Use of pressure equipment

Executive Order No. 100 of 31 January 2007 issued by the Danish Working Environment Authority

The following provisions are laid down pursuant to sections 41, 43, 46, 74 and 84 of the Danish Working Environment Act, and by order pursuant to section 73 of the said Act, cf. Consolidated Act No. 268 of 18 March 2005:

Part 1 – Scope and definitions

1.- (1) This Executive Order shall apply to pressure equipment and assemblies which contain or in which the following may develop:

1. vapours or gases subject to pressures greater than 0.5 bar,
2. vapours at such temperatures that their vapour pressure is greater than 0.5 bar.

(2) For the purposes of this Executive Order, use shall have the following meaning: any use of pressure equipment and all related work functions such as installation, mounting, filling, putting into service, operation, tending, monitoring, maintenance, setting, cleaning, etc.

2.- (1) Pressure equipment comprises vessels, piping, safety accessories and pressure accessories. Pressure equipment also includes any elements attached to pressurised parts, such as flanges, nozzles, couplings, supports, lifting lugs, etc.

(2) For the purposes of this Executive Order:

1. Assemblies means: several pieces of pressure equipment assembled to constitute an integrated and functional whole.
2. Pressure and vapour pressure means: pressure relative to atmospheric pressure, i.e. gauge pressure. As a consequence, vacuum is designated by a negative value.
3. Set pressure means: the maximum allowable working pressure.
4. Pressure vessel means: a vessel as defined in the Executive Order on the design of pressure equipment, which is not integrated into a steam boiler.
5. Steam boiler means: a fired vessel or piping with the risk of overheating intended for generation of steam or superheated water at temperatures higher than 110 degrees C for use outside the steam boiler. Firing means feeding heat by processes of combustion or by electricity.
6. Product figure means: set pressure in bar multiplied by volume in litres. When determining the product figure for a steam boiler consisting of several pieces of pressure equipment, the total volume shall be included.
7. Inspection body means: a third-party body accredited under this Executive Order for the control task concerned.
9. Equipment record means: a record for pressure equipment or assemblies containing information on the equipment's manufacturing data, significant events and their timing, and the results of the prescribed examinations. The record shall be organised and secured in such a way that it may be made available to the operating staff and inspection bodies involved throughout the life of the equipment, and altering the history of the record shall not be possible.
10. Visual inspection plate means: a plate or the like made of a durable material to be placed visibly on or near the equipment to which it is related, stating the date of the next examination, possibly the date of the next pressure test, the logo of the inspection body and
the date of the visual inspection. The plate shall be traceable to the equipment concerned.

11. Expert enterprise means: an enterprise with a certified quality system based on DS/EN ISO 9001 "Quality management systems - Requirements" for the activity described. The certification shall be provided by a certification body accredited according to DS/EN 45012:1998 "General requirements for bodies operating assessment and certification/registration of quality systems" or DS/EN ISO/IEC 17021:2006 "Conformity assessment - Requirements for bodies providing audit and certification of management systems".

(3) Vessels, piping, safety accessories, pressure accessories, volume V and nominal size DN, etc. are defined in conformity with the Executive Order on design of pressure equipment.

**Exceptions**

3. This Executive Order shall not apply to:

1. Equipment covered by the Executive Order on transportable pressure equipment.
2. Piping covered by the Executive Order on safety requirements for natural gas systems pursuant to the Danish Working Environment Act.
3. Piping in consumer installations covered by the provisions of the gas regulations.
4. Equipment for the operation, braking and steering of vehicles covered by the road traffic legislation.
5. Equipment comprising machinery or machine parts where the dimensioning, choice of material and manufacturing rules are based primarily on requirements for sufficient strength, rigidity and stability to meet the static and dynamic operational effects or other operational characteristics and for which pressure is not a significant design factor. Such equipment may include:
   a) engines, including turbines and internal combustion engines
   b) steam engines, gas/steam turbines, turbo-generators, compressors, pumps and actuating devices.
6. Pressure equipment consisting of a flexible casing, e.g. tyres, air cushions, balls used for play, inflatable craft, and other similar pressure equipment.
7. Radiators and pipes in hot water heating systems.
8. Equipment covered by Article 296 (1) (b) of the EC Treaty, concerning the production of or trade in arms, munitions and war material.
9. Items specifically designed for nuclear use, failure of which may cause an emission of radioactivity.
10. Rolling stock, which is supervised by the Danish Public Transport Authority, cf. the Danish Railway Act.

**Part 2 - General provisions**

4.- (1) The use of pressure equipment and assemblies shall take place in a way that is safe and without any risk to health in accordance with the requirements of this Executive Order and the Executive Order on the use of work equipment.

(2) Pressure equipment and assemblies shall only be used where they meet the requirements applicable to their design, appliances, protection, etc. according to the occupational health and safety legislation.

(3) The obligations under this Executive Order shall rest with employers, managers, supervisors and other employees, owners, users, suppliers, project planners, repairers and others in conformity with the general rules of the Danish Working Environment Act, cf. section 2 and Part 4 of the Act.

5. Pressure vessels, steam boilers, piping and assemblies used in Denmark shall be assigned to a control class. The control class shall be determined according to the rules in Annex 1. The control class indicates the examinations, etc. required for the equipment.
6.-(1) The examinations of the equipment shall be carried out by an inspection body accredited by the Danish Accreditation and Metrology Fund (DANAK) or by a similarly approved accreditation body that is a signatory to the multilateral agreement on mutual recognition of the European Co-operation for Accreditation (EA).

(2) Accreditation shall take place according to the standard DS/EN ISO/IEC 17020:2005 as an inspection body type A with the additional requirements of Annex 2, which, as necessary and depending on the task applied for, shall be incorporated into the quality system checked by the accreditation body.

(3) The inspection body shall perform an installation control, cf. Part 4, and periodical examinations, cf. Part 5, of control class A and B equipment.

Part 3 - Installation of pressure equipment

7.-(1) Pressure equipment and assemblies and related installations shall be placed in such a way that they are not exposed to harmful heat or cold, collisions or the like and shall, if necessary, be secured against access by unauthorised persons.

(2) The installation site shall be sufficiently lit and adequately ventilated and fireproof.

(3) The installation shall ensure that operation, control and other tending as well as visual inspection and maintenance may take place safely and in such a way as to allow the necessary cleaning, repair and visual inspection.

(4) Fittings and accessories shall also be easily accessible for operation and maintenance. If necessary, the system shall have platforms, gangways and means of access so that operation, maintenance, inspection, adjustment, etc. can be carried out in a way that is safe and without risk to health.

(5) Fittings, accessories, piping and technical installations in general shall be placed in such a way as to provide proper escape routes.

(6) Discharges from safety fittings and outlets from pressure equipment and assemblies shall be conducted away safely and without causing inconvenience to the surroundings.

(7) In general, the manufacturer's instructions on installation of the equipment, etc. shall be complied with.

(8) For certain pressure equipment and assemblies, special requirements apply to the installation and use, as set out in Annex 4.

8. Pressure equipment and assemblies involving specific danger to the surroundings shall be installed in a special building, machine room or in the open and at a safe distance from workstations, buildings and traffic routes.

Part 4 - Installation control

9.-(1) Before being put into service for the first time after modification, substantial repair or removal, control class A and B pressure vessels, steam boilers and assemblies shall be:

1. subjected to installation control,
2. provided with an equipment record,
3. provided with a visual inspection plate, and
4. registered on an updated list of the pressure equipment and assemblies of the enterprise, cf. section 20.

(2) The visual inspection plate can be replaced with other documentation as long as it contains the same information and has the same traceability to the equipment.
(3) Pressure vessels, steam boilers and assemblies intended for use at alternating places of use shall be exempt from installation control after removal, but shall otherwise be controlled according to the rules in this Part.

(4) The time of the next periodic examination shall be scheduled, cf. Part 6.

10. The installation control shall be carried out in conformity with the requirements of Annex 3, item 1, and Annex 4.

Part 5 - Periodic examinations

11.-(1) After being put into service, control class A and B pressure vessels and steam boilers shall be subjected to the following periodic examinations:

1. visual inspection and, if necessary, other related examinations and tests to check
   a) that the vessel and boiler are in good condition,
   b) that the provisions of section 23 are complied with; and
2. checks to see that the vessel and the boiler are installed, designed, equipped, maintained and tended according to the current rules thereon.

(2) In addition, control class A and B steam boilers shall be pressure tested periodically.

(3) After being put into service, control class A and B assemblies shall be subjected to periodic checks to see that the assemblies are installed, designed, equipped, maintained and tended according to the current rules thereon, including that the assembly protection measures against exceeding the allowable limits are functioning correctly.

(4) If the assessment mentioned in subsection (3) requires verification of a setting or renovation of safety valves, this work can also be carried out by an expert enterprise.

(5) For the pressure vessels, steam boilers and piping incorporated into the assembly, the provisions of subsections (1) to (4) and section 12 shall apply.

12. After being put into service, control class B piping shall be subjected to the following periodic examinations:

1. external visual inspection and, if necessary, other related examinations and tests to check
   a) that the piping is in good condition,
   b) that the provisions of section 23 are complied with; and
2. checks to see that the piping is installed, designed, equipped, maintained and tended according to the current rules thereon.

13. Further guidelines for fixing the intervals for and performing the periodic examinations pursuant to sections 11 and 12 are set out in Annex 3, items 2 and 3, in Annex 5 and in Annex 7.

14.-(1) For pressure equipment where minor cracks, unexpected significant corrosion or other unexpected damage is found, a fitness for service test shall be carried out immediately, cf. Annex 4, item 5. For control class A and B equipment, this examination shall be assessed by an inspection body.

(2) If the event in subsection (1) affects the safety of the equipment, the equipment shall be taken out of service. The equipment shall not be put into service again until the examination mentioned in subsection (1) has provided a positive result.

15. If the design of a control class A or B pressure vessel or a steam boiler prevents a full internal visual inspection, the visual inspection by the inspection body shall be supplemented by non-destructive testing of the inaccessible areas and/or pressure testing, if necessary. The type and extent of such
supplementary examinations shall be determined by an inspection body for each piece of equipment.

16. Periodic examinations of control class A and B pressure vessels, steam boilers, piping and assemblies may be performed by enterprises as internal inspections, cf. section 2(2), item 8, in conformity with the provisions in Annex 6 on internal inspection using a certified quality system.

Part 6 - Intervals and due dates of periodic examinations

17.-(1) The intervals between the periodic examinations shall take into account the type, condition and use of the equipment and the manufacturer's instructions, cf. Annex 5. The intervals shall not exceed the intervals set out in Annex 5, however.

(2) The interval up to the next periodic examination shall be reckoned from the calendar month in which the installation control was performed, or from the month in which the most recent periodic examination was carried out.

(3) The time of the subsequent periodic examination shall be the calendar month in which the interval in question ends. The periodic examination shall be carried out no later than 5 months after the calendar month in which the interval ends, unless the interval is less than one year, in which case the examination shall be carried out in the calendar month concerned.

Part 7 - Control of pressure equipment and assemblies that have been taken out of service or moved to a new installation site

18.-(1) If a pressure vessel, a steam boiler, piping or an assembly is out of service at the time when a periodic examination is to be carried out, the examination is cancelled. The owner shall note down the date on which the equipment is taken out of service in the equipment record.

(2) If an examination has been cancelled according to subsection (1), the equipment concerned shall not be put into service again until the examination has been carried out.

(3) If a steam boiler has been out of service for a continuous period of more than two years, it shall be subjected to a visual inspection and pressure testing before being put into service.

19. Before putting control class A and B pressure vessels, steam boilers or assemblies into service in a new installation site, the pressure vessels and steam boilers shall be visually inspected, and the assembly protection measures against exceeding the allowable limits shall be examined. The dates of future periodic examinations shall be determined from this time in accordance with Annex 5.

Part 8 - Documentation of installation control and periodic inspection

20. The owner shall keep an updated record of the control class A and B pressure equipment and assemblies of the enterprise, to be presented on request to the inspection body and the Danish Working Environment Authority. On request, the owner shall let the Working Environment Authority know where the equipment is located.

21. The owner shall document that the installation control or the periodic examination has been carried out with satisfactory results, by means of the inspection body's report, endorsement of the visual inspection plate and of the equipment record, cf. section 16, however.

Part 9 - Use, instructions and maintenance of pressure equipment and assemblies

22.-(1) Pressure equipment and assemblies shall be used in a way that is safe and without any risk to health. The use shall be within the scope of the Executive Order and any limitations laid down in a design approval or a verification.

(2) By adequate checks and maintenance it shall be ensured that pressure equipment and assemblies in use are always kept in good condition. The supplier's instructions shall be complied with, unless
otherwise prescribed in the provisions of the occupational health and safety legislation.

23.-(1) For pressure equipment and assemblies, the necessary instructions shall be available on safe operation, tending and maintenance, as well as the measures to be taken in case of interruption of operation or other extraordinary situations.

(2) The operating staff shall have received the necessary instruction and practice in tending the equipment, as well as in the measures to be taken in case of interruption of operation or other extraordinary situations. The instructions shall be available in writing and be easily accessible for the operating staff.

(3) In case the use of the pressure equipment or assembly involves a special risk to the worker engaged in operating the equipment or to other persons, the employer shall ensure that it is used only by specially designated workers, who have been given the required instruction and training in such use.

(4) Only certified persons or persons with equivalent qualifications may be employed for work requiring a certificate.

24.-(1) In case the pressure equipment or assembly bursts or becomes defective or damaged so that it may involve risk of an accident or risk to health and safety, or if a situation arises which may mean that operating, monitoring or control devices, on which the safety of the equipment or assembly depends, do not work, the pressure equipment or assembly shall be taken out of service in a safe way, until the defects have been remedied. The cause of the events shall be examined and the necessary measures subsequently taken.

(2) If repair or modification is required, this shall be carried out in conformity with the Executive Orders on the design of pressure equipment and on the design, modification and repair of pressure equipment.

25.-(1) In case the use of pressure equipment or the assembly involves a risk to health or safety on account of defects in the pressure equipment or the assembly or other special circumstances, adequate measures shall be taken as long as the risk exists to prevent use of the equipment or the assembly.

(2) If the automatic control of the operating state of pressure equipment or assemblies does not work as planned, the pressure equipment or the assembly shall be taken out of service in a safe way, unless the operating staff have received instruction and have sufficient practice to manually maintain a safe operating condition, cf. section 23(1), however.

26. Safety accessories and pressure accessories shall regularly be tested to the necessary extent with regard to their setup and function. Deadlines and procedures for such tests shall appear from the instructions according to section 23(1).

27. During examination, control, maintenance, repair, etc., pressure equipment and assemblies shall be stopped and prevented effectively from starting. If this is not possible, other measures shall be taken to ensure in an effective way that such work can be performed without any risk to health and safety. If there may otherwise be a risk of exposure to harmful effects, this shall be countered effectively.

28. If a periodic examination has not been carried out within the stipulated time limit, cf. section 17(3), the system in question shall be taken out of service in a safe way and not be put into service again until the examination has been carried out with satisfactory results.

Part 10 - Special provisions for steam boilers

29.-(1) A steam boiler shall be monitored constantly as long as it is fired or in operation.

(2) Constant monitoring means that the boiler attendant is so close to the steam boiler, in the boiler room or the control room, as to be able to take adequate action either automatically or manually to keep the steam boiler within the allowable limits.
(3) Where the steam boiler system includes special, suitable safety or control devices to keep the steam boiler within the allowable limits, operation without constant monitoring shall be acceptable. For control class A and B steam boilers, assessment of conformity with the requirements for operation without constant monitoring performed by an inspection body is required, cf. Annex 3, section 3.3.

(4) The special safety or control devices, cf. subsection (3) shall be subjected to a complete check by an expert enterprise which, for control class A and B steam boilers, shall comply with the requirements of Annex 4, item 3.3. The check shall be performed at appropriate intervals, but at least every six months or more frequently if prescribed by the manufacturer.

30.-(1) When in service, a steam boiler shall be fed a sufficient amount of feedwater in a condition suited for the design and use of the steam boiler.

(2) Feedwater and boiler water shall be tested at appropriate intervals to ensure the composition of the water for safe operation.

31.- (1) Only persons holding an advanced boiler attendant certificate or having equivalent training or experience may be employed to be in charge of the tending of or independently to tend control class A steam boilers, cf. Annex 4, item 3.2.3.

(2) For the tending of control class B steam boilers it is sufficient that the person concerned holds an ordinary boiler attendant certificate or has equivalent training and experience, cf. Annex 4, item 3.2.4.

32. If a boiler attendant holding a certificate is not available for the tending of a steam boiler, and this cannot be attributed to the owner or user of the boiler, the latter may let a suitable person tend the boiler for four consecutive weeks at the most. The same shall apply if a substitute with a certificate is not available during the boiler attendant’s holiday.

Cooling systems and heat pump systems

33. Cooling systems and heat pump systems shall be installed, used, maintained and checked in conformity with the special provisions of Annex 7 and any other relevant provisions of this Executive Order. Pressure vessels and piping incorporated into cooling systems or heat pump systems shall be used in conformity with the provisions on pressure vessels and piping of this Executive Order.

Part 11 – Exemptions, appeals and penalty provisions

Exemptions

34. The Danish Working Environment Authority may permit deviations from this Executive Order in individual cases where this is found reasonable and justifiable due to the special design, manufacture or use of the pressure equipment concerned or to other special conditions.

Right of appeal

35. Appeals against decisions made by the Danish Working Environment Authority pursuant to this Executive Order may be lodged in accordance with Section 81 of the Danish Working Environment Act.

Penalty provisions

36.–(1) Unless a more severe penalty is incurred under the Danish Working Environment Act or any other legislation, anyone who

1. contravenes sections 4-5, sections 7-28, section 29(1), (3) and (4) and sections 30-33,
2. fails to comply with any improvement notice or prohibition notice issued in accordance with the provisions of this Executive Order,
3. disregards the terms of authorisations under this Executive Order
shall be punished with a fine or imprisonment for up to two years.

(2) For the violations stated in subsection (1) an employer may be held liable to pay a fine even if he has not acted intentionally or negligently. The liability to be fined is on condition that the violation may be set down against one or more persons associated with the enterprise or the enterprise as such. There shall be no alternative sentence in lieu of the fine.

(3) Criminal liability may be imposed on companies, etc. (legal persons) pursuant to the rules in Part 5 of the Danish Criminal Code.

Part 12 - Entry into force and transitional provisions

Entry into force

37.--(1) This Executive Order shall enter into force on 15 February 2007.

(2) Executive Order No. 1141 of 14 November 2005 on use of pressure equipment shall at the same time be repealed.

Transitional provisions

38.--(1) Notwithstanding the provision of section 6(3) to the effect that installation control and periodic examinations shall be carried out by an accredited inspection body, experts approved by the Danish Working Environment Authority shall be authorised to carry out installation control and periodic examinations of control class B pressure vessels, steam boilers, piping and assemblies under the current rules before the entry into force of this Executive Order.

(2) Notwithstanding the provision of section 6(3) to the effect that periodic examinations shall be carried out by an accredited inspection body, experts approved by the Danish Working Environment Authority shall be authorised until 1 January 2012 to carry out periodic examinations of pressure vessels, pressure expansion vessels in hot water heating systems and hydrophores with product figures between 1000 and 10,000 according to the guidelines in Annex 3, items 2.1 and 2.2.

(3) Pressure vessels, steam boilers, assemblies and piping that have been subjected to a periodic visual inspection, pressure testing or check before the entry into force of this Executive Order shall be subjected to the next periodic visual inspection, pressure testing or check, if necessary, at a time determined according to the rules in force at the time of examination, unless longer intervals are scheduled according the relevant guidelines in Annex 5.

(4) Other pressure vessels, steam boilers, assemblies and piping put into service before the entry into force of this Executive Order, shall, if necessary, be subjected to a periodic visual inspection by 1 January 2010, a check by 1 January 2008 and pressure testing by 1 January 2014, always provided that piping shall be subjected to visual inspection by 1 January 2014. The deadlines stated shall not apply if longer intervals are scheduled according to the relevant guidelines in Annex 5.

39.--(1) Until 1 October 2007, the Danish Working Environment Authority shall undertake tasks pursuant to Parts 4 and 5 and section 29(3).

(2) The Danish Working Environment Authority shall charge a fee for time spent performing these tasks. This shall apply irrespective of whether the application is rejected or withdrawn.

(3) The fee shall be DKK 885 per hour, based on long-term average costs. For each half hour or fraction thereof, half the hourly rate shall be charged.

(4) The fee may be increased by any expenses for external consultancy services which the Danish Working Environment Authority might have in connection with the handling of an application.
(5) In the event that the fee is not paid on time, it shall accrue interest at 1.5 per cent for each month or fraction of a month from the due date.

(6) The Danish Working Environment Authority shall be entitled to recover the unpaid fee by execution.

(7) Where an applicant, despite repeated demands for payment, omits to pay a fee charged under this Executive Order, the Danish Working Environment Authority shall assign the task of collecting the fee to the Tax Administration.

40.-(1) Notwithstanding the advanced and ordinary boiler attendant certificate requirements set out in section 31, persons who have obtained a boiler attendant certificate or a control card for tending of steam boilers according to the current rules may continue tending the steam boilers to which their boiler attendant certificate or control card applies until 1 January 2011.

(2) Until 1 January 2010, the work tasks concerning cooling systems and heat pump systems set out in Annex 7, item 5.2, may be carried out by enterprises authorised according to Executive Order No. 539 of 30 December 1950 to perform checks and pressure and leakage testing of cooling systems, unless the authorisation is cancelled before the said date, notwithstanding the requirements relating to expert enterprises set out in section 2(2), item 11.

41. However, until the expiry of the recognition period, or 1 January 2012 at the latest, enterprises approved by the Danish Working Environment Authority as expert enterprises according to the rules applied so far may continue to carry out work as expert enterprises within the scope of the approval, notwithstanding the requirements relating to expert enterprises set out in section 2(2), item 11.

42. Until 1 January 2011, section 11, section 29 and section 31 shall not apply to fired steam boilers for generation of water at a temperature greater than 110 degrees C and not greater than 120 degrees C and at a pressure not greater than 6.5 bar for circulation outside the boiler in a closed circuit.

The Danish Working Environment Authority, 31 January 2007

Jens Jensen/Charlotte Skjoldager