**AFS 2010: 16**

Diving work

# Work Environment Authority on diving work and general advice on the application of Regulations

*(Changes introduced until March 25, 2014)*

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**Work Environment Authority and general advice on diving work**

decided on 21 December 2010.

*(Changes introduced until March 25, 2014)*

**Purpose**

**1 §** The purpose of these regulations is to prevent illness and accidents at diving work.

**Scope**

**2 §** These regulations apply to any activity in which an employee to an employer counting performing work under water and then breathe breathing gas under high pressure (Diving work).

For the purposes of the Regulations, the person undergoing training is equated with workers.

The employer is responsible for ensuring that these regulations are followed.

Regulations in addition to those
Of §§ 19-21 and § 23 of the are responsible for compliance.

With the purposes of these regulations those who employ hired labor for to work in his business.

The regulations also apply for work that employers carry out yourself for activities which two or more persons who are not members of the same family, pushing for their joint account without employees.

Regulations, except for the provisions of §§ 24-25, applies to the alone or together with a family member but no employees professionally run building or construction work. If such activities are conducted in a joint Establishments However Regulations in its entirety.

For those who, alone or jointly with a family member but without employees carrying on commercial activities which are not building or construction work applies Regulation at work on a common worksite, except for the provisions of §§ 29-30.

The provisions do not apply in the Armed Forces and National Police Agency National reaction force.

**Definitions**

**3 §** In these regulations following terms are used with the following meanings.

| | |
|---|---|
| Breathing gas | gas mixture intended for diving. |
| Work equipment | machines, devices, tools; gear or installations used in the work. |
| Decompression | pressure reduction obtained during ascent in the water or the pressure reduction in the pressure chamber. |
| Decompression table | a collective term for instruments and tables describes and / or illustrates safe decompression to avoid decompression. |
| Direct Ascent | ascent to the surface, which, according decompression table, not require decompression stops. |



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| | |
|---|---|
| Divers | those who are engaged in diving work. |
| Diving supervisor | the person appointed to plan, manage and monitor diving. |
| No tender | the person appointed to maintain direct contact with diver in the water. |
| Dive Profile | diving depth as a function of time. |
| Diving Equipment | equipment that allows divers to reside and work in water. |
| Buoyancy Compensator | vest that is used partly for balancing of the diver in the water, and to reach the surface in an emergency. |
| Ascent | ascent to the peak stage and stage times, according to a special decompression table, then decompression is not |

may be performed on the basis of the risk for decompression.

| | |
|---|---|
| Gas supply from the surface | diving where the diver is supplied with breathing gas from the surface via a hose. |
| Helmet Diving | diving helmet where the diver equipped with breathing from a free-flow or a demand-controlled systems. |
| Hyperbaric Oxygen-therapy (HBO) | Treatment with oxygen under pressure in pressure chamber. |
| Operating Time | the time between a distressed diver's need for assistance and reserve diver's assistance. |
| Communication equipment | equipment which at least allows the transfer of acoustic information between the surface and the diver in the water. |
| Lifeline | line, between the diver and dykarskötaren on the surface, which contact between them is maintained and signals can be exchanged. |
| Light Diving | diving with breathing apparatus, where the diver equipped with breathing gas from the surface or from a self-acoustical storage. |
| Between Lina | rope connected between the diver through which contact between divers maintained. |
| Pardykning | two or more divers who dive together and are connected between line. |
| Ytdekompression | decompression which takes place in a pressure chamber above water, according to specific ytdekompressionstabeller. |

**Planning, dive plan, risk assessment and action**

**Planning and dive plan**

**§ 4** diving work must be planned so that it can be carried out safely.

Before diving work may commence a written dive plan is drawn up. Diveplan be based on a risk assessment of the planned dykeriarbetet (see § 5) and actions (see 6 §).

Of the dive plan must show at least:

1. The type of diving work to be performed,
2. staffing and division within the dive team and among the Others involved in dykeriarbetet,
3. which certificates and diplomas that every member of the dive team has,
4. the diving and communication equipment to be used;
5. the breathing gas and decompression table to be used,
6. the measures envisaged in the event of an accident or emergency





and

7. where there is access to hyperbaric chambers and how long it takes to reach it.

**Risk assessment**

**5 §** The planned dykeriarbetet should be risk assessed.
The risk assessment shall be documented, dated and stored in an appropriate form.

The implementing risk assessment should have good knowledge about methods for risk assessment and the specific risks of the stay and work in water.

The risk assessment should be given special attention:

1. dyklagets composition: numbers, training, skills and experience,
2. The task distribution within the dive team and among the rest involved in dykeriarbetet,
3. the use of diving and work equipment,
4. choice of breathing gas and decompression;
5. dykutrustningens compatibility with respiratory gas;
6. The use of gas from the surface,
7. The use of BCs, lifelines and between the lines,
8. communication between diver and tender and divers in between,
9. The response time for standby diver,
10. access to diving and the workplace,
11. weather-, water- and soil conditions on diving and the workplace,
12. coordination of dykeriarbetet with any other duties Diving and workplace,
13. The planned measures in an accident and emergency and
14. where there is access to hyperbaric chambers and how long it takes to reach the.

**Measures**

**6 §** If the risk assessment, in accordance with § 5, justifying it'll measures which minimize risks involved in dykeriarbetet taken.

The choice of measures, the following measures in particular should be considered:

1. To expand the dive team,
2. redistributing tasks within the dive team and among the rest as involved in dykeriarbetet,
3. To choose another dykmetod, diving equipment, breathing, dekompresions- table,
4. To select other work equipment,
5. To obtain technical aids to supplement or replace Diving tion;
6. To provide additional training,
7. To provide information to diving and work equipment is used in a directed tant and safely,
8. designing and planning work and the dive in a different way.

Diving work may not begin before the measures mitigating risks are taken.

If the planned dykeriarbetet can not be carried out safely, even though measures that minimize the risks have been taken, the dykeriarbetet not be implemented.

**Knowledge requirements, certificates, diplomas and maintenance of skills**

**Knowledge Requirements**

**7 §** A person who performs or participates in diving should have the theoretical and practical knowledge corresponding to the requirements dykeriarbetet sets or may be set, with taking into account the use of diving and work equipment as well as the tasks should be performed.

The knowledge shall be documented in the form of a certificate or a departure give evidence.

The certificate or certificate must be issued by a national or international authority or organization, clearly indicating the extent of knowledge.

The requirement for certificates or diplomas do not apply to those undergoing training.

**Certificates at ease diving**

**8 §** The person conducting the diving work in the form of easy diving down to 30 meters shall have a diving certificate at least on par with a Swedish yrkesdykarcertifikat S 30th

When diving work in the form of easy diving to depths greater than 30 meters required a diving certificate at least on par with a Swedish yrkesdykarcertifikat A 40th

For instructors for recreational diving, see § 11.

**Certificate on diving helmet**

**9 §** The person conducting the diving work in the form of helmet diving down to 30 meters shall have a diving certificate at least on par with a Swedish yrkesdykarcertifikat H 30th

When diving work in the form of helmet diving to depths greater than 30 meters required a diving certificate at least on par with a Swedish yrkesdykarcertifikat B 50th

**Dykarledarcertifikat and diplomas for diving supervisor**

**10 §** Diving supervisor should have a dykarledarcertifikat or diploma diving supervisor and at least have the theoretical knowledge corresponding to the requirements to obtain a Swedish yrkesdykarcertifikat S 30th

For diving supervisor for recreational diving, see § 11.

**Diploma in recreational diving**

**11 §** Those involved in diving work as an instructor or diving supervisor for recreational diving must have a qualification at least equivalent to the requirements of EN 14153-3: 2003.

**Maintenance of knowledge**

**12 §** The employer must ensure that those who perform or participate in diving maintain sufficient knowledge and skills.

Those who perform or participate in diving work in the emergency shall maintain their knowledge and skills by at least ten exercises per year. When diving work carried out during the year, the number of exercises is reduced accordingly.

Exercise dates are to be distributed evenly over the year.

**Equipment**

**Diving and work equipment**

**13 §** Diving equipment shall meet the requirements of the Board regulations on the design of personal protective equipment.

Use of SCUBA equipment shall be done under Work Environment Authority on use of personal protective equipment.

Work equipment and use of work equipment shall meet the requirements in the Work Environment Authority on the use of work equipment.

**Gas supply from the surface**

**§ 14** Gas supply from the surface should normally be used in the following diving work:

1. in building and construction,
2. for welding and thermal cutting,
3. the use of power-operated work equipment,
4. tunnels, passageways, pipes and other enclosed spaces where the diver can not make a ascent directly straight up to the surface,

5. in and to underwater structures where the diver can get caught, snared or sucked and
6. in contaminated water.





**Buoyancy Compensator**

**§ 15** BCD should be used in all diving unless the risk assessment according to § 5, show that use increases the risk or is manifestly unnecessary.

**Communications equipment**

**16 §** Communications equipment to be used in all diving unless risk assessment, in accordance with § 5, shows that it is manifestly unnecessary.

**Lifeline and the rope**

**17 §** Lifeline or between line should be used for all diving unless risk assessment, in accordance with § 5, show that use increases the risk or obviously unnecessary.

**Staffing**

**Dive Team**

**18 §** Before diving work may commence, a Dive Team appointed.

A Dive Team shall consist of at least three people: a diving supervisor, a diver and a standby diver.

In a Dive Team will also be a tender for each diver in the water that pops with the lifeline or the gas supply from the surface.

The diving supervisor may simultaneously serve as a tender for a diver in the water if risk assessment, in accordance with § 5, shows that dykeriarbetet can be performed safely and if all of the following circumstances exist:

1. the number of divers in the water does not exceed two,
2. diving with decompression planned and
3. diving is done to a maximum depth of 30 meters.

When diving with decompression chamber at the dive site, the dive team to also be a person with the competence to manage the pressure chamber.

**Diving supervisor**

**19 §** diving supervisor shall, at the dive site plan, manage and monitor dykeriarbetet in accordance with the dive plan (see § 4) and risk assessment (see § 5), and otherwise ensure that dykeriarbetet can be performed safely.

The following information should be given special attention:

1. inform the dive team, and others who are involved in dykeriarbetet, about diving plan and risk assessment;
2. ensure that all the diving and labor necessary equipment is available, in good condition and ready to use,
3. Check that the diving equipment is designed for the breathing gas

used and the temperature conditions prevailing at the dive site and in the water net,
4. ensure that the breathing gas, which is needed for diving and emergency procedures; is available and the right composition,
5. plan the dive by the decompression used,
6. ensure that conditions at the dive site does not affect the diver's work negative,
7. ensure that there is a device that allows the diver can safely com- ma down into and up out of the water,
8. ensure that dykarflagga or dykskärm A out as needed and is illuminated at dark
9. calculate the response time for standby diver (see § 22);
10. ensure that an injured diver can be taken out of the water and
11. ensure that the dive site is first-aid equipment.





**Divers**

**20 §** The diver should
First before diving notify if the diver does not feel capable of doing dyke- riarbetet by natural or other causes,
2. follow dykarledarens and dykarskötarens instructions,
3. try scuba gear under the surface and give the go-ahead for the equipment working properly,
4. during and after diving immediately notify the diving supervisor if he or she feels some discomfort,
5. cancel dykeriarbetet if something abnormal occurs with the breathing gas, Diving and work equipment or the workpiece and
6. abort the dive if he or she needs to switch to emergency supply with breathing gas.

**Reserve Diver**

**21 §** Reserve diver must rescue diver in the water in the event of an emergency or Another incident involving a diver in the water needs assistance.

A standby diver shall be available for immediate action when diving:
1. without gas supply from the surface,
2. deeper than 30 meters, or
3. diving with decompression stops are planned.

At pardykning or when diving with several divers in the water may be divers each standby diver of the risk assessment according to § 5, allows for this.

**22 §** When diving, other than as described in § 21, the standby diver found in preparedness.

The response time for backup diver on standby shall be determined by the diving supervisor.

**No tender**

**23 §** A No tender will assist the diver when diving with gas supply from the surface and when diving with lifeline.

The following information should be given special priority:
1. ensure that the diver to safely come into and out of the water,

2. Check that the diving equipment at commissioning tests under the surface has not been no leak or other problem that the diver is unable note,
3. manage the diver's lifeline and switch agreed signals,
4. communicate with the diver if communications are used,
and
5. monitor the supply of breathing gas to the surface.

**Medical checks**

**§ 24** Employers should arrange for medical checks, according to the Swedish Work Environment regulations on medical surveillance in the workplace, for workers performing or will perform diving work.

Provisions on penalties for those who employ workers who do not assessed as a service only available in 6 § Work Environment Authority on medical controls in the workplace. *(AFS 2014: 6)*

**§ 25** Anyone who is pregnant and has notified the employer may not perform diving work.

The employer who fails one or more of pregnant workers perform diving work, despite the fact that notification has been made under the first paragraph, shall pay a penalty, see § 31.

Minimum fee is SEK 100 000 and highest fee is 1 000 000. For the that have 500 or more employees, the fee is SEK 1 000 000. For those who have fewer 500 employed should penalty is calculated as follows:

Fee = 100 000 + (number of employed - 1) x 1804 crowns.

The sum shall be rounded down to the nearest hundred. *(AFS 2014: 6)*





**Breathing gas and the partial pressure of oxygen**

**Breathing gas**

**26 §** Breathing gas, needed for diving and emergency procedures, should be available in sufficient quantity, have the right composition for the planned dive profile and be free from harmful contaminants.

**27 §** Divers should have immediate access to emergency supply of breathing gas.

**Partial pressure of oxygen**

**28 §** The partial pressure of oxygen in the open breathing system, when diving is not exceed 160 kPa during the descent and the bottom phase.

If dykeriarbetet expected to be strenuous to be the partial pressure of oxygen held lower. Oxygen dose should not exceed the values in Table 1 and 2 in Appendix 1.

At decompression dives get partial pressure of oxygen does not exceed 190 kPa.

The pressure chamber may be partial pressure of oxygen does not exceed 280 kPa.

**Hyperbaric chambers**

**29 §** When diving work, there must be access to hyperbaric chamber as described below.
1. A multi-department hyperbaric chamber to be accessed and HBO will be able to influence started within six hours after the diver has broken the surface at diving deeper than 9 meters and planned with decompression or during ascent where decompression less than 31 minutes

's.
2. A single or multi-department hyperbaric chamber to be accessed and HBO will to commence within 30 minutes after the diver has broken water surface when diving with decompression stops and the planned decompression pression time exceeds 31 minutes, or if the planned depth of immersion is greater than 40 meters.
3. A multi-department hyperbaric chamber should be on the dive site for diving with planned ytdekompression.

**First-aid equipment**

**§ 30** The first-aid equipment should be equipment and a supply of 100% oxygen which allows a diver to breathe 100% oxygen under atmospheric pressure in at least 60 minutes.

At pardykning should the equipment and the supply of oxygen to admit that two divers can breathe 100% oxygen under atmospheric pressure for at least 60 minutes.

**Provisions on penalties**

**§ 31** The provisions of § 25 are provisions under Chapter 4. 6 § Work Environment Act (1977: 1160).

Anyone who violates these provisions shall pay a sanction pursuant to Chapter 8. §§ 5-10 Working Environment Act. Sanction fee is calculated according to the grounds specified in § 25. *(AFS 2014: 6)*

These regulations come into force on 1 July 2011. The statute repeals The Board's Ordinance with regulations (AFS 1993: 57) on diving work.

*AFS 2014: 6th*
These regulations come into force on 1 July 2014.





***Appendix 1***

1 OTU (Oxygen Tolerance Unit) is the biological effect obtained during exposure for oxygen with a partial pressure of 100 kPa for 1 minute.

**Table 1 OTU per unit time at different partial pressure of O2**

| **Partial pressure [KPa]** | **OTU / minute** | **OTU / hour** |
|---|---|---|
| 60 | 0.26 | 16 |
| 70 | 0.47 | 28 |
| 80 | 0.65 | 39 |

| | | |
|---|---|---|
| 90 | 0.83 | 50 |
| 100 | 1.0 | 60 |
| 110 | 1.16 | 70 |
| 120 | 1.32 | 79 |
| 130 | 1.48 | 89 |
| 140 | 1.63 | 98 |
| 150 | 1.78 | 107 |
| 160 | 1.93 | 116 |
| 170 | 2.07 | 124 |
| 180 | 2.22 | 133 |
| 190 | 2.36 | 142 |
| 200 | 2.50 | 150 |
| 210 | 2.64 | 158 |
| 220 | 2.77 | 166 |
| 250 | 3.15 | 189 |
| 280 | 3.55 | 213 |

**Table 2 Maximum allowable cumulative OTU**

| **Exposure [Number of days in a row]** | **OTU / day** |
|---|---|
| 1 | 850 |
| 2 | 700 |
| 3 | 620 |
| 4 | 525 |
| 5 | 460 |
| 6 | 420 |
| 7 | 380 |
| 8 | 350 |
| 9 | 330 |
| 10 | 310 |
| 11 - 30 | 300 |

Work Environment The following Recommendations on the application of
Work Environment Authority (AFS 2010: 16) diving work.

General Recommendations have a different legal status from Provisions. They are not mandatory, but their function is to clarify the meaning of the regulations, such as explaining suitable way to meet the requirements, giving examples of practical solutions and procedures and provide recommendations, background information and references.

Under the Work Act, the main responsibility for the work in business. The teams describe how these responsibilities to be fulfilled. They basic obligations contained in the employer's work environment is described in the Work Environment Authority on systematic work. According these provisions, the employer must regularly examine and assess the risk of working conditions in the business and make clear about what steps need taken to prevent illness and accidents at work. Which of these measures is given in other regulations that Swedish Work Environment Authority has announced, for example, Provisions on design of personal protective equipment, use of personal protective equipment and regulations on the use of work equipment. The employer must also take the necessary measures, regularly whether these measures have had the intended effect and, if necessary, take further action.

The requirements for diving work complements regulations for Systematic work environment in terms of risk assessment in diving work. Regulations specifies how an employer should proceed to fulfill its responsibility for work regarding diving work.

The term **normally** in the regulation texts referred to the requirements of paragraph text should met except in the few cases where special circumstances make that exceptions need made.

**Comments on individual sections and appendices**

**2 §** Work Environment Act applies to all work that an employee performs for a employer's account.

In Chapter 3. 12 § Work Environment Act contains provisions on liability for those hiring labor. The provisions apply when an employer is remunerated workforce that is employed by him of a client / outsourcer to work belonging to the purchaser / lessee's business. The purchaser / lessee controls the manpower and exercises while the direct supervision. Client's / lessee's liability for temporary workers corresponds in principle to a employer's safety responsibilities, but it is limited to the current work on the external worksite.

The law also applies in part for solo entrepreneurs and family businesses. The sole or jointly with a family member conducting business without employees, however, only obliged to follow what is in the Work Environment Act and by virtue of it has been prescribed "In terms of technical devices and substances capable of causing illness or accident, and with respect to common workplace ", see Chapter 3. § 5 second paragraph of the Work Environment Act.

In terms of jobscovered by the Provisions on building and construction work, however, expanded responsibility for single and family business. A basic rule on this in § 2 The Provisions on the construction and civil engineering work. See also commentary to that section.

Examples of groups of workers covered by the Working Environment Act and the Regulations for diving work are employed in the construction industry, employees in the municipal and state emergency services, other governmental or municipal administrations, employees and students at universities and colleges. As a student also counts the undergoing job training, substance-related internships or work study program or other similar forms of unpaid or longer shorter practice. In some cases students during their training employees of a company. This

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may include apply to the apprenticeship.
A further group covered by the Act and Regulations are workers who training and / or joint recreational divers.

**3 §** The choice of decompression is important to dykeriarbetet be able to carried out in a safe manner. A decompression discloses, for a given breathing, how deep and how long a diver maximum can dive without risking decompression. To generate a decompression uses a decompression algorithm created from the model used to describe inertgasuppladdningen in various body tissues. Dekompressionstabellen can be written out or you can decompression algorithm programmed into a dive computer that calculates and displays, for example, the diver's time for decompression. These regulations are assessed a printed decompression table as equivalent to a dykdators table.
The Armed Forces rules for naval operations, Rules for naval RMS dive, indicated decompression tables for various respiratory system and breathing gases. It is specify the position that the choice of decompression select table (s) that provide a security equivalent to that obtained with the tables in RMS dive.

**4 §** Appendix 2 provides examples of what may be appropriate to consider when diving work is planned.

**5-6 §§** Of Work Environment Authority on Systematic Work Environment shows how employers and workers, in a systematic way to investigate working conditions, identify hazards and assess risks. Measures to eliminate or reduce hazards in the work should be initiated by the employer.
The employer is responsible for ensuring that risk assessments are carried out. The employer may, however, delegate the task of carrying out the risk assessment to someone another who, by the employer, given sufficient powers and resources and have necessary skills for the task (see also Work Environment Authority on systematic work regarding the allocation of tasks and skills). An natural choice for the delegation of the task can be designated as diving supervisor for the planned dykeriarbetet. However, it is appropriate to risk assessment conducted by a group of people with different skills and capabilities.
The starting point for risk assessment in diving work is normally issue which diving work as planned, for example, photography of the benthic fauna, life-saving, diving in contaminated water, work or training of students. The purpose of risk assessment is to investigate whether the planned work to be carried out safely or if the risks are so great that the work is deemed impracticable, despite mitigating measures taken.

**7 §** It is not possible to state unequivocally demands on the certificate or qualifications needed for a given diving work when tasks can differ materially from those included in the formal education of a certificate or diplomas. It is therefore important that each member of the dive team, in addition to a certificate or qualifications, have complementary skills for the information contained in it actual work. The employer is responsible for the dive team as a whole has necessary training, skills and experience for the planned dykeriarbetet.

***European Diving Technology Committee (EDTC)***

EDTC is a European network consisting of representatives from a number of European countries conducting Dykeri. EDTC publishes recommendations on, inter alia, dive training.

***IDSA (International Diving Schools Association)***

IDSA, who is also a member of the EDTC, is an international organization that has developed a number of different standards for the training of divers, including harmonizes the Swedish yrkesdykarcertifikaten with IDSA.

***Swedish yrkesdykarcertifikat***

The Armed Forces is the authority in Sweden that specifies the Swedish educational requirements





and issue the Swedish yrkesdykarcertifikaten and dykarledarcertifikaten. The Swedish yrkesdykarcertifikaten / dykarledarcerti-Certificates will include:
- Certificates of S 30 / diving supervisor S 30 - Easy Diving, with and without gas supplies from surface down to 30 m depth.
- Certificates H 30 / diving supervisor H 30 - Helmet Diving to 30 m depth.
- Certificate A 40 / A diving supervisor 40 - Easy Diving, with and without gas supplies from surface to depths greater than 30 m.
- Certificate B 50 / diving supervisor B 50 - Helmet Diving deeper than 30 m.
- Certificates of C / C diving supervisor - Diving with dry diving bell.

Education leading to diving and dykarledarcertifikat given by the Armed Forces and the schools that are approved by the Armed Forces to provide such training.

Swedish yrkesdykarcertifikat and dykarledarcertifikat can also be obtained by a equivalence assessment of other certificates or diplomas in relation to the requirements for a Swedish certificate. The assessment is made of the Armed Forces.

***Scientific diving / Science divers***

For the scientific diving have in Europe two certificates for Science divers developed within the European Scientific Diving Committee. The lower level certificate known as the European Scientific Diver (ESD) and the higher the Advanced European Scientific Diver (AESD). The basic difference between these two certificates is, except dykkompetensen, that AESD training gives authority to supervise scientific diving because it contains a basic dykarledarutbildning while ESD only gives eligibility to participate in scientific diving.

ESD certificate is deemed to Swedish yrkesdykarcertifikat S 30th

***Instructors of recreational diving***

In European standards EN 14413-1: 2004 and EN 14413-2: 2004 specifies the knowledge and skills of a diving instructor should have to be able to act as training instruction of students in recreational diving.

In the European standard EN 14153-3: 2003 specifies the knowledge and skills as a diving supervisor should have to be able to act as a diving supervisor at recreational diving.

**To §§ 13-17** Work Environment / Occupational Safety and Health has published special regulations for the provision of personal protective equipment on use of personal protective equipment and use of work equipment.

The Armed Forces rules for naval operations, Rules for naval RMS dive, specified, for example, how the respiratory and gas systems, rescue system, leveling system, Costume systems and communications equipment must be designed for use within Armed Forces. Although these rules apply strictly only in the Armed Forces, it is appropriate to the design of the equipment mentioned in the regulations take into account the rules of the RMS dive, this provided they do not violate the Work Environment Act

and the Work Environment Authority.

**14 §** In the Provisions on the construction and civil engineering work For a list of construction work on the land. The list provides examples only on what could be the building and construction work and is not exhaustive. It is appropriate to use this list as a guide to what can be considered as civil works under water.

Examples of contaminated water is water that contains chemical, biological or radioactive substances in such concentration that there is a risk of acute or long-term ill health.

Examples of machine-driven work equipment is electrical, pneumatic and hydraulic tools, nozzles, högtrycksspolaggregat and Suction.

Examples of underwater structures are wreck, fallen structures, cables and lines. Other examples are dams, locks and intake / discharge of water from power plant.





**15 §** Examples of when using the buoyancy compensator can increase the risk is at diving under ice and in closed rooms.

**16 §** It is important that the diving supervisor or dykarskötaren can maintain contact with those who pops. How this contact is maintained depends on the diver's equipment and in the respiratory gas supplied to the diver. At the gas supply from the surface it is important that the diving supervisor or dykarskötaren can hear the diver's breathing and / or can talk to the diver.

Examples of when communication may be deemed unnecessary is at pardykning.

**17 §** An example of when lifeline to a diver in the water can be judged to be unnecessary is at pardykning.

When diving in pools, dolphinariums or similar where the diving supervisor can visually follow and observe the diver or divers in the water during the dive can be a lifeline or between the rope judged to be unnecessary.

Examples of when lifeline may involve greater risk is the string search.

**18 §** Dive Mode - diving supervisor, diver and standby diver - can be extended with several person or one group member in some cases have multiple tasks. Such example is when two divers diving each with a lifeline. The diving supervisor can then simultaneously be diving supervisor and dykskötare to a diver in the water and also, if necessary, be pressure chamber operator. If three or more divers diving with the lifeline or gas supply from the surface, for example, diving supervisor, if necessary, be pressure chamber operator.

**19 §** diving supervisor has an important role in the systematic work environment. The by the employer designated as diving supervisor shall, according to the present scriptures on systematic work environment, have the powers, resources and knowledge needed task. Diving supervisor, plans, directs and supervises the current diving on dive site to dive takes place in tune with the risk assessment made. In this role is also befo-power to make decisions and take actions such as To cancel a diving work on risk, in which could not be foreseen.

**22 §** It is not possible to specify an exact time frame within which the reserve diver in readiness to be ready for diving but this time may be determined by the diving supervisor, based on an overall assessment of the conditions that apply to the current dykeriarbetet. It is important that the timeframe for backup diver's effort customized for example, by the distressed diver's depth as a delayed intervention can affect the diver's Decompression and pose a significant risk of decompression.

When the response time for standby diver on standby determined following may be appropriate to consider:

- The choice of diving equipment,
- The distressed diver's access to breathing,
- Decompression used,
- The distressed diver's depth profile,
- Access to diving and work;
- Weather, water, and soil conditions on diving and workplace.

**25 §** The employer should document the employee's notification. The employer should also provide the employee with a copy of the documented.

The relevant rule is applicable to those regulations aimed, see the regulatory § 2 with associated general council. Sanction may be imposed Only employers.

With the number of employed persons concerned, irrespective of whether they work full time or part time:

- Employees workers.
- Contracted labor force (cf. Chap. 3 § 12 second paragraph of the Work Environment Act).

In respect of business without workers (see Chap. 3 § 5 Work Environment Act) refers to the number of employees, whether they work full time or part time:

- The people running the business.
- Hired labor.





The current natural or legal person's registration number determines which persons shall be deemed to be part of the business. The number of employed persons included on activities all workplaces.

Number of employed persons shall be calculated on the basis of information regarding the date infringement of the sanctions provision was found . *(AFS 2014: 6)*

**26 §** In planning and risk assessment of dykeriarbetet includes the choose the gas mixture is used as a breathing gas. The most common gas mixtures in professional diving is air, oxygen, oxygen-enriched air (Nitrox), a mixture of oxygen, nitrogen and helium (Trimix) and a mixture of oxygen and helium (heliox). The diver can use only a gas mixture during the dive or so the diver can use combinations of different gas mixtures during a same diving depending on the planned dive profile. It is extremely important that breathing gas is properly constituted at each depth during the dive so that decompression is avoided. It is not possible to specify the gas mixture needed for a given diving work but the choice must be made based on the circumstances involved for the planned dykeriarbetet.

When diving with eg Nitrox is very important that the oxygen content in breathing gas is carefully determined and set properly so that the diver really get the gas mixture is planned for diving. When diving with breathing gas in bottles it is important to analyze the gas bottle filled with. When diving with gas supply from the surface, it is important that this analysis is done on the gas supplied the diver.

When the oxygen is mixed into a Nitroxblandning it is important to be aware of the partial pressure of oxygen is not so high that the diver suffering from oxygen toxicity. This applies especially on repetitive dives, day after day, see Appendix 1.

The Armed Forces rules for naval operations, Rules for naval RMS dive, described, for example, gases, gas mixtures, requirements on their purity, the partial pressure. Although if those rules apply strictly only in the Armed Forces, it is advisable to choose respiratory gas composition and use when diving on the basis of the rules of the RMS Dives. This provided they do not violate the AML and the Work Environment Authority.

**27 §** If the supply of breathing gas to the diver, for any reason ceases during diving, it is very important that the diver has immediate access to emergency supply with breathing gas.

When gas from the surface, it is appropriate that the diver e.g. has a smaller gas supplies on their backs, a so-called Bailout device, allowing the diver to terminate the dive safely.

When diving with self-borne gas storage it is appropriate that the diver has access to breathing through two independent gasvägar. If SCUBA used, a additional second stage connected to the same gas supply as the diver's primary second stage called Octopus assessed meet the requirement of this section.

The Armed Forces rules for naval operations, Rules for naval RMS dive, described, for example, how redundant breathing systems and nödapparater for supply of gas from the surface shall be designed for use in the Armed Forces. Although these rules apply strictly only in the Armed Forces, it is appropriate that the design and selection of emergency systems take into account the rules of the RMS dive. This under provided they do not violate the Work Environment Act and the Work Environment regulations.





***Appendix 2***

Examples of what may be appropriate to consider in the planning, preparation, action before and after diving and emergency procedures.

**Planning**

1. Weather conditions, including projections that could affect the dive.
2. Currents, including any tides.
3. Boat and ship traffic on the site.
4. Air and water temperatures.
5. Breathing gas, depth, decompression.
6. Diving equipment and equipment on the surface.
7. Other work equipment.

8. Employee education, skills, experience.
9. Influence of flight or transport at high altitude after diving.
10. Predictable changes in conditions.
11. Access and time to the pressure chamber.

**Preparations**

1. Contact with co-ordinating firm or a person who has information on conditions that can affect divers' safety.
2. Election of diving equipment, breathing, decompression table.
3. Control of diving equipment and surface equipment.
4. Election of divers and other personnel and control of divers health.
5. Measures to combat the effects of cold in and above the water.
6. Arrangement of lighting and staff areas.
7. Determination of the signals to be exchanged.
8. Measures against underwater hazards.

**Measures relating to diving**

1. Allocate tasks to the diver, diving supervisor and tender and other surface personnel.
2. Make use of personal diving equipment.
3. Check the gas supply including mine. and max. partial pressure of the mixed gas of Such is current. Although the need for gas for emergencies considered.
4. Make use of tools and machinery.
5. Check permitted diving depth and exposure.
6. Ensure that the ascent tables are on hand, even for repetitive dives on Such is current.
7. Ensure that the divers are in the vicinity of the pressure chamber long enough after diving (if applicable).
8. Be aware of any changes in conditions at the dive site.

**Measures after diving**

1. Establish a record of dives with the following information:
   a. What persons, in addition diver, diving supervisor and tender, who participated in operation and their duties they had.
   b. The equipment used on the surface.
   c. The firm responsible for coordination responsible.
   d. What measures are taken in cases of decompression or other disease state.
   e. If any accident or incident of some other kind occurred and who who then took the action.
2. Report to the coordination firm when work is completed.



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**Preparing for emergencies**

1. Determination of distress signals.
2. Planning of assistance under and above water.

3. Access to the pressure chamber and transportation facilities to the same.
4. Planning of medical assistance.
5. Reserve for possible failure of electricity supply.