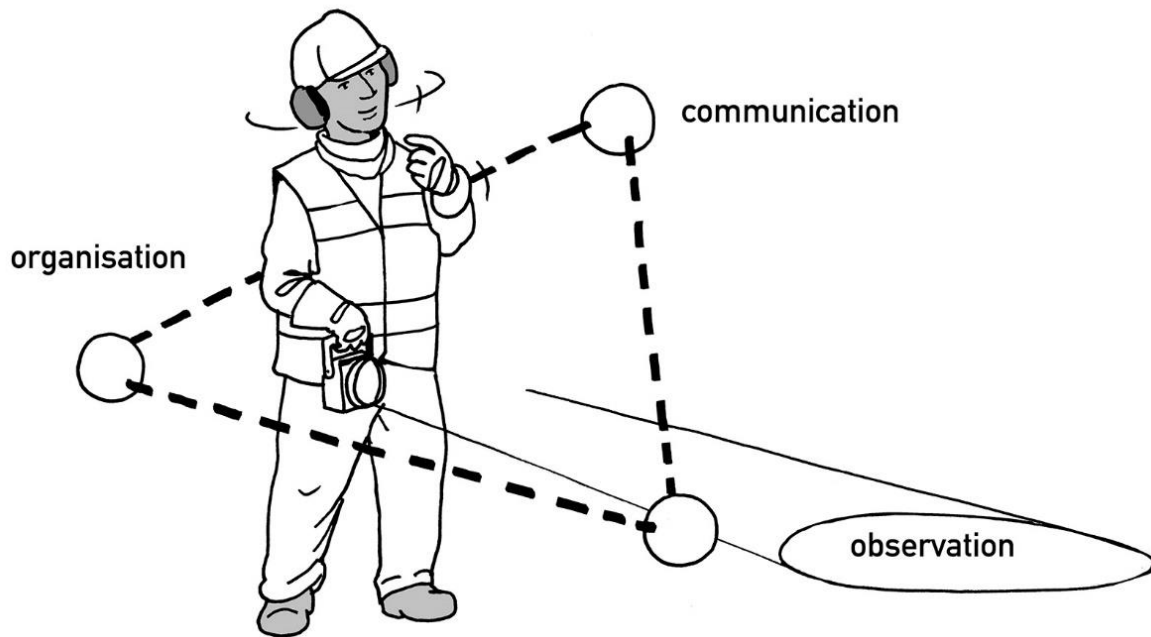
**Learning objectives**, stating the goal of the module, what will the participant learn, divided by knowledge, attitude or skill.

**Background information**, explaining the content of the module

**Key messages**, focussing on what the participants should remember after the training

**Training flow**, giving some guidelines in how to deliver the training.

**Organisation, communication, and observation** are the key components of the training. They are at the heart of safety and security and should always be part of the start of the training.



The other topics can be order in different sequences according to the need and time of the training. **Presentation** is always the last module, because it wraps up the training and repeats all the learning.

A video on safe shipbreaking in Hindi has been made especially for this training. Please follow the link <https://www.youtube.com/watch?v=fBnGLR4zMSQ>



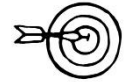
## The modules

- |   |                              |
|---|------------------------------|
| <a href="#">1. Organisation on the Yard</a>               | Error! Bookmark not defined. |
| <a href="#">2. Communication on the Yard</a>              | Error! Bookmark not defined. |
| <a href="#">3. Observation on the yard</a>                | Error! Bookmark not defined. |
| <a href="#">4. Pipelines Uni colour code</a>              | Error! Bookmark not defined. |
| <a href="#">5. Gas cylinders colour code and handling</a> | Error! Bookmark not defined. |
| <a href="#">6. Correct Lifting</a>                        | Error! Bookmark not defined. |
| <a href="#">7. Harmful Noise</a>                          | Error! Bookmark not defined. |
| <a href="#">8. Hoisting Gear</a>                          | Error! Bookmark not defined. |
| <a href="#">9. Steel cables</a>                           | Error! Bookmark not defined. |
| <a href="#">10. Cause and consequences</a>                | Error! Bookmark not defined. |
| <a href="#">11. Toolbox</a>                               | Error! Bookmark not defined. |
| <a href="#">12. Personal Protective Equipment (PPE)</a>   | Error! Bookmark not defined. |
| <a href="#">13. Fire fighting</a>                         | Error! Bookmark not defined. |
| <a href="#">14. Presentations</a>                         | Error! Bookmark not defined. |

# 1. Organisation on the Yard

*In this module we explore how the yard is organised. What tasks are expected from different people and who is responsible for what and what that implies for the safety of people on the yard.*

## Learning objectives



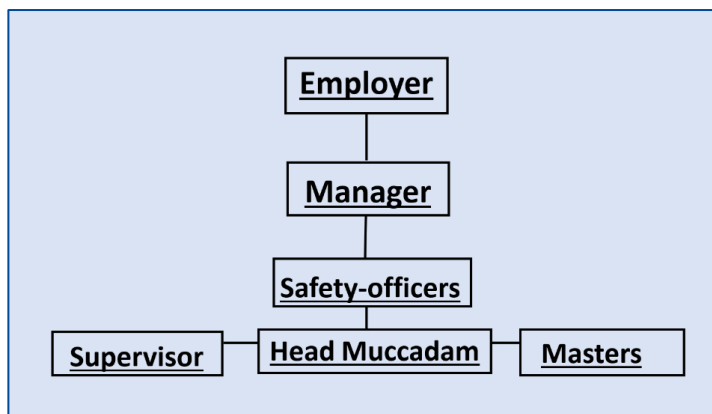
- After this module the participants:
- can read and analyse a control structure
- understand the role and responsibilities of the different functions in their own organisation.
- know where Safety and health in their organisation is placed in the structure and what the consequences of that positioning is.
- Can define the role and responsibility of the Safety (and health) Officer



## Background information

Each yard is organised in its own way, you have the employer, managers, supervisors, gas cutters, safety officers, etc. All different functions, with different tasks and different responsibilities. How these functions are organised differs at each yard.

This is an example of how a yard can be organised. This picture we call a **control structure**, or an organogram. It shows who is responsible for what, who reports to who, who makes the decisions and can reinforce behaviour.



- The **vertical line** means that the person above you is your superior, the one who gives orders to you, decides and is responsible.
- The **horizontal line** means that you operate at the same level, you cannot give instructions to each other, you can advise, but the other does not have to follow.

Each yard is structured in a certain way and can have a different control structure. Often depending on the history of the yard and the country they are in.

When you talk about Safety it is very important to look closely who is responsible for safety issues and where that person or department is placed in the control structure. First question is if you see something about safety and health in the organogram. If not, it tells you that safety is not taken seriously in this yard. If yes, then the question is where the position is in the control structure, this will tell you the authority of that position. When the Safety officer is above the team heads, he can give instructions and people have to follow the orders. If it is next to the heads, the Safety officers can only advise, but not reinforce safety behaviour



One aspect of responsibility is accountability, it is important that the person responsible for Safety at the yard is hold accountable by their superiors for their work. In case of an accident, it is crucial to see who is hold accountable and what are the consequences. Only this way safety can be improved and do people learn from mistakes.

### Key messages



1. A good control structure of the yard is the basis for a safe organisation.
2. It should be clear for everyone, who is responsible for safety and health issues.
3. A daily safety briefing by a team leader to his employees/department is vital to signal safe and unsafe places.

### Training flow



#### Part 1 Starter

As trainer it is important to get an idea on how the yard is organised. Who talks to who, about what and how often?

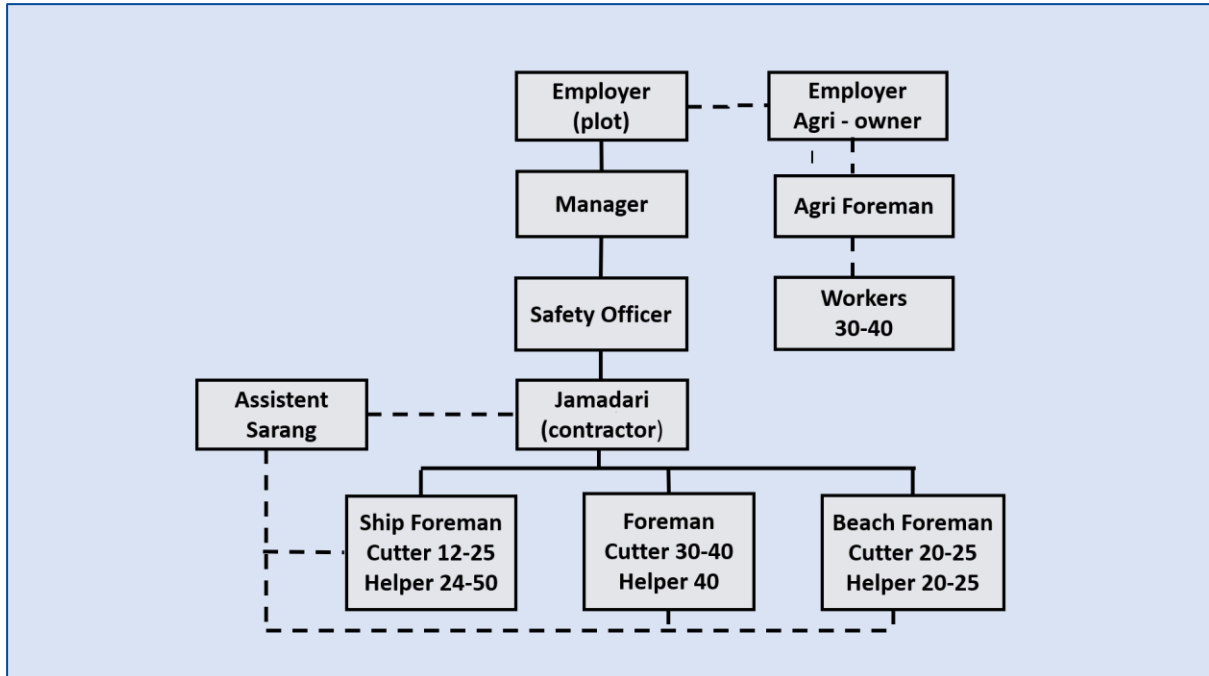
Start with a conversation, ask for general information and focus later on the safety issues. Discuss the differences between the yards within and outside your country.

#### Key questions:

- How do you communicate on the yard between your fellow colleagues and the person(s) in charge?
- Who gives out the orders in the morning? What is discussed during giving orders (safety issues as well?)
- How often do you have contact with your superior?
- Who is responsible for PPE?

## Part 2

Show different pictures of control structures. Start with a general one and follow with some examples of real shipyards. These pictures visualise how the yards are organised. It is important that participants can read the control structures and understand the consequences for safety issues.



Make sure participants understand that for a safe yard it is important that the roles, tasks, responsibilities, and divisions are clear, concrete and transparent for everyone.

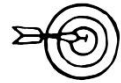
## Part 3

Introduce shortly what happens from ship to scrap on the yard. Use the flowchart of Attachment 7. What steps are taken and by who. Do not go too much into detail but give an impression on how it is organised. Let people comment, but do not give it too much time.

## 2. Communication on the Yard

*In this module we explore what is communication, how we communicate at the yard and what that implies for safety.*

### Learning objectives



After the training the participants:

- Understand the significance of clear and explicit communication
- Can define what is effective communication
- Are able to communicate verbally and non-verbally in a clear and consistent way
- Intend to use clear communication when it comes to safety issues.
- Understand the consequence and influence of good / bad communication



### Background information

Communication is of utmost importance when it comes to safety issues. Good communication can save lives. If there is a sound briefing in the morning about risks and safety measures, employees will survive the day. Most accidents happen because of lack of information and communication.

What is communication? Communication is simply the act of transferring information from one place (or person) to another. This transfer of information can be done in a wide variety of ways.

**Spoken or Verbal communication**, when we talk to someone in a bar, on the phone, or listen to the radio or television, we communicate. A message, or information goes from one side to another.

**Non-Verbal communication**, even when we do not talk, we still communicate! Through the way we dress we communicate to what group we belong; with our gestures we communicate what we want or need and even our scent communicates a message to the world.



**Written and visual communication**, well known is the way we communicate by writing things down. In letters, emails, books, on Facebook and in other media. But also pictures communicate strong messages. 'a picture says more than a thousand words'.

So, there are many different forms in which we can communicate. They all involve someone sending some a message, to someone receiving this message. The main question is: Does the one who receives the message exactly get and understand the message the way it was intended by the one sending the message?

**Effective communication is communication whereby the receiver of the message clearly understands and grasp the message the way it was intended.**



*Misunderstanding can occur at any stage of the communication process.*

## Key messages



1. Good communication is not easy, it is about receiving and sending the correct information, in a comprehensible way.
2. Good communication is about listening very well, using your brain, have a plan and do not think it is easy.
3. Your life depends on good communication
4. Reality is complex. To describe a situation in such a way that other people understand the situation correctly without being present, needs practice and repetition.
5. It is not possible to not communicate!
6. Good teams have good communication skills.

## Training flow



### Part 1 Starter

As trainer you want participants to think about communication and to understand that good communication needs practice and planning. You can start with explaining the importance of communication and provide some theory.

Exercise in pairs: ask participants to repeat to their neighbour what just has been said by you. Then ask a few people to repeat in plenary what has been said.

Afterwards discuss on what happened to the information.

Was it repeated correctly?

What was missing,

What was added?

What was helpful to remember the information?

What would have helped to retain the information better?

What is the effect of good or bad communication

How can you translate this to your work on the yard?

Write on a Flipchart tips for good communication on the yard.

## Part 2

As trainer you want participants to realise that although we communicate all the time, to communicate what happens on the yard is not always easy. You have to verbalise with words what your eyes have seen. In this part you stimulate participants to practice this skill and to check whether it has been done correctly.



Exercise in pairs: ask participants to sit with their back to each other. One person gets a piece of paper with all kinds of figures. The other person gets a blank sheet. The person with the figures has to tell the other person what he sees (he is not allowed to show it, nor to mention the shape itself!), the person with the blank sheet has to draw the figures.

First compare the pictures, the original and the one drawn by the participant, then discuss afterward the need and difficulty to clearly describe a situation to an outsider.

Questions:

- how was it to describe the picture to the other person?
- how easy was it to draw the picture without seeing it?
- what would have helped you to be able to draw the correct picture?
- how can you translate this to your work on the yard?

Wrap up with adding good communication tips to the Flipchart.

## Part 3

Good teams have good communication skills. For good collaboration and consultation good communication is vital. Effective communication under stressing circumstances is not easy. Collaboration and therefore communication is essential, instead of individual work.

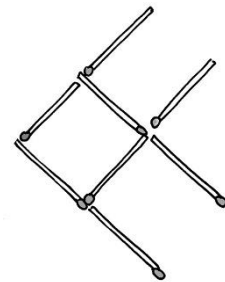
Exercise in groups of 4. Give each group 8 matches and the instruction, to move 3 matches to let the fish swim in the other direction. Set a timer to promote competition. To make it harder, you can add that they should not touch the matches till they know how to do it.

Open the link to watch the instructions:

<https://www.youtube.com/watch?v=Y95ho7kQ-sw>

In the reflection after the game as trainer you can zoom into different areas:

- How did your group communicate during the exercise?
- Was there a leader? Did that help or hinder?
- How was it to work under time pressure
- How did you collaborate, or did everyone just try on their own?
- What insights did you get about communication in a group?
- What is the effect of good or bad communication?
- What helped for good communication? Add these answers to the flipchart.



#### Part 4

As trainer you want to stress that good teamwork means good communication and good coordination of activities. But with time pressure, language barriers and unclear roles and positions it is often difficult to have a smooth collaboration and supervision. This exercise makes this clear. See Attachment 6 for the full instruction

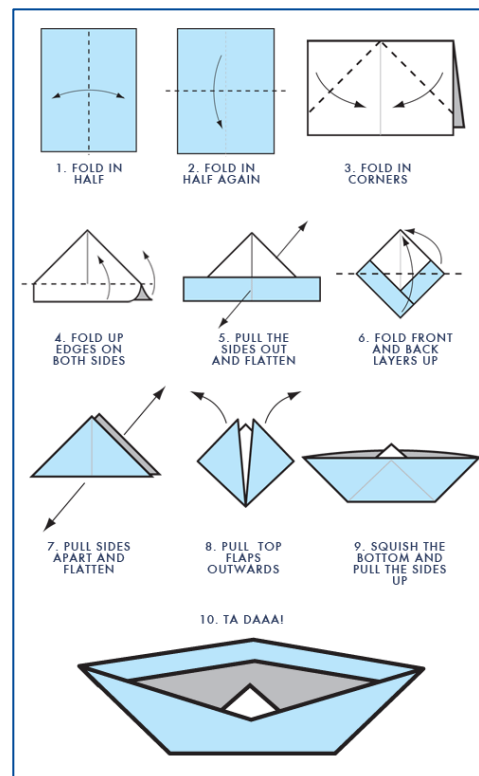
Divide the group in teams of nine people. Give each team a sheet of paper and let them fold a boat according to the picture.

**First instruction:** make a proper boat.

**Second instruction:** each fold should be done by someone else, there are eight actions, plus there should be someone who does the quality control to ensure a proper result.

**Third instruction:** the team who makes most boats in 4 minutes wins.

Afterwards discuss on what does this exercise tell us about collaboration and communication?



- How did you collaborate in your group?
- Were you satisfied with the result?
- What was the effect of the time pressure and competition?
- Was it always clear what you had to do?
- Was it always clear what others were doing?
- For quality control, how was it to have this position?
- How did the group look at the quality controller? With respect, annoyance?
- What was the effect of good or bad communication?
- What does this mean for our work on the yard?



Add suggestion for good collaboration and communication on the Flipchart.

### Wrap up

Let participants look at all the comments and remarks on the flipchart on good communication. Give each one three stickers and let them prioritise what they think are the three most important ones. The three comments with most stickers are considered the most important ones for the whole group.

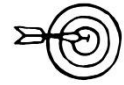
Then discuss in small groups how they are going to implement on the yard. Let them be as concrete as possible.



### 3. Observation on the yard

*In this module we explore the importance of good observation. Good observation is vital for safety on the yard, for prevention and reporting of dangerous situations.*

#### Learning objectives



After the training the participants:

- Understand the different elements of good observation
- Are able to observe a situation and report it well
- Know the link between good observation and risk management
- Feel motivated to use observation skills and Last-Minute Risk Analysis at the yard.



#### Background information

By just being present we feel, sense, see, taste, touch and hear what is going on around us. We always notice something even when we are not aware of it. We also often react or judge instinctively to what is happening around us.

**Observation is to feel, sense, see taste, touch, and hear without labelling it, reacting to it, or judging it.**

This NOT labelling or judging makes good observation difficult. Only to look at something without having an opinion about it, or just watching it to really see what is happening is a skill that needs to be nourished. Good observation is not easy, your mind wants to label what is happening rather than just being with the bare sensations of an experience. Observation is like mindfulness, you allow the experience just to happen, without pushing it away or trying to change it.

When you observe there are 2 steps:

- First watch the whole picture
- Later watch the details.

On the yard many things happen, to observe properly people have to train their eyes, ears and nose. Just describe what you see, hear and smell. With that information you can make the correct link to safety and realise what needs to be done to make the yard a safe place for all.



Observation includes several elements:

#### **Observe your colleagues**

- Are they tired?
- What do they wear? Nylon or cotton shirt?
- Do they use PPE? Shoes, helmet, gloves, mouth protection, ear protection?
- What are they doing and in what place?
- How are they reacting?

#### **Observer the workplace**

- What is happening at this moment?
- Where is action and where is not?
- Where is the crane placed and what is it doing?
- In case of emergency where can people go?

#### **Observe your own work situation**

- What is your job today?
- Is there someone to assist you?
- Are there any heavy transports today?
- Are you within reach of the crane?
- Who is your chef today?
- Do you have the right tools to do your job properly?

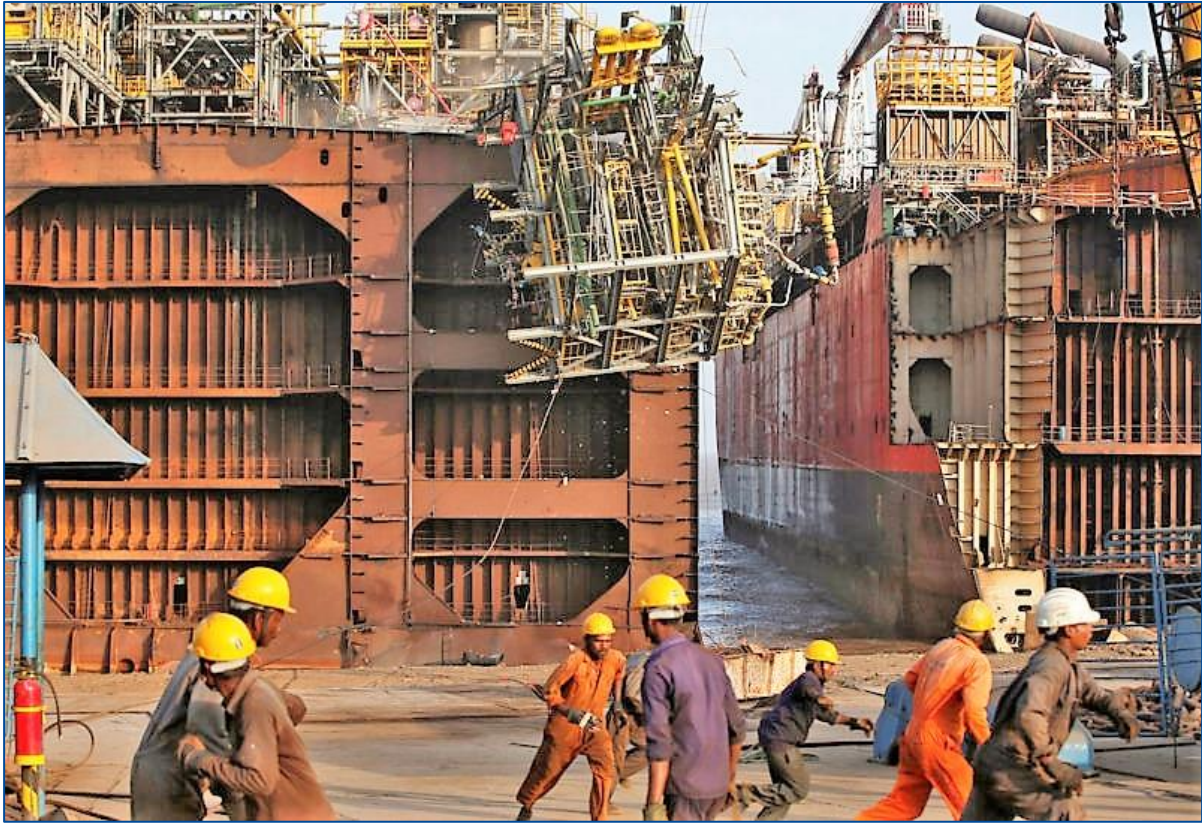
#### **Working in a safe place**

- When you work within reach of the crane, make sure the crane driver knows where you are.
- Be sure that they warn you when the crane is coming near to you
- Is there enough distance to the gas bottles?
- When you are a gas cutter, did you check your gas- and oxygen hoses?
- Protect yourself and wear, if available, your PPEs.

#### **Last minute Risk analysis**

Last minute Risk Analysis (LMRA) is the check on safety that needs to be done each time something is shifted. This could be when a section of a ship is moved to the shore, but also the forklift truck going around the corner. There should always be a check how is the surrounding, who is there and what are the security risks. This should be done by the foreman and communicated with everyone present, but also the forklift truckdriver should be aware of every changing situation and be alert. When it comes to safety never take the risk of assuming things will be all right. Your life can depend on this!

Safety is not an issue for your foreman or boss, it is for every worker vital to survive the day. So, everyone should be trained in spotting unsafe places, activities and working conditions.

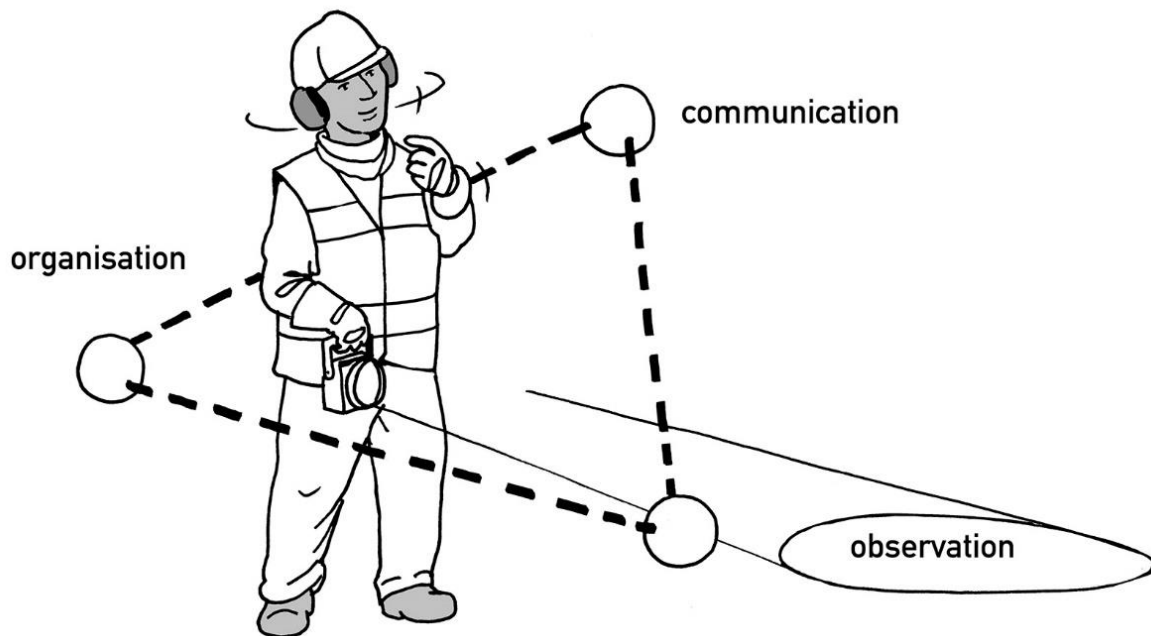


### **Manipulation**

What your eyes see is not always what is really happening. Your eyes can deceive you, especially in dangerous situations, when you feel threatened you will react instinctively, and this will colour your view and observation. It is very difficult to remain neutral and impartial under stress. You will leave out details that you do not want to see or include parts that you assumed were there, but in reality were not.

*If possible, always make pictures of a situation, so you can always check the details later.*

## The Golden Triangle: Organisation – Communication – Observation



Observation, communication, and organisation are the golden triangle to ensure safe shipbreaking. If you are able to observe a situation well, if you can assess the risks and know how to communicate that to the responsible persons in your organisation, you can create a safe environment for everyone to work in. On the contrary if any of these three parts is not in a good shape, life can be in danger and people might get injured or worse.

### Key messages



1. Observation is to feel, sense, hear, smell, touch what is happening without judging or labelling it.
2. Good observation starts with the whole picture and later zoom into the details
3. Observation is a skill that should be practiced regularly
4. Your senses can deceive you, always check and make pictures if possible
5. Good organisation, communication and observation are intrinsically connected and vital for safe shipbreaking
6. Last minute risk analysis should be done at every changing scene.

### Training flow



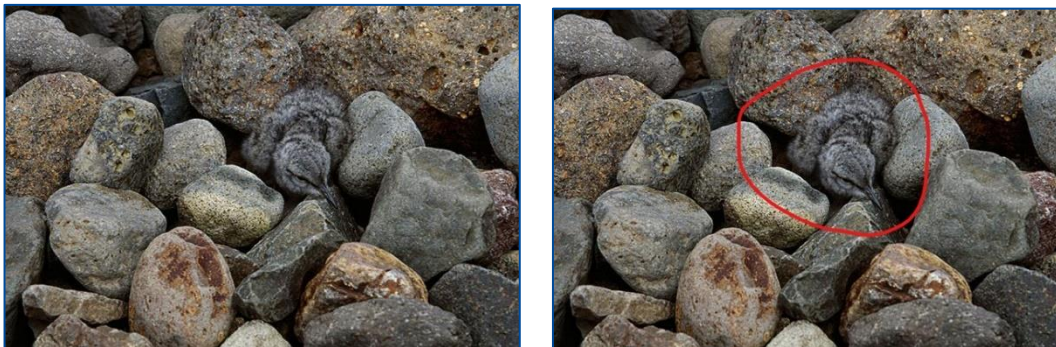
#### Part 1 Starter

You can introduce the session with the picture of a ship or yard. Ask participants to mention what they see, what people do, etc. Write them down on a flipchart. First ask what the whole picture tells them, after that zoom into the details. This will generate a lot of stories that can be used later as illustrations in your training.

#### Part 2

As trainer you want people to know what good observation is and to practice it. We observe all the time, but to do it consciously and without judgment is a skill that needs to be trained.

Exercise: to train the eyes of your participants, look on the internet for 'search-pictures'. Show the picture and let the participants look for an object, animal or whatever. Show around 10 different pictures to stress the fact that observation needs training and is not easy.



Open below links for search objects:

<https://brightside.me/wonder-quizzes/test-find-the-hidden-objects-in-these-15-images-797240/check>

<https://twentytwowords.com/spot-hidden-animals/>

Questions:

- Was it easy/difficult to look for the animal/object?
- What makes it difficult to observe well?
- Why should observation be important on the yard?
- How can we improve our observation skills on the yard?

### Part 3

As trainer you want to highlight the fact that we are easily fooled by our eyes and brain. You can easily be manipulated, distracted or selective in what you remember of a situation.

Show the short video on 'whodunnit'

<https://www.youtube.com/watch?v=ubNF9QNEQLA&feature=related>

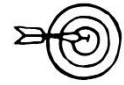
Discuss the video, what happened. and stress the fact that if possible, always make pictures of the scene. This is both proof and check.

### Wrap up

You can show a picture of the eye, how it is made, the importance and vulnerability. You have only two eyes and you have to be careful with it, otherwise you cannot see beautiful things anymore.

## 4. Pipelines Uni colour code

This module discusses the international color code for pipelines. The color code gives information on the (former) content of the pipeline and is essential information to remove them safely from the ship.



### Learning objectives

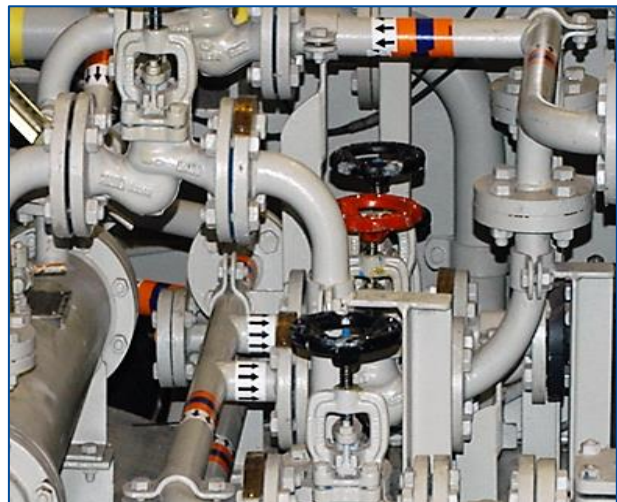
After this module the participants:

- Know how the main colour codes
- Are aware of the importance of knowing the colour code before starting to work with pipelines and gas cylinders for safety reasons



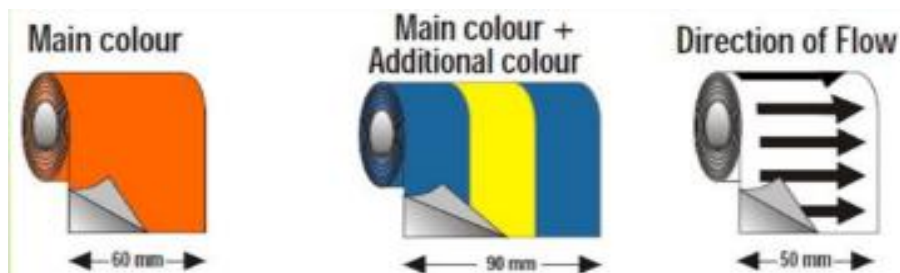
### Background information

Pipelines are everywhere on the ship, but especially in parts with a lot of equipment, like engine rooms, pump rooms, tanks and double bottoms. In these parts you often see many different types of pipelines, thick, thin, with different valves, filters, coolers, compressors, and pumps. To avoid having to search all over the ship to the origin of the pipelines, they all have a standardized color code that gives information on the (former) content and function of the pipeline.






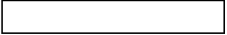




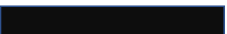


This information is vital for the safety on the yard, for example when you work with a gas cutter to remove a pipeline that contain(ed) fuels and you do not realize that you might infuse an explosion.

The color code is an international code that marks pipelines in a consistent and uniform way. During the building of the ship, rings or stickers with the color codes are applied around all the pipes. Usually close to filters, valves, equipment and bulkheads. To show which liquids or gases pass through them and with what equipment they are connected. The direction of the flow is also indicated.



## The basic identification colours

• Blue		freshwater (water from a public supply)
• Green		Sea water
• Silver		Steam
• Red		Fire, extinguish tube
• Yellow		Warning colour, Combustible gas
• White		Air in ventilation syst.
• Brown		Fuels (Combustible liquids)
• Orange		Oil (no fuels) electrical services & ventilation ducts
• Purple		Acids Waste effluents
• Grey		Water not combustible (water from an other source)
• Black		Wastewater

In the old days there was only a single-color coding, nowadays an additional color ring has been added to the base color. This gives even more detailed and accurate information. For example, in the pipes marked with a basic color blue (which is water), now you can also find out what type of water was involved, like grey or cooling water.

### Key Messages



- The colour code gives you information on the content and function of the pipeline.
- To be well prepared you need to know the basic colours, especially water, gas and oil. The additional color gives you even more detailed information on the content.
- You should first look at the colour code and flow direction before you start working
- Be extremely careful with pipelines containing hazardous liquids or gases.
- If you cannot find the colour code, or do not know what the colors mean, asks for assistance, your life could depend on this!

### Training flow



As trainer you want to encourage the participants to find out about content of the pipelines before they start working with them.

#### Part 1 Starter

Give the participants a blank color card in small groups of four people and ask them what colours they know already. (see Attachment 5).

Reflect on the results and discuss the importance of the content of the pipeline in relation to the safe removal. Ask for stories of incidents and/or accidents with pipelines and discuss what happened, and how it could have been prevented.



## Part 2

Present the theory and show examples of pipelines on pictures. First discuss the basic colors, later add the additional colors that are placed in the middle of the base color. Reflect and discuss together on the consequences of the different contents for a safe handling of the pipes

## Part 3

Ask the participants again to fill in the blind card and note the difference with the first time. Stress the fact that they do not have to learn all the color codes by heart, but that it is important to recognize the basic colors and always look up the (additional) color code in case they do not know a particular color code.

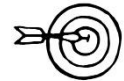


## Wrap up

Give each participant a small, laminated copy of the color codes that they can store in their pockets during work and encourage them to have a look at the colors each time they work with pipelines.

## 5. Gas cylinders colour code and handling

This module discusses the international color code for gas cylinders. The color code gives information on the (former) content gas cylinders and is essential information to remove them safely from the ship.



### Learning objectives

After the training the participants:

1. Can read and distinguish the different color codes and recognize the content of the gas cylinder
2. have some basic information about handling gas cylinders safely
3. Understand the importance of safe storage of gas cylinders
4. Are motivated to handle gas cylinders in a safe way.



### Background information

A gas cylinder is a large steel bottle with a valve in which you can store under pressure a particular industrial or medicinal gas, such as oxygen, acetylene or nitrogen. The most famous shape is the cylinder without welding seam. Important is the design and the type of steel from which gas cylinders are manufactured. In general, it is safe to use gas cylinders, but with the increasing pressure in many non-medical gas cylinders the risks are increasing as well.



There are millions of gas cylinders in circulation (in Europe alone about 40 million, in Asia a multiple number). Most have a workload up to 200 bar, but some are up to 300 bars, this is increasing since the 1990s. The maximum volume of a gas cylinder is 105 liters.

The content of the bottles is listed on the outside by sticker and a color code affixed to the shoulder of the cylinder. The specification number and maximum filling pressure are also listed on the shoulder.

There are different gas cylinders, with special use and gasses:

**Medical:** A pure grade of gas be used for medical purposes. These gases are usually stored at 137 bars.

**Industrial:** This grade of gas is normally used in laboratories and workshops. Most gas cylinders at present are charged at 175 bars. The pressure is scheduled to increase to 230 bar in the next few years. This is already the case for oxygen.

**Special gasses:** These cylinders contain mixtures of gasses or inert gasses. Pressure range between 175 bar and 230 bar.

**National Rules and Laws:** Besides international law, every country has national rules and laws about the handling and transport of cylinders. Have a look at the ones for your own country and add them to the training if needed.



**Storage and Transport:** the cylinders should always stand upright during storage and transport. Even when used, the cylinder must be upright, fixed or in a special steel box

**Steel cap:** The steel cap on the cylinder is there to protect the copper valve. When the protective cap is not present, and the valve is smashed then the cylinder can easily explode and become a projectile.



**Regulators:** regular ones, where the output pressure varies between zero and the pressure in the cylinder. There are also regulators which reduce pressure to a set figure well below that of the cylinder pressure. The output varies between zero and the reduced pressure.



**Oxygen:** Only regulators labeled for oxygen gas can be used for oxygen. They contain no oil or grease. Using a regulator labeled for a different gas could result in a fire or explosion. If an oxygen regulator has been used with another gas it must never be used again with an oxygen cylinder unless it has been serviced and declared safe. Never use oil or grease! Use a flash back arrestor between the hose and the pressure regulator to prevent an explosion

**The life span:** the life span of a regulator is about 4 years. In some cases, this can be extended by servicing the regulator. Regulators should have a date stamp; the absence of a date stamp often indicates that they more than 10 years old.

## Key messages



1. Gas cylinders are dangerous, they contain gasses under pressure
2. You need to know the content before you start using or removing
3. On the sticker you find important information about the gas cylinder
4. You should always store and transport gas cylinders upright













## Training flow



### Part 1 Starter

Show a picture of some gas cylinders and start a conversation about how gas cylinders are handled in the workplace.

After this conversation give the theory and examples of stickers and colour codes, let the participants read the stickers and interpret the meaning of it and what security measures they need to take. Add new information if needed and correct when wrong.

Gas type		Colours	
		Current ) <sub>2</sub>	New
Oxygen	O <sub>2</sub>	 Blue	 RAL 9010 White  New
Acetylene	C <sub>2</sub> H <sub>2</sub>	 Auburn	 Auburn
Argon	Ar	 Darkgreen	 Darkgreen
Nitrogen	N <sub>2</sub>	 Lightgreen	 RAL 9005 Black  New
Carbon dioxide	CO <sub>2</sub>	 Grey	 RAL 7037 Grey
Hydrogen	H <sub>2</sub>	 Red	 RAL 3000 Red

## **Part 2**

Divide the group in four and make a quiz on the different colour codes and information that you have given them. Give them a blank sheet of paper to write down the answers. Questions could be around the colours, the handling or storage of the gas cylinder. To make it more difficult you can combine the gas cylinders with the pipelines of the former module.

For example:

- Show different pictures with a gas cylinder and a visible colour code and ask for the content?
- Show a sticker and ask for the pressure, or the content
- Ask what is a safe way to store a gas cylinder?
- Give examples of gas cylinders with a certain content and ask how to handle them safely with what tools.

Give the winning group a small reward.

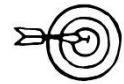
## **Wrap up**

Give each participant a small, laminated copy with some basic information on color codes and handling of gas cylinders that they can store in their pockets during work and encourage them to have a look at it each time they work with gas cylinders

## 6. Correct Lifting

*This module focuses on how to lift an object correctly. Your back is literally the backbone of your body and you have to protect it well. Correct lifting of items is essential to keep your back in a good condition.*

### Learning objectives



After this module the participants:

- know how to lift items in a correct way.
- are able to lift items in a correct way.
- know the ten rules to prevent damage of the spine



### Background information

Working on the yard involves a lot of lifting and moving objects from one place to the other. To prevent a back injury, you should lift objects in the right way. This applies for the yard and at home.

The following video give an impression what correct lifting is all about.

<https://www.youtube.com/watch?v=fBnGLR4zMSQ>

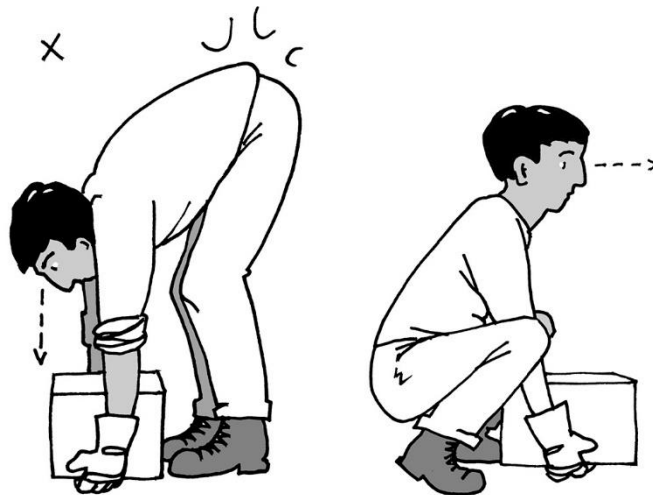
#### Ten rules of correct manual lifting

1. Do not bend and lift unnecessarily, use tools whenever possible.
2. Use your brain, lifting correctly does not need more time than incorrect lifting.
3. Beforehand think how and where to the load has to be moved to, so that you can take possible difficulties into account.
4. Beforehand determine the weight of the load; do not lift too much at once. Ask others for help in lifting heavy and big objects.
5. Always stand straight right before the load; never lift with a twisted back: move your feet if you have to make a turn.
6. Determine the centre of gravity of the load and seek the right balance before starting the lifting itself.
7. Lift with both hands, keep the load as close as possible to your body, do not lift higher than shoulder height.
8. Bend your knees, the back may be bent a little, move slowly. Mainly use your stomach and leg muscles.
9. Make sure the road is free of obstacles, use rough soled shoes if floors are slippery.
10. Listen to your body: take warnings seriously. Starting complains can soon become worse.
11. If you are lifting together with others, agree beforehand when you start lifting and how high you will go.

## Key messages



- Your back is very important for your health, without a healthy back you cannot work.
- To prevent back injuries, you have to lift objects careful and correct
- Always think before you lift something



## Training flow



The core of this module is to **practice** correct lifting. As trainer make sure you know exactly what it is and how to show it to the group. Bring different objects to the training location, with different shapes and weight and let people practice till you see that they understand and lift correctly.

### Part 1 Starter

Put a box in the middle of the room and ask someone to move it from one side to the other. Ask people to comment on the how it was executed.

Show the video and stress the importance of good lifting.

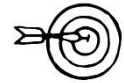
### Part 2

Let people practice in groups with different objects and weights and give feedback based on the 10 golden rules.

Finish the exercise when you have the feeling that people know what correct lifting is and feel encouraged to do it in their daily life.

## 7. Harmful Noise

This module is about the influence of sound on your ears. What is sound, when does it reach a harmful level and how to protect yourself.



### Learning objectives

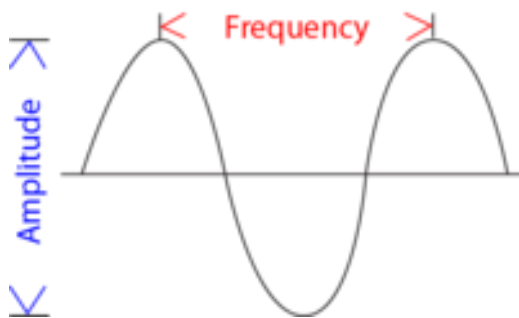
After this module the participants:

1. Know what sound and sound waves are
2. Can easily measure their own surrounding sounds in decibels
3. Know that sound can damage hearing
4. Can protect themselves and know which PPE's to wear as protection.



### Background information

Sounds is something you hear with your ears. Sound comes from your voice, instruments, or machines, these are the sound sources. Sound consists of so-called sound waves. We can visualise it in this way.



The straight line is the **zero position**, this is the position of the sound source when it is silent.

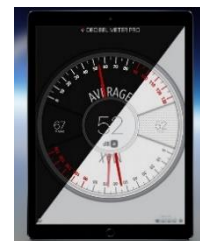
The **amplitude** indicates how hard the object vibrates. The bigger the amplitude the louder the sound.

The **frequency** indicates how often the object vibrated back and forth in one second. The higher the frequency, the higher the tone. Frequency is measured

in Hertz (Hz)

Sound is measured by **decibels (dB)**, this indicates the strength and impact of the sound. People can listen to sounds between 1 and 80 dB without having any problem. **Sounds (or noise) above 80dB can cause severe hearing damage.** Be aware that an old car already easily make noise above this level!

You can measure the decibels with a proper Decibel meter, if you have no access to such professional meter you can download a sound level meter from the app store on your mobile.



Sound moves at a certain **speed**. This differs from the speed of light. Sometimes you first see the fireworks in the sky and only later hear the bangs as well. The speed of sound also depends on the material it moves through. Sounds moves fastest through solids (like iron), less fast through liquid (like water) and slowest through gas (like air).

Sound can also **resonate**. This means that two objects vibrate in the exact same frequency (Hz). When this happens, the sound will be amplified. Resonance can be dangerous, that is the reason why soldiers are not allowed to march over a bridge because the bridge would collapse due to resonance.



## Your ear

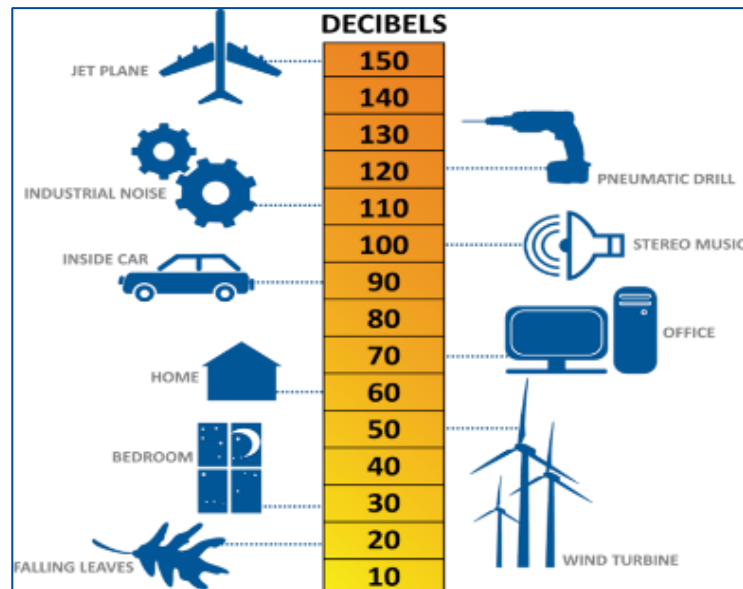
Through your ears you hear the sound and noises surrounding you. An ingenious system inside your ears transforms the sounds you hear into something you can understand. Your ears are delicate, with tiny little parts that all work together. When your ears frequently are subjected to too much noise (more than 80dB) the little parts get damaged irreversibly.

## Ear protection

Sound is very important for your work and daily life, you communicate through sound, it warns you and helps you to relax. If this sound is lost you might lose your job, start feeling lonely and feel less safe.

So, you have to protect yourself from harmful noise and be careful. **If the noise level exceeds the 85Db, you have to wear ear protection all the time!**

There are different types of hearing protection, the more noise, the more important it is to make a good choice.



## Some links with additional information

<https://www.youtube.com/watch?v=hfzCLCIVO8g->

<https://www.youtube.com/watch?v=eQEaiZ2j9oc>

## Key messages



1. You can damage your hearing now or later when you are exposed to noise above 80dB regularly
2. Above 85dB you should always wear ear protection, your standard PPE
3. Hearing damage is irreversible
4. Check the level of noise when you are not sure about the level
5. Download a sound meter on your phones, so you can measure the noise level

## Training flow



As trainer you want to make sure that the participants are aware of the hazard of noises in the workplace. And that they know how to protect themselves effectively.

## Part 1 Starter

Record workplace noises (gas cutting, drilling, etc) and let the participants listen, raise the volume and ask when people think it will damage your ears.

Check with a sound meter the level and discuss the outcome.

## Part 2

Give some background information on noise, ears, and hearing damage. From the video on myths and facts make statements and let people raise their hand or move around in the room if they agree or disagree.

1. I can build resistance up to noise, my ears will get used and toughen up
2. Only when noise is painful it is dangerous
3. Only constant noise will harm my ears, not when it is on and off noise
4. My hearing will come back after I stay away from the noise for some time
5. If I have a hearing problem, I can fix it with a hearing aid, just like eyeglasses for my eyes.

Show the video with the myths and facts and add information on the hazards of loud noises:

<https://www.youtube.com/watch?v=iTFPh-COLFK>

## Part 3

Let people practice with a sound level meter or app on their mobile. Let participants walk around in small groups, inside and outside and measure different sounds. Also measure for a certain time and see what happens. Let each group make a small report and give feedback.

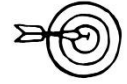
## Wrap up

Discuss ear protectors. Show different models and discuss when and how they are used.



## 8. Hoisting Gear

*This module is about safe lifting of objects with lifting materials, what to use, how to use it and how to store it. A good condition and correct use of lifting equipment prevents serious accidents.*



### Learning objectives.

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After this module, the participants:

1. Can inspect hoisting gear and recognize unsafe equipment.
2. Know what suitable lifting material for a certain object is and know how to use it in a correct way.



### Background information

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Lifting equipment is used when moving or transporting heavy and large objects. Many serious accidents have led to (inter)national safety requirements, which have stimulated the design of smart hoisting gear. One of them is being able to find out quickly the weight class of a certain tool. Also the obligation for inspection of certificates, and the associated regular checks, have increased the safety of hoisting gear.

To move objects in a safe and controlled manner, they need to be fastened in such a way that the lifting load is balanced, and the weights evenly distributed.

### Lifting materials

There are different lifting materials:

1. **Ropes.** Ropes are made from plant fibre and therefore sensitive to fungi and moisture that causes the rope to rot. A rope that is affected is no longer allowed to be used.
2. **Lifting slings.** Polyester lifting slings have almost completely replaced ropes, they are easy to handle and their light weight make them very useful for removing equipment. Lifting slings are flat or round and consist of several polyester strands with no end. The round lifting slings are packed in a cover, with the danger that it is more difficult to discover any damage. Lifting slings have different colours that represents the maximum load the sling is intended for. Data about the sling (weights, manufacturers date, etc.) is indicated on a sticker on the lifting sling. A lifting sling should not be used more than four years.

3. **Chains.** Chains are mostly used to hoist heavy loads. A chain is made of high-quality steel, divided in a few steel classes. Chains that are recently made are labelled with important data on number of wedges, outer angle, and tonnage (WLL), chain diameter and quality.



The test date is also listed on the label, which is important for inspections and registration.

Hoisting chain work is subjected to a lot of regulations, so be aware of your national regulations.

4. **2 -3- 4 leg chain slings.** With these slings it is important that the lifting power of the chainwork is always much higher than the weight you are going to move. For example, for a 2-leg sling with a WLL of 2,000 kg, you should also use a shackle of at least 2,000 kg. The capacity of the chain work depends on the chain diameter. The 2-3-4 legs slings are usually used in conjunction with Bow shackles and D shackles.



Chain diameter mm	6	8	10	13
Capacity (kg)	1120	2000	3150	5300

5. **Steel slings.** Steel slings are made of steel cables with an eye or hook on each side. There is also an endless sling with the two ends intertwined to make a circle. A steel cable is very strong because it is made of thin steel wires that are braided into a strand. Unlike chains, a steel wire is more susceptible to poor and incorrect handling. When placed around sharp corners there is the risk of breaking the small steel wires. Broken steel wires will corrode and affect the lifting capacity. Inspection is very important.



The diameter of the cable determines the capacity of the cable.

- » 10 MM (1.280 KG)
- » 14 MM (2.510 KG)
- » 18 MM (4.500 KG)
- » 22 MM (6.200 KG)
- » 26 MM (8.660 KG)

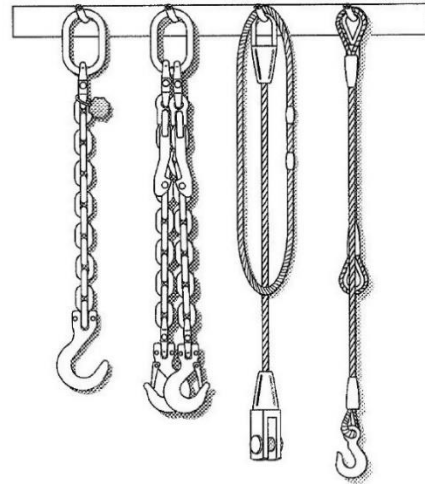
- » 12 MM (1.830 KG)
- » 16 MM (3.280 KG)
- » 20 MM (5.120 KG)
- » 24 MM (7.370 KG)
- » 28 MM (10.030 KG)

### Storage

Steel slings and chains need to be hung or stowed separately, dry and off the ground, to prevent moisture and rust.

## Hoisting

For hoisting you should take care that the lifting angles do not get too large, which means that the wires or chains are unnecessarily loaded. With a 2-leg sling, an angle between the wires of  $30^\circ$  is the safest situation. The bigger the angle, the higher becomes the load.



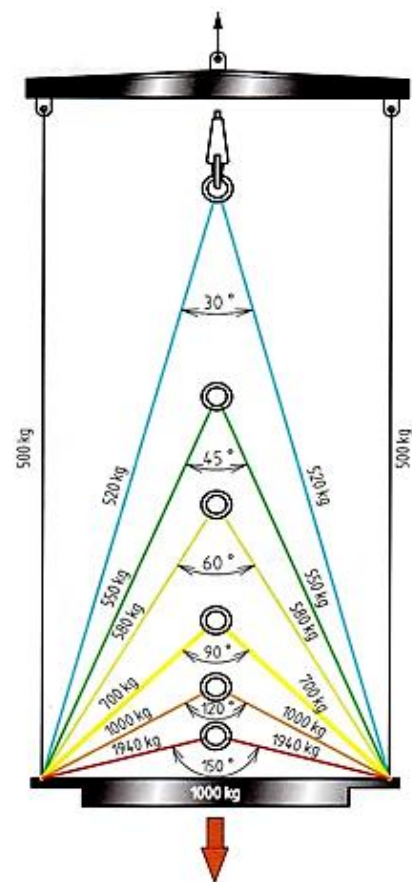
This picture shows how the forces increase when the angle between the wires increases. Here the weight is 1,000 kg. Ideally two lifting wires straight down divide 500 kg each.

From the center

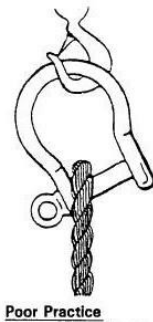
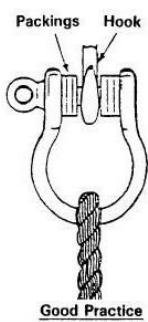
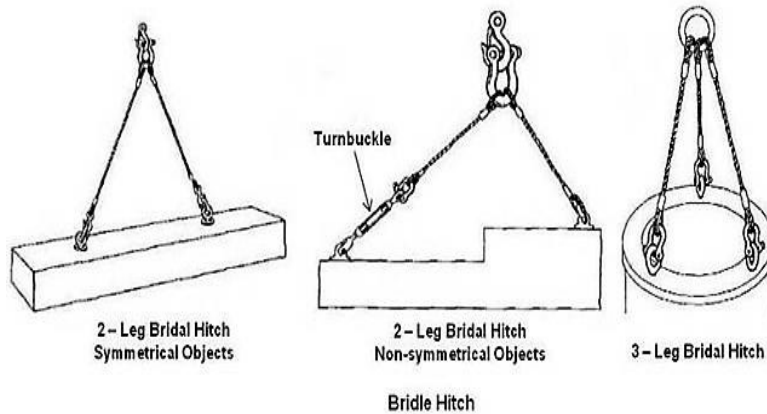
- L $30^\circ$  = 52% of the weight = 520 kg
- L $45^\circ$  = 55% of the weight = 550 kg
- L $60^\circ$  = 58% of the weight = 580 kg
- L $90^\circ$  = 70% of the weight = 700 kg
- L $120^\circ$  = 100% of the weight = 1000 kg
- L $150^\circ$  = 194% of the weight = 1940 kg

Make sure that the 2- legs sling is always sufficiently long enough so that the angle never gets too big. Never pass the  $120^\circ$ !!

Always make sure that the safe lifting capacity of the sling is a lot higher that the weight you are going to move.

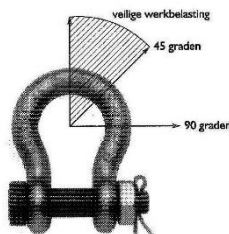


Use D shackles and harp shackles properly! If used incorrectly the shackle is skewed with a wrong pull load on the legs of the shackle.



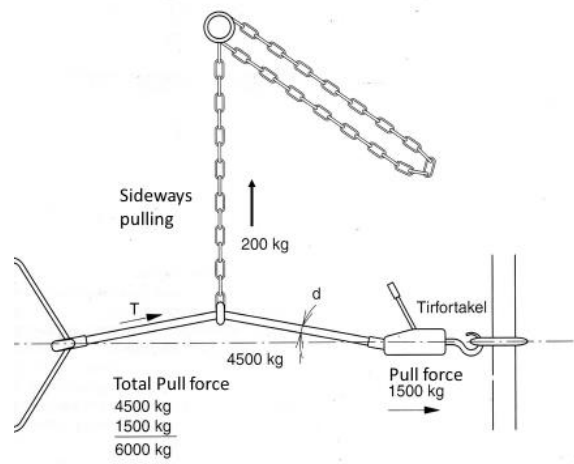
To keep the harp shackle straight when it is too large for the hook, the solution is to place two distance rings. The hook will no longer slide to the outside. Always look for a suitable and safe shackle.

A shackle with a bout may be loaded to pull within the 90° sideways. Never use the legs to pull, they will pull the legs apart and deform the shackles.



Within the 45° area, the shackle can be used 100% safely.  
 Within the area of 45°-90°, the shackle can only be pulled safely for 70%.  
 Outside the 90° area, the shackle should never be used!  
 Sideway pulling is extremely dangerous.

This picture shows that a cable that is pulled with a force of 1,500 kg and then charged sideways with 200 kg, gets an overload of up to 6,000 kg. The cable WLL is 1,500 and will therefore break.



Some other examples of incorrect use:



## Key messages



1. Lifting materials, hooks and shackles, should always be used correctly
2. There are rules and regulations about the use of hoisting gear, make sure you know them
3. You should always store lifting materials dry and hanging
4. You should maintain and check for defects of the lifting equipment regularly, if defects are detected, discard the material
5. Always check the capacity of the lifting materials in relation to the load you want to carry.
6. Always check the angle of the ropes, never get above the 120°!
7. Always check that there are no people under the lifting object during lifting.

## Training flow



### Part 1 Starter

Show some pictures of the yard where lifting materials are used and ask what they observe (use and repeat the observations techniques from the third module).

## Part 2

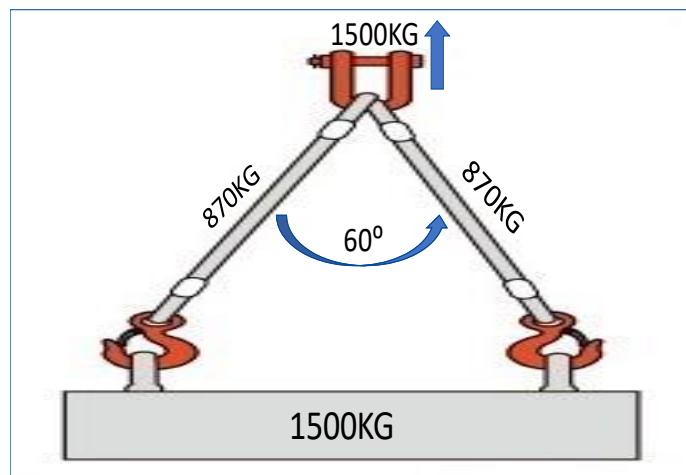
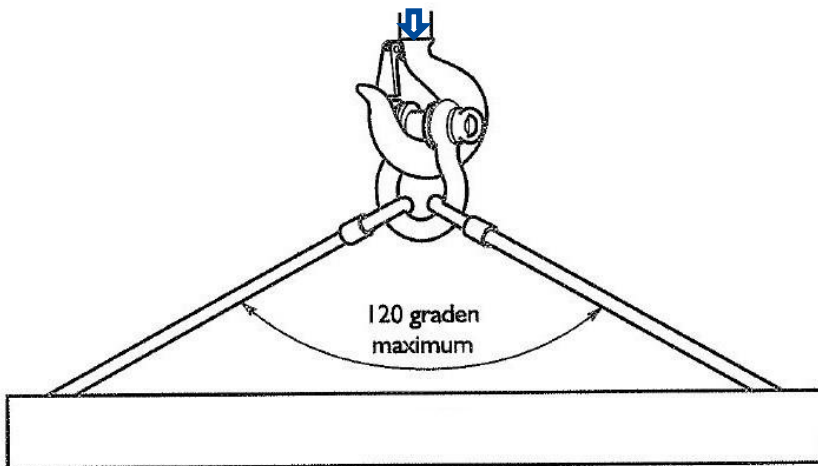
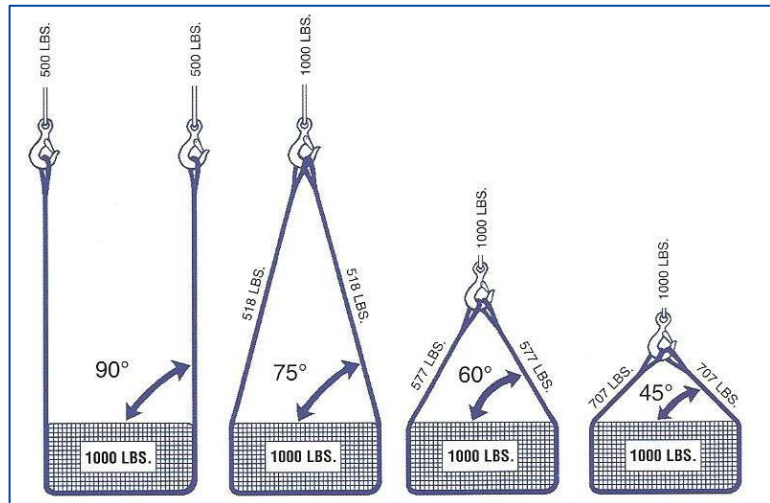
Explain the different lifting materials and their different uses. When do you use what and why? Bring lifting material to the training and demonstrate the use.

Explain how you can calculate the lifting angle and how to use a sling under different lifting angles.

Question: What should be the capacity of the sling?

1000 LBS = 453,59237 KG

Let participants practice various exercises with different weights and angles.

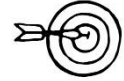




## 9. Steel cables

*This module is about the use and maintenance of steel cables. Steel cables are used on winches and as auxiliary tool on cranes for example. Good storage and maintenance extend the life of the steel cables.*

### Learning objectives



After this module, the participants:

- Know the composition of steel cables
- Are able to inspect steel cables for unsafe fractures, corrosion and other damages
- Know how to maintain and store steel cables.

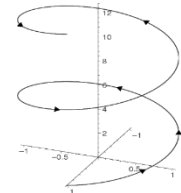


### Background information

Steel cables are developed in the mining industry in the 1830s. Since that time, the wires have improved tremendously in quality and different types. Main function is still a dynamic use for moving and hoisting in cranes, elevators, and other forms of transmission of mechanical force.

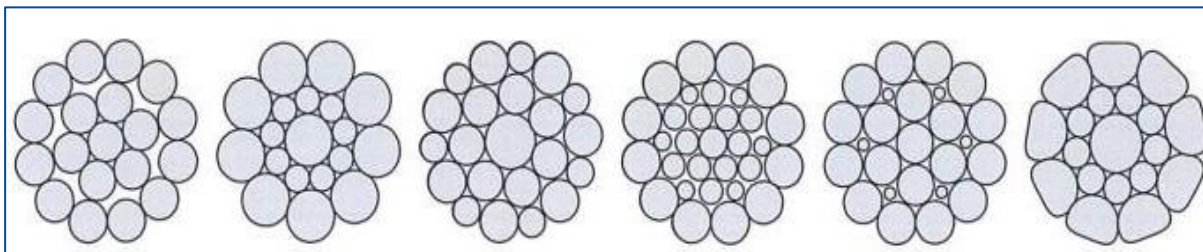
Steel cables are composed of several individual wires that are twisted into strands before being helically wrapped around a core to form a wire rope.

The number, shape and size of the individual steel wires and the construction of the core determine the properties of the steel cable. The core is the backbone of the steel cable and most important for its strength. The strand core can consist of one or more steel wires (= steel core), but also of fibres (= rope core). The build-up of the strands determines to a large extent the technical properties of the cable.



<https://www.youtube.com/watch?v=eDVf71xd2cQ> – manufacturing of steel cables.

There is a distinction between one-layer strand cables and multiple layer strand cables. A steel cable construction has usually 6 or 8 strands. But different cable constructions can have different properties.

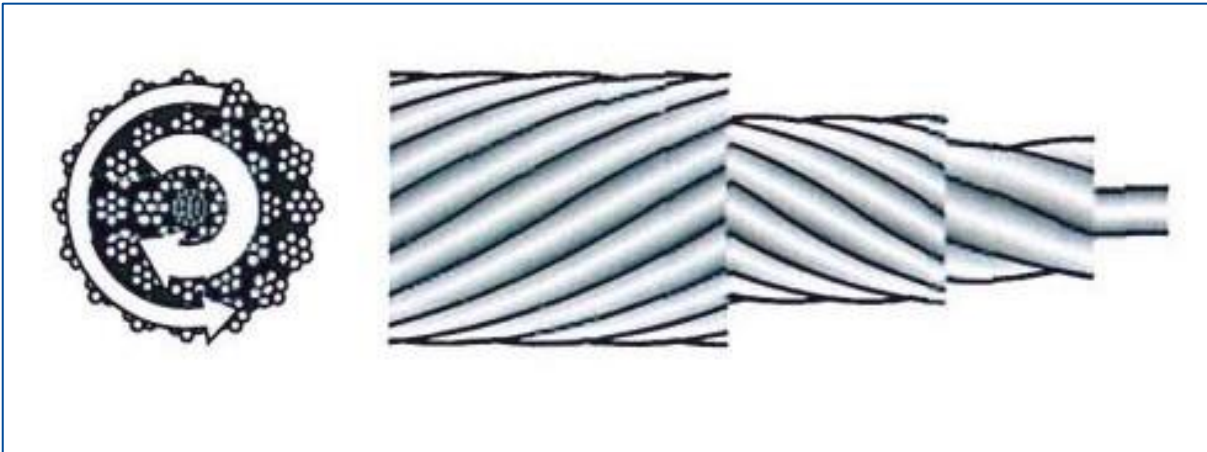


In these pictures you see a few different types of steel cables. The cross-section of the cable gives a good picture of how the cable is composed and in which direction the strands are laid: left or right.

There is a special reason to use cables with different directions in hoists that have multiple lifting cables. A crane with steel cables laid to the right can easily rotate. In cranes, a combination of cables with left and right directions are usually used side by side via different drums. Because of the opposite directions of rotation, the load will not rotate.

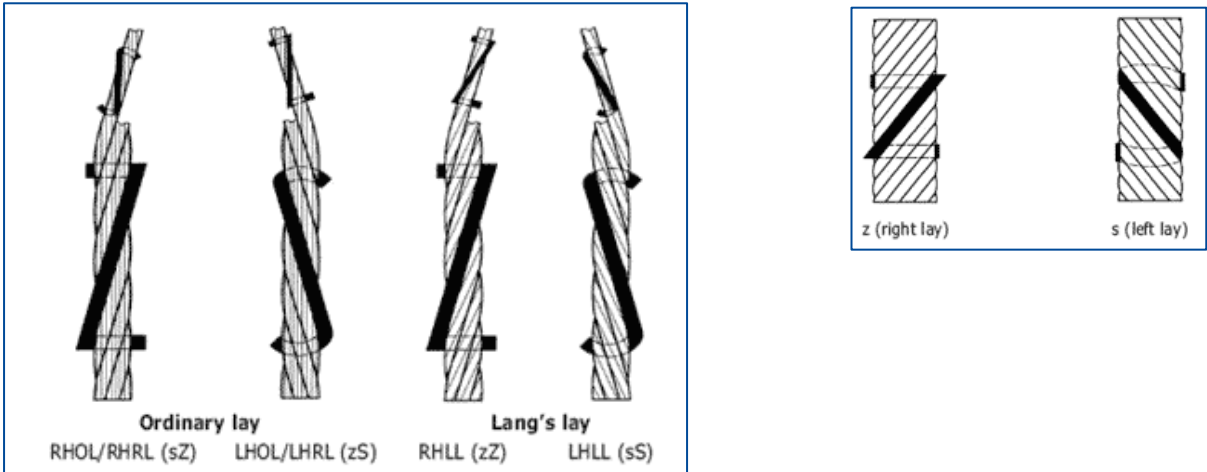


Another option against rotating is to use multi-layer strand ropes. The direction of the outer strands is opposite to that of the underlying strand layers. These multi-layer strands ensure that the cable has become rotation free. The composition of the cable is usually 19x7 or 35x7 etc.



The appropriate direction (right or left) depends on the construction method of the cable drive (drum). Right and left cables are used on one and the same installation to eliminate the torque force between the one-layer cable constructions.

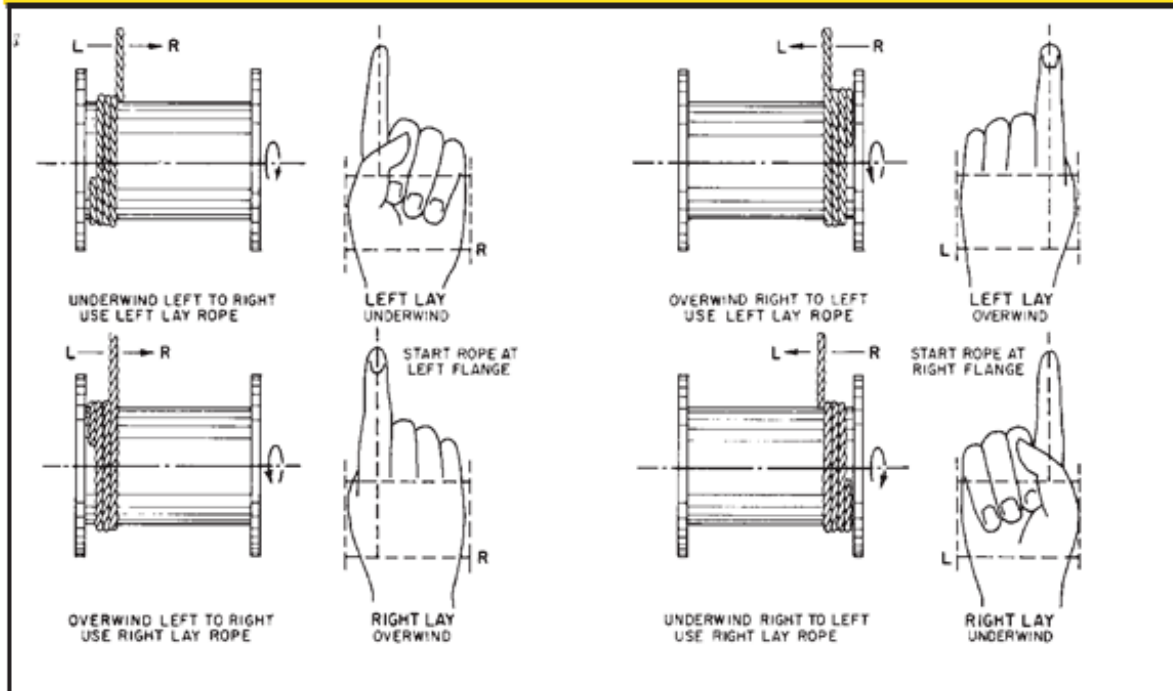
In a crane, only cables with the same direction may be combined. Here are the usual construction types and construction directions:



The first letter of the symbol (lower case) denotes strand direction, and the second letter (upper case) denotes rope direction (sZ, zS, zZ, sS).

In order to know what cable you need, it is important to know where the cable will be connected to the drum and whether the steel cable runs over the top or bottom of the drum.

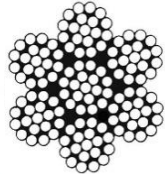
By holding the right hand or left hand with the index finger extended, palm up or palm down, the proper procedure for applying left and right lay rope can easily be determined.



### Technical data of Steel Cable

Below are the technical details on the construction of a standard 7X19 steel cable

The construction of het cable consists of 7 strands each made of 19 wires. Six strands are on the outside and one strand is the core.

7X19			
QUALITY	• galvanised	TYPE OF LAY	• regular lay
TENSILE STRENGTH	• 1770 N/mm <sup>2</sup>	DIRECTION OF LAY	• right hand lay
TOTAL NUMBER OF STRANDS	• 7	GREASING	• no
TOTAL NUMBER OF WIRES	• 133	ON REQUEST	• ungalvanised
TYPE OF CORE	• WSC		• greased
NUMBER OF OUTER WIRES	• 36		• left hand lay
NUMBER OF OUTER STRANDS	• 6		
		Nominal Diameter (mm)	MBF (kN)
		8	37,6
		10	58,7
		12	84,6
		14	115

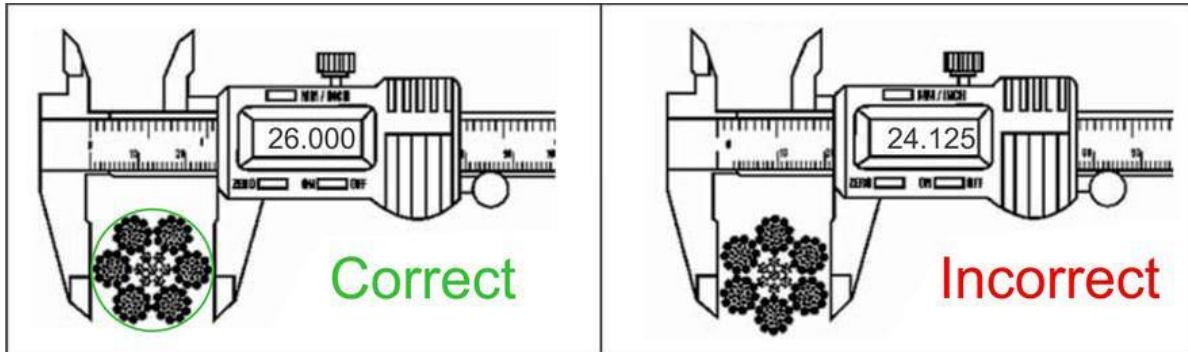
Steel cables can be used at temperatures from -40°C to +100°C. Temperatures outside this range will decrease the load capacity and should be avoided.

### Storage

Cables should be stored in a clean, well-ventilated, dry and protected area. Preferably on wooden pallets for ventilation. In the case of prolonged storage, cables should be regularly checked for corrosion and, if necessary, re-lubricated. Apply a durable and unambiguous marking to the cables to avoid mix-ups.

## Usage

Before using, check the cable diameter as indicated on the figure below and check that the end connections are free of visible defects. Check all technical data with the marking on the labels and associated certificates.



When replacing a steel cable from a drum avoid damage and twisting during the winding of the drum. In order not to transfer the torque forces of the old cable to the new steel cable, it is recommended to use cable ducts with flexible connection. Make a safe and solid connection!

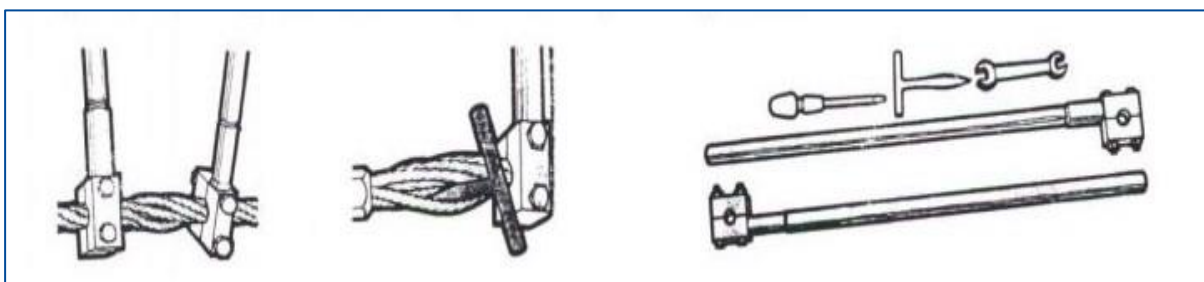
## Cutting

Protect the steel cable from unravelling when cutting. Steel cable wires that consist of more layers (or parallel cables) should be tied at least double on either side of the intended cutting place.

## Inspection

Steel cables should be inspected regularly over their entire length and especially at vulnerable places. It is always advisable to use a longer cable that you can shorten in case of damage. Wear and tear can be slowed down by reversing the cable attached to the drum to the other side. Pay particular attention to broken wires, extraordinary wearing off and areas that require extra lubrication.

Inside inspection of the cables is important to detect corrosion and other defects. With the cable under tension the inspection can be carried out on the spot with simple tools.



Two clamps are attached to the cable 10 to 20 cm from each other. By turning the clamps in the opposite direction, the strands will open, and the core becomes visible. This should be done carefully to prevent permanent deformation. In the resulting small opening the core can be cleaned and checked with a screwdriver for:

- A. the greasiness of the core
- B. the degree of corrosion
- C. the pressure of the wires in relation to each other
- D. the presence of broken wires.

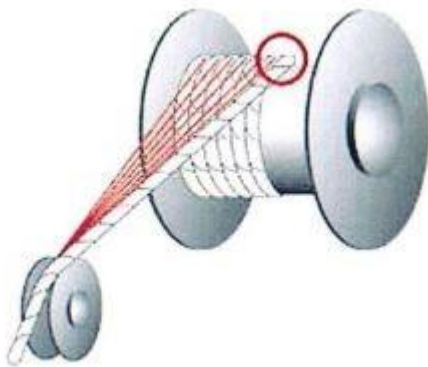
After the inspection, apply new grease on the inside and outside of the inspected place and remove the clamps.

Special attention should be given to vulnerable parts of the cable. These are:

- The part of the cable that constantly runs over a sheave.
- The bottom side of the cable on the drum, where it leaves the groove and returns. A lot of friction and tension arises here.
- Places just behind the end connections, such as sockets.



When using sheaves, check the radius of a drum with grooves. A too wide or narrow groove can adversely affect the life of the cable.



An excessive (un)winding angle may result in increased wear on steel cables. With a smooth drum, the cable angle should be between  $0.5^\circ$  and  $2.5^\circ$ . In the case of a grooved drum, it may be between  $0.5^\circ$  and  $4^\circ$ .



In the case of cable damage due to the adjacent winding, the life span can be extended by using other compacted (compressed) cable structures or long structure type cables.

On cable sheaves, the bar angle must never exceed  $2.5^\circ$ . In the case of rotary or parallel cable structures, the bar angle shall not exceed  $1.5^\circ$ .

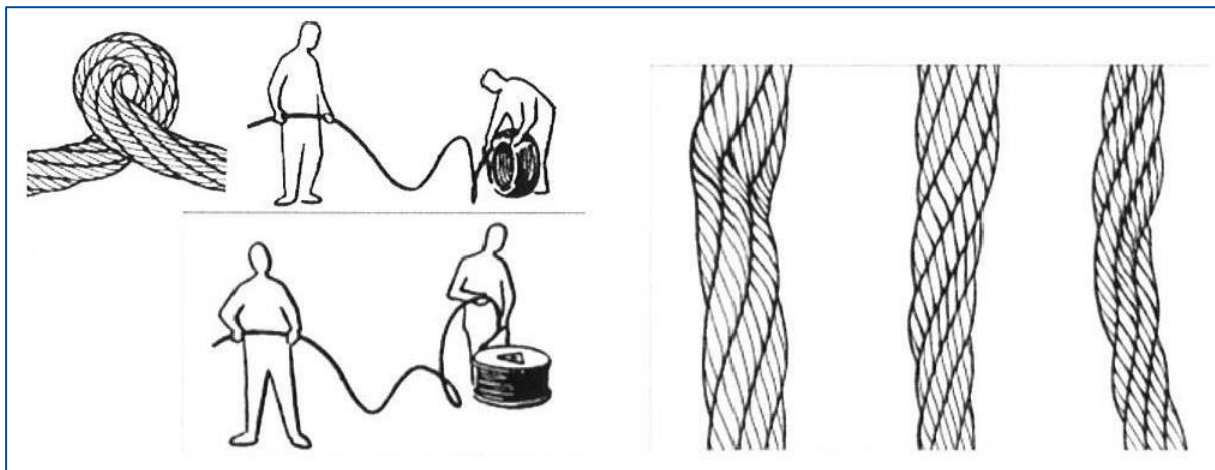
Make sure that the running steel cable cannot slide off the sheave or drum.

When checking steel cables in use, pay particular attention to the cable angle at which the cable enters the installation.



### Kinks

If the steel cable is unspooled incorrectly, kinks may occur. Kinks might shorten the life span of the cable.



Above, some examples of damage to steel cables

### Key messages



1. Steel cables should be used properly
2. Steel cable needs regular inspection and maintenance



This is a technical module and as trainer you need to check the details carefully. The danger of working with steel cables is often underestimated. Good attention should be given to proper use and maintenance.

### Part 1 Starter

Watch the short video [https://www.youtube.com/watch?v=Jj\\_K6bGQIfM](https://www.youtube.com/watch?v=Jj_K6bGQIfM)

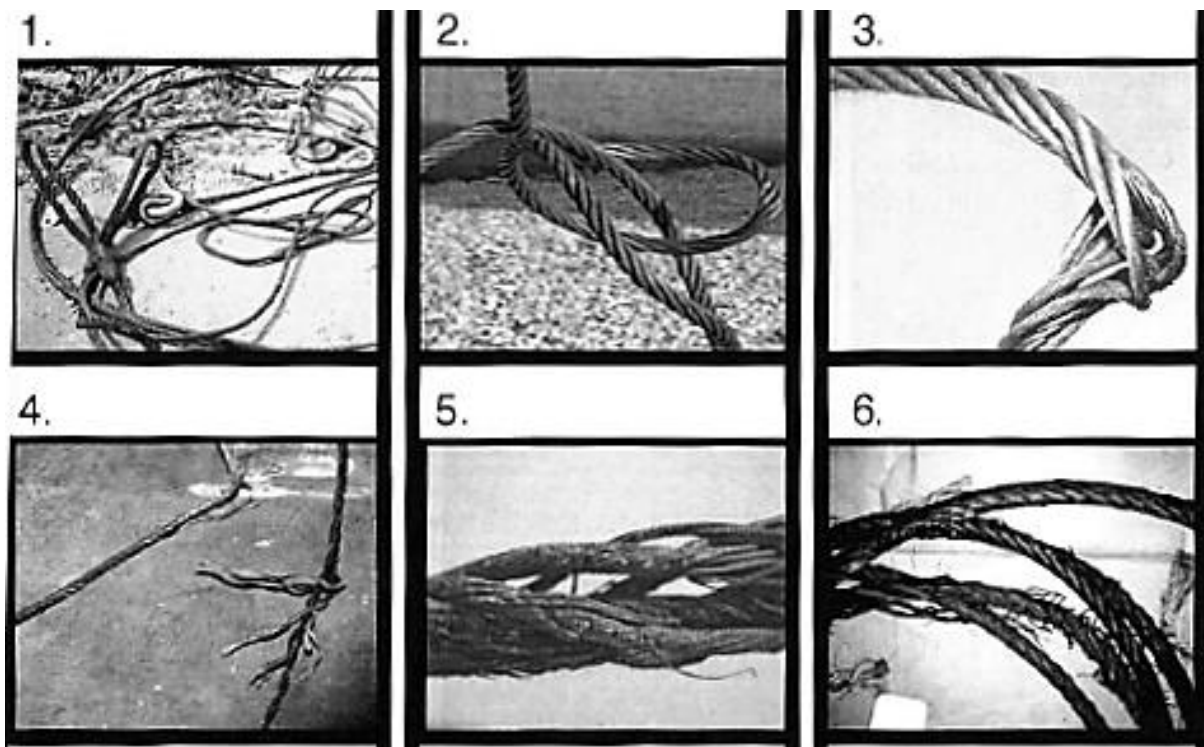
and guide a conversation on experiences with steel cables on the yard. Where are steel cables used for, who is responsible for maintenance and have they ever seen a (near) accident.

### Part 2

Give an introduction on what steel cables are made of, how to maintain, inspect and store them.

### Part 3

Show examples of cables in poor conditions and ask the participants if they think they can be used or need to be discarded. Ask why they think so.



The correct answer is that they all need to be discarded. None is fit for function.

#### Part 4

Divide the group in small teams and make a quiz to test the knowledge. Below are examples of questions you can ask. In case you add questions, always check and double check if you know the correct answer.

1. What is the name of the spiral of a steel cable?

- a) Astrix
- b) Helix
- c) Steelflix

2. Which cable is rotating free?

- a) Right constructed cable
- b) Left constructed cable
- c) Left right constructed cable

3. What does 7 X 19 mean with a steel cable?

- a) Seven strands of 19 mm.
- b) Seven X nineteen = 124 meters
- c) Seven strands consisting of 19 wires

4. What equipment can you use to measure the thickness of a steel cable?

- a) Roll size
- b) Slider size
- c) Thumb stick

5. How is a Kink in the steel cable created?

- a) Failure to unroll the steel cable correctly
- b) When clamping the steel cable
- c) In case of corrosion of the steel cable

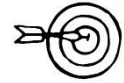
Answers 1. = b) 2. = b) 3. = c) 4. = b) 5. = a)



## 10. Cause and consequences

*This module discusses accidents and focuses on the cause of it. This module is an introduction to the subject. Professional accident analysis demands a special training.*

### Learning objectives



After this module, the participants:

- Are able to analyse the causes of accidents
- Observe their environment for possible hazardous situations.



### Background information

This module is about assessing dangerous situations and discussing how to avoid it. It refers back to the first three modules on good organisation, good communication and good observation.

In the following link you will find several examples of accidents and what causes them.

<https://www.youtube.com/watch?v=E-bU8dHwSFo>

### key message



1. every accident has consequences and causes
2. It is important to look for the causes, observe and communication changes, in order to prevent future accidents
3. you should always observe the workplace to prevent accidents.

### Training flow



Show participants the following pictures. Ask them to analyse the situation and comment on the security issues. Discuss how you can avoid this kind of situations.

#### A. The Plug

##### Questions:

What do you see in this picture?

Is it a secure connection?

What kind of socket is this?

Is it a 230V socket or 380V?

What can you see that from?



**Answer:** A plug that is connected to a socket for a higher voltage via a screw and a split pin.  
 A very unsafe and dangerous connection.  
 It is a 380V socket without a lid for protection.  
 You count 4 holes probably for a zero, two phases and an earth connection.  
 1 bolt in the zero and a screw in the phase.  
 The socket cannot be sealed with a hood.

B. Fuse box

**Questions:**

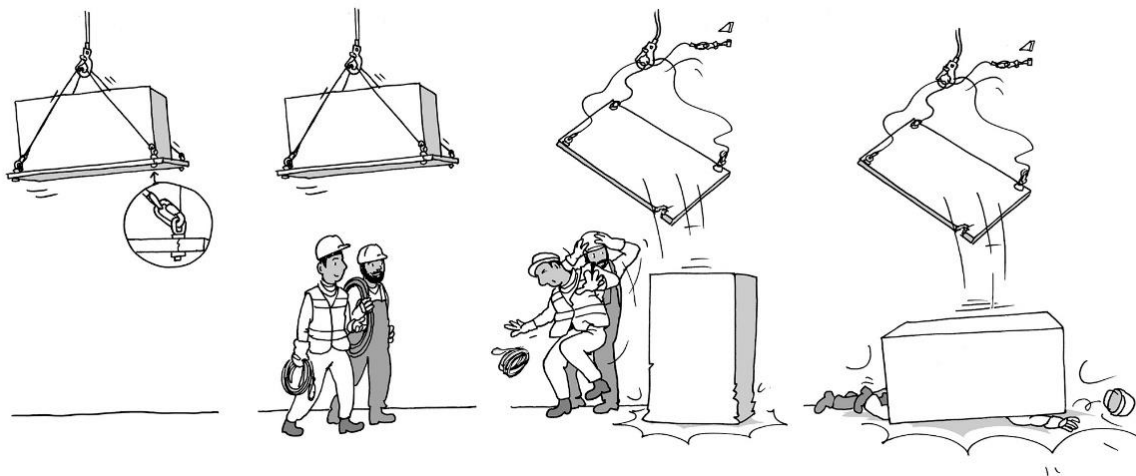
What do you see here?  
 What's not correct?  
 Is this a good solution?  
 What could be the consequences of this?



**Answer:** A fuse box with three fuses, two of which have been replaced by bolts of 6 mm thickness.  
 This is a very dangerous situation!!  
 The original fuses were burned by overload. Probably 16- or 24-ampere fuses.  
 Normally, the wire in the fuse is 0.5 mm that burns through when overloaded.  
 The 6 mm bolts will not burn out in case of overload, but the wires will glow and become red and hot, causing a fire.

C. Name the situation

Ask the participants to assess each picture and analyze whether this is:



**Answer:**

- 1 = unsafe situation
- 2 = unsafe act
- 3 = near miss
- 4 = Accident

D. Railroad crossing

**Questions:**

- How safe is this?
- Why are they doing this?
- What do we call this?

**Answer:** Act unsafely.



E. Safety equipment

**Question:**

What do you see in these pictures and what goes wrong?

**Answer:**

The man is standing on the edge of the working platform.

He works at altitude and has not fastened his safety belt to anything.



**Conclusion:** The man has all the safety equipment but uses them not or in the wrong way.

F. Counterbalance



**Question:**

What do you see here?

Unsafe action?

Unsafe situation?

Is it just going well?

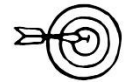
**Answer:**

It is an unsafe act and an unsafe situation and it just going well.

## 11. Toolbox

*This module explains the use of toolboxes. Toolboxes are short and effective meetings to instruct employees about hazards or changes in and around the workplace, with the aim of increasing safety at the workplace.*

### Learning objectives



After this module participants:

- Can hold a toolbox themselves
- Know how to prepare a toolbox



### Background information

A toolbox is a short presentation or conversation about a particular safety topic. The goal is always to promote safety within the company. It is created to discuss topics briefly and quickly with all the employees on the work floor, sitting on workbenches and toolboxes to listen to the instruction. Hence the name 'toolbox'.



The toolbox is meant to give instructions in a clear and short manner. Preferably with examples and pictures to illustrate the message. A toolbox usually discusses one topic within a time frame of 15 –

20 minutes. The topic can be an accident that occurred or a work situation that needs discussion. Toolboxes about prevention are of great importance when new employees have joined, or a new type of ship is going to be demolished.

Topics that are often covered during a toolbox are:

- The use of PPE
- Use of tools
- Working at altitude
- Housekeeping, order and cleanliness
- Dangerous substances

The power of good toolboxes is discussing a work situation that have a direct impact on personal safety and health of employees. Information is given on how to recognize and prevent dangerous situations and how to protect yourself and others from danger. This contributes to safety awareness in general and on particular issues.

### **Toolbox meeting**

#### **Preparation**

- Choose a current topic, specify why this topic is chosen (E.g., in case of incidents, accidents, or a wrong way of working)
- Make a good plan of action and check that your working method complies with the current laws and regulations.
- Make the toolbox meeting visual, one image often says more than a stream of words.
- Let the employees know in good time when, where and what time the toolbox meeting takes place.
- Make sure that all supplies are available, and any paperwork is ready.

#### **Meeting**

- Specify which safety issue is being dealt with and why.
- Ask for opinions or have someone share his experience.
- Explain clearly what the safe working method is. Prepare this method well and show it in the right way.
- Explain clearly what needs to be changed to enable the new way of working.

#### **Completion**

- Make a summary of the meeting, write down the action points discussed.
- Tell the employees what is being done with the action points.
- Ask the employees for their opinion on how they experienced the toolbox meeting with the aim of further improving it.
- Finally, make a list of all the employees present. If necessary, have the employees sign for attendance.

## Key messages



1. Toolboxes promote safety awareness of the employees
2. Toolboxes discuss safety issues clearly, with good examples and demonstrations
3. Toolboxes need good preparation
4. Toolboxes need to be relevant and immediately useful for the employees
5. Toolboxes last approximately 15 minutes

## Training flow



As a trainer you want participants to practice delivering a toolbox meeting. Give feedback on the content and the time. Both are important elements.

### Part 1 Starter

Ask participants if they are familiar with a toolbox, or something similar in their company. Share a story in which a toolbox has saved lives or prevented injuries.

### Part 2

Explain the different steps of a toolbox and give a good example.

### Part 3

Divide the participants in small teams and let them prepare and deliver a toolbox on a relevant subject.

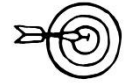
After the assignment give feedback on:

- content (is the information correct)
- supporting materials, pictures, demonstration, etc.
- time (less than 20 minutes)
- tips for improvement



## 12. Personal Protective Equipment (PPE)

*This module is about the use and importance of Personal Protective Equipment. This equipment is to prevent injuries and bodily harm. The use of PPE is the most direct way to reduce labour risks.*



### Learning objectives

After this module, the participants:

1. Can recognize the different types of PPE
2. Know how to use these PPE in the correct way
3. Are aware that they themselves play a crucial role in the choice and use of PPE
4. Are motivated to be careful with PPE



### Background information

Personal protective equipment often protects a specific part of the body, such as eyes, ears, mouth, hands or feet. It is made for specific hazards such as hitting, piercing, excessive noise levels, toxins, falling, etc. PPE should be tailored to function and purpose and not present new dangers, like for example limited freedom of movement or less visibility.

#### At the shipbuilding or shipbreaking yard

An employee wears a helmet, safety shoes (with steel noses against bumps or clamps), eye protection and overalls. When welding and flame cutting, they wear heat and radiation-resistant clothing. If respiration may be at risk, a dust or respiratory mask or other respiration-protective devices will be used. At a noise level >85 dB(A) they wear hearing protection.

A welder uses a welding hood (with or without air supply) with a dark-colored viewing window. But also, in the case of metal grinding or flame cutting, at least safety goggles with side shielding of shock-resistant glass or dark colored glass are required.

Visitors on the yard wear safety vests, safety shoes, helmet and protective goggles or safety glasses.

PPE is crucial in preventing injuries, wearing them in the right way is important. A proper introduction of each type of PPE is part of the security and safety policy of the company.

#### Helmet

Today's helmets are lightweight and have an inner helmet that can be adjusted to the size of the head. The life of the helmet should be monitored, the plastic is provided with a plasticizer that fades away and hardens the plastic, which can cause the rupture of the helmet.







There are several useful add-ons to be applied to the helmet	
hearing and face protection	
Lighting	
SOS label, containing information of the person in case of an accident. Like medicine use, blood type, etc.	
Neck protection, against the heat	

### **Welding or cutting goggles**

A welding hood is usually used during welding to protect the entire face from radiation. Both safety glasses and goggles are intended to protect the eyes during gas welding or gas cutting. During welding and cutting, the material becomes so hot that it emits an intense light that can damage the eye. The light is so strong that you cannot investigate a welding bath without glasses. Welding goggles have dark violet or red glasses that contain didymium, which is a mixture of rare metals. The glasses often have flip up glasses so the work can be inspected without taking off the glasses. Welding glasses have different strengths and if dark enough (14 or 15) you can even use it to look straight at the sun, for example to observe a solar eclipse.

Without protection you can get welding eyes. A **welding eye**, or **caecitas nivalis**, is an inflammation caused by the exposure of the eye to ultraviolet rays. It is hard to see on the outside, but it is extremely painful. The eyes feel dry and the patient tolerates no light. Even moving the eyeball from one side to the other can be painful. Welding eyes heal by itself in one or two day.

<p>Simple dark glasses for gas cutting, with only a thin plastic protection. Colour of the plastic layer must be sufficiently dark (strength 14)</p>	
<p>Welding and gas cutting glasses with flip up frame with dark glasses. The dark glasses are made of real glass</p>	

### Dust Masks

A **dust cover** or **dust mask** is a respiratory protection mask to protect the lungs from dust. It does **not** protect against the fumes of organic solvents.

It is important to protect the lungs from dust to prevent respiratory problems. Dust can cause lung diseases, such as silicosis (dust lungs due to gravel), anthracosis, asbestosis (obtained by asbestos) and siderosis (in particular dust from coal, silica, iron ore, zinc, aluminium or cement).

The dust mask is a simple mouth-nose mask, it protects the nose and mouth. It works as a filter, the smaller the holes the more dust is held back. The mask must meet certain safety standards.

An example from Europe is the FFP mask (Filtering Face Piece), this is a type of respiratory protection mask certified by the European Union that serves to protect against dust particles and against various viruses in the air. The masks are divided into three classes of filter efficiency, namely FFP1, FFP2 and FFP3.

### The FFP1 mask or P1.

It is the least filtering mask of the three types.

- Filters at least 80%.
- Inward leakage Up to 22%.

It is mainly used as a dust mask (for example, for do-it-yourself jobs).

Manufacturers use yellow elastic bands to identify this type.

### The FFP2 mask or P2.

- Filters: minimum 94%
- Inward leakage 94%

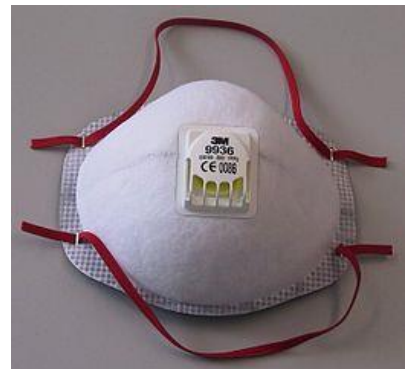
Manufacturers use white or blue elastic bands to identify this type.

### The FFP3 mask. with an exhalation valve.

- Filters: Minimum 99%
- Inward leakage: Up to 2%.

The FFP3 mask is the best filtering of the FFP masks. It protects against very fine particles like asbestos. It does **not** protect against **gases** such as nitrogen oxides. NO – NO<sub>2</sub>

Manufacturers use red elastic bands to identify this type.



Correct use is important!

The mask should be as close to the face as possible; a metal tab makes it possible to adjust the mask to the bridge of the nose. A beard is not recommended

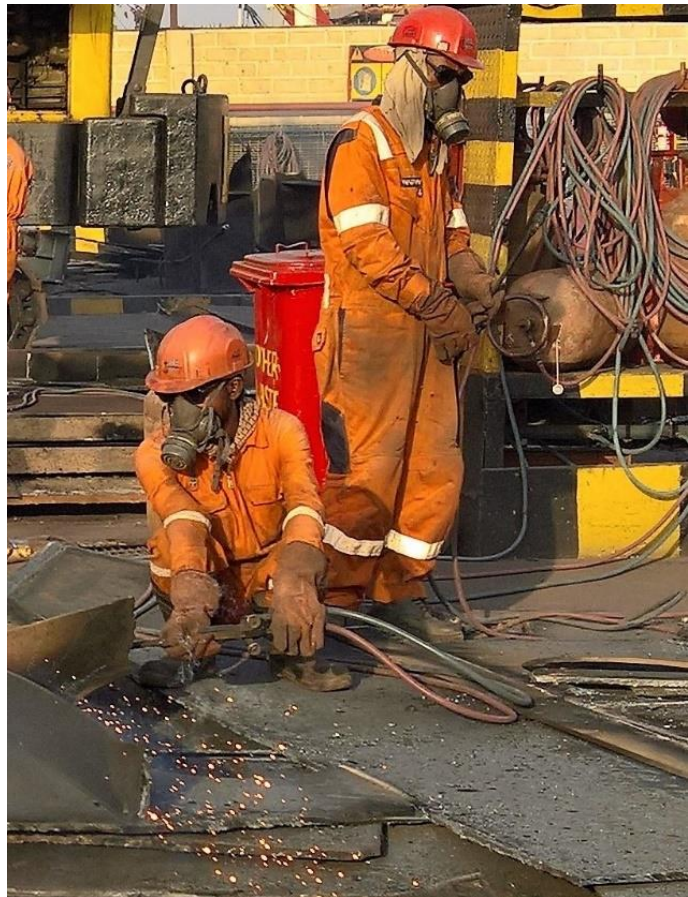
### (Half) Full Face Respiratory mask with replaceable filters

In shipbreaking, the employees are exposed to various types of (micro) dust, paint dust and combustion gases that are released during flame cutting. All over the ship, different types of paint have been used, all of which have a bad effect on the lungs and health. Gas cutters are constantly exposed to these dangerous gases. Wearing a half-face mask with replaceable filters protects against inhalation of micro dust and vapors and is therefore very important to reduce health hazards. There is a wide range of filters, for different purposes and the right filter should be carefully chosen for optimal protection.

A gas filter protects with activated carbon and can work on basis of two principles:

- Absorption: the gases deposit on the activated carbon, but no chemical compound occurs.
- Chemisorption: a chemical reaction occurs between the activated carbon and the gas or vapor.

In shipbreaking, most common are small dust particles, micro dust and combustion gases from paint and impregnated oil residues from the steel plates. For this, a combination filter gives the best protection. Filters are classified by letter and colour code. This color coding allows you to deduce which filter you need for the (chemical) substance you are dealing with.



Type Filter	Colour	Protection against
A	Brown	Organic vapours and solvents with a boiling point > 65 C
AX	Brown	Organic vapours and solvents with a boiling point <65 C
B	Grey	Inorganic substances acid gases and vapours as Chlorine (CL <sub>2</sub> ) Sulphur hydrogen (H <sub>2</sub> S) and Hydrogen cyanide (HCN)
E	Yellow	Sulphur dioxide, hydrogen chloride (hydrochloric acid)
K	Green	Ammonia
HG	Red	Mercury vapours
NO	Blue	Nitrous fumes and nitrogen dioxide
CO	Black	Carbon monoxide
I	Orange	Radioactive iodine and compounds

## Ear protection



Hearing protection has already been covered in Module 7 on harmful noise. But as important part of PPE it is repeated in this section. Wearing ear protection is recommended above the sound level over 85dB and required above 90dB.

There are many types, from simple loose foam plastic caps to protection with filter made special for your ear canal.



The most important is, that whatever is your choice, or whatever the company provides, **WEAR THEM!**



## Work shoes

Work shoes are important to prevent accidents caused by falling objects, dangerous substances or moving trucks. There are several safety standards, but the minimum safety base (SB) prescribes that:

- The steel nose should protect against falling objects
- The dent resistance of the steel nose is at least 200 joules
- The resistance of the steel nose in case of entrapment must meet a set standard
- The shock absorption in the heel is at least 20 joules (important to protect your lower back)

On the market these days you have shoes with a composite nose instead of a steel nose. Composite safety noses are made from materials as carbon, carbon fibre, plastic, or fibre glass. Advantage is that due to the lack of metal, these safety noses are ideal for work where detection gates have to be passed regularly. The lack of metal also has the advantage of the lack of conductive properties. Disadvantage is that the shoes need earlier replacement.

The shoes are made in different safety classes of properties. That runs from **SB, S1, S2, S3, S4 to S5**. The difference relates to anti-slip, safety nose, impenetrable sole, closed heel, fuel resistance, antistatic properties, energy absorbency, waterproofing, profile sole.

In this picture you can clearly see how the safety shoe is constructed and where extra invisible safety is applied such as the steel sole. This prevents sharp steel points from penetrating the shoe. (A steel sole is not fitted as standard in every type of shoe)



When you choose or use a shoe you have to take into account:

- The shoes should fit the type of work you do
- the shoes should fit well around the feet.
- Keep your shoes dry, if they get wet, put old newspapers in it. This ensures that the moisture is pulled out of the lining.
- wear the right socks to increase wearing comfort.

### Eye protection

The importance of wearing eye protection is covered in Module 3 on Observation. Goggles and safety goggles that also protect the side from loose foreign objects can mean preserving your eyes. Wear these glasses on the yard, you only have one pair of eyes!!



### Key messages



1. always wear your PPE
2. Think ahead what PPE you should use for a particular job

## Training flow

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As trainer show and give as many examples of Personal Protective Equipment as possible. Bring them to the training room and let people practice.

### Part 1 Starter

Guide a conversation on PPE, what are the experiences of the participants. What do they use, and why? Ask if they feel protected or not, and why (not).

### Part 2

Show the different PPE's that you have brought to the training room. Explain for the different elements:

- What they protect
- How they protect
- When you use them
- How you use them correctly – demonstrate

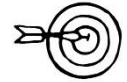
### Wrap up

If not all the right PPE is available on the yard, discuss what can be done and what support they need.

## 13. Fire fighting

*This module focuses on some basics in firefighting, how a fire occurs and what extinguishers are available. This module is not intended to make the participants firemen. This requires intensive professional training.*

### Learning objectives



After this module, the participants

1. Know the fire triangle
2. Have some basic knowledge about fire extinguishers
3. Are aware of the hazards of firefighting systems in ships
4. Realize that firefighting requires a special training

### Background information



A fire, however small, is always dangerous and easily becomes an uncontrollable disaster. Besides heat and smoke, there is panic and disorder. To fight a fire, you have to be well trained, especially when it comes to fire on board of ships or large office buildings. With many spaces that quickly fill with smoke you become disoriented. In order to act, you need to be specially trained by the fire brigade, if you have not received this kind of training or do not have the right equipment, you better stay away. Here we will limit ourselves to some basic data.

In shipbreaking the risk of fire is always present. Fire is usually caused by:

- Faults in machinery and technical problems
- Behaviour of unqualified persons
- Activities with high fire risks, like gas cutting, welding and work with electrical systems
- Combustion in bulk or waste products
- Arson
- Smoking

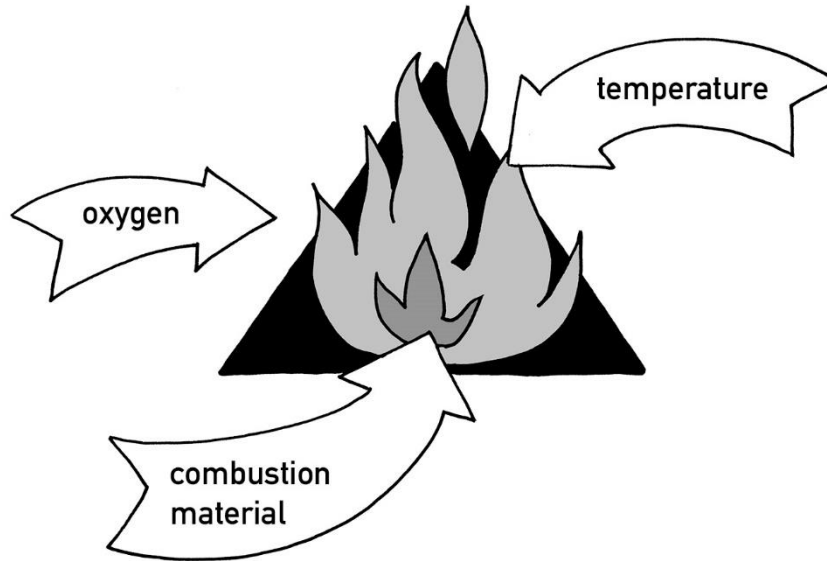
**Fire is an undesirable situation with a risk of harm and danger to people over which you may lose control.**

You can detect a fire in different ways:

- You see light, flames or smoke
- You can hear flames crackling
- You can feel heat
- You can smell burning



A fire requires three factors:



1. A combustible material
2. Sufficient oxygen
3. Sufficiently high temperature

If these three elements are present in the right proportion, a fire will occur. This is called the **fire triangle**, with each factor making up one side.

#### The television

Imagine that a television catches fire because of a short circuit. The three sides of the fire triangle would then be as follow:

1. **The combustible material:** the television itself and the materials inside it.
2. **The oxygen:** that is always present in the air. The air around us comprises about 21% oxygen. That is enough for many fires, including in a television.
3. **The high temperature:** needed to start the fire, in this case caused by the short circuit.

For a fire to occur all three sides of the triangle need to be present. If you remove one side, the fire will go out. So to extinguish a fire you can

1. **Remove the combustible material.** For most fires this is difficult, but for gas fires it is quite simple. By shutting off the gas supply the combustible material is removed and the fire will stop.
2. **Remove the oxygen.** This looks difficult as there is always oxygen in the air, but it is quite possible to smother a fire with for instance a fire blanket. This way you remove the oxygen.
3. **Lower the temperature.** Spraying the fire with an extinguishing agent will lower the temperature. Water is the best example of an extinguishing agent the lowers the temperature.

There are different kinds of fire. Before you extinguish a fire, you need to know what causes the fire. Not all fires can be fought with the same agent. In some cases, using the wrong extinguisher can lead

to dangerous situations. There are different kinds of extinguishers, each with their own specific application.

#### **Fires are divided into classifications from A to F**

Class A: fires in solid combustibles (for instance, wood, paper, textiles).

Class B: fires involving liquids at higher temperatures (for instance, diesel oil, benzene, turpentine, fuel oil, acetone, candles).

Class C: fires involving gases. There is also a danger of explosion with gas fires.

Class D: fires involving metals (for instance, aluminium, light alloy car wheels).

There are different extinguishers with different functions and application.

#### **1. Spray-foam extinguishers**

Spray-foam extinguishers are filled with water to which a foaming agent has been added. They have a special spray nozzle, which turns the water/foam mixture into a fine mist. This allows it to rapidly penetrate burning solids like paper, wood, and textile.



spray-foam extinguisher

Spray foam is therefore highly effective in extinguishing class A fires. As the foaming agent floats on liquids it can also be used for fires involving flammable liquids (class B). If indicated on the label, it is also safe to use in fires involving electricity.

Because the mixture emerges from the nozzle in the form of mist, there is no uninterrupted flow of water and therefore no danger that the operator will be electrocuted. However, always remain at a safe distance and check the extinguisher label before the using.

*Spray-foam extinguishers have a high cooling and penetrating capacity and work very well by lowering the temperature of fires involving solids. Lowering the temperature is one side of the fire*

*triangle.*

#### **2. Dry powder extinguishers**

Dry powder extinguishers have a considerable extinguishing capacity. They are suitable for liquid fires and fires involving electricity (the powder does not conduct electricity), such as in power points or switches. In the case of fires involving gas, you should always first close the gas supply, if not, the gas will spread and create the danger of an explosion.



powder extinguisher

There are different types of powder:

ABC powder, which can be used to extinguish class A, B and C fires (solids, liquids, and gases).

BC powder, which can be used to extinguish class B and C fires (liquids and gases).

D powder, which is especially for class D fires (metal fires).

One disadvantage of dry powder is that, because the powder is very fine, it causes a lot of damage to equipment.

*Powder does not remove one of the sides of the fire triangle, it affects the fire itself. It contains substances that delay the binding of the combustible material with oxygen.*

### 3. CO<sup>2</sup> extinguishers

You are most likely to find CO<sup>2</sup> (carbon dioxide) extinguishers in places where other fire-extinguishing equipment would either cause a lot of damage or present a danger to the operator. One striking



CO<sub>2</sub> extinguisher

feature of CO<sup>2</sup> extinguishers is the large discharge horn. The carbon dioxide in the container is in liquid form. When the extinguisher is operated, it makes a lot of noise expelling the CO<sup>2</sup>. The cold CO<sup>2</sup> is easily visible. When the extinguisher is nearly empty, the noise reaches a higher pitch.

Carbon dioxide is suitable for class B and C fires (liquids and gases). It can also be used for fires involving electricity and burning oil and grease. In that case you have to be careful that the fire does not flare up again. Unlike other extinguishing agents, CO<sup>2</sup> causes little secondary damage.

There is also a risk involved in using CO<sup>2</sup>. In small and low confined areas CO<sup>2</sup> may present a danger to the operator because it reduces the amount of oxygen in the room. In addition, the cloud from the extinguisher is very cold and CO<sup>2</sup> can cause serious freezing symptoms. The temperature of the horn can be as low as minus 80 degrees Celsius. You should never touch the horn or direct the spray at another person.

*Carbon dioxide does not put fires out by lowering the temperature, as many people think, but by dissipating the oxygen in the vicinity of the fire, as a result of which the flames are extinguished. It therefore removes the oxygen from the triangle.*

### 4. CO<sup>2</sup> extinguishing system

For a fire in electrical rooms (like switchboard and generator rooms) you do not want to use powder extinguishers. The damage caused by the powder is so enormous that all the equipment in the room has to be replaced. To prevent this, the Navy devised a fire extinguishing system that displaces the oxygen from the rooms. In that case you only have to replace the fire-affected equipment. This CO<sup>2</sup>

extinguishing system has been taken over by the merchant navy, these days there many ships equipped with this CO<sup>2</sup> system.

When a ship is now offered for demolition it is possible that there is a filled CO<sup>2</sup> extinguishing system on board. To prevent casualties, this extinguishing system has to be removed by professional people.



If a fire is discovered, your first response might be to put it out, especially if colleagues are at risk. **However in every fire the golden rule is to think about your own safety first.**

Fire consists of several dangers:

*Dangers of smoke:* Smoke will develop and spread more quickly than flames. The biggest danger of smoke is inhaling it and burning the bronchial tubes. Most fire victims die of smoke inhalation and not of the fire itself. Smoke is always toxic and life-threatening. You should not enter areas with a lot of smoke.

*Dangers of heat:* Fire always leads to a rise in temperature. If a fire burns for some time, the temperature will build up at the top of the room or building. In high spaces, you might not notice at first, but eventually the heat will fall like a blanket can burn anyone who is present. It can also cause material and people to catch fire, spreading the fire even more quickly.

*Dangers of carbon monoxide:* Carbon monoxide is always released during a fire, especially in the initial stages. It cannot be seen and has no smell or taste, but in a short time it can lead to asphyxiation.

*Electricity cupboards:* The danger with a fire in an electricity cupboard is that there might still be electricity present. If possible, switch the electricity off before starting to extinguish the fire. Never use water to extinguish a fire in an electricity cupboard, because water conducts electricity. You will be electrocuted if you do! There should be a pictogram on every electricity cupboard to indicate that

it is dangerous to extinguish a fire with water. You should preferably use a CO<sup>2</sup> extinguisher if that is not possible, use foam and if that is not available, powder. Be careful of collateral damage when using powder.



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### Key messages

1. first think about your own safety!
2. first investigate what causes the fire before you start extinguishing it
3. make sure you know where the fire extinguisher is and how to use it correctly
4. if possible, leave firefighting to firemen.

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### Training flow



As trainer you want to make sure that participants know the risks of fires and firefighting. Prevention is most important, and you can practice again observation and communication techniques from Module 2 and 3 and the importance of Last-Minute Risk Analysis.

#### Part 1 Starter

Ask participants to share stories about fires and what causes them and how they were extinguished and by who.

#### Part 2

Explain the fire triangle and give examples of fire extinguishers.

#### Part 3

Divide the group in different teams and do the quizz. The winning group gets a small present.

#### Questions

1. How can a fire be extinguished?
  - a. By removing the oxygen
  - b. By increasing the flow of oxygen
  - c. By raising the temperature



2. In which situation can you try to extinguish a fire?
- When the fire is still burning in various rooms in the building
  - When the fire is on one floor
  - When the fire is still restricted to the place where it started

3. You see through a window that a room is full of smoke.  
What is the best thing to do?

- Take a deep breath and go inside
- Enter the room by crawling on the floor
- Not enter the room

4. What kind of extinguisher can you use to put out a fire in an electricity cupboard?

- A CO<sup>2</sup> extinguisher
- Fire hose
- Fire blanket

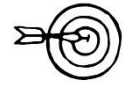
5. What kind of fire can be put out with a class C extinguisher?

- A solid substance fire
- Gas fire
- Liquid fire

Answers 1. = a) 2. = c) 3. = c) 4. = a) 5. = b)

## 14. Presentations

At the end of the training course the participants will deliver a presentation of everything they have learned during the training days.



### Learning objectives

At the end of the module the participants:

- recapitulated everything that has been learned during the training
- can give a presentation with the highlights of the training



### Background information

The final presentation serves as a feedback for the trainer to see whether the information has come across correctly. Based on the presentation the trainer can adjust the modules for the next training.

For the participants the final presentation serves to repeat one more time what has been learned during the training. To recall the highlights, to work together with the group, share all the knowledge and together make a good presentation.

### Key messages



1. Working together is essential to have a good result
2. Repetition is the key to learning





### Part 1 Starter

Ask people to share with their neighbour the one big eye-opener of this course. Let them share a few in plenary

### Part 2

Divide the group in teams of 4-5 people. Give each team the following questions and ask them to elaborate on their answers. Preparation time is 1,5 hours, presentation time is 20 minutes.

1. What have you learned from this training?
2. Which part of the training is most important for you?
3. Which topic(s) is/are clear for you?
4. Which topic(s) is/are not clear for you?
5. Of which subject would you like to learn more?

Let each team deliver the presentation and give some feedback. Correct wrong information and add when needed. Compliment each team with their learning.

Note down what is mentioned, this is an informal evaluation of the training and you can use it to improve the next training.

### Wrap up

The training is finished after the presentations.

As trainer you have to give some final considerations towards:

- **Follow up**, will there be a follow up? If yes, how will it look like. What would the participants prefer? Write that down and see if something can be organised later.
- **Formal evaluation**, often a questionnaire given to the participants.
- **Certificates**, the awarding of the certificates is part of the closure
- **Final words** of gratitude and farewell.





# Attachments

# Attachment 1 - Training Cycle

In each step of the training cycle, you have to think about a number of things. Below checklists help you to remember them.

## Step 1: Situation analysis

The purpose of a situation analysis is to assess the need for training. Collect background information:

- What are the most important problems?
- Obtain job descriptions
- Identify learner needs relevant to job performance gaps
- Discussions with staff (individuals/groups, all levels) and other people engaged
- Reports
- Observe staff (potential participants) at all levels



## Step 2: Design of the course

When a training is needed, the trainer makes a general design of how the training will look like. Important elements are:

- Define overall course objectives (see chapter 4)
- Decide on the contents of the course (curriculum)
- Consider a pre-test or questionnaire to ascertain the level of existing knowledge.
- Clearly identify the group(s) of staff to be trained and define entrance criteria
- Formulate learner objectives for each session (see chapter 4)
- Design details session, indicating the training methods (see chapter 5 and 6)
- Plan the date and length of the course
- Establish the budget
- Develop a logistic plan for the training
- Choose the trainers
- Investigate collaboration (exchange of resources, materials, trainers, curriculum, recognition of the course, certificate)
- Plan for evaluation and learning assessment
- Consider the need for a training contract



### Step 3: Preparation

Preparation means that the trainer fills in all the details of the earlier design. It is time consuming but necessary to ensure a smooth implementation of the training.



- Plan the timetable (including evaluation)
- Decide on suitable teaching methods (Knowledge/Skills/Attitude)
- Prepare lesson plans (session outlines)
- Order teaching materials
- Prepare training materials (visual aids, readers, handouts, etc.)
- Translate teaching materials, if necessary
- Prepare training logistics (venue, tea breaks, audio-visual equipment)
- Consider certificates
- Consider payment/incentives/per diem's (depending on local situation)
- Prepare training venues to create a conducive learning environment. Assure drinking water and fresh air in the training room. Arrange tables in a preferred setting, check IT facilities

### Step 4: Implementation

The actual implementation of the course should be in line with the course objectives.



- Conduct the training event according to the objectives
- Explain objectives, set-up of course to participants
- Check expectations of participants and indicate boundaries of the course
- Adapt sessions, lessons, topics to monitoring and assessment results (be flexible within your limits)
- Administer a post-test to assess participants if appropriate
- Evaluation of the lessons by participants (module, mid-course, end of course)
- Self-assessment by the trainer during and at end of training event (feedback, checklist, colleague, observer)

Throughout the training courses it is important to keep reminding the trainee's mind to the real world and what learnings they are going to transfer from the course.

- Propose participants to keep a learning logbook. This can form the basis of their personal action plan
- Ask participants to produce an individual action plan for post-course action within a realistic time frame (commitment/good basis for follow-up)

### Step 5: Evaluation

The evaluation of a course is necessary to improve your performance as a trainer, participants' learning, and the course itself. Evaluations should be done during and after a training event. Evaluation

is the quality control part of training. It provides feedback on the trainer's performance, the quality of the design and the delivery of training activities. There are different types of evaluations:



- Practice self-evaluation during and after the session, day or training event
- Ask participants to make a written and/or verbal evaluation of the session or course (module, mid-course, end of course)
- Administer a post-test to assess participants, if appropriate
- After the course the participants' progress can be observed during their daily work
- Write an evaluation report, document your experience

The outcome of an evaluation should show whether the objectives have been achieved and if not, why not. Conclusions could then be drawn if the training programme needs modifying.

Depending on the results, topics to be covered in future training sessions and refresher courses can be chosen.

#### **Step 6: Follow-up**

It is important to facilitate trainees to establish a personal action plan for post-course follow-up action. The purpose of making and discussing personal action plans with participants is:



- to monitor whether trainees could apply the skills they have acquired during the training
- to determine additional training needs
- to give relevant feedback to determine additional training needs (and restart training cycle)



## Attachment 3 - Five starters

At the start of the training, you want to introduce the subject and find out what participants already know about it. To achieve this, you usually start with an interactive training method. A starter is meant as a kick-off for the rest of the session and last usually not longer than twenty minutes.

Below, we present five methods you can use to facilitate an interactive start of your training session. These methods can also be used during other parts of the training.

### 1. Picture

Present a visual or have (groups of) participants select their own visual from your selection.

You ask the following questions (use sequence provided)



1. What do you see?

The learners can describe what they see in the picture, i.e. the situation that the picture shows. This allows everyone to see the same situation, and you can clarify points that appear unclear according to the learners' responses.

2. What is happening?

This question asks the learners to interpret the situation that the picture is trying to show and, after discussion, to identify the problem the picture depicts.

3. Does this situation happen in your experience?

The aim is to get the learners to relate this problem to their own situation. Is it relevant to their situation? If the reply is "yes", then ask them to describe an example.

#### 4. Why does this situation happen?

This is a very important question because the learners have to analyse the situation themselves and, during this analysis, the learners can learn for themselves. Sharing ideas is essential in the answering of this question.

#### 5. What can we do about this situation?

The question is posed to bring about ideas for plans and action. If the learners see that the situation being discussed is a problem that they have, then they should be encouraged to take some action. No learning session should end without discussion and a decision on a plan of action. In our work, where we are trying to encourage and enable change, learning without action is useless.

Your role: Along with the questions which lead to discussion, it is also important that you listen carefully and that you summarize the answers before continuing the discussion.

### 2. Brainstorming

Start with a specific question and ask people to generate as many ideas as they can in a short period of time. The quality of the ideas is not relevant at first; the quantity is what counts. There is one important rule: no discussion during the brainstorm. Only questions to clarify an idea are allowed. The method is meant to stimulate creativity.

Your role: Ask the question, stimulate the flow of ideas, write them down, cut short any discussions, and make sure participants do not judge or value any of the ideas given.



### 3. Problem solving

Pose a relevant problem to the group and ask them for solutions. The problem is meant to stimulate participants to think of the subject of your module (or one aspect of it). The problem should not be too complex.

Your role: Pose the problem and allow for silence. If nobody responds, ask if the problem is clear. When people come up with solutions, ask for clarification if necessary and write them on the board.

### **Problem solving in buzz groups**

If your group is large or your problem is complex, you could first have participants discuss in small group (2-4) and then discuss their solutions in a plenary.

This method works also very well if you have a superior in your group and the other participant do not feel free to give their opinion and first wait till they know what their superior thinks of a certain case. If you want everyone's opinion you first make small groups which creates a safe atmosphere for everyone to share their opinion.

### **4. Discussion through statements**

Think up provocative statements that will evoke discussion. Participants can show their opinion (which is either agree or disagree) by holding up a card (use two different colours). They can also literally choose sides. Always ask the minority to explain their position first. Participants may change their minds.

Your role: Think up statements in advance. Write them down and show them one at a time. Allow for time to think. Make sure participants reveal their opinion simultaneously and that both sides get to explain themselves.

### **5. Stories**

Tell a story about something related to your subject. It can be an example, or a narrative you have made up yourself. Participants can also be invited to share their own personal stories to illustrate the subject.

Your role: prepare a story that people will recognize and is related to your key message. Think of a catchy title and write down the key points. Make participants relax while listening to the story. Collect first reactions, then zoom into the details with focused questions.



## Attachment 4 - Five energisers

Energisers are used to cheer up participants. This can be done after lunch breaks but will fit at any moment when you as trainer have the feeling that the energy level is low. It is useful to have a few energisers at hand, but you can also ask the participants if they have a favourite energiser. It does not need to be very complex, even dancing for 3 minutes on some music already re-energises most groups.

On the internet you will find many examples and movies of energisers. Here we will describe five energisers that will serve in different parts of the training and appeals to different preferences of the participants.

### Alliteration game

Objectives To help people remember each other's name.

Materials None

Time Depending on group size 5-15 minutes.

Procedure

- 1) Ask participants to form a large circle.
- 2) Explain that the aim of the activity is to introduce yourself with a triple alliteration, containing your name (Rana), an adjective (the Remarkable), and an animal (Rhino). For example: "I'm Samantha the Shy Shark and sitting next to...."
- 3) The trainer starts with an alliteration for himself, and then explains that every next person in the circle has to 'alliterate' him/herself and repeat all the previous persons' alliterated names.

Remarks With a lot of participants this exercise gets pretty difficult but guarantees a fun and effective way of remembering names.

You could alternatively use only first names.

### Find the leader

Objectives Just for fun and energy renewal.

Materials None

Time 5-10 minutes

Procedure

- 1) One of the participants goes outside the room.
- 2) A leader is appointed. This person makes different movements, gestures etc, and the others copy this.
- 3) The outsider is called back in and has to determine who is the person who is leading the movements.



Remarks The activity could be done several times with different leaders and 'outsiders'.

### **Animal Farm**

Objectives Reduces initial shyness and creates laughter.

Materials None

Time 5-10 minutes

- Procedure
- 1) Each participant receives a card with the name of an animal on it. You can make these yourself. There are two cards for each animal.
  - 2) Let the participants walk around the room, making the sound of their animal. They have to find the person who makes the same sound.

- Remarks
- Most effective in groups with more than 10 participants.
  - Could also be used as an icebreaker: when the partner is found, they could introduce themselves and tell something about themselves.

### **A Knotty Problem**

Objectives Liven up participants, get them moving and laughing.

Materials None

Time 5-15 minutes

- Procedure
- 1) Ask the participants to stand and form a circle.

- 2) With the participants standing in a tight circle, ask them all to raise their left arm in the air and their right arm straight forward.
- 3) Tell the participants to lower their left arm and grab someone else's right hand. Once the contact is made, they are not allowed to break it.
- 4) Tell the participants that they are to untangle themselves without breaking their grip on each other. Eventually, they should end up in a circle again.

## 7-Up

Objectives For fun and excitement.

Materials None

Time 5-10 minutes

Procedure 1) Ask the participants to form a circle.

Give them the following instructions: "One person starts the count by saying "one", the person next to him says "two" and so on.

But, in this game the number "7" is a taboo, so when it's your turn, and the number contains a "7" or a multiple of 7 (i.e.: 14, 28 etc.), you clap your hands instead of saying the number. If you hesitate too long or make a mistake, you are out!"

The game ends when there is one player left.

# Attachment 5 - Colour code marking of pipes sheets




# COLOUR MARKING OF PIPES

ISO  
14726

<b>Main- and additional colours</b>	<b>Main- and additional colours</b>	<b>Main- and additional colours</b>	<b>Main- and additional colours</b>
Black (BK) Waste media	Green (GN) Sea water	Silver (SR) Steam	Yellow (YEC) Flammable gases
Blue (BU) Fresh water	Grey (GY) Non-flammable gases	Red (RD) Fire fighting-fire protection	Marrow (MN) Masses (dry and wet)
Brown (BN) Fuel	Orange (OG) Oil other than fuel	White (WH) Air in ventilation systems	Violet (VT) Acids, alkalis

Waste media	ISO 5001	Non flammable gases	ISO 5038	Air in ventilation syst]	ISO 5079
Black water	ISO 5002	Oxygen	ISO 5039	Discharge air	ISO 5080
Waste oil / Used oil	ISO 5003	Inert gas	ISO 5040	Mechanical supply air, cold	ISO 5081
Bilge water	ISO 5004	Nitrogen	ISO 5041	Natural exhaust air	ISO 5082
Exhaust gas	ISO 5005	Refrigerant	ISO 5042	Atmospheric air	ISO 5083
Grey water	ISO 5006	Compressed air LP (Low Pressure)	ISO 5043	Mechanical exhaust air	ISO 5084
Sewage, contaminated	ISO 5007	Compressed air HP (High Pressure)	ISO 5045	Decontaminated supply air	ISO 5085
Fresh water	ISO 5008	Control air / regulating air	ISO 5046	Mechanical recirculated air	ISO 5086
Fresh water, sanitary	ISO 5009	Breathing air	ISO 5047	Mechanical supply air, warm	ISO 5087
Potable water	ISO 5010	Breathing gas	ISO 5048	Smoke clearance	ISO 5088
Distillate	ISO 5011			Conditioned supply air	ISO 5089
Gas-turbine wash water	ISO 5012	Acids, alkalis	ISO 5050	Natural supply air	ISO 5090
Feed water	ISO 5014				
Cooling fresh water	ISO 5015	Masses (dry and wet)]	ISO 5052	Firefighting/fire protection]	ISO 5065
Chilled water	ISO 5016			Fire-fighting water	ISO 5067
Condensate	ISO 5017	Thermal fluid	ISO 5055	Fire-fighting gas	ISO 5068
Fuel	ISO 5018	Lubricating oil for gas turbines	ISO 5059	Sprinkler water	ISO 5069
Heavy fuel (HFO)	ISO 5019	Hydraulic fluid	ISO 5060	Spray water	ISO 5070
Aviation fuel	ISO 5020	Lubricating oil for steam turbines	ISO 5061	Fire-fighting powder	ISO 5071
Biological fuel	ISO 5022	Lubricating oil for gears	ISO 5062	Fire-fighting foam	ISO 5072
Gas-turbine fuel	ISO 5023	Lubricating oil for internal com. engines	ISO 5063		
Diesel fuel (MDO)	ISO 5024			Flammable gases	ISO 5091
Sea water	ISO 5031	Steam	ISO 5101	Hydrogen	ISO 5092
Decontamination water	ISO 5032	Steam for heating purposes	ISO 5102	Acetylene	ISO 5093
Sea water, sanitary	ISO 5033	Exhaust steam	ISO 5106	Liquid gas	ISO 5094
Ballast water	ISO 5034	Supply steam	ISO 5107	Direction of flow	ISO 5099
Cooling sea water	ISO 5035				



Longlife Pipeline Identification  
Self adhesive tapes laminated  
Standard length: 50 m

www.technische-klebeschilder.de  
tel.: 04164-4603 fax 04164-6142

Main colour



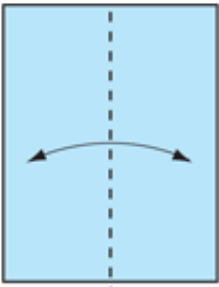
Main colour + Additional colour



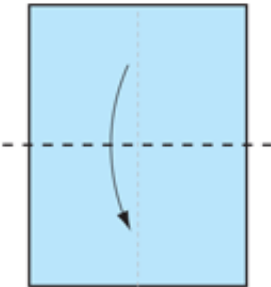
Direction of Flow



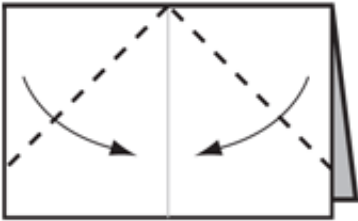
# Attachment 6 – Folding a boat



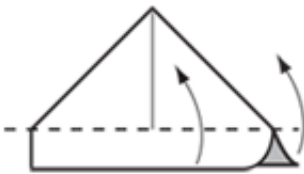
1. FOLD IN HALF



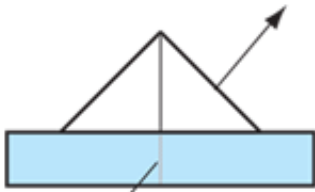
2. FOLD IN HALF AGAIN



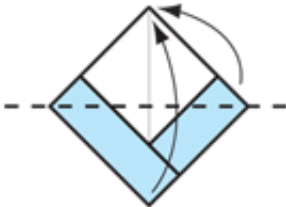
3. FOLD IN CORNERS



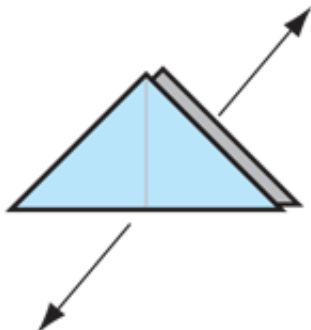
4. FOLD UP EDGES ON BOTH SIDES



5. PULL THE SIDES OUT AND FLATTEN



6. FOLD FRONT AND BACK LAYERS UP



7. PULL SIDES APART AND FLATTEN

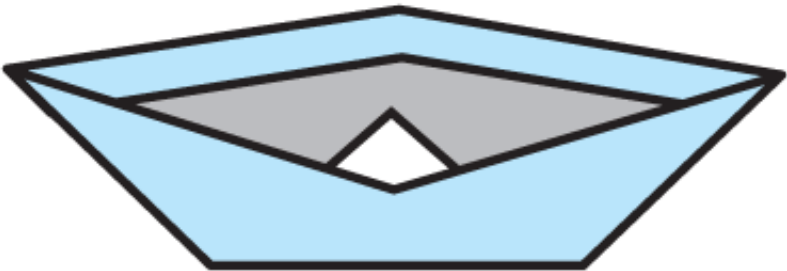


8. PULL TOP FLAPS OUTWARDS

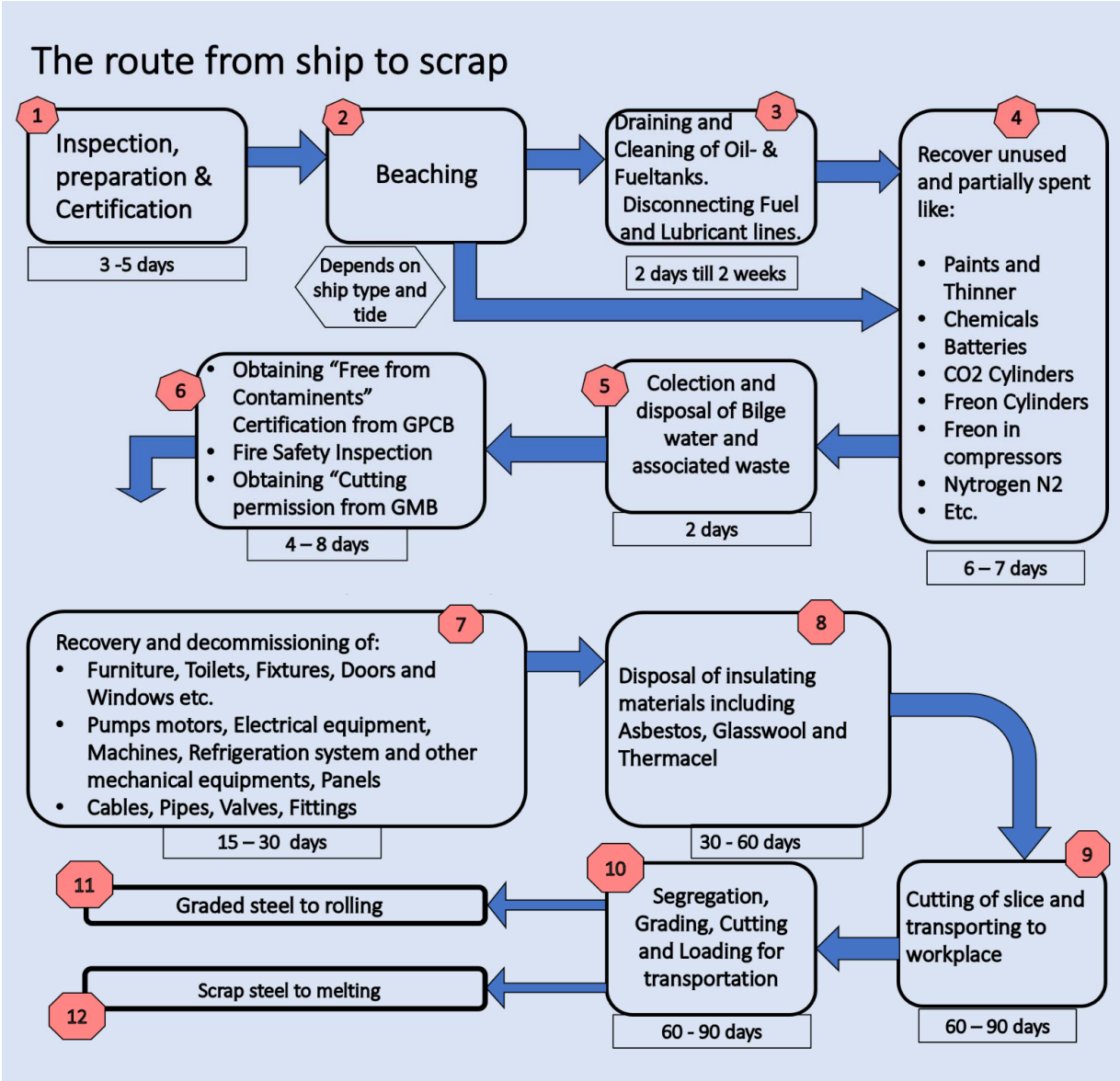


9. SQUISH THE BOTTOM AND PULL THE SIDES UP

10. TA DAAA!



# Attachment 7 – Route from ship to scrap





Mondiaal FNV, the Netherlands

December 2020