Arbejdstilsynet

Annex 1 – Safety regulations for certain activities on vessels with tanks for oil, etc. (TANK REGULATIONS)

Drawn up in accordance with section 29 of act no. 226 of 11 June 1954 on general protection of workers. The purpose of the regulations is to prevent the risk of fire, explosion and poisoning as well as other health risks in the best possible way.

Definitions

1. A tank, space and pipeline means cargo tanks and bunker tanks, lubricating oil tanks and other tanks or spaces with associated pipelines where oil or gas may have gathered, including cofferdams, peak tanks, pump rooms, valves, filters, coils, etc.

2. For the purposes of these regulations, oil means real oil of any type as well as other flammable liquids and flammable "liquid" (condensed) gas. The liquids are subdivided according to their flash point – to be decided by means of a Pensky Martens apparatus – into two groups:

Group A

Oil and other liquids with a flash point of 65.5 °C (150 °F) or lower, such as petrol, gasoline, benzene and toluene, xylene, white spirit, kerosene, crude oil, methanol and other spirits, acetone as well as liquid gas, such as propane, butane and butadiene.

Group B

Oil and other liquids with a flash point higher than 65.5 °C (150 °F), for example mineral oil, such as diesel oil, fuel oil, lubricating oil and animal and vegetable oils, such as whale oil, herring oil, cocoa oil, peanut butter oil and linseed oil.

3. Gas means gas or vapours from the liquids mentioned under item 2.

4. Naked fire means naked flames or heat from, for example, blowlamps, welding and cutting apparatuses, forges, hot spikes, heavily spark forming tools, such as grinding machines and all lighting, except safety lamps of approved type.

Access to yards

5. The yard must not receive a vessel that carries or has carried oil as cargo until cargo tanks, spaces and pipelines have been emptied and sufficiently cleaned and aired to the extent necessary (cf. items 6-10) and a satisfactory certificate is available, cf. item 38, stating that the vessel is so free of gas and gas-forming oil residues that there is no risk of explosion or ignition under the existing conditions (certificate of call, see annex 2).

Remark:

When calling at especially tank cleaning installations located outside the yard area, a certificate of call is not required.

6. Tanks, spaces and pipelines that have contained oil of group A must, before the vessel proceeds to the yard, be emptied, cleaned, aired and be found gas-free at a gas investigation pursuant to item 5. Tanks containing oil of group B need not be emptied before the vessel proceeds to the yard if the tanks meet the requirements for being free of gas pursuant to item 5 and the hatches are kept closed.

7. Bunker tanks are not required to be emptied before the vessel can proceed to the yard.

8. Dry cargo carriers with a small number of cargo tanks for vegetable or animal oil of group B can, without the tanks having been emptied, proceed to the yard without a certificate of call.

9. Tanks that, after having contained oil, have been filled with ballast water must be treated as stated under item 6 unless these tanks are found to be free of gas by the issuer of the certificate pursuant to item 5. The tanks must be filled to as high a level as possible without air pockets forming under the tank top (the deck), and it must be kept well ventilated.

10. The vessel can be received in the yard with wash water and oil residues of group A filled in loose reception barrels provided that they are kept securely closed and are removed from the vessel before work of any type is initiated on board. As regards vessels with wash water and oil residues of group B filled in tanks, what is stipulated in item 6(2) applies.

11. If it is not possible, due to loss or other special conditions, or reasonable to examine the vessel completely before it proceeds to the yard, special arrangements must be made between the shipping company, the issuer of the certificate, the yard and the port authorities.

12. A certificate of call must, when the vessel arrives at the yard, be posted in a conspicuous place at all gangways.

Initiation and performance of work

General provision

13. Work in, on or in the vicinity of tanks, spaces or pipelines must not be initiated before a certificate is available to the extent prescribed in items 26, 32, 33 and 34 stating that the place of work is so free of gas and gas-forming oil residues, sludge, sediments, rust cakes and the like that the work concerned can be initiated without any danger of ignition, explosion or poisoning (work certificate, see annex 2).

14. If it is necessary, during an inspection, cleaning or in any other connection, to enter a tank or space before the work certificate so permits, the following special protective measures must be observed:

a. The employee must use a fresh air or compressed air apparatus and a safety harness with a line. The breathing protection must be accurately adjusted and the employee must be familiar with its use.

b. Tools and equipment must be made of materials that do not form sparks. The employee must not use footwear with iron fittings or the like that may form sparks. Only lamps of an approved type must be used for lighting.

c. A “hatch man” must be posted at the place of work on board the vessel. If necessary, there must also be a fire guard with appropriate fire-extinguishing equipment and a stretcher must be easily accessible.

15. The yard management must, in consultation with the issuer of the certificate, decide whether to carry out a renewed gas investigation before any work is initiated or whether to carry out continuous gas control during the work.

16. If, following the issuance of a work certificate, for example by opening a valve or pipeline, by re-pumping oil, a leakage or any other reason, such as temperature rises or interruption of work, doubt arises whether tanks, spaces or pipelines are free of gas, the work must not be initiated or resumed until a new work certificate permits this to be done.

17. During work in tanks and spaces, vapour pipes leading to tanks must be kept closed and vapour valves must be secured against inadvertent opening; similarly, all valves, pipes, etc. must, insofar as

possible, be kept closed and secured against opening. Open pipe ends must be fitted with plugs or blind flanges.

18. Cargo tanks that are emptied for oil, oil residues, wash water or ballast water must be examined for gas as soon as possible after the emptying.

19. If the vessel has been laid up, nobody must enter tanks and spaces and naked fire must not be used on or at tanks, spaces and pipelines until a new work certificate is available.

20. All tanks and spaces must be well aired before anyone enters them, and plenty of ventilation must be secured during the work. Electric fans and other ventilation devices that may form sparks must not be located in tanks or spaces unless the tank has been declared so free of gas in a work certificate that naked fire is not permitted to be used.

21. Any vessel must, insofar as possible, be earthed in a secure way before any work is initiated.

22. In galvanically protected tanks or spaces, explosive gases, hydrogen may generate. Such tanks (spaces) must either be completely empty or be filled with water to as high a level as possible without any air pockets forming below the tank top (the deck). In both cases, the tank must be kept well ventilated.

23. In cofferdams, peak tanks, water tanks and the like, bunkers and cargo tanks, a lack of oxygen may occur. Such rooms must be well aired, either by blowing through fresh air or by filling and subsequently emptying water, before anyone enters. If necessary, it must be ascertained at an examination by a competent person (cf. item 39) that the oxygen content is sufficient for moving about in the tanks or spaces without any risk.

24. Smoking is prohibited in connection with work on board vessels with cargo oil tanks.

25. All work on vessels covered by these regulations must be managed by a person with thorough knowledge about the stipulations of the regulations.

Cleaning and other work without using naked fire

26. Cleaning and other work carried out without using naked fire that can be made without anyone entering tanks or spaces, such as flushing, fumigation and ventilation, can be initiated without a certificate of call or a work certificate being available. If it is necessary to enter tanks or spaces, either a work certificate must be available permitting this or special protective measures must be taken, cf. item 14.

27. During cleaning activities, it must be ensured that tanks, spaces and pipelines with valves, pumps, filters and the like as well as any coils are emptied as completely as possible, are fumigated and/or flushed with water or cleaned in any other effective way so that residues of oil, sludge and rust cakes and the like are, to the widest extent possible, removed or possibly dissolved and washed away. Subsequently, airing is carried out by means of, for example, windlasses or artificial ventilation.

28. Tanks or spaces that will be exposed to heating or sparks during repair work must, in addition to what is prescribed in item 13, be completely cleaned for sludge and sediments so that flammable or toxic gas cannot generate during the heating. In case of sludge and sediments that it is difficult to remove and where only a minor part of the tank surface can be exposed to heating, the cleaning can be limited to the area outside which the heat cannot spread. The tank surface must be cleaned on both sides.

29. When cleaning tanks, oil or any other detergent of group A must not be used. If the temperature is below 15 C, kerosene with a flash point above 40 C can be used. If this is the case, kerosene residues must be carefully sponged off and the tank must be completely aired. When using toxic detergents such as trichlorethylene, residues of the detergent in grooves and sediments must be completely removed. Nobody must enter the tank or the space without taking the special measures mentioned in item 14 unless

the tank has been found not to present any risk after thorough airing and examination by a competent person (cf. item 39).

30. During cleaning activities in tanks or spaces containing sludge or sediments after lead petrol (item 37) or that have contained or have been cleaned using corrosive liquids, a suitable protective suit must be used. The suit must be completely cleaned after use.

31. Tanks, spaces and pipelines that have contained benzene, must at temperatures below the freezing point of this liquid (about +6 °C) – in addition to what is described in item 13 – be thoroughly cleaned for frozen benzene by flushing with hot water or vapours or be washed off using diesel oil or similar oil of group B.

Work using naked fire

32. Work using naked fire must be carried out on a vessel provided that the tanks, spaces and pipelines that will be exposed to heating are, prior to this, subject to special cleaning in accordance with item 27 and that the work in, on or at tanks, spaces or pipelines is permitted by a work certificate, possibly following a renewed gas examination (see item 15).

33. Minor works using naked fire, such as the welding on of fittings, pipe clamps, “doublings” and foundations directly on the outside of a tank or space that contains or has contained oil of group B, can in consultation with the issuer of the certificate be carried out without previous cleaning provided that there is no risk of burning through and that the tank (space) is at a height of at least 50 cm above the heated place kept filled with water and/or oil of group B or that the air in the tank (space) is expelled by inert gas, for example nitrogen or carbon dioxide which must be added continuously during the work. After having used inert gas, the tank must be completely aired and it must be checked by a competent person (cf. item 39) before anyone enters it.

Remark

During work using naked fire on such enclosed cavities as for example double plate rudders (balance rudders) and bilge keels that may contain oil or where there may be fear that explosive gas originating from rust preventives or the like will occur as a consequence of heating, a work certificate should be acquired or the space should be filled entirely with water or the air in the space should be expelled by means of inert gas added continuously.

34. In vessels that carry or have carried oil as cargo, naked fire must not be used in machinery and boiler spaces outside the permanent furnaces unless permitted by a work certificate for each individual place of work. In every vessel, work using naked fire must be stopped in machinery and boiler spaces for as long as adjacent tanks, spaces and pipelines are aired through these or for any other reason are in open connection with these spaces and the work must not be resumed until a work certificate is available stating that naked fire can be used.

35. During work using naked fire a fire guard with appropriate fire-extinguishing equipment must be present and a stretcher must be easily accessible. The access to the work place must be kept open in the best possible way with a view to any fast evacuation.

Examination and certificates, etc.

36. Certificates of call and work must be made on a form, cf. annex 2.

37. Certificates must, insofar as possible, contain information about what oils the vessel has carried as the last and second-last cargoes. Insofar as the vessel has carried petrol cargoes, it must be stated whether lead compounds have been added to it.

38. Certificates of call and work as prescribed by these regulations must be issued only by a reliable person who has proven to have the necessary chemical knowledge and experience and who has at

disposal the appropriate equipment. The yard is to inform the Directorate of the Danish Working Environment Authority who it designates as the issuer of certificates.

39. Continuous gas control (cf. item 15), examination for residues of toxic detergents (cf. item 29) and for lack of oxygen (cf. item 23) must be carried out by a responsible, competent person who has at disposal the appropriate equipment.

40. When issuing the work certificate mentioned in these regulations and in connection with renewed gas examinations and continuous gas control, the gas content in tanks or spaces in which or in the vicinity of which work is to be carried out should, as regards the risk of explosion, not exceed 5 per cent of the lower explosion limit. Furthermore, it should be possible to keep the gas content below the limit mentioned. As regards the risk of poisoning, the gas concentration should not exceed or be assumed to exceed the hygienic limit values in force (MAC values) in connection with stays of longer duration in tanks or spaces.

41. Tanks, spaces and pipelines must have been cooled to a reasonable working temperature before the gas examination is carried out.

The safety regulations have been drawn up by a common Nordic working committee and have been acceded to by the working environment authorities in Denmark, Norway and Sweden.