「LOCAL RULE ON OCCUPATION SAFETY AND HEALTH STANDARD」

[Enforcement Date Jul. 6, 2011]
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PART I GENERAL PROVISIONS

CHAPTER 1 COMMON PROVISIONS

Article 1 (Objective)

The purpose of this Local Rule is to prescribe matters related to Occupation Safety and Health standard entrusted pursuant to the provisions of Article 5, Article 12, Article 14, Article 23 through Article 25, Article 29, Article 33, Article 34, Article 35, Article 36, Article 37, Article 38, and Article 38-3 of 「Occupation Safety and Health Act」 and those required to its enforcement.

Article 2 (Definition)

The terms as used in the Local Rule shall be, unless specified otherwise in the Local Rule, the same as defined in the 「Occupation Safety and Health Act」 (Hereinafter referred to as "The Act") 「Enforcement Decree, Occupation Safety and Health Act」 (Hereinafter referred to as "The Decree") and 「Occupation Safety and Health Act Rule」.

CHAPTER 2 WORKPLACE

Article 3 (Prevention of Tripping)

① An employer shall keep the workplace clean and sanitary so that employees won't have any risk to tripping or slipping at the workplace.

② An employer shall take such safety precautions against falling of products, materials, and sub-materials by adequately supporting and holding them: Provided that it shall be otherwise if an action is taken that doesn't allow worker's access.

Article 4 (Cleanliness of a Workplace)

An employer shall keep and maintain the workplace free from dirt, while dumping waste at a certain designated area.

Article 5 (Washing Contaminated Floor, etc)

① An employer shall, from time to time, wash and disinfect floor or walls of the workplace that might be contaminated by hazardous material, easily decaying material, or bad-odor material.

② In the event of washing or disinfection as pursuant to paragraph (1), an employer shall paint the workplace floor or walls with impermeable substance and make its structure conveniently drained if it is assumed that frequent use of large amount of water or liquid could cause the floor to be wet.

Article 6 (Disposal of Sewage, etc)

① An employer shall dispose of sewage that a workplace discharge or discard in the way that is not exposed except for in designated area, while making sure that the floor, walls, or vessels that can be contaminated by pathogen shall be frequently disinfected.

② In the case where an employer dispose of waste in the way of incineration, etc, it shall take adequate actions such as improving work process or giving away individual protectors so that employees are not exposed to pollutants such as Dioxin, etc.

③ An employer shall put on such individual protectors distributed as pursuant to paragraph (2).

Article 7 (Natural Lighting and Artificial Lighting)

An employer shall arrange natural lighting and artificial lighting in the way that no significant difference in light and shade is made and it is not eye-dazzling.

Article 8 (Illumination)

An employee shall satisfy the requirements to working surface illumination at workplaces in the following manner: Provided that it shall be otherwise in the cases of mine workplace and photosensitization material handling work.

1. Superprecision work: 750 lux or higher
2. Precision work: 300 lux or higher
3. Ordinary work: 150 lux or higher

4. Other work: 75 lux or higher

Article 9 (Walk Plate, etc)

If it is deemed that elevation of mechanical work or equipment or its control part such as a shelf or a roller is relatively higher or lower than height of workers, an employer shall install safe and supporting walk plates or adjust the machine or equipment to an adequate elevation level.

Article 10 (Windows of a workplace)

① The windows of workplace shall be arranged at a place where workers are not disturbed to working or passing when opened.

② An employer shall take necessary actions by adapting supplementary tools that enable workers to open and close, and clean the windows in a safe and undisturbed manner.

Article 11 (Entrance of Workplace)

An employer shall abide by the provisions as follows in the event of installing entrance at a workplace(excluding an emergency exit, hereinafter the same shall apply).

1. The location, number, and size of entrance shall satisfy the purpose and characteristics of the workplace.
2. When installing a door at entrance, the door shall be easy to open and close.
3. An entrance which is mainly used by loading and transporting vehicles shall have an additional entrance for the pedestrians.
4. If it is deemed to cause hazard to passing-by workers due to its arrangement close to the passage for unloading and transporting machinery, alarm devices such as emergency light · emergency bell shall be installed.
5. In cases where stair and exit are directly connected, make sure to place safety distance between them for a safe passage of a worker with at least 1.2 meters distance or install information sign or emergency bell: Provided that it shall be otherwise in cases where a door is not installed at exit.

Article 12 (Conditions under Installing Power-Driven Door)

In cases where an employer installs power-driven door, its structure shall satisfy the requirements pursuant to any of falling under the following items:

1. The employ shall take necessary measures such as installation of an emergency stop device in order to stop door operation In cases where emergent or hazardous situation may happen to the height of 2.5m where workers get caught up in power-driven door: Provided that it shall be otherwise if there is a safety device only operating when no man is detected or an around-the-clock working operator at a hazard zone.
2. Emergency stop device on a power-driven door shall be easily noticed and manipulated by a worker.
3. Power-driven door shall be suspended immediately in case of a power failure: Provided that it shall be otherwise in case of a fire door.
4. Power-driven door needs to be opened and closed manually.
5. In cases where manually operating a power-driven door, its power should be suspended by a control unit without delay.

Article 13 (Structure and Installation Requirement of Safety Guard Rail)

In cases where an employer installs safety guard rail to prevent a worker from fall accident, etc, its structure shall satisfy the requirements pursuant to any of falling under the following items:

1. It shall consist of upper guard rail, midrail, toe guard and handrail pole: Provided that midrail, toe guard and handrail pole can be replaced with that with similar structure and capacity.
2. Upper guard rail shall be erected at a position 90cm or higher from surface floor · plate or ramp surface(Hereinafter "Surface floor, etc), however, in case of installing an upper guard rail lower than 120cm in height, the midrail shall be located between an upper guard rail and a surface floor, and in case of higher than 120cm in height, a 2-stage midrail is evenly installed with its gap between top and bottom not more than 60cm.
3. Top guard shall keep up with 10cm or more in height from a surface floor: Provided that it shall be otherwise in case of places free from hazard of falling objects or precautionary measures being taken to prevent potential hazard.
4. Handrail pole shall keep up with relevant distance to solidly support an upper guard rail and a midrail.
5. Upper guard rail and midrail shall keep a parallel with surface floor, etc extended over entire guard rail length.
6. Guard rail shall be made from rigid metal pipe with its diameter 2.7cm or longer

or material with more intensity.

7. Safety guard rail shall endure 100kg load which reacts to the weakest point in the weakest direction.

Article 14 (Prevention of Hazard Caused by Falling Object)

① If it is deemed to cause damage to the worker due to falling objects from workshop floor, road and passage, an employer shall take necessary measures including installing a protection net.

② An employer shall take measures necessary to prevention of hazard such as installation of falling objects protection net, erection of vertical protection net or protection rack, establishment of restricted area, or putting on personal protective equipment in cases where an object might fall or fly.

③ In cases where installing falling objects protection net or protection rack pursuant to paragraph (2), an employer shall observe the matters in the following subparagraphs:

1. It shall be established every 10 meters in height and with a top bar more than 2 meters distant from a wall surface.
2. It shall keep a angle with horizontal plane at 20 to 30 degrees.

Article 15 (Dropping Equipment, etc)

An employer shall take measures necessary to prevent hazard by installing a dropping equipment or placing a watchman in case of dropping an object from a place more than 3 meters in height.

Article 16 (Storage of Hazardous Substance, etc)

An employer shall keep hazardous substance prescribed in Table 1 at a place other than workplace, with such amount needed to work left at a workplace.

Article 17 (Installation of a Fire Exit)

① An employer at least one fire exit leading to a safe place evacuation as well as exit referred to in Article 11 whose structure shall satisfy the requirements pursuant to any of falling under the following items at a workplace producing · handling hazardous substance prescribed in Table 1 and at a building of the workplace.

1. It shall not be in the same direction of exit and it is 3 meters distant from exit.

2. The horizontal distance between each of a workplace between a fire exit or exit shall be not more than 50 meters.
3. Fire exit width shall be more than 0.75m, and its height is more than 1.5m.
4. Fire exit door shall be opened in a fire escape direction, being always opened from indoors.

② An employer shall maintain the door that can be always open In cases where installing a door at a fire exit referred to in paragraph (1).

Article 18 (Fire Exit, Maintenance)

An employer shall maintain for fire exit · emergency passage or emergency apparatus.

Article 19 (Alarming System, etc)

An employer shall install alarming system or apparatus to quickly inform workers of emergency at an indoor workplace having a total square of more than 400 square meters or 50 full-time workers or more workplace.

Article 20 (Restriction on Entrance, etc)

An employer shall prohibit strangers, not workers from entering by installing stockade at each work or workplace: Provided that it shall be otherwise in cases where safety support or safety block should be used to bear the load from arm, etc movement for repair or checkup at a place under subparagraphs 2 and 7.

1. A place deemed to cause hazard to workers due to fall accident.
2. A place deemed to cause hazard to workers due to sudden operation of machine · apparatus dump, ram, lift, fork and arm held by oil pressure, chain or rope.
3. A place near internal angle side of a wire rope deemed to cause hazard to workers due to damage of pulley or its part through which raising wire rope or traversing wire rope pass in case of working using cable crane.
4. A place on bottom of hung and raised cargo in case of working using crane attaching lifting magnet.
5. A place on bottom of hung and raised cargo in case of working using a mobile crane affixing lifting magnet.
6. Places where a lift is used for work.
   A. A place deemed to cause hazard to workers due to climbing a life carrier.

B. A place deemed to cause hazard to workers due to falling of falling of pulley or its part through which raising wire rope or traversing wire rope pass at am internal angle side of a raising wire rope of the lift.

7. A place on bottom of fork · bucket · arm or their supporting cargo of unloading and transporting machinery of vehicle type and aerial work platform of fork lift · platform truck · cargo truck, etc(Hereinafter "Unloading and transporting machinery of vehicle type, etc): Provided that it shall be otherwise in case of the ones having a device to prevent unexpected fall.
8. A place deemed to cause hazard to workers due to falling of drum, pulley bunch as a result of damage of raising wire rope, etc fixture or wearing-off of wire rope of operating pile driver or pile extractor.
9. A place deemed to cause hazard to workers due to fire or explosion.
10. Places deemed to cause hazard to workers due to rock falling in the following items.
    A. A place deemed to cause hazard to workers due to fragmented rock falling.
    B. A place deemed to cause hazard to workers due to rock falling or rockslide at a place that reinforcement work or repair work are being done for tunnel timbering.
11. A place under excavation site operating stone-cutting work deemed to cause hazard to workers due to falling of earth rock.
12. A place deemed to cause hazard to workers due to contact to excavator · dividing machine · loading machine or transporting machine(Hereinafter "Excavator, etc) in case of rock-collecting excavation, stone-cutting, divided processing and transporting, or other supplementary work(Hereinafter "Stone-cutting work")
13. A place deemed to cause hazard to workers due to dismantlement work.
14. A place deemed to cause hazard to workers due to falling apart or falling down of piled cargo in case of cargo working.
15. Places deemed to cause hazard to workers due to harbors unloading work place in the following items.
    A. A place deemed to cause hazard to workers due to falling of hatch board or hatch beam in case of working on opening and closing · installation or dismantlement work of hatch cover[including hatch board and hatch beam]

B. A place deemed to cause hazard to workers due to tripping of boom of onboard lifting equipment.

C. A place deemed to cause hazard to workers due to falling of cargo hanging onto onboard lifting equipment, derrick, crane, mobile crane(Hereinafter "Onboard lifting equipment, etc")

16. A place deemed to cause hazard to workers due to rolling down logged timbers in case of working on logging, timber gathering or transporting, etc work

17. A place deemed to cause hazard to passing-by workers due to falling of cargo in case of working on cargo loading[refer to work by the time cargo is hooked and loaded onto a ship on harbor] using onboard lifting equipment or unloading(Refer to work by the time cargo is unhooked and unloaded onto on harbor out of a ship).

CHAPTER 3 PASSAGE

Article 21 (Lighting of a Passage)

An employer shall install 75lux or more natural lighting or lighting equipment so that workers can safety pass: Provided that it shall be otherwise if a worker uses portable lighting apparatus who passes through basement without going through mine shaft or regularly passing.

Article 22 (Installation of a Passage)

① An employer shall install and maintain a safe passage for workers at a place going to workplace or inside a workplace.

② Major parts of a passage shall be marked as passage, where workers safely pass.

③ There shall be no obstacles within 2 meters distance in height from passage side.

Article 23 (Temporary Path Structure)

In case of installing a temporary path, shall observe the matters in the following subparagraphs:

1. Solid structure shall be applied.
2. Tilt shall not more than 30 degrees: Provided that it shall be otherwise in cases where installing stairs or strong straps as a temporary path with less than 2

meters in height.

3. Anti-slippery structure shall be applied in cases where exceeding 15 degrees of tilt.
4. In case of places with hazard of fall accident, safety guard rail shall be installed: Provided that in case of unavoidable occasions, any necessary part can be disassembled.
5. Install stair land every 10 meters in cases where length of a passage installed at vertical mine is longer than 15m.
6. Install stair land every 7 meters in case of 8 meters or higher used for construction work scaffold plank.

Article 24 (Ladder Pathways, etc Structure)

① In case of installing ladder pathways, shall observe the matters in the following subparagraphs:

1. Solid structure shall be applied.
2. Material without serious damage · corrosion shall be used.
3. Gap between plates shall be regular
4. More than 15cm gap shall be maintained between a plate and a wall.
5. Its width shall be more than 30cm.
6. Any measures shall be taken against falling or tripping of a ladder
7. Upper part of a ladder shall be located at more than 60cm in height from the set point.
8. Place stair land every 5 meters in case of 10 meters or longer ladder pathways
9. The tilt angle of a ladder pathways is less than 75 degrees: Provided that the slope angle for fixed type of ladder pathways shall be less than 90 degrees, if its height is more than 7m, install a hoop guard starting from 2.5m high point from the floor.
10. In case of using a folding ladder column, any measures shall be taken against folding or extending while using hardware.

② The provisions of paragraph (1) 5 through 10 shall not apply to caisson ladder pathways and ladder pathways for a ship with life rope under construction · repair(excluding ladder pathways temporarily installed for construction · repair work).

Article 25 (Prevention of Hazard at a Tunnel Passage, etc)

In cases where winding device is installed onto a passage or ladder pathways at a mine, a wood siding wall or other preventive partition wall shall be installed at a place in anticipation of hazard caused by contact between winding device and workers.

Article 26 (Stair Intensity)

① In case of installing stair and stair landing, it shall have intensity in its structure enough to endure 500kg per every 1 square meter, safety rate[referring to safety degree, a proportion of destructive stress rate of material to allowable stress rate)] shall be not less than 4.

② An employer can create a stair and entrance floor using pored material where wrench or other tools do not have the risk to fall.

Article 27 (Stair Width)

① In cases where an employer installs a stair, its width shall be more than 1 meter: Provided that it shall be otherwise in cases of for oil supply · repair · emergency stair and spiral stair.

② An employer shall not install or pile up things at a stair other than straps.

Article 28 (Stair Landing Height)

An employer shall install 1.2 meters wide or more stair land every 3 meters in height at a stair exceeding 3m in height.

Article 29 (Ceiling Height)

In case of installing stairs, an employer shall leave nothing on the space within 2 meters high from surface floor: Provided that it shall be otherwise in cases of oil supply · repair · emergency stair and spiral stair.

Article 30 (Stair Guard Rail)

An employer shall install a safety guard rail at an open side of the stair which is higher than 1 meter.

CHAPTER 4 PERSONAL PROTECTIVE EQUIPMENT

Article 31 (Restricted Use of Personal Protective Equipment)

① An employer shall take measures to protect workers from harmful · hazardous work including improving equipment even if workers do not personal protective equipment.

② An employer only allows workers to put on personal protective equipment in cases where it is deemed difficult to take such measures under paragraph (1).

Article 32 (Distribution of Personal Protective Equipment, etc)

① An employer shall enable workers operating work which refer to any of the following cases to put on personal protective equipment according to working conditions pursuant to the following items.

1. Work involved with hazard of object falling or flying or worker's fall accident: safety helmet
2. Work involved with hazard of fall accident from more than 2 meters in height or in depth: safety harness
3. Work involved with hazard of object falling · shock, caught up in an object, electric shock or static electricity electrification: safety shoes
4. Work involved with hazard of object scattering: goggles
5. Work involved with hazard of welding spark or object scattering hazardous: face-shields
6. Work involved with hazard of electric shock: personal protective equipment for insulation
7. Work involved with hazard of high temperature burning: heat protective gear
8. Work involved with hazard of dusty cargo working at a wharf: dust respirator
9. Work involved with hazard of cargo working at a freezing fish warehouse 18 degrees Celsius below zero: coldness protective cap · coldness protective gear · coldness protective shoes · coldness protective gloves

② The worker who is instructed by an employer to put on personal protective equipment referred to in paragraph (1) shall put on his personal protective equipment.

Article 33 (Personal Protective Equipment Management)

① An employer, in case of providing personal protective equipment pursuant to this provisions, shall make a regular checkup whether it needs repair, exchange, or cleaning: Provided that it shall be otherwise in case of safety shoes, safety helmet, and goggles whose cleanliness worker need to maintain.

② An employer shall have enough dust respirator filter to exchange.

Article 34 (Exclusive Personal Protective Equipment, etc)

An employer shall give out exclusive personal protective equipment and take necessary measures to prevent disease infection if it is deemed to cause infection to workers due to sharing personal protective equipment.

CHAPTER 5 SUPERVISOR'S DUTIES, RESTRICTION ON USE, ETC

Article 35 (Supervisor's Harm and Hazard Prevention Duties, etc)

① An employer shall allow the supervisor referred to in Article 14 (1) of the Act(In case of construction work, refer to a supervisor who supervises and supervises the work from the ranks of foreman · leader and group leader) to carry out duties for the prevention of harm and hazard pursuant to the Table 2.

② An employer shall ask the supervisor to check the necessary matters prior to starting work under the conditions prescribed by Table 3 work.

③ In cases where mal-function is detected after check up referred to in paragraph (2), an employer shall repair immediately or take other measures as necessary.

Article 36 (Restriction on Use)

An employer is prohibited from taking protective measures referred to in Article 33 of the Act or from utilizing machine · apparatus · installation and protective equipment · personal protective equipment that are not suitable for safety certification standard referred to in Article 34 of the Act, voluntary safety standard referred to in Article 35 of the Act, or safety inspection standard referred to in Article 36 of the Act.

Article 37 (Suspended of Work in case of Bad Weather or Strong Wind)

① An employer shall stop the work if it is deemed to cause hazard to worker due to rain · snow · wind or other climatic instability: Provided that it shall be otherwise in cases where emergency restoration work is required due to typhoon that is expected to occur or cause hazard.

② An employer shall stop tower crane installation · repair · checkup or dismantlement work in cases where instantaneous wind speed exceeding 10

meters per second blows in, and tower crane operation work shall be stopped in cases where instantaneous wind speed exceeding 20 meters per second blows in.

Article 38 (Pre-Survey and Work Plan Creation, etc)

① An employer shall pre-survey and keep record of relevant work, workplace topology · natural ground and stratum state referred to in Table 4 when it comes to work falling under the following subparagraphs for the prevention of workers from hazard, and compile a work plan referred to classification in Table 4 and carry out the work therewidth by taking investigation result into account.

1. Works related to tower crane installation · assembly · dismantlement.
2. Works using unloading and transporting machinery of vehicle type, etc excluding driving on the road using cargo truck. Hereinafter, the same shall apply).
3. Works using vehicle type construction machinery
4. Works related to chemical equipment and its auxiliary installations.
5. Electric work referred to in Article 318(Limited to voltage exceeding 50volts and electric energy exceeding 250volt-ampere).
6. Works related to natural ground excavation with its cutting surface higher than 2m(Hereinafter "Excavation).
7. Tunnel excavation.
8. Works related to installation · dismantlement or change of a bridge(Limited to a bridge whose upper structure consists of metal or concrete and whose height is more than 5m, or whose maximum span reaches more than 30 meters).
9. Stone-cutting work.
10. Building, etc dismantlement work.
11. Heavy material handling.
12. Repair and maintenance of railway or other related equipment.
13. Train exchange · connected or separation work(Hereinafter "Shunting).

② An employer shall inform the worker of work plan content made pursuant to paragraph (1).

③ In case of assembly · dismantlement · change or move of pile driver or pile extractor, an employer shall make workers aware of its work method and procedure.

④ In cases where an employer operates motor car, multiple tie tamper, ballast compactor, track stabilizer, etc working vehicles(Hereinafter "Track working vehicle) to the work referred to in paragraph (1) 12, it shall discuss with

operation staff operating on the train track in advance.

Article 39 (Supervisor's Ddesignation)

① An employer shall designate a supervisor and let him control the work according to a work plan In cases where a work plan referred to in Article 38 (1) 2 · 6 · 8 and 11: Provided that a supervisor might not be designated if it is deemed to have no hazard because no worker can access to workplace for Article 38 (1) 2 work or no worker is around as an a single unloading and transporting machinery of vehicle type, etc.

② An employer shall designate a supervisor and let him control the work in case of assembly · dismantlement · change or move of pile driver pile extractor at work.

Article 40 (Signal)

① An employer shall make a sign in a certain method when it comes to work in the following items and the operation shall follow the sign.

1. Lifting machinery work.
2. Placement of a guardian pursuant to the proviso of Article 171 and 172 (1).
3. Placement of a guardian pursuant to the proviso of Article 200 (1).
4. Operation work of pile driver or pile extractor.
5. Work where two or more workers handle and transport heavy material.
6. Onboard lifting equipment work.
7. Placement of a guardian pursuant to Article 412.
8. Shunting.

② Operator or worker shall observe signal method referred to in paragraph (1).

Article 41 (Prevention from Breakaway of Operation Position)

① An employer, when it comes to machine operation in the following items, shall keep the operator from breaking away from operation position.

1. Lifting machinery.
2. Pile driver or pile extractor(winding device-loaded state).
3. Onboard lifting equipment(cargo-loaded state).

② The operator referred to in paragraph (1) should not break away from operation position in the course of carrying out work.

CHAPTER 6 PREVENTION OF HAZARD OF FALL ACCIDENT OR COLLAPSE

SECTION 1 PREVENTION OF HAZARD OF FALL ACCIDENT

Article 42 (Fall Accident Prevention)

① If it is deemed to cause hazard to workers when the worker works at a place which has hazard of fall accident or tripping [excluding work plate end · opening, etc] or machinery · equipment · block of vessel, an employer shall install work plate in the way of scaffolding assembly, etc.

② In cases where it is deemed difficult to install a work place referred to in paragraph (1), safety net in the way that satisfies the requirements pursuant to any of falling under the following items shall be installed: Provided that if it is deemed difficult to install safety net, an employer shall take necessary measures to prevent hazard of fall accident by allowing workers to put on safety harness.

1. Safety net installation position shall be installed as close to working surface as possible, with vertical distance between working surface and net installation point not exceeding 10 meters
2. Safety net shall be installed horizontally, with net drooping exceeding 12% of short side length
3. In cases where it is installed outside of the building, etc, net top bar shall be more than 3m distant from the surface of a wall: Provided that in cases where using 20ml or less net knot, it shall be deemed to install falling objects protection net referred to in Article 14(3).

Article 43 (Opening, etc Protective Measures Concerning)

① If it is deemed hazardous to trigger a fall accident to a worker at a place such as end or opening of a work plate and passage, an employer shall install strong protective measures such as safety guard rail, fence, vertical type of fall accident protection net or cover, etc(Hereinafter referred to as "Guard rail, etc") with enough intensity in its structure, with its cover installed free from overturn or fall. In such case, opening sign shall be marked so that it can be identified even in a dark place.

② An employer shall install safety net falling under any of the following subparagraphs of Article 42 (2) if it is deemed difficult to install a guard rail, etc

or necessary to temporarily dismantle the guard rail, etc for the convenience of work: Provided that if it is deemed difficult to install safety net, an employer shall take necessary measures to prevent hazard of fall accident by allowing workers to put on safety harness.

Article 44 (Safety Harness Adhesive Equipment, etc)

① An employer shall install equipment that workers can hang safety harness safely In cases where making them put on safety harness at a place more than 2 meters in height and hazardous from fall accident. In case of installing supporting rope using such safety harness adhesive equipment, an employer shall take necessary measures to prevent hazard caused by hanging or getting loose.

② An employer shall check mal-function of safety harness and auxiliary installations referred to in paragraph (1) before starting work.

Article 45 (On-Roof Hazard Prevention)

An employer shall take necessary measures to prevent hazard by installing more than 30cm wide plate or safety net if it is deemed to cause hazard to workers such as fall out while working on a roof covered with low-intensity material such as slate, sunlight.

Article 46 (Elevating Equipment Installation)

In cases where working at a place whose height exceeds 2 meters, an employer shall install equipment including construction work lift, etc where such workers can lift with safety: Provided that it shall be otherwise if it is deemed difficult to install elevating equipment when considering qualities of the work.

Article 47 (Lifesaving Device, etc)

If it is deemed to cause hazard to workers engaged in on-the-water or shipbuilding work such as falling into water, an employer shall take necessary measures to save workers by placing a lifesaving device or lifesaving boat at such place.

Article 48 (Fence Installation)

If it is reasonably deemed that kettle, hopper, and pit might cause burn · suffocation, etc hazard to workers due to falling down in the course of

carrying out work or on passing, an employer shall install fence at a place more than 90 meters in height necessary to prevent hazard.

Article 49 (Lighting Maintenance)

An employer shall maintain lighting necessary to safely work at a place more than 2 meters in height.

SECTION 2 PREVENTION OF HAZARD CAUSED BY COLLAPSE

Article 50 (Hazard Prevention from Collapse · Falling)

If it is deemed to cause hazard to workers due to natural ground collapse, structure collapse or earth rock falling, an employer shall take measures falling under any of the following subparagraphs for the prevention of hazard.

1. Natural ground shall be made into a safe ramp with falling-hazardous earth rock removed or installed with retaining wall, sheating timbering.
2. Rainwater or underground water shall be removed that causes natural ground collapse or earth rock falling.
3. In cases where mine rock falling · a side wall collapse are anticipated, any actions shall be taken necessary to install timbering and remove fragmented rock.

Article 51 (Structure or Other Similar Equipment, etc Safety Maintenance)

An employer shall take measures falling under any of the following subparagraphs to prevent hazard caused by collapse · tripping · destruction · explosion by dead weight, live load, drifted snow, wind pressure, earthquake or vibration and shock of the structure or other similar equipment.

1. Confirms whether they construct it according to engineering documentation.
2. Confirms whether they construct it according to a construction work specification.
3. Confirms whether they observe structure standard referred to in「Regulations on Building Structure Standard」.

Article 52 (Structure or Other Similar Equipment Safety Assessment)

An employer shall remove any hazard to workers by making safety assessment

such as safety diagnosis in cases where structure or other similar equipment fall under any of the following subparagraphs:

1. In cases where settlement · fissure might bring about collapse due to excavation · pile driving work near structure or other similar equipment.
2. In cases where fissure · distortion occurs as a result of earthquake, freezing, differential settlement near structure or other similar equipment.
3. In cases where structure, building, other equipment might collapse as a result of dead weight · drifted snow · wind pressure or other added load.
4. In cases where the strength of structure or other similar equipment is seriously damaged due to fire, etc.
5. In cases where safety is to be reviewed because structure or other similar equipment is used again after not being used for a long time.
6. In cases where other potential hazard is expected.

Article 53 (Measuring Instrument Installation, etc)

If it is deemed to cause hazard to workers due to collapse in the process of construction work of a tunnel, etc, or an employer is instructed to operate instrumentation at time of examining a harm · hazard prevention plan referred to in Article 48 (3) of the Act, an employer shall take necessary measures to prevent hazard by installing measuring instrument, etc.

CHAPTER 7 SCAFFOLDING

SECTION 1 MATERIAL AND STRUCTURE, ETC

Article 54 (Scaffolding Material)

① An employer shall not use transformed · corroded or seriously damaged material for scaffolding.

② An employer shall adopt steel tube scaffolding material or above quality referred to in Korean Standard pursuant to the 「Industrial Standardization Act」.

Article 55 (Maximum Live Load of a Work Plate)

① An employer determines maximum live load of a work plate depending upon scaffolding structure and material without exceeding its weight.

② In cases where calculating maximum live load of a hanging

scaffolding(excluding gondola's hanging scaffolding), its safety factors shall be the same as in the following subparagraphs:

1. Safety factors of hanging wire rope and hanging steel wire safety factors: more than 10
2. Safety factors of hanging chain and hanging hook: more than 5
3. Safety factors of hanging steel tape and hanging scaffolding substructure and upper point: more than 2.5 in case of steel, more than 5 in case of wood

③ Safety factors under paragraph (2) means a value which divides wire rope, etc breaking load value by maximum load value hung on its wire rope.

Article 56 (Work Plate Structure)

An employer shall install a work plate in the way that satisfies the requirements pursuant to any of falling under the following items at a workplace with its scaffolding(excluding hanging scaffolding, hanging scaffolding and step ladder) more than 2 meters in height.

1. Plate material shall be rigid in structure enough to endure working load.
2. Work plate width shall be more than 40cm, gap between plate material shall be less than 3cm: Provided that in a case of single scaffold shall be additionally prescribed by the Minister of Employment and Labor.
3. Fall accident-dangerous place에는 safety guard rail shall be installed: Provided that it shall be otherwise if measures are taken to prevent hazard caused by fall accident such as safety net installation or worker's putting on safety harness when safety guard rail is dismantled temporarily for the convenience of work if it is deemed difficult to install safety guard rail considering qualities of the work.
4. Work plate support shall be the one that is not destroyed by load.
5. Work plate material shall be connected or fixed on a support in order not to overturn or fall.
6. Any necessary actions should be taken to prevent hazard in case of working along with a work plate.

SECTION 2 ASSEMBLY · DISMANTLEMENT AND CHECKUP, ETC

Article 57 (Scaffolding, etc Assembly · Dismantlement and Modification)

① In case of assembling, dismantling or modifying hanging scaffolding or scaffolding work more than 5m in height, an employer shall observe the matters in the following subparagraphs:

1. To let a worker carry out duties under supervise of a supervisor
2. To remind relevant workers of timing, range, and procedure of assembly · dismantlement or change.
3. To prevent people other than relevant workers from getting access to assembly · dismantlement or alternation zone and post its content at a place easily accessible.
4. To stop further work in cases of bad weather such as rain, snow, other climatic instability.
5. To take necessary measures to prevent hazard caused by fall accident by installing more than 20cm wide plate and letting workers put on safety harness in case of connecting · dismantling scaffolding material.
6. To let workers use hanger line or a hanging plate in case of raising or lowering material · apparatus or tools.

② An employer shall apply two point suspended to steel tube scaffolding or log scaffolding assembly: Provided that in cases where additional work plate can be installed at a facility, a single can be used instead.

Article 58 (Scaffolding Checkup and Repair)

In cases where an employer stops work due to rain, snow, other worsening weather condition or begins work at its scaffolding after scaffolding assembly · dismantlement or change, an employer shall check up the matters falling under any of the following subparagraphs prior to beginning to work, and shall repair mal-function, if any, without delay.

1. Plate material damage and attachment or jamming state
2. Loose state of connecting piece or connector of scaffolding
3. Connect material and connect steel damage or corrosion state
4. Strap breakaway
5. Column settlement, deformation, displacement or shaking state
6. Rope attachment state and hanging device shaking state

SECTION 3 STEEL TUBE SCAFFOLDING AND PREFABRICATED STEEL TUBE SCAFFOLDING

Article 59 (Matters to be Observed for Steel Tube Scaffolding Assembly)

In case of steel tube scaffolding assembly, an employer shall observe the matters in the following subparagraphs:

1. To take actions including installation of intertruss bracing using planking · base plate as well as application of base steel to prevent slipping or settlement on a scaffolding column.
2. To rigidly bind a steel tube connector or intersection with a suitable auxiliary steel.
3. To reinforce with cross bracing.
4. Wall connect and brace shall be installed pursuant to any of falling under the following items with regard to single scaffold · two point suspended scaffold or protruded scaffolding: Provided that it shall be otherwise in cases where a wall connect or brace is removed to attach a windowsill or complete surface of a wall, or where actions are taken to prevent scaffolding from tripping such as installing diagonal bracing at a scaffolding column or wale installation instead of a wall connect or brace for any other unavoidable convenience of work.
   A. Assembly gap of steel tube scaffolding shall satisfy criteria referred to in Table 5.
   B. It shall be a rigid one using steel tube · log, etc material.
   C. In cases where it consists of tensile member and compression member, the gap between tensile member and compression member shall be within 1 meter.
5. In cases where installing scaffolding close to processed electric pathway, such measures shall be taken to prevent contact to processed electric pathway by transferring processed electric pathway or equipping insulation isolator at a processed electric pathway.

Article 60 (Steel Tube Scaffolding Structure)

In case of forming a scaffolding using a steel tube, an employer shall observe the matters in the following subparagraphs:

1. Scaffolding column gap shall be more than 1.5m and less than 1.8 meters in the direction of wale, and not more than 1.5m in the direction of underflooring.
2. Wale gap shall be installed lower than 1.5m, with the first wale set up at 2 meters high from the ground: Provided that it shall be otherwise if it is

reinforced by double column framework when considering qualities of the work.

3. Scaffolding column of the point located 31 meter down from the utmost top of scaffolding column shall be erected with two steel tubes: Provided that it shall be otherwise the intensity is maintained if it is reinforced with bracket and bound with two steel tubes.
4. Live load between scaffolding columns shall not exceed 400kg.

Article 61 (Steel Tube Intensity Identification)

In case of using a steel tube with a same or a similar outer diameter and width but different intensity at a workplace, an employer shall take measures to identify a steel tube intensity by marking a color or a sign on it.

Article 62 (Prefabricated Steel Tube Scaffolding)

In case of using a steel tube in a form of scaffolding assembly, an employer shall observe the matters in the following subparagraphs:

1. A base steel shall be applied to scaffolding column doup, in case of there is difference of elevation on base, regulating type base steel shall be used to keep each prefabricated steel tube scaffolding horizontal and vertical.
2. In case of operating work accompanied by loading material more than 20 meters in height, the gap between main frames shall be not more than 1.8m.
3. Cross bracings between main frames shall be erected and horizontal member shall be installed every top and 5th floors.
4. Operate wall connect 6m in the vertical direction, 8 meters in the horizontal direction.
5. A brace column shall be erected in the direction of a wale every 10 meters in cases where it is less than 4m in length in the direction of a wale and it is more than 10 meters in height.

SECTION 4 HANGING SCAFFOLDING AND HANGING SCAFFOLDING

Article 63 (Hanging Scaffolding Structure)

In case of installing a hanging scaffolding, an employer shall observe the matters in the following subparagraphs:

1. Wire ropes which refer to any of the following cases shall not applied to

hanging scaffolding.

A. One with a joint.
B. The number of sole wire[excluding pillar wire)] cut off from one strand of a wire rope[(Hereinafter, the same shall apply)] exceeding more than 10%(provided that in case of multi strand rope, the number of sole wire cut off wire is more than 4 within a range of 6 times of nominal rope diameter and more than 4 within a range of 30 times of nominal diameter).
C. Diameter reduction exceeding 7% of nominal diameter.
D. Twisted one.
E. Seriously deformed or corroded one.
F. One that is damaged by heat and electric shock.

2. Hanging chains which refer to any of the following cases shall not applied to hanging scaffolding.
   A. Hanging chain length exceeding 5% of that was made when hanging chain was manufactured.
   B. One whose ring section diameter is reduced more than 10% compared with that was made when hanging chain was manufactured.
   C. Fissured or seriously deformed one.
3. Fiber ropes or fiber belts which refer to any of the following cases shall not apply to hanging scaffolding.
   A. One with a cut strand.
   B. Seriously damaged or corroded one.
4. Hanging steel wire and hanging steel tape shall not use seriously damaged · deformed or corroded one.
5. Hanging wire rope, hanging chain, hanging steel wire, hanging steel tape or a hanging fiber rope shall be fixed so that its one end is attached onto a scaffolding beam, the other end onto an overhanging beam, anchor bolt, or building beam without being loose.
6. Work plate width shall be more than 40cm without a gap.
7. Work plate material shall be connected or fixed scaffolding beam in order not to overturn or fall.
8. In order to prevent scaffolding from shaking or overturning such actions as installing a brace at a scaffolding beam · work plate shall taken.
9. A beam connector and intersection shall be rigidly connected or linked using a

wire · joint metal, etc at a lathe scaffolding.

10. Safety harness and life rope shall be installed onto a hanging scaffolding, and in the case where its structure is suitable for safety guard rail installation, safety guard rail shall be installed for the prevention of hazard caused by worker's fall accident.

Article 64 (Hanging Scaffolding Checkup and Repair)

In case of reminding workers of its related work at a hanging scaffolding, prior to beginning to work, an employer shall check its hanging scaffolding pursuant to the following matters under Article 58 and repair it immediately, if any abnormality is found.

Article 65 (Hanging Scaffolding)

An employer shall assembly a hanging scaffolding enough to endure load.

Article 66 (Stop Using High Step Board, etc)

An employer shall not make the worker operate work on a hanging scaffolding or a hanging scaffolding using a high step board, a ladder, etc.

SECTION 5 STEP LADDER AND MOBILE SCAFFOLDING

Article 67 (Step Ladder)

In case of applying a step ladder assembly, an employer shall observe the matters in the following subparagraphs:

1. Antislip studs are affixed on bottom of a support member, not allowing workers to work on either of ends
2. The tilt of support member and horizontal plane is less than less than 75 degrees, with assistance member fixing the gap between support member and support member
3. In cases where step ladder exceeding 2 meters in height, work plate width shall be more than 40cm

Article 68 (Mobile Scaffolding)

In case of applying a mobile scaffolding assembly, an employer shall observe the matters in the following subparagraphs:

1. An employer shall take necessary measures to prevent mobile scaffolding wheels from accidentally unexpected transfer or tripping by fastening wheels with brake · wedge and fixing part of scaffolding onto rigid installation, or installing outriggers.
2. Trap shall be solidly installed.
3. In cases where work is being done at the utmost top of the scaffolding, safety guard rail shall be installed.
4. The horizontal level of a work plate shall be always maintained and workers are not allowed to operate while stepping on safety guard rail on the work place, or using pedestal or ladder.
5. Maximum live load of a work plate shall not exceed 250kg.

SECTION 6 SYSTEM SCAFFOLDING

Article 69 (System Scaffolding Structure)

In case of form a scaffolding using a system scaffolding, an employer shall observe the matters in the following subparagraphs:

1. It shall be established in a structure of solidly connecting vertical member · horizontal member · bracing member structure.
2. Vertical member and base plate of scaffolding bottom shall be installed as compact as possible, overlap length of connecting piece for vertical member and base plate base plate shall be not less than one third of a total length.
3. Horizontal member shall be installed at a right angle with a vertical member solidly without being shaken after bonding shaking.
4. Connect steel between vertical members shall be made in a solid structure to prevent breakaway.
5. The installation gap of wall connect steel shall abide by the criteria determined by the manufacturer.

Article 70 (Matters to be Observed in case of Assembly of System Scaffolding)

In case of system scaffolding assembly work, an employer shall observe the matters in the following subparagraphs:

1. Base steel is used for scaffolding column doup, in the event of difference of elevation on a base, regulating type base steel might be used so that the

system scaffolding always keeps horizontal and vertical level.

2. In the case of installing it on a slant floor, pivot type of base plate or wedge is used to make surface floor of base steel maintain horizontal level.
3. In cases where installing scaffolding close to processed electric pathway, such measures shall be taken to prevent contact to processed electric pathway by transferring processed electric pathway or equipping insulation isolator at a processed electric pathway.
4. In cases where a worker transfers it upward or downward, or to the right or to the left at a scaffolding, an employer shall guardian him to use designated passage.
5. Scaffolding work operator are not allowed to operate the work both on top and on bottom of a vertical plane simultaneous.
6. An employer shall not allow workers to overload at a work plate by exceeding maximum live load determined by a manufacturer with a sign board marked with a maximum live load attached.

SECTION 7 LOG SCAFFOLDING

Article 71 (Log Scaffolding Structure)

① In case of applying a log scaffolding assembly, an employer shall observe the matters in the following subparagraphs:

1. Scaffolding column gap shall be installed lower than 2.5m, with the first wale set up at 3m high from the ground: Provided that it shall be otherwise if it is reinforced by double column framework when considering qualities of the work.
2. To prevent scaffolding column from slipping or settlement, lower section of scaffolding column shall be buried, intertruss bracing shall be installed or planking shall be used
3. In cases where joint of scaffolding column is overlap joint, more than 1 meter is tied in overlapping out of joint part at two different positions, however, in cases where joint of scaffolding column is a butt joint, more than 4 parts are tied by applying double column framework as scaffolding column or using more than 1.8 meters embedded wood.
4. Connector and intersection of scaffolding column · wale · underflooring, etc shall be strongly tied with wire or other sturdy material.
5. It shall be reinforced with cross bracing.

6. Wall connect and brace shall be installed pursuant to the following items with regard to single scaffold · two point suspended scaffold or protruded scaffolding: Provided that it shall be otherwise if wall connect or brace is removed for the purpose of windowsill attachment or completion of the surface of a wall, or if measures are taken, for any other unavoidable convenience of work, such as installing diagonal bracing at a scaffolding column or wale instead of wall connect or brace to prevent scaffolding from destruction.
   A. Gap shall be less than 5.5m in the vertical direction, and less than 7.5m in the horizontal direction.
   B. It shall be made with a rigid type using steel tube · log, etc material.
   C. In a case where it consists of tensile member and compression member, the gap between tensile member and compression member within 1 meter.

② Log scaffolding can only be used for drying · dismantlement and assembly of building · structure below 4th floor or less than 12 meters in height from the ground.

CHAPTER 8 VENTILATION DEVICE

Article 72 (Hood)

An employer shall install a hood of local ventilation equipment in the way of in the way that satisfies the requirements pursuant to any of falling under the following items that are installed to discharge harmful dust, fume, mist, vapor or gas state material(Hereinafter "Dust, etc").

1. To be installed at every place where harmful substance arises.
2. To be structured to control emitter of dust when installed by taking account of occurrence type and percentage, work method of harmful factors.
3. Hood type shall be adopted from enclosing or booth type hood.
4. External or receiver type hood shall be installed at a position nearest to dust, etc emitter.

Article 73 (Duct)

An employer shall install the duct of a local ventilation equipment(excluding mobile) in the way of in the way that satisfies the requirements pursuant to any of falling under the following items that is installed to discharge dust, etc.

1. Length should be as short as possible, the number of bents being least.
2. Inner part of connector shall have no protrusion.
3. Clean-out shall be installed in a structure where can be easily cleaned.
4. Conveying speed shall be maintained not to leave dirt piled up in a duct.
5. Connect part shall be kept from outside air.

Article 74 (Ventilator)

An employer shall install a ventilator at a position where purified air passes through in case of installing air filter on a local ventilation equipment: Provided that the ventilator might be installed at a place where air before purification passes through in cases where there is no concern about explosion by sucked-in material or no corrosion of ventilator wings.

Article 75 (Outlet)

An employer opens outlet of a local ventilation equipment(excluding mobile local ventilation equipment with an air filter installed) toward outside that is installed to discharge dust, etc so that discharged dust can't return to the workplace.

Article 76 (Ventilation Process)

An employer shall install air filter at a dust discharging device or installation by utilizing absorption · combustion · dust collection or other adequate type so that its dust can't cause serious health problems to workers.

Article 77 (General Ventilation Device)

An employer shall install a general ventilation device of local ventilation equipment in the way of in the way that satisfies the requirements pursuant to any of falling under the following items that are installed to discharge harmful dust, fume, mist, vapor or gas state material(Hereinafter "Dust, etc").

1. Fan or ventilator(Referring to its duct intake in case of using a duct) shall be installed at a position nearest to dust, etc emitter.
2. An employer opens fan or ventilator toward outside that is installed to discharge dust, etc so that discharged dust can't return to the workplace.

Article 78 (Ventilation Device Operation)

① An employer shall turn on local ventilation equipment or general ventilation

device during operating dust-related work in cases where he installs local ventilation equipment or general ventilation device to discharge dust.

② An employer shall take necessary measures to fully operation its device by removing air current disturbing ventilation using a regulate valve in cases where he installs a local ventilation equipment or a general ventilation device.

CHAPTER 9 RESTING FACILITY

Article 79 (Resting Facility)

① An employer shall establish resting facility where workers relieve physical fatigue and psychological stress during break.

② An employer shall install resting facility referred to in paragraph (1) isolated from area emitting harmful dust or area handling harmful substance handling: Provided that it shall be otherwise if resting facility cannot be established at such isolated places in case of mind, etc.

Article 80 (Placement of Chairs)

An employer shall place chairs that workers who keep standing in the course of carrying out work sit on from time to time.

Article 81 (Place for Sleeping, etc Installation)

① An employer shall establish a place for sleeping respectively for men and women where workers can sleep during a night shift.

② An employer shall place bedding and other necessary supplies at the place under paragraph (1) and clean · wash and disinfect it regularly.

Article 82 (First Aid Outfit)

① An employer shall keep first aid outfit necessary to first aid for the injured falling under any of the following subparagraphs and inform workers of the method of how to use it.

1. Bandage material · absorbent cotton · pincette and band-aid.
2. Would disinfectant.
3. Tourniquet · epithesis and stretcher.
4. A remedy for burns(only applicable to workplaces handling hot objects or concerned with other burn).

② An employer shall designate and maintain a person who manages first aid outfit referred to in paragraph (1).

CHAPTER 10 RESIDUE, ETC MEASUREMENT STANDARD

Article 83 (Residue, etc Diffusion Control Measures Concerning)

An employer shall take necessary measures to install local ventilation equipment or general ventilation device as well as establish equipment to control diffusion of emitter or confine emitter with regard to indoor workplace diffusing harmful gas, liquid or residue, etc(Hereinafter "Residue, etc").

Article 84 (Air Volume and ventilation)

An employer shall satisfy the requirements regarding air volume and ventilation pursuant to any of falling under the following items with regard to indoor workplaces in cases where workers are engaged in handling harmful residue.

1. Air volume of the rest space excluding more than 4m in height from the floor shall be more than 10m3 per worker.
2. A window that can be opened toward outside shall be installed and its area shall be not less than 1/20 of floorage(excluding such cases where enough ventilating installation are installed for the convenience of worker's occupational health)
3. In cases where it is ventilated at less than 10 degrees Celsius, a worker shall be kept from more than 1 meter air current every second

Article 85 (Residue Process)

① An employer shall dispose of residue by way of neutralization · precipitation · filtering or other adequate manner so that its substance cannot cause serious health problems to workers.

② An employer shall dispose of gas or residue contaminated by pathogen by way of disinfection · sterilization or other adequate method so that the pathogen cannot cause serious health problems to workers.

③ An employer shall provide consigned disposer with information regarding main component, contamination factor type and its harm · hazard of its gas or residue in cases where he consigns to dispose of gas or residue referred to in paragraph (1) and (2).

PART 2 SAFETY STANDARD

CHAPTER 1 HAZARD PREVENTION FROM MACHINE · APPARATUS AND OTHER INSTALLATION

SECTION 1 GENERAL CRITERIA FOR MACHINE, ETC

Article 86 (Boarding Restrictions)

① An employer shall not allow workers to be transported by a crane or engaged in work on a state of being hung and raise: Provided that it shall be otherwise if exclusive boarding equipment are installed in a crane and measures are taken in the following subparagraphs for the prevention of hazard caused by fall accident.

1. An employer shall take necessary measures for boarding equipment not to overturn or fall
2. Safety harness or life rope shall be installed, and safety guard rail shall be installed if possible.
3. Boarding equipment shall be descended by power.

② An employer shall not allow workers to be transported by a mobile crane or engaged in work on a state of being hung and raised.

③ An employer shall not allow workers to board on a lift carrier that has no boarding control device installed without an emergency stop device · control switch: Provided that it shall be otherwise if measures are taken to prevent workers from fall accident by repairing · adjusting and checking a lift.

④ An employer shall not allow workers to board on a small lift carrier: Provided that it shall be otherwise if measures are taken to prevent workers from fall accident by repairing · adjusting and checking a lift.

⑤ An employer shall not allow workers to board on gondola's carrier: Provided that it shall be otherwise if measures are taken for the prevention of hazard caused by fall accident falling under any of the following subparagraphs:

1. An employer shall take necessary measures for a carrier not to overturn or fall.
2. Safety harness or life rope shall be installed, and safety guard rail shall be installed if possible.

⑥ An employer shall not allow workers to board on cargo elevator: Provided that it shall be otherwise in cases where he repairs · adjusts and checks an elevator.

⑦ An employer shall not allow workers to board on a seat other than a riding

seat in case of working with unloading and transporting machinery of vehicle type(excluding cargo truck): Provided that it shall be otherwise if measures are taken to prevent hazard caused by fall accident.

⑧ An employer shall not allow workers to board on cargo truck cage: Provided that it shall be otherwise if measures are taken to prevent fall accident by installing a fence at a cargo truck.

⑨ An employer shall not allow workers to board on operating conveyor: Provided that it shall be otherwise if measures are taken to prevent hazard caused by fall accident · contact as a conveyor whose structure is capable of transporting workers.

⑩ An employer shall not allow workers to board on a moving transportation life carrier: Provided that it shall be otherwise if measures are taken to prevent hazard caused by fall accident while repairing · adjusting and checking a moving transportation lift.

Article 87 (Prime Mover · Rotation Shaft, etc Hazard Prevention)

① An employer shall install cover · fence · sleeve and over bridge around area such as prime mover · rotation shaft · gear · pulley · fly wheel · belt and chain of the machine that can cause hazard to workers.

② An employer shall apply sunk type to key · pin attached to rotation shaft · gear · pulley and fly wheel or cover to those area.

③ An employer shall not use protruded holder to belt joint.

④ An employer shall install safety guard rail and anti-slippery structured plate at an over bridge under paragraph (1).

⑤ An employer shall install a cover or a fence around grinding machine or planer table, shaping machine ram, etc after operation where it is deemed to cause hazard to workers.

⑥ An employer shall install a cover or a fence around tools which are protruded and/or circulating at a lathe where it is deemed to cause hazard to workers.

⑦ An employer shall install a convert on a centrifuge(Referring to a series of equipment separating or extracting material with the help of centrifugal force. Hereinafter, the same shall apply).

⑧ An employer shall take necessary measures by install a cover around the part where it is deemed to cause hazard to workers to operate crusher · concrete breaker · pulverizer · mixer and flash mixer, etc(Hereinafter "Crusher, etc") or

flutter its material.

⑨ An employer shall install a cover or a fence around opening or operating part of the crusher if it is deemed to cause hazard to workers by contacting it.

⑩ An employer shall install a cover or a fence around the part where it is deemed to cause hazard to workers by paper · cloth · vinyl and wire rope, etc winder.

⑪ An employer shall install a cover or a fence around prime mover · axis joint · belt · pulley rotation part attached to pressure vessel and air compressor, etc(Hereinafter "Pressure vessel, etc") where it is deemed to cause hazard to workers

Article 88 (Machine's Power Shut-off Device)

① An employer shall install power shut-off device switch · clutch and belt transfer device, etc around power-driven machine: Provided that it shall be otherwise in cases where it is a machine as a whole group with a common power shut-off device or it is deemed unnecessary for workers to supply or draw out raw material.

② An employer shall install a power shut-off device pursuant to paragraph (1) on the machine operating cutting · drawing · compression · strand · blanking or bending referred to in paragraph (1) where workers will be able to manipulate tools without moving to other position.

③ The power shut-off device referred to paragraph (1) shall be easy to manipulate and free from unexpected displacement caused by contact or vibration.

④ An employer shall maintain optimum the operation state of clutch · brake, other control part of the machine · apparatus, etc.

Article 89 (Measures before Starting Operation)

① An employer shall, prior to beginning to operate the machine, take necessary measures to prevent hazard by confirming the matters necessary to worker placement and training, work method, protective equipment that can cause hazard to workers.

② An employer, in the case of starting machine operation pursuant to paragraph (1), shall determine a certain signal method and a person to signal the worker, and signal the worker according to a signal method.

Article 90 (Prevention of Hazard of Flying Tools)

An employer shall install a cover or a fence at a machine that can cause hazard caused by tools cutting or cutting chip flying to workers: Provided that it shall be otherwise if he allows workers to use personal protective equipment when considering qualities of the work if is deemed difficult to install a cover or a fence.

Article 91 (Dysfunctional Machine Maintenance, etc)

① an employer, in cases where flaw of a machine or protective equipment is found, shall allow workers to use it after repairing it.

② An employer shall not allow workers to use machine and protective equipment, etc till maintenance referred to paragraph (1) is completed.

Article 92 (Operation Suspended, etc during Maintenance)

① An employer shall stop further machine operation if it is deemed to cause hazard to workers in cases where he operates maintenance · cleaning · fueling · inspection · repair · replacement or adjustment or other similar work of machine tool · transportation machine · construction machinery, etc: Provided that it shall be otherwise if measures are taken to prevent hazard to workers such as installation of a cover.

② An employer shall take any necessary protective measures for the prevention of machine operation by others by installing a locking device onto an operating device, managing the keys or installing sign boards in cases where he stops machine operation pursuant to paragraph (1).

③ An employer shall take necessary measures such as placing an supervisor if it is deemed to cause sudden operation of a machine by an inadequate work method.

④ An employer shall take necessary measures to prevent hazard such as taking measures under the provisions of paragraph (1) through(3) or releasing compressed gas or liquid in advance if it is deemed to cause hazard to workers due to released gas or liquid compressed inside machine · apparatus and installation, etc.

Article 93 (Prohibition of Dismantlement of a Protective Equipment)

① An employer shall not dismantle or stop the use of protective equipment

installed on a machine · apparatus or equipment: Provided that it shall be otherwise in cases of repair · adjustment and replacement, etc of protective equipment.

② An employer shall make protective equipment work adequately immediately after protective equipment referred to paragraph (1) is repaired · adjusted or replaced.

Article 94 (Putting on a Bump Cap, etc)

If it is deemed to cause the worker to have his hair or clothes caught up into a power-driven machine, such worker shall put on adequate bump cap or working clothes.

Article 95 (Prohibition of Using Gloves)

An employer shall allow workers to use gloves tightly fitting into worker's hands without being concerned about being caught up in cases where workers handle blade · structure or axis rotational machine.

Article 96 (Prohibition of Use of Working Tools for Other Purposes)

① An employer shall not use machine · apparatus · installation and hand tools for other purposes than that at time of being manufactured.

② In case of lever puller or chain block, an employer shall observe the matters in the following subparagraphs:

1. Do not use it exceeding rated load.
2. In cases where it is likely that a hook falls out and flicks during lever puller operation, an employer shall not directly hang it onto the object, but connect it using a pivot clamp or a lug.
3. Do not insert a pipe into a lever puller lever.
4. Top hook of chain block shall have strong intensity enough to endure lifting load and shall be hung where it can exactly support.
5. Hook mouth gap whose current status is more than 10% below compared with product specification shall be discarded.
6. No tangling between chain block a chain strand is allowed.
7. Chain and hook shall be kept from deformation, damage, corrosion, abrasion, or fissure.
8. The following matters under Article 167 shall be observed.

Article 97 (Prevention of Bolt · Nut from Loosening)

An employer shall take necessary measures for the prevention of hazard caused by bolt · nut attached to a machine such as regularly confirming fastening of its bolt · nut to an adequate degree.

Article 98 (Designation of Speed Limit)

① An employer shall determine suitable speed limit for workplace topology and natural ground state in advance and make operators observe it in cases where unloading and transporting machinery of vehicle type and vehicle type construction machinery(excluding the one whose maximum speed limit does not exceed 10km/h)are used.

② An employer shall set a suitable speed limit that operators should observe in cases where he operates a track working vehicle and a shunting machine.

③ Operator shall not exceed a speed limit referred to in paragraph (1) and (2) speed limit.

Article 99 (Measures in the Event of Operation Position Breakaway)

① In cases where an operator of vehicle type construction machinery including unloading and transporting machinery of vehicle type, etc, breaks away from operation position, an employer shall make the operator to abide by the matters falling under any of the following subparagraphs:

1. To put down devices such as fork, bucket, dipper, etc down on a the most lowered position or floor.
2. To take necessary measures to prevent hazard caused by unexpected driving or breakaway such as prime mover suspended or putting on the brake.
3. To separate an ignition key from a steering wheel in the event of breakaway of driver's seat: Provided that it shall be otherwise if measures are taken so that no one other than operator can operate by setting up a locking device at a driver's seat.

② An operator of vehicle type construction machinery of unloading and transporting machinery of vehicle type, etc shall take necessary measures falling under subparagraphs in paragraph (1) in the event of breakaway from operation position.

SECTION 2 MACHINE TOOL

Article 100 (Band Sawing Machine Cover, etc)

An employer shall install a cover or a fence around any hazardous saw blade other than saw blade necessary to cutting by a band sawing machine(excluding wood-processing band sawing machine).

Article 101 (Saw Blade Contact Prevention Device of a Circular Saw)

An employer shall install saw blade contact prevention device around a circular saw(excluding wood-processing circular sawing machine).

Article 102 (Prevention of Boarding)

An employer shall not allow workers to board on a operating planer table or vertical lathe table: Provided that it shall be otherwise if measures are taken necessary to prevent from anticipated hazard by arranging a worker boarding on a table or placed worker to immediately stop the machine in an emergency.

SECTION 3 PRESS AND SHEARING MACHINE

Article 103 (Press, etc Hazard Prevention)

① An employer shall take any necessary protective measures such as installing a cover around hazardous part so that workers can't have part of his body caught up into a danger limit in the course of carrying out work process of press or shearing machine)(Hereinafter "Press, etc")danger limit: Provided that it shall be otherwise if it is made up of structure where prevents hazard caused by slide or knife-blade.

② An employer shall take necessary measures such as installing a protective equipment equipped with capacity corresponding to press type, pressure capacity, stroke per minute, stroke length and work method(In case of two-hand control safety device and sensitive safety device, its corresponding capacity) if it is deemed difficult to take measures referred to in paragraph (1) when considering qualities of the work.

③ An employer shall maintain in a good status a changeover switch of the press with an attachment of a stroke changeover switch a protective equipment changeover switch for the purpose of taking measures referred to in paragraph

(1) and paragraph (2).

④ An employer shall maintain a protective equipment capacity when measures are taken pursuant to paragraph (2), however, in cases where if it is deemed not to use a protective equipment by using a foot switch, actions are taken such as removing a foot switch, etc: Provided that in cases where measures referred to paragraph (1) are taken, a foot switch might not be removed.

Article 104 (Hazard Prevention of Mold Adjustment)

An employer shall take necessary measures for the prevention of hazard to workers by using safety block if it is deemed to cause accident to workers' body while operating a slide within a danger limit on occasions of mold attachment · dismantlement or adjustment of a press.

SECTION 4 MACHINE FOR WOOD PROCESSING

Article 105 (Anti Kick-Back Device against Circular Sawing Machine)

An employer shall install anti kick-back devices including a spreader at a wood-processing circular sawing machine[(excluding the one that des not cause hazard to workers from a circular sawing machine for transsection and kick-back.

Article 106 (Safety Device for Circular Sawing Machine)

An employer shall install saw blade contact prevention device at a wood-processing circular sawing machine(Including portable circular sawing machine, but excluding lumbering circular sawing machine and circular sawing machine attaching automatic conveyor).

Article 107 (Band Sawing Machine Cover)

An employer shall install a cover or a fence around hazardous saw blade other than saw blade needed for cutting by a wood-processing band sawing machine.

Article 108 (Band Sawing Machine's Blade-Contact Prevention Device, etc)

An employer shall install blade-contact prevention device or cover at a conveying roller or ribbed conveying roller with spikes out of wood-processing band sawing machine: Provided that it shall be otherwise in cases where emergency stop device is installed onto a conveying roller or ribbed conveying roller.

Article 109 (Blade-Contact Prevention Device of Unbanking Machine)

An employer shall install a blade-contact prevention device onto power-driven manual unbanking machine where a work object is fed manually.

Article 110 (Blade-Contact Prevention Device of Chamfering Machine)

An employer shall install a blade-contact prevention device at a chamfering machine(excluding the one attached with an automatic conveyor): Provided that it shall be otherwise in cases where he allows workers to use adequate working tools if it is deemed difficult to install blade-contact prevention device when considering qualities of the work.

SECTION 5 CENTRIFUGE AND CRUSHER, ETC

Article 111 (Operation Suspended)

An employer shall stop its further machine operation in a case where he takes out contents out of a centrifuge or a crusher, or where he operates maintenance · cleaning · inspection · repair or other similar work of a centrifuge or a crusher: Provided that it shall be otherwise if necessary protective measures are taken around hazardous part or safe assistance apparatus is used in cases where its structure allows content to be automatically taken out or maintenance · cleaning · inspection · repair or other similar work is operated in the course of carrying out work of the machine.

Article 112 (Excessive Use Prohibition of Maximum Allowed Revolutions)

An employer shall not exceed maximum allowed revolutions of a centrifuge.

Article 113 (Measures to be taken related to explosive materials handling)

An employer shall take necessary measures such as restricting acts referred to subparagraph 1, Article 225 to prevent industrial accident from explosion, etc in cases where an employer handles explosive materials, organic peroxide referred to in Table(1) 1 using a crusher, etc or operates dust-occurring work.

SECTION 6 HIGH-SPEED ROTATOR

Article 114 (Hazard Prevention Related to Rotation Test)

An employer shall take a rotation test of high-speed rotator at a place where exclusive rigid inside installation or rigid wall is placed place for the prevention of hazard caused by destruction of high-speed rotator in cases where high-speed rotator[(Limited to a turbine rotor · centrifugal separator bucket rotator whose circumferential speed exceeds 25m/sec. Hereinafter the same will apply)]: Provided that it shall be otherwise if measures are taken necessary to prevent from hazard caused by its destruction of high-speed rotator by installing a rigid cover at a test facility when taking such rotation test of high-speed rotator(excluding high-speed rotator referred to in Article 115).

Article 115 (Operating Non-Destructive Inspection)

An employer shall confirm whether there is any defect or flaw after conducting non-destructive inspection of a corresponding type regarding quality and shape of a rotation shaft when taking a rotation test of a high-speed rotator(Limited to rotation shaft weight exceeding one tone and circumferential speed exceeding 120m/sec).

SECTION 7 BOILER, ETC

Article 116 (Pressure Relief Device)

① An employer shall install one or more than two pressure relief devices satisfying boiler standards for a safe operation of a boiler and keep it running under the limit of maximum operating pressure(design pressure or maximum allowable pressure. Hereinafter, the same shall apply): Provided that in a case where two or more pressure relief devices are installed, only one operates under the limit of maximum operating pressure, other pressure relief devices are designed to operate under the limit of 1.05 times as much as maximum operating pressure.

② The pressure relief device referred to paragraph (1) shall be used after it is inspected and sealed with lead at least once a year using the pressure gauge calibrated by an authority in charge of nation's calibration businesses(Hereinafter "National Calibration Institute") designated by the Minister of Knowledge and

Economy under Article 14(3) of 「Korea Standards Basic Act」 regarding whether it is adequately operated at a set pressure: Provided that the pressure relief device in a workplace which proves to be excellent as a result of performance assessment of process safety report executed by the Minister of Employment and Labor shall be inspected more than once every four years regarding whether it is adequately operated at a set pressure subject to submission of a process safety report under the Act 33-6.

Article 117 (Pressure Limit Switch)

An employer shall attach a pressure limit switch to shut off burner combustion of a boiler between maximum operating pressure and normal pressure to prevent a boiler from overheating.

Article 118 (Level Controller)

An employer shall install a warning light or automatic alarm to monitor level controller's operation status level point, and water shall be automatically supplied or stopped.

Article 119 (Prevention of Explosion Hazard)

An employer shall maintain · manage whether pressure relief device, pressure limit switch, level controller, flame detector, etc operates without a problem to prevent a boiler from explosion accident.

Article 120 (Mark of Maximum Operating Pressure)

An employer shall carve marks into maximum operating pressure, date of production, name of maker of the pressure vessel to make it possible to identify pressure vessels without being deleted.

SECTION 8 INJECTION MOLDING MACHINE, ETC

Article 121 (Injection Molding Machine, etc Protective Equipment)

① If it is deemed to cause get worker's part of a body catched up into injection molding machine · molding machine and die forging equipment(excluding press, etc), an employer shall take any necessary protective measures such as gate guard or two-hand control, or others.

② A gate guard under paragraph (1) shall be interlocking system which cannot be operated unless it is closed.

③ An employer shall take necessary safety measures including a installing a protective cover around are heating part or electric shock part of heater in the machine referred to in paragraph (1).

Article 122 (Grinding Wheel Cover, etc)

① An employer shall place a cover around the part if it is deemed for a rotational grinding wheel(Limited to more than 5cm in diameter) to cause hazard to workers.

② An employer shall confirm where the machine is mal-functioning after taking a pilot operation for more than 3 minutes in the event of replacement of a grinding wheel, for more than 1 minute in the event of operating a grinding wheel prior to beginning to work.

③ An employer shall confirm whether a grinding wheel used for pilot operation referred to in paragraph (2) has any defect before starting to work.

④ An employer shall not allow workers to exceed maximum rotational speed of a grinding wheel.

⑤ An employer shall not allow workers to use section in cases where he uses a grinding wheel which is not designed to use section.

Article 123 (Roller Fence, etc Installation)

An employer shall install fence or guardian roller to the part where it is deemed for a roller that passes through plywood · paper · cloth and metal leaf to cause hazard to workers.

Article 124 (Shuttle Guard of a Loom)

An employer shall install shuttle guard at a loom with an attachment of shuttle.

Article 125 (Drawing Block Cover, etc of Wire Drawing Machine)

An employer shall install a cover or a fence to area where it is deemed to cause hazard to workers due to drawing block or twist machine cage of wire drawing machine.

Article 126 (Buffing Machine Cover)

An employer shall install a cover except for some part necessary to grinding buffing machine(excluding buffing machine using cloth or cork).

Article 127 (Prevention of Hazard from Fan, etc)

An employer shall install a net or a fence to area where it is deemed to cause hazard to workers due to rotational wings of a blower · a fan, etc.

Article 128 (Packaging Machine Cover, etc)

An employer shall take necessary measures by installing a cover in cases where pavior or filler operation part of a paper box · burlap bag, etc might cause hazard to workers.

Article 129 (Hazard Prevention by Refining Machine)

① Article 111 of the Act shall apply mutatis mutandis to the work applying refining machine. In such case, the centrifuge under Article 111 shall be regarded as refining machine.

② An employer shall confirm whether inner tube rotation is suspended in the event of opening an outlet lid of refining machine and inner pressure or temperature might cause hazard to workers in advance.

Article 130 (Food Crusher Cover, etc)

An employer shall put on a cover other than the part needed to put in or take food out of the crusher if a machine operation part that crushes food put in by hand is deemed to cause hazard to workers, and he shall take necessary measures to prevent worker's hand caught up into the machine by using assistance apparatus for crushing substance.

Article 131 (Prevention Caused by Agricultural Machinery Hazard)

An employer shall use machinery equipped with safety device under Article 18-5 of「the Enforcement Regulation of the Agricultural Mechanization Promotion Act」in cases where working with agricultural machinery.

SECTION 9 LIFTING MACHINERY

SUB-SECTION 1 GENERAL PROVISIONS

Article 132 (Lifting Machinery)

① Lifting machinery means machinery falling under any of the following subparagraphs:

1. Crane[including a hoist].
2. Mobile crane.
3. Lift(In case of moving transportation lift its live load is limited to above 0.1 ton).
4. Gondola.
5. Elevator(Limited to maximum load of 0.25 ton or more).

② Meaning of machinery under paragraph (1) shall be the same as in the following items.

1. "Crane" means a power-driven machine or mechanism to lift and transport a heavy material in the direction of up/down and right/left[horizontally moving or slewing], "Hoist" is to lift cargo by both raising and traversing or only by raising using a hook or other hanging apparatus.
2. "Mobile crane" means a power-driven machine or mechanism equipped with a prime mover inside as a crane to transfer at certain place automatically which hangs and transports heavy material in the direction of up/down and right/left(horizontally moving or slewing), installed on top of a crane referred to as「Construction Machinery Management Act」 or operating part of cargo · specific vehicle referred to in Article 3, 「Vehicle Administration Act」.
3. "Lift" means a machine equipment to transport a person or cargo referred to in the following items.
   A. Construction work lift: a power-driven equipment or others equipped with other similar structure and capacity mainly used at a construction site to transport a person or cargo in a carrier that can move upward/downward along a guide rail
   B. Non-construction lift: a power-driven equipment or others equipped with other similar structure and capacity mainly not used at a construction site to transport cargo in a carrier that can move upward/downward along a guide rail.

C. Small lift: a power-driven equipment with a similar structure where of an elevator that is mainly used for small cargo to transport cargo in a carrier that can move upward/downward along a guide rail, whose carrier's floorage does not exceed 1 square meter and whose ceiling height does not exceed 1.2 meters or a power-driven vehicle maintenance lift that is used for raising or lowering a vehicle upward/downward along a guide rail.

D. Moving transportation lift: a power-driven equipment to transport cargo in a moving carrier along a structured ladder path with one end of the lift held on the building, etc equipped on top of a cargo truck mainly used for moving transportation, etc with capacity of stretching and folding a ladder.

4. "Gondola" an equipment having a boarding place where hanging plate or carrier moves up and down along a wire rope or a hanging steel wire manipulated by an exclusive lifting device, consisting of hanging plate or carrier, lifting device, other device and attached mechanical part thereto.

5. "Elevator" means a power-driven machinery · equipment to transfer · transport a person or cargo in a carrier in the direction of up/down or right/left along a guide rail as referred to in the following items.

A. Passenger elevator: mainly used for passenger's vertical transportation.

B. Passenger/cargo elevator: mainly used for passenger and cargo's vertical transportation with only passengers and an operator need to load/unload cargo on board.

C. Cargo elevator: mainly used for cargo transportation with no passenger on board.

D. Escalator: a power-driven in-a-row stairs or sidewalk to transport passengers.

Article 133 (Rated Load Display)

An employer shall display rated load, operation speed, warning sign of the machine so that operators or workers handing lifting machinery(excluding elevator) and hanging apparatus can identify it easily: Provided that hanging apparatus requires only display of rated load.

Article 134 (Protective equipment adjustment)

① An employer confirm whether overload limiter, over winding protector, emergency stop device and brake, other protective equipment[(elevator's final limit switch, governor, gate inter lock, etc] operates well on a lifting machinery falling under any of the following subparagraphs:

1. Crane.
2. Mobile crane
3. Moving transportation lift mounted on vehicle operating part pursuant to 「Vehicle Administration Act」.
4. Small lift(excluding vehicle maintenance lift).
5. Gondola.
6. Elevator.

② Over winding protector of lifting machinery under paragraph (1) 1 and 2 shall have its gap more than 0.25m [(more than 0.05m in the case of directive acting over winding protector)] in cases where it is deemed that upper part of hanging apparatus such as hook · bucket(upper part of raising pulley in cases where raising pulley is installed on a hanging apparatus) might contact lower part of winding device such as drum, upper pulley, trolley frame, etc.

③ An employer shall mark hazard on a raising wire rope on a crane that has no over winding protector under paragraph (2) installed and take necessary measures to prevent hazard to workers caused by raising wire rope being wound too much by installing an alarm device.

Article 135 (Restriction on Overload, etc)

An employer shall not allow workers to use a lifting machinery by loading a live load exceeding under each subparagraph of Article 132 (1).

SUB-SECTION 2 CRANE

Article 136 (Safety Valve Adjustment)

An employer shall make a safety valve that prevents a crane powered by oil pressure from excessive pressure increase operated under the pressure for rated load(jib crane's maximum rated load shall apply): Provided that it shall be otherwise in case of load test or safety test.

Article 137 (Latch Use)

An employer shall use a crane equipped with devices to prevent a wire rope for hook hanger from take off(Hereinafter "Latch"), with a latch used in cases where transporting load using a crane.

Article 138 (Restriction on Tile Angle)

An employer shall use a jib crane within a range of tile angle of a jib crane(In case of a jib crane whose lifting load is less than 3 tons jib crane, tile angle of a jib crane designed by the manufacturer shall apply) written on a crane detail.

Article 139 (Crane Repair, etc)

① An employer shall take necessary measures by placing a watchman or installing a stopper on the drive road to prevent hazard from workers caused by other driving cranes or collision between driving cranes in cases where he repairs · adjusts and checks a driving crane installed on parallel on the same runway.

② An employer shall confirm safety space by marking at least 40cm wide safety space on the floor between saddle protrusion and surrounding structure which is operated along a fixed rail on the workshop floor such as a gantry crane.

Article 140 (Prevention of Breakaway due to Storm)

An employer shall take necessary measures to prevent hazard caused by breakaway by operating driving crane installed outside with a storm anchor in cases where instantaneous wind speed exceeding 30 meters per second blows in.

Article 141 (Measures Related to Assembly, etc)

An employer shall take measures falling under any of the following subparagraphs in cases of conducting crane installation · assembly · repair · checkup or dismantlement work.

1. Working order shall be observed.
2. No irrelevant workers are kept from entering working zone, with its information posted at a place easily noticeable.
3. Any further work will be stopped if the weather condition is bad due to rain, snow, other climatic instability.
4. Workplace shall be kept free from obstacles.
5. Equipment or material to be lifted or put down shall be kept with balance.

6. Its structure shall be supported with enough stress depending upon crane capacity, working condition without bring about settlement.
7. Standard assembly bolts shall be used with symmetric position assembled and disassembled one after another

Article 142 (Tower Crane Support)

① In cases where he installs a tower crane above free standing height, an employer shall support it to a building wall or with a wire rope.

② In case of supporting a tower crane onto a wall, an employer shall observe the matters in the following subparagraphs:

1. To arrange a written evaluation under Article 58-4 (1) 2 「the Enforcement Regulation of the Occupation Safety and Health Act」(Including type approval documents under Article 18, 「Construction Machinery Management Act」) or manufacturer's installation working manual, etc
2. In cases where written evaluation documents of subparagraph 1 is not available or not clear, it shall be arranged with an approval of Occupational Safety Consultant referred to in architectural structure · construction machinery · mechanic safety · construction safety consultant engineer or construction safety field under「National Technical Qualification Act」or standard method shall be arranged certified per type and model
3. Reclamation or penetration or above method shall apply to fixture onto a concrete structure
4. In cases where supporting to an equipment under construction, its support shall not affect structural stability of its equipment

③ An employer, in case of support tower crane with a wire rope, shall observe the matters in the following items.

1. To take necessary measures falling under subparagraph 1 or 2 in paragraph (2).
2. To use exclusive supporting frame to fix a wire rope.
3. To keep a wire rope installation angle within 60 degrees at a horizontal plane.
4. To install anchoring site of a wire rope with enough intensity and tension, and to solidly fix wire rope with anchoring apparatus clip · shackle, etc not to touch a pulley.
5. To keep a wire rope away from processed cable.

Article 143 (Mal-function Checkup due to Storm)

An employer in cases where he operates a lifting machinery installed outside after instantaneous wind speed exceeding 30 meters per second blows in. or intermediate or higher intensity of earthquake hits, shall check mal-function around each part of machine in advance before starting work.

Article 144 (Passage between Structures)

① In cases where an employer installs passage between driving crane or slewing crane and structure or equipment, he shall make its width more than 0.6m: Provided that contact to structure's column of the passage might be more than 0.4m in width.

② In cases where an employer conducts maintenance · repair · checkup, etc under passage or running track referred to in paragraph (1), he shall take necessary safety measures so that the workers involved cannot contact the moving crane by suspending operation of a crane.

Article 145 (Structure Wall and Passage Gap, etc)

An employer shall keep the gap falling under any of the following subparagraphs within 0.3m: Provided that it shall be otherwise if it is deemed for workers to be free from any fall accident.

1. Gap between end of passage and structure wall reaching crane operation chamber or steering wheel.
2. Gap between end of passage of crane girder and crane girder
3. Wall gap between end of passage and structure reaching passage of crane girder.

Article 146 (Measures Related to Crane Operation)

① An employer shall observe the measures falling under any of the following subparagraphs and have the workers involved abide by its measures in cases where he operates a crane.

1. Not to pull or push the cargo to lift on the floor.
2. To safely transport hazardous substance such as vessel oil drum or gas tank in a storage box(or locker) if it is deemed to explode or leak during transfer.
3. Not to directly separate · remove fixed object.
4. Not to make lifted cargo pass overhead by controlling worker's access in

advance

5. Not to take action if lifted cargo cannot be seen(excluding the cases operated by the signal indicator).

② An employer shall take measures falling under any of the following subparagraphs with regard to crane without a cabin installed.

1. To install and use wireless remote controller or pendant switch satisfying manufacturing standard and safety standard of a crane announced by the Minister of Employment and Labor.
2. To sufficiently inform workers handling wireless remote controller or pendant switch of safety control such as operation method.

SUB-SECTION 3 MOBILE CRANE

Article 147 (Design Standard Observance)

An employer shall observe design standard(user manual provided by a manufacturer) of the mobile crane so that steel that consists of its mobile crane structure may not be deformed.

Article 148 (Safety Valve Adjustment)

An employer shall make a safety valve that prevents a mobile crane powered by oil pressure from excessive pressure increase operated under the pressure for rated load: Provided that it shall be otherwise if pressure is adjusted suitable for test load in case of load test or safety test.

Article 149 (Latch Use)

An employer shall use a latch in cases where transporting load using a mobile crane.

Article 150 (Restriction on Tile Angle)

An employer shall use a mobile crane within a range of tile angle of a mobile crane(In case of a jib crane whose lifting load is less than 3 tons, tile angle of a mobile crane designed by the manufacturer shall apply) written on a mobile crane detail.

SUB-SECTION 4 LIFT

Article 151 (Over Winding Protection, etc)

An employer shall take necessary measures to prevent hazard of a lift(excluding a small lift. Hereinafter the same shall apply to sub-sections) from carrier breakaway by installing over winding protector, overload limiter, emergency stop device, etc.

Article 152 (Restriction on Manless Operation)

① An employer shall not allow workers to operate a lift where a boarding control device is installed only inside a carrier with no man on board.

② An employer shall take necessary measures to prevent hazard caused in cases where unauthorized worker voluntarily control a lift by installing a locking device on a lift control panel.

Article 153 (Measures Related to Pit Cleaning)

An employer shall take measures falling under any of the following subparagraphs for the prevention of workers from hazard from carrier falling in cases where he cleans the floor of a lift pit.

1. To cover the elevator hoistway with square timbers or logs.
2. To place a carrier on top of square timbers or logs covered pursuant to subparagraph 1, and braking driving motor or winch(winch) using a brake attaching an one-way clutch bearing.

Article 154 (Prevention of Collapse)

① An employer shall take necessary measures against natural ground settlement, faulty material use or loose wiring so that a lift cannot collapse or fall down.

② An employer shall take necessary measures to prevent hazard from its collapse by increasing the number of bases of construction work lift(excluding underground installation) in cases where instantaneous wind speed exceeding 35m per second blows in.

Article 155 (Carrier Suspended Position)

An employer shall not leave a life carrier suspended with it hung and raised over the runway.

Article 156 (Assembly, etc Work)

① An employer shall take measures falling under any of the following subparagraphs in cases where conducting installation · assembly · repair · checkup or dismantlement work of a lift.

1. To appoint a person who supervises work and keep working under his supervision.
2. To prevent unauthorized worker from entering working zone and, with its information posted at a place easily noticeable.
3. To stop further work in cases of bad weather such as rain, snow, other climatic instability

② An employer shall make a supervisor in charge of work under paragraph (1) 1 to fulfill the duties falling under any of the following subparagraphs:

1. To determine work method and worker's placement and supervise operation.
2. To check up material defect or apparatus and tools function, or remove defective products.
3. To monitor putting on personal protective equipment such as safety harness in the course of carrying out work.

Article 157 (Reminding of Operation Method of a Moving Transportation Lift)

An employer shall remind moving transportation lift workers of operation method and measures to take when it fails to operate.

Article 158 (Tripping Prevention of Moving Transportation Lift)

An employer shall observe the following paragraphs to prevent a moving transportation lift from tripping in cases where operating a moving transportation lift.

1. In cases where outrigger is not positioned at a set operating position or maximum development position(Including the case where outrigger does not land), cargo shall not displace with its ladder boom assembly extended.
2. A moving transportation lift shall not transfer with its ladder boom assembly extended.
3. An employer shall take measures against differential settlement of natural ground.

Article 159 (Prevention from Falling of Cargo)

An employer shall take necessary measures falling under any of the following subparagraphs to prevent cargo from falling down or tripping out of a moving transportation life carrier.

1. Cargo load shall keep balance.
2. If it is deemed to cause cargo on board, an employer shall take measures to prevent cargo from falling using a rope.

SUB-SECTION 5 GONDOLA

Article 160 (Reminding of Operation Method)

An employer shall remind gondola workers of gondola's operation method or how to trouble-shoot.

SUB-SECTION 6 ELEVATOR

Article 161 (Prevention of Destruction by Storm)

An employer shall take necessary measures to prevent hazard from its destruction by increasing the number of bases of elevator installed outside in cases where instantaneous wind speed exceeding 35m per second blows in.

Article 162 (Assembly, etc Work)

① An employer shall take measures falling under any of the following subparagraphs in cases where conducting installation · assembly · repair · checkup or dismantlement work of a lift.

1. To appoint a person who supervises work and keep working under his supervision.
2. To prevent unauthorized worker from entering working zone and, with its information posted at a place easily noticeable.
3. To stop further work in cases of bad weather such as rain, snow, other climatic instability.

② An employer shall make a supervisor in charge of work under paragraph (1) 1 to fulfill the duties falling under any of the following subparagraphs:

1. To determine work method and worker's placement and supervise operation.
2. To check up material defect or apparatus and tools function, or remove

defective products.

3. To monitor putting on personal protective equipment such as safety harness in the course of carrying out work.

SUB-SECTION 7 WIRE ROPE, ETC OF A LIFTING MACHINERY

Article 163 (Safety Factors of Hanging Apparatus such as Wire Rope)

① An employer shall not use safety factors of hanging apparatus such as wire rope, etc of a lifting machinery(hanging apparatus breaking load value divided by maximum load value of its hanging apparatus) in cases where it fails to satisfy standard falling under any of the following subparagraphs:

1. In case of hanging wire rope or a hanging chain supporting the carrier where workers are on board: 10 or more.
2. In case of hanging wire rope or a hanging chain directly supporting cargo load: 5 or more
3. In cases of hook, shackle, clamp, lifting beam: 3 or more.
4. In case of others: 4 or more.

② An employer shall use the one whose maximum allowance load is marked solidly in the case of hanging apparatus.

Article 164 (Safety Factors Regarding Hitch Hook, etc)

An employer shall use a hanging wire rope having safety factors of a hanging wire rope or a hanging chain and single unit hitch hook or shackle of a lifting machinery(Referring to breaking load value of a hook or shackle divided by maximum load value of its hook or shackle respectively) or the one having at least the same safety factors of a hanging chain.

Article 165 (Cutting Method, etc of a Wire Rope)

① An employer shall cut a wire rope in a mechanical method in cases where he manufactures lifting working tools by cutting without making use of heat such as fusion cutting.

② An employer shall not make use of a wire rope affected by the heat of arc(arc), flame, high temperature contact.

Article 166 (Prohibition of Use of Seamed Wire Rope, etc)

Subparagraph 1 of Article 63 shall apply mutatis mutandis to the use of a wire rope. In such case, "Hanging scaffolding" shall be regarded as "Lifting machinery".

Article 167 (Prohibition of Use of Extended Hanging Chain, etc)

Subparagraph 2 of Article 63 shall apply mutatis mutandis to the use of a hanging chain. In such case, "Hanging scaffolding" shall be regarded as "Lifting machinery".

Article 168 (Prohibition of Use of Deformed Hook · Shackle, etc)

① An employer shall not use deformed or fissured hook · shackle · clamp and ring, etc for hitch tool of a crane or mobile crane.

② An employer shall make efforts to prevent jig, hook structure from breakaway of a sling to be produced to transport a heavy material due to collision with surrounding structure.

③ An employer shall use tools handing heavy material whose safety rate is not less than 3 or take a non-destructive test against his own tools handling heavy material handling.

Article 169 (Prohibition of Use of Strand-Cut Fiber Rope, etc)

Subparagraph 3 of Article 63 shall apply mutatis mutandis to the use of a fiber rope. In such case, "Hanging scaffolding" shall be regarded as "Lifting machinery".

Article 170 (Ring)

① An employer shall not use hitch tool of crane or mobile crane in cases where hook · shackle · ring or loop is not equipped on its both ends with regarding a wire rope or a hanging chain other than endless.

② The loop referred to in paragraph (1) shall be manufactured while maintaining the strength of twisted putting[referring to(eye splice(eye splice). Hereinafter, the same shall apply)], compression halt, etc. In such case, in a twisted putting, it shall be done in the way that every strand of a wire rope is inserted and weaved more than three times, half of a sole wire of each strand is cut off, and the remaining sole wire is inserted and weaved more than twice(more than once in cases where inserting and weaving every strand more than four times).

SECTION 10 UNLOADING AND TRANSPORTING MACHINERY OF VEHICLE TYPE, ETC

SUB-SECTION 1 GENERAL PROVISIONS

Article 171 (Prevention from Tripping)

If it is deemed to give rise to hazard to a worker by causing machine to fall or roll down when an employer works with unloading and transporting machinery of vehicle type, etc, a person who guides the machine(Hereinafter "Guardian") shall be placed and such actions as preventing natural ground from differential settlement and shoulder collapse shall be taken.

Article 172 (Contact Prevention)

① An employer shall prevent workers from entering the place where it is likely that contact to unloading or transporting cargo or its unloading and transporting machinery of vehicle type, etc might cause hazard to workers, in case of operating unloading and transporting machinery of vehicle type, etc: Provided that it shall be otherwise if a supervisor or an guardian referred to in Article 39 is placed, guiding its unloading and transporting machinery of vehicle type, etc.

② An operator of unloading and transporting machinery of vehicle type, etc shall follow the way that the supervisor or the guardian under paragraph (1) guide.

Article 173 (Measures Related to Cargo Loading)

① In case of loading cargo onto a unloading and transporting machinery of vehicle type, etc, an employer shall observe the matters in the following subparagraphs:

1. Load shall keep its balance
2. In case of platform truck or cargo truck, an employer shall take necessary measures to prevent workers from hazard caused by cargo collapse or falling by tying a rope, etc
3. Cargo shall be loaded without blocking operator's view

② Cargo loaded under paragraph (1) shall not maximum load allowed.

Article 174 (Conveyance of Unloading and Transporting Machinery of Vehicle Type, etc)

An employer shall observe the matters in the following subparagraphs for the prevention of hazard from tripping or falling down caused by unloading and transporting machinery of vehicle type, etc in cases where he loads or unloads using plate · banking, etc to convey unloading and transporting machinery of vehicle type, etc.

1. Loading or unloading work shall be done on a flat and rigid place.
2. A plate shall have enough length · width and intensity and shall be solidly installed to maintain adequate tilt.
3. Temporary construction platform shall be secured with enough width and intensity and adequate tilt.
4. Designated operator's name · phone number shall be displayed where easily noticeable and it shall not be operated by no one other than designated operator himself.

Article 175 (Restriction on Use other than for Main Purpose)

An employer shall use unloading and transporting machinery of vehicle type, etc for its main purpose such as cargo loading · unloading: Provided that it shall be otherwise if measures are taken to prevent hazard to workers.

Article 176 (Measures Related to Repair)

An employer shall observe the matters falling under any of the following subparagraphs by designating a supervisor in cases where he operates repair of a unloading and transporting machinery of vehicle type, etc or installation and dismantlement of an auxiliary device.

1. To confirm working orders and supervise operation.
2. To check up operation status of safety support or safety block under the partial clues other than under Article 20.

Article 177 (Loading or Unloading Work)

An employer shall observe the matters falling under any of the following subparagraphs by designating a supervisor in cases where he loads more than 100kg in weight per unit cargo(Including rope hanging work and cover closing work. Hereinafter, the same shall apply) or unloads it(Including rope untying work or cover opening work. Hereinafter, the same shall apply) when it comes to unloading and transporting machinery of vehicle type, etc.

1. To confirm working order and work method per its order and supervise operation.
2. To check up apparatus and tools and remove defective products.
3. To prevent unauthorized worker from entering the workplace.
4. To operate rope untying work or cover opening work after confirming that no cage cargo might fall.

Article 178 (Restriction on Excessive Allowance Load, etc)

① An employer shall not allow allowance excessive load of a fork lift(Referring to maximum load taken in onto the device loading fork lift structure, material and fork · ram cargo depending upon cargo's central position) and observe standard described in the product manual provided by fork lift manufacturer for the purpose of maintenance · management for a safe operation or other matters.

② An employer shall not allow platform truck, cargo truck to exceed its maximum load allowed.

SUB-SECTION 2 FORK LIFT

Article 179 (HeadLamp and Rear Lamp)

An employer shall not use a fork lift that is not equipped with headlamp and rear lamp: Provided that it shall be otherwise if it is used at a place where lighting necessary to a safe operation is secured.

Article 180 (Head Guard)

An employer shall not use a fork lift equipped with suitable head guard(head guard) listed in the following items: Provided that it shall be otherwise if it is not deemed to cause hazard to fork lift operators from cargo falling.

1. Intensity level shall endure uniform static load of double value of maximum load of a fork lift(4 tons shall apply in case of exceeding 4 tons).
2. Opening width or length of upper frame shall be not more than 16cm.
3. In case of a fork lift where an operator sits and controls, the height between upper part of operator's seat bottom of upper frame of a head guard more than 1 meter.
4. In case of a fork lift where an operator stands and controls, the height between surface floor of a driver's seat and bottom of upper frame of a head guard more

than 2m

Article 181 (Backrest)

An employer shall not use a fork lift equipped with backrest: Provided that it shall be otherwise if it is not deemed to cause hazard to fork lift operators from cargo falling at the back of a mast cargo.

Article 182 (Pallet, etc)

An employer shall use the pallet(pallet) or skid(skid) in the following items in case of using it for unloading & transporting work by a fork lift.

1. To have enough intensity referred to in loading cargo weight.
2. To have no serious damage · deformation or corrosion.

Article 183 (Fasting a Seat Belt, etc)

① An employer shall make workers to fasten a seat belt in case of a sit-and-control type of fork lift.

② Workers shall put on a seat belt in cases where operating a fork lift referred to in paragraph (1).

SUB-SECTION 3 PLATFORM TRUCK

Article 184 (Brake, etc)

In case of using a platform truck(however, limited to vehicles mainly used for transportation at a workplace), an employer shall observe the matters in the following subparagraphs:

1. To have an effective brake system installed to maintain braking or stopping.
2. To have a horn.
3. To maintain distance from the center of a handle to outer car body more than 65cm.
4. To have a direction indicator respectively for right and left in cases where a driver's seat is located inside of the car.
5. To be equipped with a headlamp and a tail light: Provided that it shall be otherwise in case of platform truck that is used at a place where lighting necessary to a safe operation is secured.

Article 185 (Connect Device)

An employer shall use an adequate connect device in cases where connecting a trailing truck to a platform truck.

SUB-SECTION 4 AERIAL WORK PLATFORM

Article 186 (Measures Related to Aerial Work Platform Installation, etc)

① An employer shall install the one in the following items in cases where installing an aerial work platform.

1. In cases where raising or lowering a work platform using a wire rope or a chain, a wire rope or a chain shall not be cut off that work platform never falls down, with safety rate of a wire rope or a chain more than 5.
2. In cases where raising or lowering work platform using oil pressure, it shall be equipped with a device that can maintain work platform at a certain position while prevent pressure from mal-functioning.
3. It shall either be equipped with over winding protector or prevent pressure from abnormal increase.
4. It shall prevent tripping resulted from excessive operation of maximum floor tile angle of boom.
5. Rated load(safety rate 5 being more than 5) shall be marked at a work platform.
6. Guard or limit switch shall be installed to prevent workers from hazard from getting caught into or colliding with a work platform.
7. Title and direction mark shall be visually displayed on a control panel switch to identify them

② In case of installing an aerial work platform, an employer shall observe the matters in the following subparagraphs:

1. Floor and aerial work platform shall, if possible, maintain horizontal level.
2. Outrigger or brake shall be used to prevent unexpected transfer.

③ In case of transferring an aerial work platform, an employer shall observe the matters in the following subparagraphs:

1. To lower a work platform to a lowest level.
2. Not to transfer a work platform with workers on board at a raised height: Provided that it shall be otherwise if an employer places a guardian and transfers a short distance to prevent hazard from tripping, etc during transfer.

3. To confirm whether or not there is any bumpy state or obstacles in a transfer port.

④ In case of using an aerial work platform, an employer shall observe the matters in the following subparagraphs:

1. Workers shall put on personal protective equipment such as safety helmet · safety harness, etc
2. An employer shall take necessary measures to prevent unauthorized person from entering work zone.
3. An employer shall maintain adequate level of intensity of illumination for a safe work.
4. An employer shall take necessary measures to prevent hazard from electric shock accident by placing a guardian in cases where working near electric pathway.
5. An employer shall regularly check a work platform and confirm mal-function around boom · work platform.
6. Changeover switch shall not be fixed using other object.
7. Object exceeding rated load shall not be load or board on a work platform.
8. In cases where work platform boom is increased, passenger shall not get out of a work platform: Provided that it shall be otherwise if safety harness adhesive equipment are installed and safety harness is connected at a work platform.

SUB-SECTION 5 CARGO TRUCK

Article 187 (Elevating Equipment)

An employer shall install equipment where the workers involved might safely ascend the space between floor and upper part of cargo in cases where loading or unloading freight in a cargo truck whose height from floor upper part of cargo 2 meters or more.

Article 188 (Prohibition of Use of Strand-Cut Fiber Rope, etc)

An employer shall not use a fiber rope, etc which refer to any of the following cases as load hanger for a cargo truck.

1. one with a cut strand.
2. seriously damaged or corroded one.

Article 189 (Fiber Rope, etc Checkup, etc)

① An employer shall take measures falling under any of the following subparagraphs prior to beginning to work in cases where using a fiber rope for load hanger of a cargo truck.

1. To confirm working order and work method per its order and directly supervise operation.
2. To check up apparatus and tools and remove defective products.
3. To prevent unauthorized worker from entering the workplace.
4. To operate rope untying work or cover opening work after confirming that no cage cargo might fall.

② An employer shall check mal-function of a fiber rope referred to in paragraph (1), if any abnormality is found, the fiber rope shall be replaced.

Article 190 (Prohibition of Taking out in the Middle of Cargo Pile)

An employer shall prevent workers from take out the cargo in the middle of the cargo pile in case unloading cargo out of cargo truck.

SECTION 11 CONVEYOR

Article 191 (Prevention from Breakaway)

An employer shall be prepared for a device that prevents cargo or carrier breakaway and reverse driving referred to in power failure · voltage drop, etc in cases where using conveyor, conveyance roller, etc(Hereinafter "Conveyor, etc"): Provided that it shall be otherwise if it is deemed to cause no hazard to workers since it is operated by no power or only transfers horizontally.

Article 192 (Emergency Stop Device)

If it is deemed to cause the worker to have his part of body catched up into a conveyor and for emergency, a device that immediately stops a conveyor shall be installed: Provided that it shall be otherwise in cases where the worker is not ever hazardous owing to without-power state.

Article 193 (Hazard Prevention from Falling Objects)

If it is deemed to cause hazard to an employer owing to falling of cargo from a conveyor, actions shall be taken in order to prevent from falling by installing a

cover or a fence onto a conveyor.

Article 194 (Trolley Conveyor)

An employer shall link trolley and chain · hanger solidly without being taken off in cases where using a trolley conveyor(trolley conveyor).

Article 195 (Passage Reservations)

① An employer shall take necessary measures for the prevention of hazard from worker's pass over an operating conveyor by installing an over bridge.

② An employer shall install a stopper to prevent collision with a heavy material or prevent workers from access in cases where he transports heavy material on a conveyor installed at the same sectional row.

SECTION 12 CONSTRUCTION MACHINERY, ETC

SUB-SECTION 1 VEHICLE TYPE CONSTRUCTION MACHINERY, ETC

Article 196 (Definition of Vehicle Type Construction Machinery)

"Vehicle type construction machinery" is a construction machinery in Table 6 that can transfer itself to any unspecific place using power source.

Article 197 (Headlamp Installation)

An employer shall install headlamp on a vehicle type construction machinery: Provided that construction machinery is used at a place lighting is ready for safe operation.

Article 198 (Head Guard)

An employer shall equip vehicle type construction machinery with a rigid head guard in cases where using a vehicle type construction machinery[limited to(bull dozer, tractor, shovel(shovel), loader(Loader), powder shovel(powder shovel) and drag shovel(drag shovel))] at a dangerous place such as area where rocks fall.

Article 199 (Prevention from Tripping)

If it is deemed to give rise to hazard to a worker by causing vehicle type

construction machinery to fall or roll down when an employer works with unloading and transporting machinery of vehicle type, etc, a person who guides the machine(Hereinafter "Guardian") shall be placed and such actions as preventing natural ground from differential settlement and shoulder collapse, and maintaining road width shall be taken

Article 200 (Prevention of Contact)

① An employer shall prevent workers from entering the place which may undermine the safe performance of work due to contact to vehicle type construction machinery in cases where operating vehicle type construction machinery: Provided that it shall be otherwise if an employer places a guardian and guides vehicle type construction machinery.

② An operator of vehicle type construction machinery shall follow the way that a guardian under paragraph (1) guides.

Article 201 (Conveyance of Vehicle Type Construction Machinery)

An employer shall observe the matters in the following subparagraphs for the prevention of hazard from tripping or falling down of vehicle type construction machinery in cases where using plate · banking for loading or unloading at a cargo truck by self-propel or traction to convey vehicle type construction machinery.

1. Loading or unloading work shall be done on a flat and rigid place.
2. A plate shall have enough length · width and intensity and shall be solidly installed to maintain adequate tilt
3. Burlap bag · temporary construction platform shall be secured with enough width and intensity and adequate tilt

Article 202 (Prevention of Boarding other than a Riding Seat)

An employer shall not allow workers to board on a seat other than a riding seat in case of working with a vehicle type construction machinery.

Article 203 (Safety Grade Observance)

An employer observe the structure, safety grade and maximum working load of the machine for the prevention of hazard from its vehicle type construction machinery's tripping or collapse or working equipment destruction such as boom · arm.

Article 204 (Restriction on Use other than for Main Purpose)

An employer shall use vehicle type construction machinery, etc for its main purpose of the machine: Provided that it shall be otherwise if measures are taken to prevent hazard to workers.

Article 205 (Hazard Prevention from Boom Drop)

An employer shall make the workers involved utilize safety support or safety block for the prevention of hazard from sudden dropping of boom · arm of vehicle type construction machinery in cases where operating repair · checkup under boom · arm.

Article 206 (Measures Related to Repair)

An employer shall observe the matters falling under any of the following subparagraphs by designating a supervisor in cases where repairing vehicle type construction machinery or installing removing its auxiliary device.

1. To confirm working orders and supervise operation.
2. To check up operation status of safety support or safety block under Article 205.

SUB-SECTION 2 PILE DRIVER AND PILE EXTRACTOR

Article 207 (Checkup Related to Assembly)

① An employer shall check the matters pursuant to the following items in the case of assembling a pile driver or a pile extractor.

1. Loosening or damage of main body connecting piece.
2. Attachment of raising wire rope · drum and pulley.
3. Brake and wedge device function of a winding machine.
4. Traction machine installation state.
5. Bracing method and anchoring state.

Article 208 (Intensity, etc)

An employer shall use main body · auxiliary device and accessories of a power-driven pile driver and pile extractor(excluding self-propel used at a unspecific place) in the following items.

1. To have an adequate intensity.
2. To have no serious damage · abrasion · deformation or corrosion.

Article 209 (Destruction Prevention)

An employer shall observe the matters in the following subparagraphs to prevent a power-driven pile driver or a pile extractor from destruction.

1. To use planking · base plate to prevent a leg or a holder from settlement in cases where installing on a feeble natural ground.
2. To confirm strength of facilities or temporary installations and reinforce its strength if needed in cases where installing on those facilities or temporary installations.
3. If it is deemed for a leg or a holder to slide down, a pile or a wedge shall be used to fix a leg or a holder.
4. To anchor a pile driver or pile extractor transferred by a railway or a vehicle using a rail clamp(Rail clamp) and a wedge to prevent sudden transfer.
5. To apply 3 or more angle braces and anchor its bottom with rigid angle brace · pile or steel frame in cases where stabilizing upper part only with an angle brace,
6. To apply 3 ore more bracing cable and place them by the same gap in cases where stabilizing upper part only with brace cables.
7. To attach a balance weight onto a holder to prevent a balance weight from transfer in cases where stabilizing with a balance weight.

Article 210 (Prohibition of Use of a Seamed Raising Wire Rope)

An employer shall not use the raising wire rope of pile driver or pile extractor falling under any of the following subparagraphs under Article 166.

Article 211 (Safety Factors of Raising Wire Rope)

An employer shall not use safety factors of raising wire rope of a pile driver or pile extractor whose grade is not more than 5.

Article 212 (Raising Wire Rope Length, etc)

In case of applying a raising wire rope to a pile driver or a pile extractor, an employer shall observe the matters in the following subparagraphs:

1. A raising wire rope shall be long enough to wind up the winding device drum

twice or more beginning from the time weight or hammer is located at optimum position or a sheet pile is taken out.

2. A raising wire rope shall be solidly anchored onto a winding device drum using clamp · clip.
3. Linking with weight · hammer at a raising wire rope of a pile driver shall be solidly anchored with clamp · clip.

Article 213 (Linking with a Sheet Pile)

An employer shall link raising wire rope · pulley of a pile extractor with pile · sheet pile using shackle · fastening metal having enough intensity.

Article 214 (Brake Attachment, etc)

An employer shall attach wedge device or one-way clutch bearing brake to a traction machine using pile driver or pile extractor.

Article 215 (Traction machine installation)

An employer shall install traction machine of a pile driver or a pile extractor free from rising, tripping or shaking.

Article 216 (Pulley Attachment, etc)

① An employer shall solidly attach it with bracket · shackle and wire rope which cannot be destructed by the load of attachment part in cases where attaching pulley or pulley bunch onto a pile driver or a pile extractor.

② An employer shall keep the distance between winding device drum axis of pile driver or pile extractor and the first pulley axis from winding device 15 times wider than that of width of a winding device drum.

③ The pulley under paragraph (2) shall passing through the center of winding device drum and be located at a vertical plane on its axis.

④ If it is deemed that raising wire rope may not be twisted when considering the structure of a pile driver or a pile extractor, paragraph (2) and paragraph (3) shall not apply in cases where.

Article 217 (Measures for Operation)

① In case of applying a pile driver or a pile extractor powered by vapor or compressed air, an employer shall observe the matters in the following

subparagraphs:

1. To anchor part of vapor hose or air hose not consisting of its connector to the hammer to prevent vapor hose or air hose and hammer connector from damaged or peeled off on account of hammer use.
2. To install a device to intercept vapor or air at a place where a hammer operator can easily control

② An employer shall not load a wire rope in cases where a raising wire rope is twisted at a winding device drum of a pile driver or a pile extractor.

③ An employer shall make sure to stop by using wedge device or one-way clutch bearing brake in cases where stopping with winding device of a pile driver or a pile extractor loaded.

Article 218 (Measures Concerning Raising a Pile, etc)

① In cases where an employer raising a pile or a sheet pile using a pile driver, he shall have its hook raised to the very down to a drum or a pulley.

② Paragraph (1) shall apply mutatis mutandis to the raising a pile or a sheet pile by attaching chain block, etc to a pile driver.

Article 219 (Measures Concerning Bracing Cable Loosening)

In cases where an employer loosens a bracing cable(Including a temporary brace cable) of a pile driver or a pile extractor, he shall take any safety measures against worker's hazard from any load exceeding its limit which supports workers adjusting a bracing cable by using a tension adjustment block or winch.

Article 220 (Transfer of Pile Driver, etc)

In cases where an employer transfers a pile driver or a pile extractor supported by two supports, he shall prevent a pile driver or a pile extractor from tripping or falling down on account of pulling each part by fixing it using a tension wire rope with winch.

Article 221 (Gas piping, etc Damage Prevention)

If it is deemed to cause hazard to the worker due to damage of gas piping, underground electric cable and other underground structure while working with pile drivers, an employer shall take measures such as transfer installment or suspended protection at a workplace by investigating gas piping · underground

electric cable in advance.

SECTION 13 INDUSTRIAL ROBOTS

Article 222 (Confirming a Robot Operation Status)

In cases where an employer checks manipulator's operation order, position · speed configuration · modification or confirm its result within a range of applications of industrial robots(Hereinafter "Robots"), he shall take measures for the prevention of hazard from unexpected operation or wrong manipulation of a robot falling under any of the following subparagraphs: Provided that subparagraph 2 and subparagraph 3 shall not apply in cases where available power supplied to a robot is intercepted.

1. To determine directives pursuant to any of falling under the following items and let workers follow its directives
   A. Robot's manipulation method and order.
   B. Sanipulator's speed in the course of carrying out work.
   C. Signal method in cases where two or more workers are working at the same time.
   D. Measures to take in cases where problems are found.
   E. Measures to take in cases where it is re-operated after problems are found and robot operation is suspended.
   F. Other necessary measures to prevent hazard from other robot's unexpected operation or wrong manipulation.
2. A person who is engaged in the work or watches the person shall take necessary measures such as stopping the robot operation after finding problems.
3. An employer shall take necessary measures to prevent unauthorized person from controlling the switch by displaying a sign saying 'in the course of carrying out work' on a robot's operation switch.

Article 223 (Hazard Prevention during Operation)

An employer shall take necessary measures to prevent hazard by installing safety mat and 1.8 meters high or more stockade(Provided, however its height might be adjusted in cases where it is deemed to have no hazard when taking consideration of robot operation range) in cases where it is deemed to cause

hazard to workers while operating a robot(excluding the cases where he operates a robot to check manipulator's operation order, position · speed configuration · modification or confirm its result or pursuant to the proviso of robot under Article 224).

Article 224 (Measures Relating to Repair)

In cases where an employer operates a robot's repair · inspection · adjustment(excluding the case where he checks manipulator's operation order, position · speed configuration · modification or confirms its result) · cleaning · fueling or confirms its result work within the range of robot's applications, he shall suspend further robot operation, lock the robot's operation switch with a key in the course of carrying out work, or display a sign saying 'in the course of carrying out work' on a robot's operation switch so that unauthorized person cannot control the operation switch: Provided that it shall be otherwise if measures falling under each subparagraph in Article 222 shall be unavoidably taken for the prevention of hazard from robot's unexpected operation or wrong manipulation in the course of robot operation work.

CHAPTER 2 HAZARDPREVENTION FROM EXPLOSION · FIRE AND HAZARDOUS SUBSTANCE LEAK.

SECTION 1 HANDLING HAZARDOUS SUBSTANCE, ETC.

Article 225 (Measures concerning manufacturing hazardous substance, etc)

In cases where an employer manufactures and handles hazardous substance in Table 1(Hereinafter "Hazardous substance"), he shall take adequate protective measures to prevent explosion · fire and leak and shall be prohibited from doing any things falling under any of the following subparagraphs:

1. To contact, heat, contact, or shock explosive materials, organic peroxide near fire or other source of ignition
2. To contact water-responsive substance, flammable solid near fire or other source of ignition or to heat, contact, or shock substance that causes ignition
3. To contact, heat, contact, or shock substance which could cause oxidizing liquid · oxidizing solid to disassemble
4. To contact flammable liquid to fire or other source of ignition, or to inject, heat, or evaporate it
5. To contact flammable gas to fire or other source of ignition, or to compress, heat, or evaporate it
6. To contact leak of corrosiveness substance or acute toxicant to human body
7. To neglect to leave flammable gas or oxidizing liquid and oxidizing solid at a place where hazardous substance is manufactured or handling equipment is located

Article 226 (Prohibition of contacting water)

In cases where an employer handles water-responsive substance · flammable solid under subparagraph 2 in Table 1, he shall store it in a completely sealed vessel to keep it off water or rainwater by storing it in the building.

Article 227 (Injection of flammable liquid, etc using a hose)

In cases where an employer injects liquid state of hazardous substance into chemical equipment, tank lorry, drum in Table 7 with a hose or piping, he shall confirm whether its hose or piping joint is solidly connected without any leak in advance.

Article 228 (Injection of kerosene into equipment where gasoline remains)

In cases where an employer fills in kerosene, diesel, chemical equipment where gasoline remains as a chemical equipment in Table 7(Limited to storing hazardous substance. Hereinafter the same shall apply to Article 229), tank lorry, drum, he shall operate its work after taken safety actions such as washing and cleaning its inside and changing gasoline vapor into inert gas safe state: Provided that it shall be otherwise if the measures falling under any of the following subparagraphs are taken.

1. To reduce potential difference by linking connecting line or ground wire between tank · drum and injection equipment prior to filling in kerosene or diesel.
2. To maintain injection speed below one meter per second till its liquid surface height reaches filing tube's height in cases of injecting kerosene or diesel.

Article 229 (Handling ethylene oxide, etc)

① In cases where an employer injects ethylene oxide, acetaldehyde or propylene into a chemical equipment, tank lorry, drum in Table 7, he shall operate its work after taken safety actions such as changing non-inert gas or vapor into inert gas.
② In cases where an employer injects ethylene oxide, acetaldehyde or propylene into a chemical equipment, tank lorry, drum in Table 7, he shall operate its work after taken safety actions such as changing non-inert gas or vapor into inert gas.

Article 230 (Classification and management of explosive hazardous area)

① In cases where drawing an explosion classified area falling under any of the following subparagraphs place, an employer shall establish and manage it by classifying gas explosion classified area or dust explosion classified area referred to as the criteria in Korean Standard pursuant to the 「Industrial Standardization Act」.

1. Area producing · handling or using flammable liquid vapor or flammable gas.
2. Area producing or using flammable solid.

② An employer shall manage and administer drawing of explosion classified area referred to in paragraph (1).

Article 231 (A place regularly handling flammable liquid)

① An employer shall not turn on electric unit · apparatus without enough ventilation at a place where he regularly handles flammable liquid, flammable gas.
② In cases where an employer washes or paints flammable liquid at a regularly sealed space with a spray gun, he shall operate electric unit · apparatus after taking measures falling under any of the following subparagraphs.

1. To ventilate enough within a limit that concentration of the substance in the air does not exceed 25% of minimum ignition value not to cause explosion risk resulted from flammable liquid, flammable gas, etc.
2. To completely seal lighting using rubber, silicon, etc packing or sealing material.
3. To take measures by installing an interlocking system, etc not to operate it together with washing or painting spray gun.
4. To install electric equipment including switch and outlet other than explosive proof structure at a sealed place outside.

③ An employer might operate electric unit · apparatus having explosive proof capacity notwithstanding paragraph (1) and (2), without taking measures falling under each subparagraph referred to paragraph (1) and paragraph (2).

Article 232 (Explosion or fire, etc prevention)

① An employer shall take measures such as ventilation and dust removal to prevent explosion or fire, etc resulted from vapor · gas or dust which could cause explosion or fire due to existence of flammable liquid vapor, flammable gas or flammable solid.
② An employer shall install a gas detection and alarm device equipped with gas detection and alarm function to prevent explosion or fire from vapor or gas in advance referred to in paragraph (1): Provided that it shall be otherwise if it belongs to zone 0 or zone 1 explosion classified area referred to in Korean Standard pursuant to the 「Industrial Standardization Act」 and explosive proof structure electric unit · apparatus are installed pursuant to the Article 311.

Article 233 (gas welding, etc work)

In cases of operating metal welding · gas cutting or heating work using flammable gas, inert gas and oxygen(Hereinafter "Gas, etc"), an employer shall observe the matters in the following subparagraphs to prevent gas, etc leak or release from explosion · fire or burn.

1. An employer shall keep gas hose and blowpipe free from gas leak from any

damage · abrasion.

2. The contacting link between gas blowpipe and hose shall be kept from leak using fastening apparatus such as a hose bank, hose clip.
3. An employer shall take necessary measures to keep gas from leak out of its hose when supplying a gas hose with gas, etc.
4. An employer shall take measures to prevent wrong manipulation by placing a name tag of a person who uses the gas home linked to feeding inlet valve or cock on a feeding inlet valve or a cock.
5. An employer shall remind workers that they should control the valve slowly to prevent burn from overrelease of oxygen from a blowpipe in cases of operating gas cutting work worker.
6. An employer shall lock feeding inlet valve or cock in cases where he stops work and leaves the workplace.
7. An employer shall prevent gas branch pipe from wrong bonding using exclusive connection tools, and prevent gas branch pipe from bonding with other gas piping by using unconnected structured connection tools, different colored piping · using a hose and attaching a name tag.

Article 234 (Gas vessels)

In cases of handing gas vessels used for metal welding · gas cutting or heating, an employer shall observe the matters in the following subparagraphs:

1. An employer shall not use, install, store, or neglects to leave gas vessels at a place which refers to any of the following cases
   A. A place where ventilation is not enough.
   B. A place where fire is used.
   C. A place where hazardous substance or flammable liquid referred to in Article 236 is handled.
2. An employer shall maintain vessel temperature at 40 degrees or lower.
3. An employer shall clear off tripping hazard.
4. An employer shall not shock.
5. An employer shall put on a cap while transporting.
6. An employer shall remove oil and dust attached to a lid of a vessel when used.
7. An employer shall open and close the valve slowly.
8. An employer shall differentiate and keep vessels that are being used from those that are not used.

9. An employer shall make dissolution acetylene vessel stand in keeping.
10. An employer shall check the vessel's corrosion · abrasion or deformation and use it.

Article 235 (Prevention of ignition from different substance contact)

An employer shall not store or load any substance in the same carrier that is deemed to ignite or explode when contacting different substance: Provided that it shall be otherwise if measures are taken to prevent contact.

Article 236 (Fire hazard workplace, etc)

An employer shall establish adequate placement structure to prevent place · equipment from fire where he handles plenty of synthetic fiber · cotton · wool · cloth · sawdust · straw · paper or other flammable liquid.

Article 237 (Spontaneous combustion prevention)

An employer shall take measures that prevent piles of spontaneous combustion-hazardous substance such as nitrocotton, alkylaluminium from hazardous temperature increase.

Article 238 (Disposal of oil-stained rag, etc)

An employer shall take measures to prevent oil-stained or printing ink-stained cloth or tissue from fire by putting it into an incombustible vessel with a lid.

SECTION 2 FIRE MANAGEMENT

Article 239 (Prohibition of using fire at a place where hazardous substance lies)

An employer shall not use fire · machine · apparatus and tools which contains hazardous substance that might cause spark or arc, or high temperature which could cause explosion or fire.

Article 240 (Oil piping or vessel welding, etc)

An employer shall not operate which could welding · gas cutting, other fire work, or hazardous work which might cause spark till he takes measures for the prevention of explosion or fire by removing flammable oil, flammable solid or

hazardous substance in advance in reference to piping · tank or drum, etc vessel which might be classified into flammable oil or flammable solid other than hazardous substance, hazardous substance.

Article 241 (Welding, etc at a place where ventilation is not enough)

① An employer shall not use oxygen for ventilation in cases where he operates other work which could cause spark such as fire work including welding · gas cutting and metal heating or dry grinding work with a grinding wheel at a place where ventilation is not enough.

② In cases where there is not much ventilation and fire work such as welding · gas cutting is being operated inside the building or equipment with inflammables, an employer shall observe the matters in the following subparagraphs necessary to fire prevention.

1. To prepare for work and establish a procedure.
2. To identify standing of hazardous substance use · storage at a workplace.
3. To place protective measures and fire extinguisher relating neighboring flammable liquid referred to in fire work.
4. To take anti-spattering measures such as anti-spattering cover against welding fire-flakes, welding fire cloth spark, fire-flakes, etc.
5. To take actions that completely remove flammable liquid vapor by ventilating, etc.
6. To take emergency measures such as preventing workers from fire and training evacuation drill.

Article 242 (Prohibition of using fire)

An employer shall prohibit fire use at a place where fire or explosion might take place.

Article 243 (Fire extinguisher system)

① An employer shall place fire extinguisher system at a building, at a place where chemical equipment in Table 7 or hazardous substance drying machinery in Section 5 is located, or at a place where substance is handled such as other flammable oil other than hazardous substance which could cause explosion or fire(Hereinafter referred to as "Building, etc").

② Fire extinguisher system referred to paragraph (1) shall be suitable for the

prevention of explosion or fire that might break out depending upon building size · area and type of handling substance.

Article 244 (Fire-prevention measures)

An employer shall maintain safety distance between flammable liquid and a brazier, a heating furnace, a heating device, an incinerator, a steel chimney, a hazard equipment and a building which might cause fire, or protect apply incombustible object as an isolation-heat material for the prevention of fire.

Article 245 (Fire prevention at a fire place)

① An employer shall install a fire prevention equipment at a place where a smoking area and a stove are located.

② A person who uses fire shall wind up fire-flakes clean.

Article 246 (Incinerator)

An employer shall installs an incinerator at a place where there is no hazard from fire spread out or apply incombustible material.

SECTION 3 HAZARD PREVENTION CONCERNING HOT MOLTEN MATERIAL

Article 247 (Hot material handling equipment structure)

An employer shall install an equipment handling plenty of hot material such as brazier made up of a structure which prevents fire.

Article 248 (Vapor explosion prevention concerning hot molten material handling pit)

An employer shall take measures falling under any of the following subparagraphs to prevent vapor explosion in reference to pit(excluding processing hot metal residue with water) which handles hot molten mineral(Hereinafter "hot molten material"):

1. It shall be made up of a structure where underground water infiltrates inside: Provided that it shall be otherwise if equipment that discharges stagnating underground water is installed.
2. Equipment such as partition wall, etc shall be installed to prevent working water

or rainwater from infiltrating inside

Article 249 (Building structure)

An employer shall take measures falling under any of the following subparagraphs to prevent a building where equipment handing hot molten material is installed from vapor explosion:

1. Floor shall be made up of a structure where water stagnates.
2. Roof · wall · window shall be made up of a structure where rainwater does not infiltrate.

Article 250 (Hot molten material handling)

In cases where an employer handles hot molten material(excluding processing and removing hot metal residue with water), he shall operate the work after confirming whether or not water stagnates or is moist state at a pit referred to in Article 248, building floor referred to in Article 249, or other equipment which handles hot molten material to prevent vapor explosion.

Article 251 (Processing hot metal residue with water)

In cases where an employer disposes of or discards hot metal residue with water, he shall do it at a place where drainage is in good consideration to prevent vapor explosion: Provided that it shall be otherwise if treated in a granulated disposal.

Article 252 (Hot metal residue processing work)

In cases where an employer disposes of or discards hot metal residue with water, he shall operate the work after confirming that no water stagnates at a place referred to in Article 251: Provided that it shall be otherwise if treated in a granulated disposal.

Article 253 (Inserting metal fragments into metal melting furnace)

In cases where an employer inserts metal fragments into a metal melting furnace, he shall operate the work after confirming that there is no water · hazardous substance and sealed vessel in metal fragments to prevent vapor explosion.

Article 254 (Prevention of burn)

① An employer shall take adequate measures for the prevention of burn or other hazard from arsenic acid and spill of hot material at a place where he handles blast furnace, cupola or glass melting furnace, other plenty of hot material.
② An employer shall put on heat protective gear or suitable personal protective equipment at the place under paragraph (1) for the prevention of burn or other hazard to workers.

SECTION 4 CHEMICAL EQUIPMENT · PRESSURE VESSEL, ETC

Article 255 (Building structure where chemical equipment is installed)

In cases where an employer installs chemical equipment(Hereinafter "chemical equipment") and its auxiliary installations in Table 7 in a building, he shall apply incombustible material for building floor · wall · column · stair and roof.

Article 256 (Prevention of corrosion)

An employer shall take measures by applying or painting material that is hardly corroded by any type · temperature · concentration of hazardous substance to area where 60 degrees C or higher hazardous substance(Hereinafter "Hazardous substance, etc") or flash point among chemical equipment or its piping(excluding chemical equipment or valve or cock of its piping) contacts to prevent explosion · fire or leak.

Article 257 (Cover, etc joint connection)

An employer shall take adequate measures by using adequate gasket and pressing contact prevent explosion · fire or hazardous substance leak at a joint connection in connection with chemical equipment or its piping cover · flange · valve and cock joint connection.

Article 258 (Marking valve, etc opening and closing direction)

An employer shall mark and classify closing and opening direction in colors to prevent explosion · fire or hazardous substance leak by manipulating valve · cock of chemical equipment or its piping or a switch and a press button to control them in a wrong way.

Article 259 (Valve quality)

An employer shall apply endurable material to a chemical equipment or valve or cock of its piping depending upon opening and closing frequency, type · temperature · concentration of hazardous substance, etc.

Article 260 (Display of feeding raw material type)

An employer shall mark raw material type, equipment name feeding raw material, etc at a place where it is easily noticeable to workers to prevent explosion · fire or hazardous substance leak which might be caused by wrong manipulation of a worker who feeds raw material into a chemical equipment.

Article 261 (Safety valve, etc installation)

① An employer shall install safety valve or rupture disc(Hereinafter "safety valve, etc") equipped with explosion prevention capacity and standards to prevent explosion from overvoltage shall be installed regarding equipment which refers to any of the following cases: Provided that it shall be otherwise if corresponding protective equipment is installed onto a safety valve.

1. Pressure vessel(It shall be true only if it is deemed for increased pressure to exceed maximum operating pressure of this pressure vessel in a case of tubular heat exchanger among pressure vessels excluding a pressure vessel with its inner diameter below than 150ml)
2. Positive displacement compressor
3. Positive displacement pump(only applicable to the one which has a block valve installed on a discharge)
4. Piping(limited to the one which could be ruptured by heat expansion of liquid at the air temperature after being shut off by two or more valves)
5. Other chemical equipment and its auxiliary installations which could exceed maximum operating pressure of equipment

② In cases where safety valve is installed pursuant to paragraph (1), an employer shall install safety valve per each stage or each air compressor linked to multistage compressor or series.

③ The safety valve referred to paragraph (1) shall be used after it is inspected and sealed with lead at least once every checking period falling under any of the following subparagraphs using the pressure gauge calibrated by National Calibration Institute regarding whether it is adequately operated at a set

pressure: Provided that it might not be inspected or sealed with lead in cases where an employer can regularly confirm with a lever or loop attached to a safety valve itself is mounted onto an air or nitrogen handing vessel whether a safety valve normally operates.

1. In cases where chemical process fluid and safety valve disk or sheet might directly contact: more than once every year
2. In cases where a rupture disc is installed on a safety valve front: more than once every two years
3. In cases where an employer, as a business subject to submission of a process safety report executed by the Minister of Employment and Labor under the Act 33-6, adopts a safety value whose performance assessment of process safety report is proved to be excellent: more than once every 4 years

④ An employer shall not allow safety valve sealed with lead pursuant to paragraph (3) to be dismantled or adjusted.

Article 262 (Rupture disc installation)

An employer shall install a rupture disk onto an equipment in cases where the equipment falling under any of the subparagraphs under Article 261 (1) refers to any of the following cases:

1. If it is deemed to cause rapid pressure increase such as runaway reaction
2. If it is deemed to pollute surrounding work environment due to acute toxicant leak
3. If it is deemed to cause mal-function of a safety valve due to accumulation of abnormal material in the course of carrying out work

Article 263 (Series installation of rupture disc and safety valve)

An employer shall install a rupture disc and a safety valve in a series structure and set up pressure indicator meter or automatic alarm device between them on top of a chemical equipment and its auxiliary installations where acute toxicant continuously might spill outward.

Article 264 (Operating conditions of safety valve, etc)

An employer shall make sure that the safety valve installed pursuant to Article 261 (1) operates under the maximum operating pressure of equipment that is protected by the safety valve: Provided that in cases where two or more safety

valves are installed, either one shall be operated under 1.05 times(1.1 times in the case of preparation for external fire) of the maximum operating pressure.

Article 265 (Relieving capacity of a safety valve)

An employer shall determine the upmost value as a relieving capacity of a safety valve by estimating each consumed relieving capacity per operating source in cases of determining relieving capacity in connection with safety valve.

Article 266 (Prevention of a block valve installation)

An employer shall not install a block valve at the front or rear end of a safety valve: Provided that a locker type or similar type of block valve which refers to any of the following cases might be installed.

1. In cases where a safety valve is installed onto a neighboring chemical equipment and its auxiliary installations respectively, and no block valve is available on a connect piping of the chemical equipment and its auxiliary installations.
2. In cases where automatic pressure control valve(limited to the structure that is opened when driving power source supply is shut off) and safety valve with capacity amounting to more than a half of relieving capacity of a safety valve are arranged in a row.
3. In cases where a safety valve is installed on a chemical equipment and its auxiliary installations as a dual type.
4. In cases where a reserved equipment is installed and a safety valve is installed onto each equipment.
5. In cases where a safety valve is installed to keep the pressure increased by heat expansion lowered.
6. In cases where two or more unit processes of flare headers are connected to one flare stack and it is monitored by Central Control Center to control opening and closing state of a block valve installed onto each unit processes of flare header.

Article 267(disposal of discharging material)

An employer shall dispose of hazardous substance discharged from safety valve, etc by the means of combustion · absorption · washing · collection or recall, etc: Provided that an employer might guide hazardous substance to a safe place and

discharge it outside in the event of referring to any of the following cases.

1. where it is deemed to hinder function of rupture disc when disposing of discharging material by means of combustion · absorption · washing · collection or recall, etc
2. where it is deemed to cause harmful gas when applying combustion to discharging material.
3. where it is not deemed to completely dispose of discharging material in the way of combustion · absorption · washing · collection or recall, etc due to discharge of high-pressured hazardous substance in large amount.
4. where safety measures such as chilling equipment or automatic fire extinguisher system are already taken in a storage tank when the safety valve is installed in a storage tank of flammable liquid or flammable liquid distant from process equipment zone.
5. where other safety measures are taken such as installing chilling equipment or automatic fire extinguisher system in cases where other discharge is small and its discharge is rapidly dispersed without the need to worry about disaster.

Article 268 (Vent facility)

① An employer shall install vent line or breather valve, etc(Hereinafter "Vent facility") in an atmospheric pressure tank that stores · handles flammable liquid.

② The vent facility referred to in paragraph (1) shall be maintained · repaired thoroughly and have an enough capacity where inner part of atmospheric pressure tank may not be vacuumized or pressurized during normal operation.

Article 269 (Flame arrestor installation, etc)

① An employer shall install a flame arrestor on top of its equipment to prevent flame from outside in cases where he releases vapor or gas out of the chemical equipment that handles flammable liquid and flammable gas: Provided that it shall be otherwise in cases where a breather valve is installed in a vent line connected outside in the air or a flame arrestor is installed used for storing · handling flammable liquid whose flash point is between 38 degrees and 60 degrees C.

② An employer shall install, repair and maintain flame arrestor referred to as the criteria in Korean Standard pursuant to the 「Industrial Standardization Act」, in cases of installing flame arrestor pursuant to paragraph (1).

Article 270 (Fire-proof standard)

① An employer shall apply fire-proof structure to parts falling under any of the following subparagraphs in cases of buildings installed at a gas explosion classified area or dust explosion classified area referred to in Article 230 (1) while taking adequate measures such as check · repair to maintain its capacity: Provided that fireproof structure shall not be applied in cases where he installs automatic fire extinguisher system including water spray facilities or foam head equipment, etc around building, etc to prevent a fire while maintaining its safety against fire for more than two hours.

1. Column and beam of building: to the ground floor(6 meters in cases where ground floor height exceeds 6 meters)
2. Hazardous substance storing · handing vessel buttress(excluding the one whose height is less than less than 30cm): from the ground to buttress end
3. Piping · cable tube, etc buttress: from the ground to the 1st stage(6 meters in cases where the 1st stage height is exceeds 6 meters)

② Fire-proof material shall have at least the capacity which shall satisfy the criteria referred to in Korean Standard pursuant to the 「Industrial Standardization Act」

Article 271 (Safety distance)

In cases where an employer installs hazardous substance which stores · handles chemical equipment and its auxiliary installations referred to in subparagraph 1 through 5 in Table 1, he shall maintain enough safety distance between equipment and facility referred to in Table 8 to minimize damage from explosion or fire: Provided that it shall be otherwise if an employer maintains safety distance or confirms its safety based upon risk assessment to minimize risk by submitting a process safety report under Article 49-2 of the Act.

Article 272 (Dike installation)

In cases where an employer installs a storage tank which stores hazardous substance in Table 1 Article 4 through 7 as a liquid state, he shall install disk to prevent hazardous substance from leaking and spreading.

Article 273 (Installation of measuring instrument, etc)

In cases where an employer installs chemical equipment which refer to any of

the following cases which manufactures and handles hazardous substances referred to in Table 9 (Hereinafter "specific chemical equipment") more than standard amount as fixed, he shall install measuring instrument of thermometer · flow meter · pressure gauge, etc to find out whether any inner abnormality state occurs as soon as possible.

1. Reaction device where exothermic reaction occurs.
2. Devices for separation such as
   distillation · rectification · evaporation · extraction.
3. Equipment where the temperature of heating substance is kept higher than disassembly temperature or ignition point of heated hazardous substance.
4. Equipment which could cause hazardous substance owing to abnormal chemical reaction such as runaway reaction.
5. Equipment which is operated with temperature over 350 degrees C or gauge pressure over 980 kilo pascals.
6. Heating furnace or heater.

Article 274 (Automatic alarm device installation, etc)

In cases where an employer installs specific chemical equipment, he shall install an automatic alarm device to find out its inner abnormality state earlier: Provided that if it is deemed to difficult to install an automatic alarm device, he shall locate a guardian and monitor its specific chemical equipment during the operation of equipment.

Article 275 (Emergency shut-off device installation, etc)

① In cases where an employer specific chemical equipment, he shall install devices necessary to emergency shut-off of raw material supply, product release, inert gas injection or cooling water supply to prevent explosion · fire or hazardous substance leak caused by abnormality.

② The devices referred to paragraph (1) shall be repaired and maintained to be safe and easy to control.

Article 276 (Reserved power source, etc)

In cases of power source of specific chemical equipment and its auxiliary installations, an employer shall observe the matters in the following subparagraphs.

1. An employer shall install a reserved power source that can be available in no time to prevent explosion or fire from power source abnormality.
2. An employer shall lock a valve · a cock · a switch and differentiate them in different colors in order to prevent wrong manipulation.

Article 277 (Checkup prior to use, etc)

① An employer shall use equipment after confirming safety inspection contents regarding chemical equipment and its auxiliary installations in cases which refers to any of the following cases:

1. Where it is used first.
2. Where disassemble or remodel or repair is done.
3. Where it is used again after it has not been operated for over a month.

② An employer shall use the equipment after confirming the matters regarding equipment falling under any of the following subparagraphs in cases where he uses chemical equipment or its auxiliary installations for other purposes other than those referred to paragraph (1)(including the case where raw material type is changed).

1. Where there is any substance inside its equipment which could cause explosion or fire.
2. Mal-functions in connection with safety valve · emergency shut-off device and other protective equipment.
3. Mal-functions in connection with cooling system · heating device · agitating machine · compressing unit · measuring instrument and control unit.

Article 278 (Remodel · repair, etc)

In cases of disassembling equipment for the purpose of remodel · repair and cleaning of chemical equipment and its auxiliary installations or working inside the equipment, an employer shall observe the matters in the following subparagraphs:

1. To determine a work manager and let him supervise the work.
2. To keep workplace from hazardous substance leak or hot vapor.
3. To regularly measure concentration of flammable liquid vapor or flammable gas around workplace and its neighboring area.

Article 279 (Evacuation, etc)

① An employer shall stop the work and make the worker evacuate to a safe

place in cases where industrial accident might happen as a result of explosion or fire.

② In the event of occasions referred to paragraph (1), an employer shall prevent unauthorized person from entering workplace and place a post where it is easily noticeable till a worker is completely free from such industrial accident.

SECTION 5 DRYING MACHINERY

Article 280 (Building structure equipped with hazardous substance drying machinery)

An employer shall erect an independent single story building equipped with a drying chamber out of hazardous substance drying machinery(Hereinafter "Hazardous substance drying machinery") which refer to any of the following cases: Provided that it shall be otherwise if the drying chamber is installed on the top floor of a building or the building is built to have a fire-proof structure.

1. In cases where an employer heats or dries substance causing hazardous substance or hazardous substance, inner volume reaches 1 cubic meter or larger drying machinery.
2. Drying machinery amounting to capacity pursuant to any of falling under the following items heating · drying unhazardous substance.
   A. Maximum use of solid or liquid fuel is more than 10kg per hour.
   B. Maximum use of gas fuel is more than 1 cubic meter per hour.
   C. Electric rated capacity reachers 10 kilo watts or higher

Article 281 (Drying machinery structure, etc)

An employer shall install the structure falling under any of the following subparagraphs in cases of installing drying machinery: Provided that it shall be otherwise if it is deemed to cause no explosion or fire when considering drying material type, degree of drying-by-heat, heat source type.

1. Outer part of drying machinery shall be made of incombustible material.
2. Inner part, inner lathe or frame of drying machinery(excluding dry-by-heat organic peroxide) shall be made of incombustible material.
3. Solid structure shall apply to a side wall or floor of hazardous substance drying machinery.
4. Upper part of hazardous substance drying machinery shall be made up of light

material, explosion vent shall be installed by taking surrounding atmosphere into account.

5. Hazardous substance drying machinery shall have a complete structure that releases gas · vapor or dust into a safe place while drying.
6. The drying machinery that uses liquid fuel or flammable gas as a fuel for heat source shall have a structure that ventilate combustion chamber or other ignition part to prevent explosion or fire.
7. Interior drying machinery shall have a structure that can be easily cleaned.
8. The openings of drying machinery such as sight glass · exit and outlet shall have a structure that prevent flame from spreading and can immediately be confined if necessary.
9. Drying machinery shall have a structure whose inner temperature does not locally increase.
10. Hazardous substance drying machinery shall not use direct fire as a heat source.
11. In cases where an employer uses direct fire as a heat source of drying machinery other than hazardous substance drying machinery, he shall install cover or partition wall to prevent a fire from spark, etc.

Article 282 (Auxiliary electric equipment of drying machinery)

① An employer shall use wiring and switch exclusively used for electric heater · motor and electric lamp attached onto a drying machinery in cases of using them.

② An employer shall not install electric unit · apparatus or wiring which might be a source of ignition of hazardous substance as a result of occurrence of electric spark from interior part of hazardous substance drying machinery.

Article 283 (Drying machinery use)

In cases of working with drying machinery, an employer shall observe the matters in the following subparagraphs to prevent explosion or fire.

1. In cases where an employer uses hazardous substance drying machinery, he shall clean or ventilate interior part in advance.
2. In cases where an employer uses hazardous substance drying machinery, he shall release explosion · fire risk substance into a safe place drying which might be caused by gas · vapor or dust created by drying.

3. An employer shall not make drying material dried by heat using hazardous substance drying machinery easily breakaway.
4. The flammable liquid dried by heat at hot temperature shall be stored after cooling temperature enough to have no ignition risk.
5. Flammable liquid shall not be located near the drying machinery(only limited to the equipment whose outer part reaches a significant high temperature).

Article 284 (Measurement of drying machinery temperature)

An employer shall install a device which can regularly measure inner temperature of the drying machinery or which automatically adjust inner temperature.

SECTION 6 ACETYLENE WELDING EQUIPMENT AND GAS AGGREGATION WELDING EQUIPMENT

SUB-SECTION 1 ACETYLENE WELDING EQUIPMENT

Article 285 (Restriction on pressure)

An employer shall not generate acetylene whose gauge pressure exceeds 127kpa in cases where he uses acetylene welding equipment metal welding · gas cutting or heating work.

Article 286 (A place to install a generator room)

① In cases where an employer installs acetylene generator of acetylene welding equipment(Hereinafter "generator"), he shall install it at an exclusive generator room.

② The generator room referred to paragraph (1) shall be located on top floor of the building, being 3 meters or more distant from the equipment using fire.

③ In cases where the generator room referred to paragraph (1) is installed outdoors, its opening shall be 1.5 meters or more distant from other buildings.

Article 287 (Generator room structure, etc)

In cases of installing a generator room, an employer shall observe the matters in the following subparagraphs:

1. Walls shall be made up of incombustible material, supported by steel reinforcement concrete or other similar or more intensity of structure.

2. Thin iron place or light incombustible material shall be applied to roof and ceiling.
3. An employer shall protrude a ventilator on the roof whose cross section has floorage amounting to one sixteenth or more floorage with its opening 1.5 meters distant from windows or exit.
4. Exit door shall be made up of incombustible material whose width is 1.5ml or more iron place or has other more intensity structure.
5. An employer shall secure gap between a wall and a generator not to be disturbed when it comes to generator adjustment or carbide supply, etc.

Article 288 (Storing chamber)

An employer shall store mobile acetylene welding equipment that is not being used into an exclusive storing chamber: Provided that it shall be stored at a random place if it is separated per type and a generator is washed and stored.

Article 289 (Safety device installation)

① An employer shall install safety device per blowpipe of acetylene welding equipment: Provided that it shall be otherwise if safety device is installed per branch pipe nearest to main pipe and blowpipe.

② An employer shall install safety device between a generator and a gas vessel regarding acetylene welding equipment where a gas vessel is separated from a generator.

Article 290 (Acetylene welding equipment management, etc)

In cases of carrying out metal welding · gas cutting or heating work using acetylene welding equipment, an employer shall observe the matters in the following subparagraphs:

1. The types, manufacturer's name, average gas occurrence and one time carbide supply of generator(excluding a generator of mobile acetylene welding equipment) shall be placed where it is easily noticeable in a generator room.
2. An employer shall prevent unauthorized worker from entering a generator room.
3. An employer shall prevent smoking, fire use, or spark-causing hazardous action within 5 meters' distance of a generator or within 3 meters' distance from a generator room.
4. An employer shall take necessary measures to prevent misunderstanding

between oxygen pipe and acetylene pipe.

5. An employer shall place adequate fire extinguisher system at a site where acetylene welding equipment is installed.
6. An employer shall not install a generator of a mobile acetylene welding equipment at a site where temperature is high, where ventilation is not enough, or where vibration is serious.

SUB-SECTION 2 GAS AGGREGATION WELDING EQUIPMENT

Article 291 (Gas aggregation apparatus hazard prevention)

① An employer shall install gas aggregation apparatus at a place which is 5 meters away from the equipment that uses fire.

② An employer installs gas aggregation apparatus referred to paragraph (1) at an exclusive chamber(Hereinafter "Gas apparatus chamber) if so: Provided that it shall be otherwise in cases of mobile gas aggregation apparatus.

③ If it is deemed to cause shock to auxiliary installations of gas apparatus chamber or other gas vessels when replacing gas vessels of gas aggregation apparatus at a gas apparatus chamber.

Article 292 (Gas apparatus chamber structure, etc)

An employer shall install gas apparatus chamber in the same structure falling under any of the following subparagraphs installation.

1. Where gas leak shall not stagnates if it happens.
2. Light incombustible material shall be applied to roof and ceiling.
3. Incombustible material shall be applied to walls.

Article 293 (Piping of gas aggregation welding equipment)

In cases of piping a gas aggregation welding equipment(Including a mobile), an employer shall observe the matters in the following subparagraphs:

1. Joint connection such as flange · valve · cock shall be done using a gasket and joint section shall be pressed each other.
2. Safety device shall be applied to a main pipe and a branch pipe. In such case, two or more safety devices shall be installed onto one blowpipe.

Article 294 (Restriction on use of copper)

An employer shall not apply 70% or more copper or copper content to piping of gas aggregation welding equipment and auxiliary apparatus of dissolution acetylene.

Article 295 (Gas aggregation welding equipment management, etc)

In cases of operating a metal welding · gas cutting and heating work using gas aggregation welding equipment, an employer shall observe the matters in the following subparagraphs:

1. An employer shall place gas names used and maximum gas store at a gas apparatus chamber where it is easily noticeable.
2. An employer shall have a supervisor exchange gas vessels if needed.
3. An employer shall post controlling valve · cock and checkup at a gas apparatus chamber where it is easily noticeable.
4. An employer shall gas prevent unauthorized person from entering apparatus chamber.
5. An employer shall prevent smoking, fire use, or spark-causing hazardous action within 5 meters' distance of gas aggregation apparatus.
6. An employer shall take necessary measures on the pipe to prevent misunderstanding from oxygen.
7. An employer shall install an adequate fire extinguisher system at a place where a gas aggregation apparatus is installed.
8. An employer shall not install a gas aggregation apparatus of mobile gas aggregation welding equipment at a place where temperature is high, where ventilation is not enough or where vibration is serious.
9. An employer shall have workers put on goggles and safety gloves.

SECTION 7 HAZARD PREVENTION FROM EXPLOSION · FIRE AND HAZARDOUS SUBSTANCE LEAK

Article 296 (Underground workplace, etc)

An employer shall take measures falling under any of the following subparagraphs to prevent explosion or fire in cases where he works at an underground workplace which might cause flammable gas(excluding construction work of a tunnel under Article 350) or where he excavates at a hazardous place where gas pipe might release gas(including natural ground excavation or subsequent earth

rock transportation, etc taking place at a place or at its neighboring place):

1. To appoint a person who measures gas concentration and make him measure it if applicable to the following items.
   A. Prior to starting to work everyday.
   B. In cases where he doubts gas leak.
   C. In cases where there is a hazard place where gas occurs or stagnates.
   D. In cases where continuous work is needed for hours(In such case, gas concentration shall be checked every 4 hours.
2. If it is deemed that gas concentration proves to be 25% or more of flame lower bound value, an employer shall evacuate workers to a safe place without delay, stop using and ventilate the machine and apparatus which might cause fire or other source of ignition.

Article 297 (Equipment pumping corrosiveness liquid)

In cases where an employer pumps corrosiveness substance in Table 1 in a hose by power, he shall take measures against equipment used for pumping falling under any of the following subparagraphs:

1. An employer shall place a pressure gauge at a position where it is easy for an operator that handles equipment used for pumping to see (Hereinafter referred to as "operator") and shall take measures such as shutting down power at a place where it is easy for an operator to control.
2. An employer shall use hose and its connect tools which has corrosion resistance, thermal-resistance and low-temperature resistance to pumping corrosiveness liquid
3. An employer shall mark rated pressure on a hose and shall not pump it by exceeding its rated pressure
4. An employer shall install overvoltage protector onto equipment used for pumping in cases where abnormal pressure is forced on a hose interior while causing risk
5. An employer shall make sure to link pipes other than between hose and hose and hose-to-hose connector using connect tools without leak
6. An employer shall designate an operator and make him monitor pumping peration and pressure gauge of the equipment
7. An employer shall check hose and its connect tools everyday prior to beginning to operate it and exchange it with other one if any defect including

damage · corrosion, etc might cause pumping corrosive liquid to spatter or leak

Article 298 (Restriction on using gas other than air)

An employer shall not use any gas other than air as a compression gas in cases where he pumps corrosiveness liquid using compressed gas pressure in Table 1: Provided that an employer might use nitrogen or carbonic acid gas in cases where he releases gas right after finishing the work, or takes measure against suffocation hazard to interior part of equipment that a worker used for pumping by marking gas existence state.

Article 299 (Toxic substance leak prevention)

An employer shall take measures falling under any of the following subparagraphs for the prevention of hazard from acute toxicant leak.

1. To minimize acute toxicant storing and handling amount at a workplace
2. To solidly press connecting part of equipment that handles and stores acute toxicant without leaking and confirm whether there is any abnormality between connecting parts at least once a month
3. Not to release acute toxicant through cooling · separation · absorption · absorption · incineration, etc disposes of process in cases where an employer discards · disposes of acute toxicant.
4. To install and safely recall storing · collection or disposal plant in cases where abnormal operation of acute toxicant handling equipment causes acute toxicant to be released outside.
5. To be made up of structure that automatically treats acute toxicant or of manual control structure that can control remote adjustment in cases where an employer installs equipment that discards · disposes of or releases acute toxicant
6. To install an alarm system at a worker's near side so that workers can easily identify in cases where equipment handling acute toxicant is stopped.
7. To be furnished with equipment that can sense and alarm leak of acute toxicant spilling outside.

Article 300 (Hazard prevention during air-tight test)

① In cases where an employer takes an air-tight test against piping, vessel, other equipment using inert gas pressure such as nitrogen · carbonic acid gas, for

the prevention of hazard from rupture caused by excessive pressure injection or faulty working methods, he shall confirm that the pressure gauge calibrated by National Calibration Institute should be installed and internal pressure should be regularly checked.

② The pressure gauge of referred to paragraph (1) shall be placed where it is easily noticeable so that workers can check internal pressure of piping, etc for air-tight test.

③ In cases where an employer completes air-tight test and checks interior equipment, he shall ventilate and confirm whether inert gas still remains to make sure its safety state.

④ An employer shall install air-tight test equipment solidly enough to endure injection pressure installation and measure safety and check its state to prevent connect pipe, etc rupture from abnormal pressure.

CHAPTER 3 ELECTRIC HAZARD PREVENTION

SECTION 1 HAZARD PREVENTION CONCERNING ELECTRIC MACHINE · APPARATUS

Article 301 (Electric machine · apparatus, etc a live part protective)

① An employer shall take measures falling under any of the following subparagraphs method to prevent a live part from electric shock in cases where a worker contacts(including an electric conductor connected to a live part. Hereinafter the same shall apply) or access electric unit, apparatus [referring to machine · apparatus, other equipment other than wiring and portable cable which passes through electricity among motor · transformer · connector · switch · distribution board · switchboard. Hereinafter, the same shall apply)] or a live part of electric pathway, etc(excluding a live part which is subject to exposure depending upon purpose of use such as electric unit · apparatus including exothermic part of an electric heater, resistance connector electrode, etc. Hereinafter, the same shall apply) for work or for passing-by.

1. Its structure shall be made up of enclosed switchboard or cubicle without protruding a live part.
2. A protection net or insulation cover shall be installed onto a live part having enough insulation effect.
3. A live part shall be completely covered with durable insulation.
4. An employer shall install a live part at a place where unauthorized worker is prohibited from entering, by showing hazard, etc divided into subsections such as electric power station · substation and switching station.
5. An employer shall install a live part at a place where unauthorized worker is prohibited from entering such as on top of electric pole and on top of iron tower.

② In cases where workers operate in an enclosure such as manhole or basement with exposure live part, an employer shall install cover, stockade or insulation partition to prevent electric hazard from contacting exposure live part for the prevention of electric hazard.

③ An employer shall solidly fix open/close door, hinge-attached panel, etc(distribution board or control panel door) for the prevention of electric shock

to workers.

Article 302 (Electric machine · apparatus earthing)

① An employer shall place an earth to each one falling under any of the following subparagraphs for the prevention of hazard from electric shock due to earth leakage.

1. Rigid metal enclosed switchboard or cubicle, rigid metal cover and iron band of electric machine · apparatus.
2. Non conductive metal parts which refer to any of the following cases which might be charged among non conductive metal parts of exposed electric unit · apparatus anchored or connected to hard-wired.
   A. Its vertical distance 2.4m, horizontal distance 1.5m or less from metal parts grounded to the floor.
   B. Installed at a moist or humid place.
   C. Coating · exterior or conduit, etc for equipment earthing cable made up of metal.
   D. Service voltage exceeding 150 bolts of voltage to ground.
3. Metal parts which refer to any of the following cases among equipment which does not use electricity.
   A. Frame and railway of electric lifting machinery.
   B. Frame of non-powered lifting machinery with cables.
   C. Electric machine · apparatus neighboring rigid metal partition · net and other similar device using high pressure(referring to 750 bolts to 7,000 bolts D.C. voltage or 600 bolts to 7,000 bolts A.C. voltage. Hereinafter, the same shall apply) or more electricity.
4. Non conductive metal parts exposed to any one which refer to any of the following cases among electric machine · apparatus which uses cord and plug for connection.
   A. Service voltage exceeding 150 bolts of voltage to ground.
   B. Fixed electric unit · apparatus such as refrigerator · washing machine · computer and peripheral equipment.
   C. Fixed · mobile or portable electric machine · apparatus.
   D. Electric unit · apparatus, non-earthing outlet used where moisture or conductible is highly likely.
   E. Portable flash light

5. The tank in cases where underwater pump is installed in an interior of a rigid metal water tank(In such case, the tank shall be grounded to ground wire of underwater pump)

② Paragraph (1) shall not be applied if falling under any of the following cases.

1. Electric unit · apparatus protected by double insulation structure or similar structure pursuant to「Electric Products Safety Management Act」
2. Electric unit · apparatus which is used at a place such as on an insulation stand where electric shock risk is not available.
3. Electric unit · apparatus used by linking to non-earthing type of electric pathway(limited to the case where insulation transformer of power electric pathway of its electric unit · apparatus does not exceed 300 bolts for 2nd voltage, its rated capacity does not exceed 3 kilo volt-ampere, and its electric pathway to insulation voltmeter's load is not grounded)

③ An employer shall take measure against electric shock risk from increase of potential of earthing poles in cases where ground fault accident takes place at a substation · switching station, other similar place which handles extra-high voltage(referring to 7,000 bolts or higher D.C./A.C. voltage. Hereinafter, the same shall apply).

④ An employer shall check whether the earthing equipment installed pursuant to paragraph (1) maintains its relevant state and repair or reinstall it immediately if any abnormality is found.

Article 303 (Appropriate installation of electric machine · apparatus)

① An employer shall install electric machine · apparatus by taking consideration of the matters falling under any of the following subparagraphs.

1. Enough electric capacity and mechanical intensity of electric machine · apparatus.
2. Surrounding environment around the place such as humidity · dust.
3. Relevance of electric · mechanical protective means.

② An employer shall apply electric machine · apparatus certified by publicly certified institutes in and out of Korea and install and use it under the terms and conditions referred to in manufacturer's product manual.

Article 304 (Prevention of electric shock using an earth leakage breaker)

① An employer shall install an earth leakage breaker against electric shock

suitable for the relevant rated electric pathway and with a good sensitivity for the prevention of hazard electric shock due to earth leakage in relation to electric machine · apparatus falling under any of the following subparagraphs.

1. Mobile or portable electric unit · apparatus whose voltage to ground exceeds 150 bolts.
2. Electric unit · apparatus used for low-pressure(less than 750 bolts D.C. voltage or less than 600 bolts A.C. voltage) available at a moist place where there is liquid such as water whose conductible is high.
3. On tope of mobile or portable electric unit · apparatus iron place · steel frame available at a place which has high conductible.
4. Mobile or portable electric unit · apparatus available at a place where electric pathway for a temporary wiring is installed.

② In cases where it is deemed difficult for an employer to install earth leakage breaker to prevent electric shock pursuant to paragraph (1), he shall, before starting to work, check connection and connector state of a ground wire whether it is suitable or not.

③ Paragraph (1) and (2) shall not apply to any of the following cases:

1. Electric unit · apparatus protected by double insulation structure or similar structure pursuant to「Electric Products Safety Management Act」
2. Electric unit · apparatus which is used at a place such as on an insulation stand where electric shock risk is not available
3. Electric pathway of a non-earthing type

④ An employer shall check operation state earth leakage breaker of an earth leakage breaker pursuant to paragraph (1) prior to beginning to use electric unit · apparatus, if any abnormality is found, it shall be repaired or exchanged without delay.

⑤ In cases of connecting to earth leakage breaker pursuant to paragraph (1), an employer shall observe the matters in the following subparagraphs:

1. Earth leakage breaker installed on an electric unit · apparatus has a rated current sensitivity less than 30 milli ampere and operation time less than 0.03 seconds: Provided that an employer might adjust rated current sensitivity less than 200 milli ampere and operation time less than 0.1 seconds to prevent earth leakage breaker rated linked to electric unit · apparatus whose full load current is 50 ampere or more.
2. Link earth leakage breaker to each branch circuit or electric unit · apparatus:

Provided that in branch circuits are collectively linked to light load of electric pathway whose normal leakage current is very little.

3. Earth leakage breaker shall be installed at a place which can prevent damage or electric shock accident by connecting to switchboard or distribution board or linking plug-in type socket connector type of earth leakage breaker to an outlet.
4. The earth leakage breaker which only has an exclusive ground fault protection function shall be connected in combination with fuse or circuit breaker that shuts off over-current.

Article 305 (Over-current shut-off device)

An employer shall install over-current shut-off device[referring to (breaker · fuse or protective relay, and its subsequent transformer. Hereinafter, the same shall apply)] to prevent hazard from over-current[(referring to current exceeding rated current short-circuit accident current, ground fault accident current. Hereinafter, the same shall apply)] falling under any of the following subparagraphs method.

1. An employer shall connect over-current shut-off device to electric pathway, not ground wire in a series structure and make it automatically shut off electric pathway in the event of occurrence of over-current.
2. Breaker · fuse shall have capacity enough to shut off maximum over-current occurred in the system.
3. An employer shall make over-current shut-off device collaborate shut off over-current effectively in the electric system.

Article 306 (Welding rod holder)

An employer an employer shall ensure the insulation strength and thermal-resistance in reference to welding rod holder used for arc welding(excluding automatic welding) work which shall at least satisfy the criteria referred to in Korean Standard pursuant to the 「Industrial Standardization Act」.

Article 307 (Open/close of disconnecting switch)

In cases where an employer opens or closes a circuit for high pressure or extra-high voltage disconnecting switch or line switch(Hereinafter "Disconnecting switch, etc) which cannot shut off load current, he shall install a sign board that

says the electric pathway is non-loaded to prevent disconnecting switch from wrong manipulation: Provided that it shall be otherwise if it is deemed impossible to close or open the circuit unless electric pathway to its disconnecting switch is non-loaded.

Article 308 (Emergency power source)

① If it is deemed to cause unexpected suspended of machinery and equipment due to power failure as a result of fire · explosion, an employer shall supply such machinery · equipment with emergency power source.

② Emergency power source capacity shall be operated depending upon connected load as necessary.

Article 309 (Hazard prevention from temporary electric lamp, etc)

① An employer shall attach a protection net for the prevention of hazard from electric shock and light bulb damage caused by contacting portable cable of a fabricated hanging electric lamp connected to wiring or portable cable of a temporary electric lamp or temporary construction.

② In cases of installing a protection pursuant to paragraph (1), an employer shall observe the matters in the following subparagraphs:

1. It shall be made up of a structure where workers hardly contact protruded metal part of a light bulb.
2. Material shall not be easily damaged or deformed.

Article 310 (Safety measures concerning electric machine · apparatus control, etc)

① An employer shall secure 70cm or more wide work space from electric machine · apparatus where he checks or repairs manipulation or control unit of electric unit · apparatus to work safely: Provided that it shall be otherwise in cases where an employer allows workers to put on personal protective equipment for insulation due to difficulty of securing work space.

② An employer shall provide workers with working clothes with flame-proof or flame resistance capacity in cases where he makes workers engaged in high pressure of charge electric pathway work which might cause burn from electric spark or arc.

Article 311 (Electric machine · apparatus selection, etc used for explosion classified area)

① an employer shall select and use explosive proof structure electric machine · apparatus with suitable explosive proof capacity to its vapor, gas or dust referred to as the criteria in Korean Standard pursuant to the 「Industrial Standardization Act」 In cases where using electric machine · apparatus in gas explosion classified area or dust explosion classified area referred to in Article 230 (1).

② An employer shall maintain · manage explosive proof structure electric machine · apparatus referred to paragraph (1) so that it can exert its upmost capacity all the time.

Article 312 (Transformer room, etc position)

An employer shall not install transformer room, switchboard room, control room, other similar facilities(Hereinafter referred to as "transformer room, etc) in a gas explosion classified area or a dust explosion classified area referred to in Article 230 (1): Provided that it shall be otherwise in cases where an employer keeps indoor atmospheric pressure of a transformer room pressurized (referring to 25 pascal or more pressure. Hereinafter, the same shall apply) all the time, take measures falling under any of the following subparagraphs, or installs or uses electric machine · apparatus equipped with suitable explosive proof capacity in a transformer room at a gas explosion classified area or dust explosion classified area.

1. Where an employer sets up an alarm in cases that it fails to pressurize due to mal-function of ventilation equipment to maintain pressurization.
2. Where an employer places a gas detector that can confirm whether any gas remains in a transformer room after it is reoperated after ventilation equipment operation is stopped.
3. Where an employer shall take measures to supply air blown into a transformer room by a ventilation equipment from somewhere else other than a gas explosion classified area or a dust explosion classified area referred to in Article 230 (1).

SECTION 2 HAZARD PREVENTION CONCERNING WIRING AND PORTABLE CABLE

Article 313 (Wiring, etc insulation coating, etc)

① An employer shall take necessary measures to prevent workers from hazard from electric shock caused by damaged or old-aged insulation coating of wiring or portable cable which might cause workers to contact in the course of carrying out work or passing by.

② An employer shall use coating or adequate connection tools have enough cable insulation capacity when linking cables.

Article 314 (Portable cables at a moist place)

If it is deemed to cause the worker to contact portable cable or its auxiliary connection tools(Hereinafter and in Article 315 referred to as "Portable cable, etc") while working or passing by at a moist place with high conductible liquid such as water, an employer shall use them with enough insulation effect.

Article 315 (Prohibition of using cables on a passage floor, etc)

An employer shall not install a cable or a portable cable, etc on a passage floor: Provided that it shall be otherwise if it is not deemed to for vehicles or other object to cause damage to cable insulation coating.

Article 316 (Matters to be observed in cases of installing or using a plug-in type socket connector)

In cases of installing or using plug-in type socket connector, an employer shall observe the matters in the following subparagraphs:

1. Different voltage of plug-in type socket connectors shall not be linked together.
2. A plug-in type socket connector used for moist place shall be a water-proof one.
3. Workers shall keep wet hand off the plug-in type socket connector when handling it
4. In cases where there is a locking device at a plug-in type socket connector, be sure to use it after locking it.

Article 317 (Electric work concerning mobile and portable equipment, etc)

① An employer shall take measures falling under any of the following subparagraphs during travel or operating portable equipment:

1. To keep conductible tools · equipment that workers put on or handle from touching the exposure live part.
2. To prevent workers from using conductible quality ladder in cases of using a ladder near exposure live part.
3. To prevent workers from plugging or removing the cord of electric unit · apparatus with wet hands.
4. In cases where workers opens, transforms or inserts an electric circuit, they shall use a switch or a breaker specifically designed for electric shut off.
5. Not to insert an over-current shut-off device again till electric circuit or electric unit · apparatus is proved to be safe by an over-current shut-off device of a breaker, etc even after it is automatically shut off.

② Workers shall fulfill the duties designated by an employer pursuant to paragraph (1).

SECTION 3 HAZARD PREVENTION OF ELECTRIC WORK

Article 318 (Restriction of electric worker's qualification)

In cases where workers operate works(Hereinafter "electric work) in reference to installation · dismantlement · maintenance · checkup(limited to confirming and checking effectiveness of equipment using tools) of the electric shock risk electric unit · apparatus or electric pathway(Hereinafter and in Article 319, it shall be referred to as "electric equipment), an employer shall have worker having qualification · license · experience or skill(Hereinafter "a qualifier") under Article 3, 「Local Rule on Restriction of Employment to Harmful Hazardous Work」 operate this type of work.

Article 319 (Electric work concerning power failure electric pathway)

① An employer shall shut off electric pathway if it is deemed to cause electric shock to workers by working at an exposure live part or its nearby: Provided that it shall be otherwise if it falls under any of the following subparagraphs.

1. Where hazard of an accident increases due to interruption of life sustenance device, emergency alarm system, ventilation equipment in an explosion classified area, emergency lighting equipment, etc device · equipment operation
2. Where it is deemed impossible to shut off electric pathway due to restriction on design or operation of the equipment

3. Where it is confirmed that there is no burn, fire · explosion risk caused by electric shock, arc.

② Electric pathway shut off referred to paragraph (1) shall be performed pursuant to the procedures falling under any of the following subparagraphs.

1. To confirm all power supplied to electric equipment using a blueprint or a wiring diagram
2. To open and confirm each disconnecting switch after shutting off power.
3. To attach a locking device and name tag onto a shut-off device or disconnecting switch.
4. To completely discharge remanent charge from the electric equipment before contacting that could cause electric hazard to workers due to accumulation of induced voltage or electric energy at an open-circuit electric pathway.
5. To confirm whether the equipment is charged using a voltage detector.
6. To ground it using a earthing and short circuiting equipment having enough capacity electric if it is deemed for the equipment to cause voltage due to contact other exposure live part, reverse power transmission by induced or reserved power source.

③ In cases where an employer supplies power in the course of carrying out work or after finishing work referred to in each subparagraph of paragraph (1), he shall observe the matters in the following subparagraphs so that the workers concerned or the workers who might contact power-failed electric equipment, etc(limited to an anchored installation):

1. To remove working tools, earthing and short circuiting equipment and confirm whether electric equipment safely applies an electric current
2. To confirm whether all workers are kept off from electric equipment where the work is finished.
3. To confirm that the worker who installs a locking device and a name tag directly tears it down.
4. To turn on the power of the electric equipment after checking all mal-functions.

Article 320 (Electric work near power failure electric pathway)

An employer shall confirm whether the measures under Article 319 (2) 3 have been taken in cases where workers operate the work at a power failure electric pathway or its nearby or power-failed electric equipment which might cause

electric hazard(limited to an anchored installation).

Article 321 (Electric work on a charge electric pathway)

① An employer shall take measures falling under any of the following subparagraphs in cases where workers handles charge electric pathway or works its nearby:

1. He shall take measures referred to in Article 319 in the case of power failure of a charge electric pathway.
2. In cases of protection, shielding or insulation, etc measures of a charge electric pathway, worker's body shall be kept off from direct contacting electric pathway and indirect contacting conductible material, tools or equipment.
3. He shall have workers engaged in handling charge electric pathway put on a suitable personal protective equipment for insulation.
4. In cases where an employer operates electric work at a nearby site to the charge electric pathway, he shall install suitable insulation isolator for the voltage: Provided that in cases of low-voltage, electric workers shall put on personal protective equipment for insulation, however, an employer might not install insulation isolator in cases where it is deemed to have no concern over contacting charge electric pathway.
5. Workers who operate electric work at a high pressure and extra-high voltage electric pathway shall be made to use apparatus and device for live wire work.
6. Workers who operate insulation isolator installation · dismantlement work shall be made to put on personal protective equipment for insulation or apparatus and device for live wire work.
7. Workers, not a qualifier, shall be kept distance away from a charge electric pathway where they work at a high elevation of charge electric pathway without worker's body or long conductible object being protected. Its distance shall be within 300cm in cases where voltage to ground is less than 50kilo volts, with its distance estimated by adding 10cm per each additional 10kilobolts, in cases where voltage to ground exceeds 50kilobolts 10kilobolts.
8. In cases where a qualifier works at a charge electric pathway, if otherwise specified in the following items, he shall be kept off an exposure live part from electric conductor without insulation strap as well as closer to the distance within access limit falling under the following table.
   A. Where workers have insulation from exposure live part or put on suitable

insulation gloves for the voltage.

B. Where exposure live part is insulated from electric conductor having other potential or workers.

C. Where workers are insulated from all electric conductors having other potential.

Line voltage for charge electric pathway (Unit: kilobolt)	Minimum approach distance for charge electric pathway (Unit: centimeter)
Less than 0.3	30
0.3 to 0.75	45
0.75 to 2	60
2 to 15	90
15 to 37	110
37 to 121	130
121 to 145	150
145 to 169	170
169to 242	230
242 to 362	380
362 to 550	550
550 to 800	790

② If it is deemed necessary to stop or restrict to access to a live part without insulation or its neighboring worker, an employer shall install stockade and enable workers to easily identify it: Provided that if it is deemed to contact electricity, he shall not use conductible rigid metal stockade, or he shall not install it within a minimum approach distance in Table referred to paragraph (1).

③ An employer shall place a guardian to warn hazard in advance to prevent workers from electric shock risk if it is deemed difficult to take measures under paragraph (2).

Article 322 (Vehicle · mechanism work near charge electric pathway)

① In cases where an employer operates vehicles, mechanism, etc(Hereinafter referred to as "Traction lamp) near charge electric pathway, he shall keep traction lamp 300cm or more distant from a live part of charge electric pathway. In cases where voltage to ground exceeds 50kilobolts, another 10cm of separation distance (Hereinafter referred to as "separation distance") shall be increased per every 10kilobolts: Provided that in cases where an employer lowers traction lamp height and transfers it, separation distance might be adjusted

to 120cm or more (in cases where voltage to ground exceeds 50kilobolts, another 10cm of separation distance shall be increased per every 10kilobolts).

② Notwithstanding paragraph (1), in cases where insulation isolator suitable for voltage of a charge electric pathway is installed, separation distance might move up to insulation isolator. In cases where traction lamp's processed boom bucket or end is insulated suitably for the voltage of a charge electric pathway and a qualifier operates the work, the distance between uninsulated part of the boom and charge electric pathway might extend to minimum approach distance in Table of Article 321 (1).

③ An employer, if otherwise specified as follows, shall install stockade or place a guardian to prevent workers from contacting any part of traction lamp.

1. In cases where workers put on or use personal protective equipment for insulation suitable for the voltage under Article 323 (1)
2. In cases where uninsulated part of traction lamp is prevent from getting access to minimum approach distance under the Table of Article 321 (1)

④ An employer shall prevent workers on the ground from contacting contact ground point in cases where grounded traction lamp might contact charge electric pathway.

Article 323 (Personal protective equipment for insulation, etc)

① An employer shall have workers apply personal protective equipment for insulation, insulation isolator, live wire work apparatus, live wire work device(Hereinafter referred to as "Personal protective equipment for insulation, etc") falling under any of the following subparagraphs per type · quality and dimension depending upon its purpose of use.

1. Electric work at an enclosure referred to in Article 301 (2)
2. Electric work using a mobile and portable equipment referred to in Article 317
3. Power failure electric pathway or its nearby electric work referred to in Article 319 and Article 320.
4. Electric work on a charge electric pathway referred to in Article 321.
5. Vehicle · mechanism, etc work near charge electric pathway referred to in Article 322

② An employer shall regularly confirm whether a personal protective equipment for insulation maintains its safe capacity.

③ An employer shall take an immediate follow-up action in cases where workers

find defect · fissure · damage, other damage in a personal protective equipment for insulation and asks for maintenance or exchange.

Article 324 (Exceptions for application)

The provisions of referred to in Article 38 (1) 5, Article 301 through 310 and Article 313 through 323 shall not apply to electric unit · apparatus · wiring or portable cable whose voltage to ground is 30 bolts or less.

SECTION 4 PREVENTION OF HAZARD FROM ELECTROSTATIC AND ELECTROMAGNETIC WAVE

Article 325 (Prevention of fire explosion due to electrostatic)

① In cases where an employer uses equipment falling under any of the following subparagraphs, he shall take necessary measures to prevent or remove occurrence of electrostatic by installing earthing to the equipment that is deemed to cause fire or explosion due to electrostatic, or applying conductible material or utilizing a remover free from humidification and source of ignition.

1. Equipment that injects hazardous substance into tank lorry and drum.
2. Equipment that stores hazardous substance such as a tank lorry and drum.
3. Equipment that manufactures · stores · handles or applies paint and garnish and adhesive using flammable liquid.
4. Machinery or its auxiliary installations what dries hazardous substance.
5. Equipment that stores or handles flammable solid.
6. Equipment that uses flammable organic solvent such as dry cleaning equipment, dying equipment or fur-washing equipment.
7. Equipment that sprays or carries flammable liquid or flammable solid using oil pressure, compressed air or high potential electrostatic, etc
8. Equipment that carries or stores · handles high pressure gas.
9. Equipment that manufactures explosives.
10. Blasting machine used for explosives loaded at a blaster(excluding the cases where water is used to protect blaster or where a tunnel blasting is used)

② An employer shall take necessary measures to prevent human body from fire or explosion risk due to electrification electrostatic by having them put on electrostatic electrification protection safety shoes, antistatic garment use electrostatic antistatic tools or make preparations for conductible on a workshop

floor.

③ Paragraph (1) and (2) shall apply mutatis mutandis to the cases that are deemed necessary to take measures against potential electric shock from electrostatic during production process.

Article 326 (Lighting protection equipment installation)

① An employer shall install lighting protection equipment to prevent equipment storing and handling explosives or hazardous substance from industrial accident from lightning.

② An employer shall apply suitable lighting protection equipment referred to in Korean Standard pursuant to the 「Industrial Standardization Act」 In cases where installing lighting protection equipment pursuant to paragraph (1).

Article 327(Prevention of mal-function of machinery · equipment in reference to electromagnetic wave)

If it is deemed that electromagnetic wave created by electric machine · apparatus might cause machinery · equipment mal-function and industrial accident thereto, an employer shall take measures falling under any of the following subparagraphs:

1. Where the size of electromagnetic wave produced by electric unit · apparatus shall not disturb the operation of machinery · equipment as originally planned.
2. Where machinery · equipment shall have adequate level of electromagnetic susceptibility immunity in order to be operated as originally planned, or taking measures against similar electromagnetic wave shielding.

CHAPTER 4 HAZARD PREVENTION CONCERNING CONSTRUCTION WORK

SECTION 1 FORM TIMBERING AND FORM

SUB-SECTION 1 MATERIAL, ETC

Article 328 (Material)

An employer shall not use transformed · corroded or seriously damaged material for that of form timbering and form(Hereinafter in this chapter "form timbering, etc").

Article 329 (Guidelines on use of steel)

An employer shall use steel such as main part for timbering · yoke that satisfies criteria under Table 10.

Article 330 (Structure of a form timbering)

An employer shall use solid structure of form timbering depending upon form shape and concrete cast method, etc.

SUB-SECTION 2 ASSEMBLY, ETC

Article 331 (assembly drawing)

① An employer shall review structure of form timbering prior to assembly, make an assembly drawing, and start assembly according to its assembly drawing.

② Assembly drawing referred to paragraph (1) shall describe the matters regarding member quality · sectional standard · installation gap and joint method of timbering · yoke.

Article 332 (Safety measures such as form timbering)

In the event of assembling a form timbering, an employer shall observe the matters in the following subparagraphs:

1. An employer shall take necessary measures to prevent timbering settlement such as base plate use, concrete cast, piling
2. An employer shall install rigid pedestal to withhold upper load in cases where

he installs timbering at an upper opening

3. An employer shall takes measures to prevent timbering from moving upward/downward and slipping and maintain load support
4. An employer shall confirm that timbering joint has the same quality of material as that of butt joint or tenon joint
5. An employer shall confirm that steel, steel connector and intersection are solidly connected using an exclusive steel for bolt · clamp
6. An employer shall take necessary measures to prevent hazard from its form up lift by attaching angle brace to a form if the form is curved
7. An employer shall follow the matters falling under the following items regarding steel tube [excluding pipe support] used for timbering
   A. An employer shall make horizontal connect steels in two directions every 2 meters in height and prevent horizontal connect steel from displacement
   B. An employer shall anchor a yoke by attaching a single board of steel on top when raising a yoke on top
8. An employer shall follow the matters falling under the following items with regard to pipe support used for timbering
   A. Do not use more than three pipe supports
   B. An employer shall extend a steel pipe support using more than 4 bolts or xclusive
   C. In cases where height exceeds 3.5m, an employer shall take measures under item 7, subparagraph 7
9. An employer shall follow the matters falling under the following items with regard to steel tube frame used for timbering
   A. To install a cross bracing between a steel tube frame and a steel tube frame
   B. Every top floor and 5th floor, install horizontal connect steel and prevent horizontal connect steel from displacement in the direction of section and frame phase of a form timbering and cross bracing
   C. Every top floor and 5th floor, install wale from the direction of frame phase of a form timbering to the direction of cross bracing per every end and 5 frames
   D. An employer shall takes measures under item B, subparagraph 7
10. An employer shall follow the matters regarding assembly steel ball used for

timbering falling under the following items regarding timbering

A. An employer shall take measures under item B, subparagraph 7
B. In cases where height exceeds 4m, horizontal connect steel shall be installed in two directions every 4 meters or less and prevent horizontal connect steel from displacement

11. An employer shall install system timbering(referring to timbering type supported by form while assembling members such as standardized · prefabricated vertical member, horizontal member and bracing member) in the same way under the following items:
    A. To install horizontal member at a right angle with a vertical member solidly without being shaken
    B. To connect vertical member solidly using a connect steel, without causing breakaway or bending of the connect part
    C. Installs bracing member at a vertical member and a horizontal member solidly so that it can prevent main body of timbering from displacement by vertical and horizontal load
    D. Vertical member and base plate of top and bottom of timbering shall be installed in contact and overlap length of connecting piece for vertical member and base plate hall be not less than one third of a total length of base plate
12. An employer shall follow the matters falling under the following items with regard to timbering wood
    A. An employer shall take measures under item A of subparagraph 7
    B. In cases where an employer uses wood in succession, two or more embedded wood shall be placed and 4 or more places shall be solidly bound by anchoring its top to beam or yoke
13. An employer shall follow the matters falling under the following items in cases where it consists of beam:
    A. To fix both ends of beam with support and prevent beam from slipping and breakaway
    B. To install horizontal connect steel between beam and beam solidly enough not to fall
14. An employer shall install solid structured form tier, angle brace or buttress with which the form can stand concrete load or other external force, or trip during form assembly.

Article 333 (Assembly form timbering stair shape)

An employer shall observe the matters in the following subparagraphs under Article 332 with regard to form timbering assembled as a stair shape by inserting planking and base plate.

1. Unless except for the unavoidable occasions referred to in form shape, 2-stage or more planking · base plate shall not be embedded
2. In cases where planking · base plate are used in succession, its planking · base plate shall be solidly connected
3. Upper structure and substructure of timbering shall be solidly connected to be positioned at a identical line by anchoring planking · base plate

Article 334 (Concrete cast work)

In cases of concrete cast work, an employer shall observe the matters in the following subparagraphs:

1. An employer shall check deformation · displacement and natural ground settlement of form timbering, etc prior to beginning to daily work, if any abnormality is found, it shall be repaired.
2. An employer shall place a surveillant to monitor deformation · displacement and settlement of form timbering, etc in the course of carrying out work, if any abnormality is found, work should be stopped and the workers should be evacuated.
3. An employer shall reinforce the form in cases where it is deemed for the form to collapse in the event of concrete cast work.
4. An employer shall observe concrete curing time in an engineering drawing and dismantle form timbering.
5. An employer shall cast concrete evenly without creating partial disposition.

Article 335 (Matters to be observed when using a concrete pump)

In cases of operating concrete pump or concrete pump car for a concrete cast, an employer shall observe the matters in the following subparagraphs:

1. Before starting to work, an employer shall check scaffolding for concrete pump and repair any problems if found.
2. An employer shall take necessary measures to prevent workers from fall accident which might be caused by hose jolting · slewing on a building guard rail

by building safety guard rail installation.

3. An employer shall take adequate measures to prevent hazard from neighboring cables, etc in cases of adjusting boom of a concrete pump car
4. If it is deemed for a concrete pump car to cause to fall due to natural ground settlement, outrigger damage, etc in the course of carrying out work, an employer shall take adequate measures to prevent it therewidth.

Article 336 (Matters to be observed for assembly work)

① in the event of assembling or dismantling column · beam · wall · slab, etc form timbering, an employer shall observe the matters in the following subparagraphs:

1. To prevent unauthorized worker from entering working area.
2. To stop doing further work in cases where the weather is bad due to rain, snow, other climatic instability.
3. In cases where worker raise or lower material, apparatus or tools, an employer shall have them use a hanger line, a hanging plate, etc.
4. An employer shall install support wood and have workers do the work after hanging form timbering to lifting equipment to prevent incidental accident from falling · shock.

② In cases of steel reinforcement assembly, etc work, an employer shall observe the matters in the following subparagraphs:

1. In cases where an employer transports steel reinforcement using a lifting machinery, two or more places shall be tied and transferred horizontally.
2. In cases where work position height is 2 meters or more, an employer shall install a work plate or have workers put on safety harness to prevent hazard.

Article 337 (Safety measures concerning single unit work plate form)

① "Single unit work plate form" is a form where its form and work plate is manufactured in a single unit for the purpose of operating form installation · dismantlement, steel reinforcement assembly, concrete cast, concrete phase processing work falling under any of the following subparagraphs form.

1. Gang form.
2. Slip form.
3. Climbing form.
4. Tunnel lining form.
5. A form combining other form and work plate in a single unit.

② In cases of operation of gang form assembly · transfer · lifting · dismantlement(Hereinafter referred to as "Assembly, etc") under paragraph (1) 1, an employer shall observe the matters in the following subparagraphs:

1. To remind the workers concerned of range and procedure in reference to assembly in advance
2. To install transfer port where workers can enter work plate of a gang form safely inside a structure
3. To check mal-function of supporting or fastening metal of a gang form, if any abnormality is found, it shall be replaced
4. To start operating the work after hanging a gang form on a lifting equipment, and to make sure no supporting or fastening metal shall be dismantled prior to suspending it onto a lifting equipment in the event of assembly or dismantlement of gang form.
5. To make sure that no lifting work shall be operated while a worker is on board a work place cage in cases of lifting a gang form.

③ In cases of operation of assembly referred to in paragraph (1) 2 through 5, an employer shall observe the matters in the following subparagraphs:

1. To confirm whether there is any deformation in a form member and mal-function for connect and supporter during assembly, etc.
2. To take necessary measures to prevent workers from access to a place which could cause hazard to workers by malfunction · wrong manipulation of transfer · lifting · transportation equipment involved with assembly, etc.
3. To take necessary measures to observe curing time for concrete and solidly support a form to the concrete under engineering drawing in cases where it is deemed to cause hazard to workers by breakaway or falling of the form as a result of concrete hardness and form weight, wind pressure, etc when supported by a form concrete.
4. To take necessary measures to prevent falling · collapse · tripping by operating the work while hanging a form onto a lifting equipment in cases where workers working on assembly, etc of a member assembled with a connecting or supporting type.

SECTION 2 EXCAVATION, ETC HAZARD PREVENTION

SUB-SECTION 1 OPEN CUT EXCAVATION

CLAUSE 1 CUTTING SURFACE TILT, ETC

Article 338 (Hazard prevention concerning natural ground excavation)

① In cases where an employer excavates natural ground, he shall satisfy the cutting surface tilt in Table 11: Provided that it shall be otherwise if measures are taken to prevent tilting side from collapse such as sheating:

② In cases where it is difficult to calculate tilt due to difference of cutting surface tilt referred to paragraph (1), an employer shall maintain each title under the conditions prescribed by Table 11 regarding cutting surface not to increase collapse risk.

Article 339 (Prevention of earth rock collapse risk)

An employer shall have a supervisor check work place and its neighboring fragmented rock · fissure existence, contained water spring and freezing state change before starting to work to prevent workers from hazard caused by natural ground collapse or earth rock falling referred to in Article 14 (1) in the event of excavation.

Article 340 (Prevention of natural ground collapse hazard)

① In cases where it is deemed to cause hazard to workers by natural ground collapse or earth rock falling, an employer shall take necessary measures to prevent hazard by taking actions such as installing sheating timbering or protection net, or preventing workers from access.

② An employer shall take necessary measures to prevent collapse accident caused by rainwater infiltration by covering vinyl acetate around excavation slope or installing side gutter in cases of rain.

Article 341 (Prevention concerning damage to buried structure hazard)

① An employer shall take necessary measures such as reinforcing or transferring the structure to prevent workers from hazard caused by damage to temporary installations in cases where he excavates at a place neighboring to buried

structure · masonry wall · concrete wall or retaining wall.

② An employer shall take necessary measures to protect or transfer buried structure if it is deemed to cause damage to workers by buried structure exposed by excavation.

③ An employer shall have the supervisor referred to in Article 14 (1) of the Act supervise protective work regarding buried structure under paragraph (2) etc.

Article 342 (Prohibition of using an excavator, etc)

An employer shall not use excavator · loading machine and transporting machine, etc if it is deemed for gas pipe, underground electric cable, other underground structure to cause hazard to workers to use them.

Article 343 (Reminding of routing, etc)

An employer shall remind the workers concerned of routing and entering earth rock loading area as well as transporting machine, excavator and loading machine(Hereinafter and in this Article 344, "Transporting machine, etc").

Article 344 (Guidance on transporting machine)

① An employer shall have a guardian guide transporting machine in cases where transporting machine, during excavation, might access or fall down to worker's workplace.

② An operator of a transporting machine shall follow a guardian's guidance.

CLAUSE 2 SHEATING TIMBERING

Article 345 (Sheating timbering material)

An employer shall not use deformed · corroded seriously damaged sheating timbering material.

Article 346 (Assembly drawing)

① An employer shall assemble sheating timbering according to its assembly drawing after making an assembly drawing in advance.

② The assembly drawing referred to paragraph (1) shall include sheating placement · dimension · quality and installation method and order of a member such as plate · pile · angle brace and wale.

Article 347(Collapse, etc hazard prevention)

① In cases where sheating timbering is installed, an employer shall regularly check the matters falling under any of the following subparagraphs, repair it immediately, if any abnormality is found.

1. Existence and state of member damage · deformation · corrosion · displacement and breakaway.
2. The degree of angle brace microvolts.
3. State of member connector · attachment part and intersection.
4. State of settlement.

② An employer shall take immediate measures by reinforcing in cases where he finds any problems including increase of earth pressure as a result of analysis of instrumentation referred to in the engineering drawing other than check up under paragraph (1).

SUB-SECTION 2 BLASTING WORK HAZARD PREVENTION

Article 348 (Work standard for blasting)

An employer shall have blasting the workers concerned observe the matters falling under any of the following subparagraphs:

1. Do not melt frozen dynamite by directly approximating it to fire or other hot material.
2. Do not use fire or smoke while loading gunpowder or explosive.
3. Use a safe charger free from explosion risk caused by friction · shock · electrostatic, etc.
4. Fill a blaster with such material that has no ignitable or flammable risk such as clay · sand.
5. In cases where explosives loaded after ignition fail to explode or it is difficult to confirm whether it fails to explode or not, follow the matters falling under the following items.
   A. In cases of electric detonator, take measures against reignition by taking blasting wire off from source of ignition with its end short-circuiting and do not get access to explosive loading area within 5 minutes thereafter.
   B. In cases of other than electric detonator, do not get access to explosive

loading area within 15 minutes thereafter since ignition.

6. An employer shall measure resistance and take a continuity test, before ignition, with a cable at a place 30 meters or more away from explosive loading area in the case of blasting by electric detonator

Article 349 (Suspension of work and evacuation)

① An employer should stop further work relating loading gunpowder or explosive and evacuate workers to a safe place if it is likely that lightning strikes.

② An employer shall install an evacuation place that solidly protects front and upper part if it is deemed impossible to evacuate workers to a safe place during blasting work.

SUB-SECTION 3 TUNNEL WORK

CLAUSE 1 INVESTIGATION, ETC

Article 350 (Measurement of flammable gas concentration, etc)

① An employer shall designate a person who is in charge of measuring flammable gas concentration to prevent explosion or fire and have him measure its flammable gas concentration before starting to work, in cases where flammable gas occurs in the course of construction work such as tunnel construction, etc.

② In cases where an employer confirms that as a result of assessment pursuant to paragraph (1), flammable gas might cause explosion or fire, he shall install an automatic alarm device at its place to find out abnormal increase of flammable gas concentration earlier.

③ An employer who operates underground railway construction shall install an automatic alarm device such as a connector at a place where needed and make a regular route check up with urban gas business referred to in「Urban Gas Business Act」.

④ An employer check the matters regarding automatic alarm device referred to in paragraph (2) and (3) falling under any of the following subparagraphs: before starting to work and repair it immediately, if any abnormality is found.

1. Instrumental mal-function
2. Mal-function for detection part

3. Operation status for an alarm device

CLAUSE 2 PREVENTION OF ROCK FALLING HAZARD

Article 351 (Prevention of rock falling hazard)

An employer shall take necessary measures such as tunnel timbering and lock bolt installation, fragmented rock removal, etc to prevent hazard to workers caused by rock falling during construction work of a tunnel, etc.

Article 352 (Prevention of hazard of natural ground collapse near exit, etc)

An employer shall take necessary measures such as installing sheating timbering or protection net to prevent hazard to workers caused by natural ground collapse or earth rock falling tunnel, etc near exit if it is deemed to cause hazard to workers during construction work of a tunnel, etc.

Article 353 (Visibility maintenance)

An employer shall take necessary measures to maintain visibility such as ventilation or spraying water in cases where tunnel inner visibility is significantly restricted due to ventilation gas or dust during tunnel construction work.

Article 354 (Excavator prohibition of use, etc)

The provisions of Article 342 through 344 shall apply mutatis mutandis to the tunnel construction work.

Article 355 (Gas removal, etc measures concerning)

An employer shall take necessary measures such as prevention of gas removal through boring and other flammable gas effusion of its flammable gas in cases where flammable gas might be effused during tunnel excavation, etc

Article 356 (Measures concerning welding, etc)

An employer shall take measures falling under any of the following subparagraphs to prevent interior work of metal welding · gas cutting or heating from a fire during tunnel construction work:

1. To remove neighboring rags, chips of wood, wastepaper, other flammable liquid, put incombustible substance cover on its flammable liquid, or install partition

wall to prevent fire-flakes from scattering.
2. To remind the workers concerned of how and where to install a fire extinguisher system.
3. To confirm whether there is any chance of fire outbreak due to fire-flakes after finishing the.

Article 357 (Prevention of carrying Ignition material)

An employer shall prevent workers from carrying fire, match, lighter, other ignition hazardous substance inside a tunnel and place its notice where it is easily noticeable except for the unavoidable occasions tunnel interior.

Article 358 (Designation of fire-prevention supervisor, etc)

An employer shall designate a fire-prevention supervisor for tunnel construction work at a place where inner fire or arc is used inside its tunnel and have him carry out the duties falling under any of the following subparagraphs: Provided that it shall be otherwise in the case of the workplace where measures under Article 356 are taken.

1. To monitor fire or arc use and take immediate measures as necessary where problems are found.
2. To check if there is any remaining fire residue.

Article 359 (Fire extinguisher system, etc)

An employer shall install a fire extinguisher system at a place for installing switchboard, a transformer, or a breaker or at a place where fire or arc is used inside a tunnel during tunnel construction work.

Article 360 (Suspension of work, etc)

① An employer shall stop the work and make the worker evacuate to a safe place in emergent cases where industrial accident might happen due to falling · water eruption during tunnel construction work rock.

② An employer shall install communication equipment such as an emergency bell to report an accident outbreak hazard referred to in paragraph (1) to the workers concerned without delay and let the workers know where it is located.

CLAUSE 3 TUNNEL TIMBERING

Article 361 (Tunnel timbering material)

An employer An employer shall not use deformed · corroded seriously damaged tunnel timbering material.

Article 362 (Tunnel timbering structure)

An employer shall use solid structured tunnel timbering corresponding to state of geological features · stratum · contained water · spring · fissure and corrosion and its excavation method in connection with natural ground of tunnel timbering installation site.

Article 363 (Assembly drawing)

① An employer shall assemble tunnel timbering according to its assembly drawing after making an assembly drawing in advance.

② The assembly drawing referred to paragraph (1) shall include material quality, sectional standard, installation gap and joint method, etc.

Article 364 (Measures concerning assembly or change)

An employer shall take measures against the matters falling under any of the following subparagraphs in cases where he assembles or changes tunnel timbering:

1. To place one set of member consisting of principal member on the same plane.
2. To keep wood tunnel timbering holding even level of microvolts for each member of its tunnel timbering.
3. To apply bridging to prevent column from settlement.
4. To follow the matters falling under the following items in the case of assembly of steel arched timbering.
   A. To apply provisions of assembly drawing to assembly gap.
   B. To take necessary measures to enable principal member have enough arch reaction by fixing wedges, etc.
   C. To connect principal members using connect bolt and wale.
   D. To install a pedestal around a tunnel ext.
   E. To install planks if it is deemed for falling objects to cause hazard to workers.

5. To shall follow the matters falling under the following items regarding wood support type of timbering.
   A. To anchor a principal column onto a natural ground using wedges to prevent it from displacement.
   B. To install pedestals on both ends.
   C. To install pedestals at other places other than both ends if it is deemed for wood support type of timbering to trip or get distorted due to vertical direction load to the timbering while creating jamming.
   D. To anchor a member connector with a clamp, etc.
6. To install pedestal at around tunnel exit in the cases of tunnel timbering other than steel arched timbering and wood support type of timbering.

Article 365 (Member dismantlement)

An employer shall dismantle a member after taking measures to transfer the load to the member to tunnel form timbering in cases where he dismantles a tunnel timbering member which is load.

Article 366 (Prevention of collapse)

In cases where tunnel timbering is installed, an employer regularly check the matters falling under any of the following subparagraphs, reinforce, and repair it immediately, if any abnormality is found.

1. Member damage · deformation · corrosion · displacement breakaway existence and state.
2. The degree of member microvolts.
3. State of member connector and intersection.
4. Column settlement existence and state.

CLAUSE 4 TUNNEL FORM TIMBERING

Article 367 (Tunnel form timbering material)

An employer shall not use deformed · corroded seriously damaged tunnel form timbering material.

Article 368 (Tunnel form timbering structure)

An employer shall use solid structured tunnel form timbering corresponding to

load or form shape taken to a tunnel form timbering.

SUB-SECTION 4 BRIDGE WORK

Article 369 (Matters to be observed at work)

In cases of bridge installation · dismantlement or alternation referred to in Article 388 (1), an employer shall observe the matters in the following subparagraphs.

1. To prevent unauthorized worker from entering working zone
2. In cases where worker raise or lower material, apparatus or tools, he shall have them use a hanger line, a hanging plate, etc
3. In cases where an employer lifts a heavy material member with a crane, etc, he shall solidly place a lifting loop on a member installed, tie a lifting rope to a member more than two places, and keep the hanging rope attached to a heavy material till it is completely lift
4. In cases where material or member falling · tripping or collapse might cause hazard to workers, an employer shall take measures such as beam steel attachment to prevent deformation, placement of a restricted area, material or buckling of a temporary construction facilities.

SUB-SECTION 5 STONE-CUTTING WORK

Article 370 (Prevention of natural ground collapse risk)

An employer shall take measures falling under any of the following subparagraphs for the prevention of hazard to workers caused by natural ground collapse or earth rock falling when operating stone-cutting work.

1. An employer shall designate a supervisor and have him check fragmented rock and fissure existence and state, contained water · spring and freezing state of the neighboring natural ground before starting to work
2. A supervisor shall check its blasting place and its neighboring fragmented rock and fissure existence and state after blasting

Article 371 (Contacting neighboring stone pit)

An employer shall maintain contacting the stone pit to discuss the matters related to blasting time · fragmented rock removal method of the neighboring stone pit to prevent workers from hazard caused by natural ground collapse, earth rock flying

object.

Article 372 (Prevention of hazard caused by collapse)

An employer shall take necessary measures such as removal of earth rock · standing trees or installation of protection net which could cause damage to workers by collapse or falling in the event of stone-cutting work(excluding work at a mine).

Article 373 (Prevention of rock falling hazard)

An employer shall install a timbering or angle brace, create an arched ceiling to prevent hazard to workers caused by rock · earth and sand falling or a side wall collapse in the event of operating stone-cutting work at a mine.

Article 374 (Reminding a routing, etc)

① An employer shall remind the workers concerned of excavator's routing and how to enter earth rock loading area in advance in the event of operating stone-cutting work.

② An employer shall place a guardian or show a sign that says it is under operation to repair the routing or maintain the routing in the event of operation the work referred to paragraph (1).

Article 375 (Guidance on excavator)

① An employer shall have a guardian guide excavating machine in cases where excavating machine, during excavation, might access or fall down to worker's workplace. An employer in the event of operating excavating work.

② The operator of excavation machine shall follow a guardian's guidance.

SUB-SECTION 6 CAISSON WORK, ETC

Article 376 (Prevention of sudden settlement hazard)

In cases of excavating inside a caisson or a pontoon, an employer shall observe the matters in the following subparagraphs for the prevention of hazard caused by caisson or caisson's sudden settlement.

1. To determined excavation method and loading volume in accordance with settlement diagram

2. To keep 1.8 meters or more distance in height from the floor to the ceiling or beam

Article 377 (Work inside a caisson)

① In cases of excavating inside a pontoon, a caisson, vertical mine, other similar structure or equipment(Hereinafter "Caisson, etc"), an employer shall observe the matters in the following subparagraphs.

1. To designate a person and let him measure oxygen concentration if it is deemed to cause lack in oxygen.
2. To install an equipment for a worker to walk up and down freely.
3. To install communication equipment which makes it possible to communicate with workplaces or outside in cases where excavation depth exceeds 20m.

② An employer shall install an equipment to provide air supply as required in cases where the measurement result under paragraph (1) 1 proves lack in oxygen is admitted or excavation depth exceeds 20m.

Article 378 (Prohibition of work)

An employer shall not allow workers to excavate inside a caisson which refers to any of the following cases.

1. In cases of mal-functions of equipment referred to in Article 377 (1) 2 · 3 and paragraph (2) of the same Act.
2. In cases where lots of water might infiltrate in an interior part of a caisson, etc.

SUB-SECTION 7 TEMPORARY CONSTRUCTION ROAD

Article 379 (Temporary construction road)

In cases of installing a temporary construction road, an employer shall observe the matters in the following subparagraphs.

1. Road shall be solidly constructed for equipment and vehicles to safely move in and out
2. A stockade shall be constructed in cases where road and workplace are located each other at a close position.
3. Road shall constructed in a tilted way for drainage or with drainage facilities.
4. Vehicles's speed limit sign shall be posted.

SECTION 3 PREVENTION OF STEEL FRAME WORK HAZARD

Article 380 (Prevention of steel frame assembly hazard)

An employer shall not separate hoisted steel frame from a hanging rope till he completes fastening steel frame joint connection with bolts or its structure becomes solid enough in the event of in the event of steel frame assembly.

Article 381 (Elevator hoistway installation)

An employer shall install a fixed elevator hoistway whose stepping stair gap is less than 30cm for a steel frame member what a worker transfers in the vertical direction and install a work plate at a connected part between steel frame in horizontal direction and steel frame in the vertical direction to do a connect work.

Article 382 (Temporary path installation)

An employer shall install a fixed temporary path at a worker's main transfer port in the event of steel frame work: Provided that it shall be otherwise if it is deemed to be equipped with safety harness adhesive equipment referred to in Article 44.

Article 383 (Restriction on work)

An employer shall stop steel frame work falling under any of the following cases

1. Where wind speed 10 meters or faster per second.
2. Where rainfall is one meter or more per hour.
3. Where snowfall 1cm or more per hour.

SECTION 4 HAZARD PREVENTION CONCERNING DISMANTLEMENT WORK

Article 384 (Suspension of work)

An employer shall stop further dismantling work in cases where the weather is bad due to rain, snow, other climatic instability.

CHAPTER 5 HAZARD PREVENTION CONCERNING HEAVY MATERIAL HANDLING.

Article 385 (Heavy material handling)

An employer shall use unloading and transporting machinery · transportation tools(Hereinafter "Unloading and transporting machinery, etc") in the event of transporting or handling heavy material: Provided that it shall be otherwise if it is deemed to apply unloading and transporting machinery when considering qualities of the work.

Article 386 (Heavy material handling on the tilt)

In cases of handling on-the-tilt drum barrel, etc, an employer shall observe the matters in the following subparagraphs.

1. To adjust heavy material trembling or transfer using heavy ball and roller stopping board, wedge, etc.
2. To prevent workers from entering the section below the tile where heavy material rolls down.

CHAPTER 6 HAZARD PREVENTION CONCERNING CARGO WORKING

SECTION 1 CARGO HANDLING WORK

Article 387 (Prohibition of use of strand-cut fiber rope, etc)

An employer shall not use a fiber rope, etc which refer to any of the following cases as cargo transportation or mounting.

1. One with a cut strand.
2. Seriously damaged or corroded one.

Article 388 (Checkup prior to use, etc)

An employer shall check a fiber rope and immediately replace it in cases where problems are found in the event of handling cargo using a fiber rope.

Article 389 (Prohibition of taking out in the middle of cargo pile)

An employer shall prevent the workers concerned from taking out the cargo in the middle of the cargo pile in cases of unloading cargo out of cargo vehicle.

Article 390 (Guidelines on unloading workplace instruction)

An employer shall take measures falling under any of the following subparagraphs at a place such as wharf · quay where he operates cargo working.

1. To maintain lighting to the workplace and hazardous passage part so that they can operate their work with safety.
2. To keep its width 90cm or more in the event of installing a passage along with a line of wharf or quay.
3. To install a safety guard rail or fence such as sidewalk which overpasses bridge or dock tide lock and is deemed dangerous as a passage and workplace on the ground.

Article 391 (Lower stack gap)

An employer shall keep the gap between lower stack(limited to a pile of cargo packaged in a burlap · a straw bag, etc) whose height is 2 meters or more from the floor and a neighboring lower stack 10cm or more based upon a bottom of a lower stack.

Article 392 (Prevention of lower stack collapse hazard)

① An employer shall take necessary measures such as tying with a rope or hammering lower stack to prevent hazard to workers caused by lower stack collapse or cargo falling.

② To pile up a lower stack on a basis of basic type.

③ To tear down a lower stack in the order of from top to bottom consecutively without taking one out in the middle.

Article 393(Cargo loading)

In cases of loading cargo, an employer shall observe the matters in the following subparagraphs.

1. To load it on top of sturdy basis that is not deemed to settle.
2. To prevent cargo loading from piling up against a partition or a wall unless the partition or the wall of a building has a strong intensity to support cargo pressure.
3. To prevent it from piling up to the unstable height.
4. To prevent one-sided load.

SECTION 2 HARBOR UNLOADING WORK

Article 394 (Pass equipment installation, etc)

An employer shall install an equipment which helps workers to safely pass in the event of handling cargo at a wharf interior where the depth from upper part of a deck to a wharf bottom floor exceeds 1.5m: Provided that it shall be otherwise in cases where such a safe equipment is installed on a ship.

Article 395 (Prevent of acute poisoning substance hazard)

An employer shall check whether there is any acute toxicant in Table 1 in the cargo at a wharf interior, on a deck or quay, etc and set up a rule for a safe handling method and disposal of its leak, if any, prior to beginning harbor unloading.

Article 396 (Bulk cargo handling method)

① An employer shall dismantle its partition and operate the work if it is deemed

for partition to prevent cargo transfer such as shifting board, feeder box, etc to trip or fall causing hazard to workers in cases where he unloads bulk cargo such as wharf inner wheats · beans · corns.

② An employer shall take necessary measures such as preventing workers from access if it is deemed for transfer or trembling during running of its unloading machine to cause hazard to workers in cases where he unloads bulk cargo using an unloading machine such as vacuum inhalation unloader, etc.

Article 397 (Installation of a ship elevating equipment)

① An employer shall install a gangway ladder with its safety net beneath the ladder where workers freely walk up and down in cases where he has workers engaged in cargo working of a 300ton or more ship.

② A gangway ladder referred to in paragraph (1) shall be made up of rigid material whose width shall be 55cm or more, and 82cm or higher stockade shall be installed on both sides, with its floor treated with suitable quality to prevent slipping.

③ A gangway ladder referred to paragraph (1) shall not be used for cargo plate or cargo scaffold board, but be only used for worker's pass.

Article 398 (Prevention of worker transportation by barge hazard)

An employer shall confirm that the barge should not board workers exceeding boarding capacity and the barge should place lifesaving tools to prevent worker from hazard in cases where barge transports workers to a workplace.

Article 399 (Prevention of on-the-water wood · rafting work hazard)

An employer shall have workers put on life vests who work on a wood · log · rafting on the water, while placing a lifesaving ship around.

Article 400 (Bailing cargo handling)

An employer shall not place a hook onto a wire · rope used for its packaging in the event of unloading a bailing cargo using an onboard lifting equipment.

Article 401 (Prohibition of multiple works operation)

An employer shall not allow workers to operate on more than two different floors in a wharf at the same time: Provided that it shall be otherwise in cases where

the equipment to prevent cargo from falling such as arrestor and discharger is installed.

Article 402 (Safety measures concerning unloading work)

① An employer shall transfer onboard lifting equipment in advance at a vertical substructure of a hatch to safety transport cargo in a wharf in the event of onboard lifting using an unloading work.

② In the event of transporting cargo pursuant to paragraph (1), an employer shall use a safe method such as a truck or a snatch block, but he shall not use an unsafe method that directly drags cargo down with a sling rope.

Article 403 (Hook attached sling use)

An employer shall install a hook attached sling equipped with a latch that prevents cargo from slipping off or breakaway using an onboard lifting equipment in the event of drum barrel, etc cargo hoisting work: Provided that it shall be otherwise in the case of a hook directly connected to a cargo if an assistance sling is used when considering qualities of the work.

Article 404 (Prevention of rope breakaway hazard)

An employer shall prevent workers from entering the place which might cause hazard to workers by falling a rope or a pulley in the event of pulling cargo with a rope using onboard lifting equipment.

CHAPTER 7 PREVENTION OF LOGGING WORK HAZARD

Article 405 (Logging work hazard prevention)

① An employer shall observe the matters falling under any of the following subparagraphs in cases where operating a logging work: Provided that it shall be otherwise in case of using oil pressure type of logging machine.

1. An employer shall make preparations for clearway and evacuation shelter in advance in the event of logging.
2. In cases where the breast-high diameter of a tree to log 40cm or more, an employer shall make a ditch whose dept is more than 1 quarter of the diameter of root.

② An employer shall attach a rigid head guard to an oil pressure type of logging machine.

Article 406 (Logging signal, etc)

① An employer shall remind the workers concerned of certain signal method in the case of doing the logging work.

② An employer shall have the logging workers start logging after confirming that other workers evacuate by sending signals referred to paragraph (1) to them in advance if it is deemed to cause hazard to them by logging.

CHAPTER 8 PREVENTION OF RAILWAY WORK HAZARD

SECTION 1 OPERATING TRAIN HAZARD PREVENTION

Article 407 (Train operation guardian's placement, etc)

① In cases where he repairs or checks railway which could cause collision accident due to train operation, he shall place a train operation guardian: Provided that it shall be otherwise in the case of a simple mobile checkup of a route such as a route inspection.

② An employer shall place an exclusive train operation guardian to monitor train operation and give out suitable signal equipment such as loudspeaker · alarm · wireless communication gear to workers to report hazard.

Article 408 (Restriction of work during train pass)

An employer shall extend the gap between train passes enough to make workers evacuate safely in the event of hazard caused by maintenance or checking work related to railway operated by a train(including a neighboring railway) and other related equipment and have workers resume their work after confirming that they safely evacuate the dangerous area.

Article 409 (Train check · repair, etc)

① An employer shall take measures falling under any of the following subparagraphs if it is deemed to cause contact · collision · electric shock or fall accident, etc to workers by a train in cases where he checks · repairs or handles other similar work during train operation.

1. To resume the work after suspending train operation, and make sure to resume operation after confirming that it is not deemed to cause contact hazard to workers by communicating with workers after completion of checkup, etc
2. To take necessary measures to scotch block to prevent train from running
3. To have workers put on personal protective equipment for insulation or take remanent charge discharge measures against exposed train live part
4. To install a work plate or a safety mat around in the event of working on an upper plate of a train

② An employer shall have workers make a regular checkup · maintenance of a train at a designated maintenance garage or at a place such as car storage track

which is not deemed to cause workers to get caught in or collide with a train.

SECTION 2 PREVENTION OF RAILWAY REPAIR AND MAINTENANCE HAZARD

Article 410 (Safety guard rail and stockade installation, etc)

① An employer shall take necessary measures to prevent hazard to workers by installing solid structured safety guard rail or similar equipment or applying safety harness in cases where workers might fall out of a track working vehicle.

② An employer shall take necessary measures to prevent electric shock accident by installing stockade at a place where electric shock might cause hazard such as upper plate of its track working vehicle or insulation isolator at a charge electric pathway in the event of working with a track working vehicle

Article 411 (Prevention of material collapse · falling)

An employer shall take necessary measures to prevent hazard to workers by installing support wood or arrestor or hanging a rope for the prevention of hazard caused by material collapse · falling in the event of transportation · installing · scattering sleepers an pebbles using a track working vehicle.

Article 412 (Prevention of contact)

An employer shall designate a guardian to guardian track working vehicles in cases where operating them, while preventing unauthorized worker from entering working zone or track working vehicles where it is deemed for workers to contact hazard.

Article 413(Preparations for brake, etc)

① An employer shall make preparations for brake to a trolley which exclusively operates railway shall confirm its braking system prior to operation.

② An employer shall apply adequate connect device in the event of connecting traction trolley to track working vehicle.

SECTION 3 HAZARD PREVENTION CONCERNING SHUNTING

Article 414 (Designation of a guardian, etc)

① Shunter operator and a guardian shall communicate and confirm their signals using arms or flags or, light to safely operate, and a linked guardian might help them to confirm the signals that can't be identified with naked eyes: Provided that a linked guard might not be needed in the event of giving out communication tools such as radios with which they can communicate each other clearly.

② An employer shall have a guardian guide the shunter while monitoring worker's fall accident · collision · getting jammed, etc referred to in paragraph (1) in the event of operating shunter, and he shall give out an alarm equipment such as loudspeaker · alarm · wireless communication gear to a guardian that can inform other workers of hazard.

Article 415 (Prevention of fall accident · collision · constriction, etc)

① An employer shall remind workers of that fact that they should not jump up and down during train operation at a shunter work prior to starting operation, and he shall install a plate and a solid and anti-slip strap on a position where workers board.

② An employer shall prevent other trains from running into a shunter operation route which might cause an operating train and a worker to collide each other: Provided that it shall be otherwise if it is a safe operation led by a guardian.

③ An employer, in the event of connecting or separating a train, shall safely suspend operation a shunter if it is deemed to make the workers get jammed in the vehicles.

④ An employer take necessary measures to prevent unauthorized person from entering workplace during shunting operation: Provided that it shall be otherwise if it is deemed that a safe passage is placed at a workplace so that there is no concern about contacting a train.

Article 416 (Workplace, etc facilities maintenance)

An employer shall repair workplace facilities so that workers can safely operate shunting and maintain and manage them frequently to make them operated normally and safely.

SECTION 4 HAZARD PREVENTION CONCERNING TUNNEL · UNDERGROUND SECTION AND BRIDGE WORK

Article 417 (Evacuation space)

① An employer shall install evacuation shelters per adequate intervals in cases where workers pass or work at a tunnel · underground section and bridge where railway is installed: Provided that it shall be otherwise if it is deemed not to contact vehicles operated on its railway since there is significant space next to the railway or it is easy to cross the bridge.

② An employer shall secure enough space at an evacuation shelter referred to in paragraph (1) where workers where workers can evacuate with working tools.

Article 418 (Fall accident prevention at a bridge)

An employer shall take necessary measures to prevent fall accident hazard to workers by installing solid structured safety guard rail or similar equipment or applying safety harness in cases where workers repair · checkup railway and other related equipment.

Article 419 (Sleeper exchange work, etc)

An employer shall suspend train operation in the event of operating sleeper exchange at a tunnel · underground section or bridge, and secure enough work space in order to work safely.

PART 3 OCCUPATIONAL HEALTH STANDARD

CHAPTER 1 PREVENTION OF HEALTH PROBLEMS BY HARMFUL SUBSTANCES REQUIRING MANAGEMENT

SECTION 1 COMMON PROVISIONS

Article 420 (Definition)

The terms used in this Chapter shall have the same meanings as follow:

1. The term "harmful substances requiring management" means substance in Table 12 such as organic compound, metal, acid · alkali, gas state material as raw material referred to in the Act 24 (1) 1.
2. The term "Organic compound" means substances referred to in subparagraph 1 in Table 12 among hydrocarbon compound containing organic solvent that solves other substances as volatile liquid at a room temperature · normal pressure.
3. The term "metal" means substances referred to in subparagraph 2 in Table 12 among substances having malleability and ductibility which gives off metal gloss in the form of a solid and transfers electricity · heat.
4. The term "acid · alkali" means substances referred to subparagraph 3 in Table 12 which melts in water as a hydroxide compound neutralizing acid and substances creating salt by neutralizing base after creating hydrogen ion while dissociating aqueous solution.
5. The term "gas state material" means substances referred to subparagraph 4 in Table 12 as a gas state material created and used at a room temperature · normal pressure.
6. The term "Carcinogen" means a substance marked as "carcinogenic" in Table 12 which is confirmed or questioned to cause cancer.
7. The term "special area for handling organic compound" means the following places which handle organic compound.
   A. Ship interior.
   B. Vehicles interior
   C. Tank interior(including chemical equipment such as a reactor, etc).
   D. Tunnel or mine interior.
   E. Manhole interior.

F. Pit interior.
G. At a place where ventilation is not enough watercourse interior.
H. Duct interior.
I. A water pipe interior.
J. Other at a place where ventilation is not enough place

8. The term "temporary work" means a work less than 24 hours per month temporarily performed in the course of carrying out work: Provided that it shall be otherwise if 10 to 24 hours of work is performed every month.
9. The term "short-term work" means a work where it takes less than one hour per day to handle harmful substances requiring management: Provided that it shall be otherwise if one hour or less of work is performed every day.

Article 421 (Exceptions for application)

① The provisions of this Chapter shall not apply to the cases where the amount of harmful substances requiring management(gram) consumed per one hour of work is less than that of workplace air volume(m^3) divided by 15(Hereinafter "the amounts of permissible usage") In cases where an employer has workers engaged in handling harmful substances requiring management: Provided that it shall be otherwise in cases of special area for handling organic compound, carcinogen handling place, basement interior, an indoor workplace where ventilation is not enough.

② Workplace air volume referred to in paragraph (1) refers to space volume of an indoor workplace using cubic meters excluding the space to 4m height from the floor: Provided that air volume shall be deemed to be its air volume in the event of exceeding 150m^3.

SECTION 2 GUIDELINES ON EQUIPMENT, ETC

Article 422 (Equipment concerning harmful substances requiring management)

In cases where an employer has workers engaged in handling harmful substances requiring management at an inside workplace, he shall install equipment confining gas · vapor or dust emitter relating harmful substances requiring management or local ventilation equipment: Provided that it shall be otherwise if he handles powder state of harmful substances requiring management in a humid state.

Article 423 (Special occasions in cases of temporary work equipment)

① In cases where an employer has workers engaged in temporarily handling harmful substances requiring management at an indoor workplace, an employer might not install an equipment confined equipment or local ventilation referred to in Article 422.

② An employer might not install confined equipment or local ventilation referred to in Article 422 in cases where he installs general ventilation system where workers temporarily handle organic compound at a special area for handling organic compound.

③ Notwithstanding paragraph (1) and (2), an employer shall install confined equipment or local ventilation equipment referred to in Article 422 at a workplace where he handles carcinogen referred to in Table 12 among harmful substances requiring management.

Article 424 (Special occasions for short-term work equipment)

① In cases where an employer has workers temporarily engaged in handling harmful substances requiring management at an inside workplace where general ventilation system is installed, an employer might not install confined equipment or local ventilation referred to in Article 422.

② An employer might not install confined equipment or local ventilation referred to in Article 422 in cases where he gives out air supplied mast to put on to the workers concerned who handles organic compound for a short-term at a special area for handling organic compound.

③ Notwithstanding paragraph (1) and (2), an employer shall install confined equipment or local ventilation equipment referred to in Article 422 at a workplace handling carcinogen referred to in Table 12 among harmful substances requiring management.

Article 425 (Special occasions for local ventilation equipment)

An employer might not install confined equipment or local ventilation referred to in Article 422 in cases where he installs air supply · push-pull ventilation system which refers to any of the following cases.

1. Where an employer cannot install equipment referred to in Article 422 due to large release area of harmful substances requiring management in cases where

he handles and carries out harmful substances requiring management with regard to wall · floor or ceiling of indoor workplace.

2. Where an employer cannot install equipment referred to in Article 422 due to large vapor release area of harmful substances requiring management in cases where an employer handles and carries out harmful substances requiring management with regard to surface of an object with large surface area such as vehicle body, plane gas, body of a ship block, etc.

Article 426 (Special occasions of equipment relating workplace separated from other indoor workplace)

An employer might not install confined equipment or local ventilation referred to in Article 422 in cases where he installs general ventilation system at an indoor workplace where workers handle harmful substances requiring management and which they do not need to enter since it is separated from other indoor workplace.

Article 427 (Special occasions referred to in replacing equipment installation)

An employer might not install confined equipment or local ventilation equipment or general ventilation system referred to in Article 422 in cases where an employer install an equipment that can be adequately disposed of by others methods than emitter confined equipment, local ventilation equipment or general ventilation system (Hereinafter referred to as "Replacing equipment") and where the Minister of Employment and Labor deems it reasonable to do so.

Article 428 (Special occasions of organic compound equipment)

An employer might not install confined equipment or local ventilation referred to in Article 422 in the event of places handling organic compound equipped with general ventilation system satisfying the requirement falling under any of the following subparagraphs.

1. Where exposure standard of organic compound is 100ppm or more
2. Where organic compound occurs equally in general
3. Where plenty of pollution source is dispersed at the same workplace
4. Where pollution source has rambling particle

SECTION 3 CAPACITY OF LOCAL VENTILATION EQUIPMENT

Article 429 (Capacity of local ventilation equipment)

An employer shall install a local ventilation equipment whose capacity guarantees capture velocity referred to in Table 13.

Article 430 (General ventilation system capacity, etc)

Breathing capacity necessary to 1 hour work= 24.1×weight×amount of harmful substances used per hour×K/(Molecular mass×guidelines on exposed harmful substances s)×10^6
Note) 1. Breathing capacity unit necessary per hour: m^2/hr 2. Unit of using harmful substances per hour: L/hr 3. K: safety coefficient A. K=1: where air mixture is efficient at a workplace B. K=2: where air mixture is normal at a workplace C. K=3: where air mixture is inefficient at a workplace

① An employer shall secure at least the ventilation(Hereinafter referred to as "required ventilation") estimated in accordance with the following formula where he installs a general ventilation system at a workplace which creates a single component of organic compound.

② Notwithstanding paragraph (1), where organic compound occurs in a form of mixed substance, a total sum of each ventilation shall be applied to required ventilation: Provided that the value of substance with a largest required ventilation shall be applied where addictive effect is not available.

③ An employer shall install a ventilator of a general ventilation system (Referring to opening of the duct in cases of a general ventilation system using duct)at a position nearest to emitter of harmful substances requiring management.

Article 431 (Workshop floor)

An employer shall use impermeable material with an easily cleaned structure at a floor of an indoor workshop which handles harmful substances requiring management.

Article 432 (Anti-corrosion measures)

An employer shall take necessary measures to prevent corrosion by making harmful substances requiring management contact equipment out of stainless material.

Article 433 (Anti-leak measures)

An employer shall take necessary measures to prevent joint connection such as a lid · a flange · a valve and a cock, etc of the handling harmful substances requiring management equipment from leak of harmful substances requiring management by applying a gasket, etc.

Article 434 (Alarm system, etc)

① Where an employer daily handles a total of 100liters or more(In case of gas, 1 cubic meter of volume of the gas is translated into 2liters) metal, acid · alkali, gas state material among harmful substances requiring management at a workplace, he install an alarm system or alarming apparatus at a workplace where it is deemed to cause leak.

② An employer shall make preparations for or install chemicals · apparatus or equipment to remove its substance where harmful substances requiring management might leak at a workplace referred to in paragraph (1).

Article 435 (Emergency shut-off device installation, etc)

① An employer shall take necessary measures against equipment handling harmful substances requiring management equipment which might cause leak of harmful substances requiring management caused by abnormal chemical reaction such as exothermic reaction by stopping raw material supply or installing a device to supply inert gas and cooling spring.

② An employer shall maintain valves or cocks installed onto a device referred to in paragraph (1) In order to make them normally operate, and shall take necessary measures such as having the workers exactly and safely control them by classifying them in different colors, etc.

③ An employer shall make a device to discharge harmful substances requiring management in a closed structure or a structure that safely disposes of harmful substances requiring management.

SECTION 4 WORKING METHODS, ETC

Article 436 (Work instructions)

An employer shall have workers operate the work in accordance with work instructions falling under any of the following subparagraphs so that harmful substances requiring management may not leak where he handles harmful substances requiring management equipment or its auxiliary installations work.

1. Controlling valve · cock(Limited to the case of discharging harmful substances requiring management.
2. Controlling cooling system, heating device, agitating machine and compressing unit.
3. Measuring instrument and monitoring · adjusting control unit.
4. Adjusting safety valve, emergency shut-off device, automatic alarm device and other safety device.
5. Checking any leak out of joint connection such as a lid · a flange · a valve and a cock.
6. Sampling.
7. Working methods in the event of handling harmful substances requiring management equipment.
8. Emergency measures in case of abnormal accident occurrence.
9. Measures which prevent other harmful substances requiring management from leaking.

Article 437 (Work in a tank)

① An employer shall take measures falling under any of the following subparagraphs where workers remodels · repairs or cleans a tank or works in equipment or a tank containing harmful substances requiring management.

1. To let a supervisor with knowledge of harmful substances requiring management do the work.
2. To open all openings of the working equipment where no harmful substances requiring management is deemed to carry in.
3. To wash it immediately where worker's body is contaminated by harmful substances requiring management or the work is finished.
4. To make preparations for apparatus and other equipment to evacuate or rescue

workers in equipment in an emergency.

5. To measure concentration of harmful substances requiring management regarding inner part of equipment or measure serious health problems which could cause workers in accordance with other methods
6. To ventilate an inner part of equipment with a ventilation system where there is significant amount of harmful substances requiring management in an inner part of equipment under subparagraph 5.
7. To take measures against the tank where organic compound is put in, prior to starting the work, falling under the following items beside the measures prescribed under the provisions of subparagraph 1 through 6:
   A. To prevent organic compound which is released from a tank from flowing back to a inner part of a tank after release.
   B. To wash an inner part of a tank with water or vapor and release the water or the vapor out of the tank.
   C. To fill a tank with air whose volume is three times bigger than that of the tank and fill the tank with water and release it.

② Where an employer won't be able to confirm the measure taken to equipment referred to in subparagraph 7 of paragraph (1), he shall have workers not work on its inner part of equipment with heads put in and let them know about it in advance.

Article 438 (Evacuation due to accident, etc)

① An employer shall stop the work and make the worker evacuate its place where workers encounter the occasions which refer to any of the following cases and might be poisoned by harmful substances requiring management while handling and carrying out harmful substances requiring management.

1. Where its function is reduced or lost due to mal-function of the ventilation system installed to ventilate the place handling harmful substances requiring management.
2. Inner part of the place handling harmful substances requiring management is contaminated by harmful substances requiring management or harmful substances requiring management is leaked.

② An employer shall take necessary measures to prevent unauthorized person from entering, with its sign posted at a place where it is easily noticeable where he stops the work due to generation of the events referred to in each

subparagraph of paragraph (1), till contaminated or leaked harmful substances requiring management are removed an employer: Provided that it shall be otherwise if lifesaving or harm prevention work is done in accordance with safe method.

③ Workers shall not enter the place which is prohibited to enter in accordance with paragraph (2) Without an approval of entry from an employer.

Article 439 (Carcinogen handling report)

An employer shall prepare for a carcinogen handling report containing substance name · use and job sheet where he handles carcinogen prescribed by Table 12.

Article 440 (Announcement of carcinogen)

An employer shall inform workers of the fact through a bulletin board, etc that they are handling carcinogen prescribed by Table 12 its substance.

SECTION 5 MANAGEMENT, ETC

Article 441 (Checkup prior to use, etc)

① An employer shall check it pursuant to the following items before using it where he uses a local ventilation equipment after installing it, firstly uses a local ventilation equipment after disassembling, remodelling, or repairing it.

1. To check duct and ventilator dust.
2. To check duct connect loosening.
3. To check inhalation and ventilation capacity.
4. Other matters necessary to maintain capacity of local ventilation equipment.

② An employer shall take measures deemed necessary such as cleaning · repair, etc in a case where mal-function is found as a result of check out conducted pursuant to paragraph (1).

③ Article 555 shall apply mutatis mutandis to the keeping the recorded referred to in paragraph (1).

Article 442 (Notification of title, etc)

An employer post the matters falling under any of the following subparagraphs at a workplace handling harmful substances requiring management where they

are easily noticeable: Provided that it shall be otherwise if an employer fills in and posts substance safety occupational health referred to in Article 41 (1) Of the Act.

1. Titles of harmful substances requiring management.
2. Effect to human body.
3. Precautions for handling.
4. Personal protective equipment to put on.
5. Emergency measures and emergency fire and disaster measures.

Article 443 (Strong harmful substances requiring management)

① An employer shall tightly pack the substance of harmful substances requiring management, in the event of transporting or storing it, using a sturdy vessel with a lid or a stopper on it where it is not deemed to cause any leak or release of its substance, and shall take measures falling under any of the following subparagraphs at its storing place.

1. To mark the sign that prevents unauthorized worker from entering prevent.
2. To install equipment to release vapor of harmful substances requiring management outdoors.

② An employer shall designate a designated place where he stores harmful substances requiring management, in the event of storing it.

Article 444 (Empty vessel, etc management)

An employer shall confine vessels or packaging used for transporting and storing harmful substances requiring management or designate a designated place where he stores harmful substances requiring management.

Article 445 (Cleaning)

An employer shall clean indoor workplace, lounge or restaurant, etc to remove harmful substances requiring management which might cause contamination.

Article 446 (A restricted area, etc)

① An employer shall prevent unauthorized worker from entering indoor workplace handling harmful substances requiring management, with its sign posted at a place where it is easily noticeable: Provided that it shall be otherwise if where an employer daily handles a total of 100 liters or less(In

case of gas, 1 cubic meter of volume of the gas is translated into 2 liters) metal, acid · alkali, gas state material among harmful substances requiring management at a workplace.

② An employer shall discards · store harmful substances requiring management or its contaminated substance at a certain designated place and prevent unauthorized worker from entering the place, with its sign posted at a place where it is easily noticeable.

③ Workers shall not enter the place which is prohibited to enter in accordance with paragraph (1) and (2) without an approval of entry from an employer.

Article 447 (Prohibition of smoking, etc)

① Workers shall be prohibited from doing smoking or food intake, etc at an inside workplace where an employer has workers engaged in handling harmful substances requiring management, with its sign posted at a place where it is easily noticeable.

② Workers shall be prohibited from doing smoking or food intake, etc at a place where smoking or food intake pursuant to paragraph (1) Is prohibited.

Article 448 (Washing equipment, etc)

① An employer shall install equipment and tools for wash up · bath · washing and drying where a worker treats harmful substances requiring management.

② An employer shall establish structure that can divide and store contaminated working clothes and ordinary clothes in the event of installing equipment pursuant to paragraph (1).

Article 449 (Reminding of harmfulness, etc)

① An employer shall inform workers of the matters falling under any of the following subparagraphs before having them placed for handling harmful substances requiring management where they are engaged in handling harmful substances requiring management.

1. Titles of harmful substances requiring management and physical · chemical characteristics.
2. Effect to human body and its symptoms.
3. Precautions for handling.
4. Personal protective equipment to put on and its wearing method.

5. Emergency response procedures and its emergency measures.
6. Matters related to other to prevent workers from catching health problems.

② Where workers are engaged into working with substances such as dimethylformamide, benzene(Carcinogenic), carbon chloride(Carcinogenic), acrylonitrile, tetrachloroethane, perchloroethylene under subparagraph 1 in Table 12and cause inform workers that the substance creates acute poison substance before starting to work.

SECTION 6 PERSONAL PROTECTIVE EQUIPMENT, ETC

Article 450 (Distribution of personal protective equipment for breathing, etc)

① An employer shall have workers put on a distributed air supplied mast where a worker operates the work which refers to any of the following cases.

1. Washing and painting inside a tank which contained organic compound(Excluding a tank where it is not deemed to cause any organic compound vapor.
2. Handling organic compound at a special area for handling it in accordance with Article 424 (2).

② An employer shall have workers put on a distributed air supplied mast or a gas mask where they are engaged in the work which refers to any of the following cases.

1. Work related to handling organic compound at a place confined equipment or local ventilation equipment is not installed in accordance with Article 423 (1) (2), Article 424 (1), Article 425, Article 426 and Article 428 (1)
2. Work related to handling organic compound related to handling object which could cause expansion of air current in a ventilation system installed at a place handling organic compound.
3. Work related to opening equipment(Excluding equipment whose organic compound is removed) which confines organic compound vapor emitter at a place handling organic compound.

③ An employer shall provided workers with air supplied mast with an attachment of a device holding capacity of supplying fresh air where he provides them with air supplied mast in accordance with paragraph (1) and (2).

④ An employer shall have workers put on personal protective equipment for sufficient breathing suitable for to prevent workers from catching health problems at a workplace handling metal, acid · alkali, gas state material, etc and

if it is deemed that sharing a personal protective equipment for breathing might spread infection, he shall give out an exclusive personal one.

⑤ Workers shall put on personal protective equipment given out pursuant to paragraph (1), (2) and (4) In accordance with instructions of an employer.

Article 451 (Placement of protecting suit, etc)

① An employer shall prepare for medicine including ointment for impermeable protecting suit · protective gloves · protective boots and skin protection where a worker treats skin irritant or corrosive harmful substances requiring management.

② An employer shall have workers put on distributed goggles where workers carry out the work related to scattering harmful substances requiring management.

③ An employer shall install equipment for wash up · bath · washing and drying where workers have contact with harmful substances requiring management in their skin or eyes.

④ Workers shall put on personal protective equipment given out pursuant to paragraph (1) and (2) In accordance with instructions of an employer.

CHAPTER 2 PREVENTION OF HEALTH PROBLEMS CAUSED BY PERMISSION-REQUIRED HARMFUL SUBSTANCES AND ASBESTOS

SECTION 1 COMMON PROVISIONS

Article 452 (Definition)

The terms used in this Chapter shall have the same meanings as follows:

1. The term "permission-required harmful substances" means substances under the Act 30 which are prohibited from manufacturing · use if otherwise approved by the Minister of Employment and Labor.
2. The term "manufacturing" means a course that transfers chemical substance or its component into permission-required harmful substances by forcing physical · chemical reaction.
3. The term "use" refers to making use of permission-required harmful substances as raw material to produce new product or substance.
4. The term "disposal and removal" means the work asbestos dust is anticipate to scatter and small particles of asbestos waste is generated due to asbestos-containing equipment or building crush, remodeling · repair.
5. The term "heating cohesion" means a phenomenon that permission-required harmful substances get sticked or hardened when they are heated after they plastered.
6. The term "heating desorption" means a manipulation that removes whole or part of volatile component by heating permission-required harmful substances at a high temperature.

SECTION 2 GUIDELINES ON EQUIPMENT AND CAPACITY, ETC

Article 453 (Guidelines on equipment, etc)

① In cases of manufacturing or using permission-required harmful substances (Excluding beryllium and asbestos)and cause observe the matters in the following subparagraphs.

1. An employer shall separate an area for a manufacturing or using permission-required harmful substances from other workplace, build the floor and wall of the workplace with impermeable material, and establish its structure

in the way that he can easily remove the substance by cleaning with water.

2. An employer shall supply · carry or transport raw material in the way that its substance does not directly touch the worker's body.
3. An employer shall confine joint connection of a batch reactor with a gasket so that gas or vapor may not leak out of the cover of an agitator for the reasons of exothermic reaction or heating.
4. An employer shall check the interior part of a selector or a vacuum filter in a sealed state in the event of checking the operating selector or vacuum filter.
5. An employer, where workers directly powdered permission-required harmful substances, shall use its substance in a humid state or use a remote control or apply a method without dust scattering in an isolated room.

② An employer, where workers manufacture or use permission-required harmful substances(Excluding beryllium and asbestos), shall install equipment confining gas · vapor or dust emitter of permission-required harmful substances or local ventilation equipment such as enclosing hood or booth type hood: Provided that if it is deemed difficult to install confined equipment or enclosing hood or booth type hood when considering qualities of the work, an employer might install a local ventilation equipment(Excluding upper draught) Of the external hood.

Article 454 (Local ventilation equipment installation · capacity)

The capacity of local ventilation equipment installed in accordance with Article 453 (2) Shall satisfy the criteria for capture velocity or more referred to in the following Table depending on state of substances.

State of substance	Capture velocity(Meter/sec.)
Gas	0.5
Particle	1.0

Remarks

1. The capture velocity in this table means capture velocity when all hoods of a local ventilation system are open.
2. The capture velocity in this table means capture velocity at a position determined pursuant to the following depending upon types of hood.
   A. Wind speed at aperture of hood for enclosing hood or booth type hood
   B. Wind speed at a working site farthest from aperture sucking gas · vapor or dust of harmful substances for exterior or receiver type hood

Article 455 (Disposal of effluent)

An employer, where he releases contaminants out of the manufacturing · using equipment of permission-required harmful substances, shall dispose of effluent in the way of neutralization · precipitation · filtering or other appropriate method to prevent to prevent workers from catching health problems.

SECTION 3 GUIDELINES ON WORK MANAGEMENT, ETC

Article 456 (Checkup prior to use, etc)

① An employer shall check it pursuant to the following items before using it where he uses a local ventilation equipment after installing it, firstly uses a local ventilation equipment after disassembling, remodelling, or repairing it.

1. To check state of duct and ventilator dust
2. To check duct connect loosening
3. To check inhalation and ventilation capacity
4. Other matters necessary to maintain capacity of local ventilation equipment

② An employer shall clean · repair or take other necessary measures without delay if any abnormality is found as a result of check up referred to in paragraph (1).

③ Article 555 shall apply mutatis mutandis to the keeping the recorded referred to in paragraph (1)

Article 457 (A restricted area)

① An employer shall prevent unauthorized worker from entering the workplace manufacturing or using permission-required harmful substances, with its sign pursuant to subparagraph 1, Table Form posted: Provided that its sign shall be posted pursuant to subparagraph 2, Table Form in the event of a workplace manufacturing or using asbestos.

② An employer shall discards · store permission-required harmful substance or its contaminated substance at a certain designated place and prevent unauthorized worker from entering the place, with its sign posted at a place where it is easily noticeable.

③ Workers shall not enter the place which is prohibited to enter in accordance with paragraph (1) and (2) without an approval of entry from an employer.

Article 458 (Prohibition of smoking, etc)

① Workers shall be prohibited from doing smoking or food intake, etc at a place which manufactures or uses permission-required harmful substances, with its sign posted at a place where it is easily noticeable.

② Workers shall be prohibited from doing smoking or food intake, etc at a place where smoking or food intake pursuant to paragraph (1) Is prohibited.

Article 459 (Notification of title, etc)

An employer post the matters falling under any of the following subparagraphs at a workplace manufacturing or using permission-required harmful substances where they are easily noticeable.

1. Titles of Permission-required harmful substances.
2. Effect to human body.
3. Precautions for handling.
4. Personal protective equipment to put on.
5. First aid and emergency fire and disaster measures.

Article 460 (Reminding of harmfulness, etc)

Where workers are engaged into manufacturing or using permission-required harmful substances and cause inform workers of the matters falling under any of the following subparagraphs:

1. Physical · chemical characteristics.

2. Carcinogenicity, etc effect to human body and its symptoms.
3. Precautions for handling.
4. Personal protective equipment to put on and its wearing method.
5. Emergency response procedures and its emergency measures.
6. Matters related to other to prevent workers from catching health problems.

Article 461 (Vessel, etc)

① An employer shall tightly pack the substance of harmful substances requiring management, in the event of transporting or storing it, using a sturdy vessel where it is not deemed to cause any leak or release of its substance.

② An employer shall display precautions for handling and titles of the substances at an easily recognized position of vessel or packaging referred to in paragraph (1).

③ An employer shall designate a designated place where he stores permission-required harmful substances, in the event of storing it.

④ An employer shall store vessels or packaging at a confined or designated place used for transporting · storing permission-required harmful substances.

Article 462 (Work instructions)

Where workers manufactures and uses permission-required harmful substances (Excluding beryllium and asbestos)and cause have workers operate the work in accordance with work instructions falling under any of the following subparagraphs:

1. Controlling valve · cock(Limited to the case where an employer manufacturer permission-required harmful substances or provides equipment with raw material or extracts products from its equipment.)
2. Controlling cooling system, heating device, agitating machine and compressing unit.
3. Measuring instrument and monitoring · adjusting control unit.
4. Adjusting safety valve, emergency shut-off device, automatic alarm device and other safety device.
5. Checking any leak out of joint connection such as lid · flange · valve and cook
6. Sampling and disposal of apparatus used for the work.
7. Emergency measures in case of abnormal accident occurrence.
8. Using · checking · storing and cleaning personal protective equipment.

9. Putting and taking permission-required harmful substances into or out of vessel or putting it into a batch reactor.
10. Measures which prevent other harmful substances requiring management from leaking.

Article 463 (Locking device, etc)

An employer shall take appropriate measures to prevent unauthorized persons from entering the place where permission-required harmful substances are stored by installing a locking device, etc.

Article 464 (Bath equipment, etc)

① An employer, in cases of manufacturing · using permission-required harmful substances, shall make furnish fitting room · bathroom and a locker room for working clothes as well as necessities and tools at a place separated from a workplace.

② An employer, where he installs bath facility and bathhouse pursuant to paragraph (1), shall install them in the order of fitting room, bathroom, a locker room for working clothes and exit, etc so that workers enter the workplace in its order and gets out of the workplace in a reverse order.

③ An employer shall take necessary measures such as taking off working clothes, personal protective equipment, etc that workers handling permission-required harmful substances wore at a place where contamination could be prevented and washing contamination to remove it. In such cases, workers shall not take contaminated working clothes out of the designated area to wash them.

Article 465 (Emergency washing equipment, etc)

An employer shall install emergency washing equipment and eye-washing equipment that workers can easily make use of at a place manufacturing · using permission-required harmful substances, in such cases, he shall take measures to have clean water flow out instead of piping residue and rust.

Article 466 (Measures against leak)

An employer, where substances leak at a place manufacturing · using permission-required harmful substances, shall immediately take necessary

measures to remove it not to scatter the substance.

Article 467 (Sampling)

An employer shall follow the matters falling under any of the following subparagraphs in the event of sampling from manufacturing equipment of permission-required harmful substances(Excluding beryllium).

1. The sample vessels used for sampling shall be exclusive ones.
2. Sampling shall be carried out at a designated place in advance without scattering or leaking of samples.
3. An employer shall wash the vessels used for samples and store them at a designated place.

Article 468 (Keeping records)

An employer shall keep in the documents titles, manufacturing volume or use, job sheet, leak measures of permission-required harmful substances in the event of manufacturing or using permission-required harmful substances.

SECTION 4 GAS MASK, ETC

Article 469 (Giving out gas masks, etc)

① An employer, where workers carry out manufacturing or using permission-required harmful substances work, shall have workers put on an exclusive dust respirator or a gas mask, etc(Hereinafter "gas mask, etc").

② An employer shall furnish a storage box that can hold a gas mask distributed pursuant to paragraph (1).

③ An employer shall have workers put on a distributed air supplied mast or a gas mask where they are engaged in the work which refers to any of the following cases. Workers shall put on a gas mask distributed pursuant to paragraph (1) In accordance with instructions of an employer.

Article 470 (Placement of a protecting suit, etc)

① An employer shall prepare for impermeable protecting suit · protective gloves · protective boots and skin protection medicine where a worker treats permission-required harmful substances which might cause skin damage.

② Workers shall put on personal protective equipment given out pursuant to

paragraph (1) In accordance with instructions of an employer.

SECTION 5 SPECIAL MEASURES INVOLVING BERYLLIUM MANUFACTURING · USE WORK

Article 471 (Guidelines on equipment)

An employer shall abide by the matters falling under any of the following subparagraphs in the event of manufacturing or using beryllium.

1. To install equipment(Excluding equipment which manufactures high purity beryllium oxide from hydroxide beryllium) applying heating cohesion or heating desorption to beryllium in an indoor area separated from other workplace and install a local ventilation equipment.
2. To install beryllium manufacturing equipment(Excluding equipment applying heating cohesion or heating desorption to beryllium, equipment which manufactures beryllium alloy with beryllium melted in an arc furnace, and equipment which manufactures high purity beryllium oxide with hydroxide beryllium) In a closed structure or to install a cover attached on top · bottom and side section.
3. To observe interior state of equipment with its covered closed where he needs to check the interior during operation of equipment referred to subparagraph 2
4. To build the floor and wall of the workplace manufacturing or using beryllium with impermeable material.
5. To install arc a local ventilation equipment at a place which manufactures beryllium melted by beryllium alloy.
6. To furnish equipment which manufactures high purity beryllium oxide with hydroxide beryllium with the matters falling under the following items.
   A. To install an enerator at an inside place separated from other workplace.
   B. To install other equipment in a closed structure or to install a cover attached on top · bottom and side section or install a lid.
7. To supply · carry or transport beryllium while keeping the substance off from a worker's body
8. To use powdered state of beryllium(Excluding the cases of supplying · carrying or transporting) at an isolated room using a remote manipulation method.
9. Where it is deemed significantly difficult to meet the provision of above item 8 in the events of measuring powdered state of beryllium, putting in and taking

out of vessel, packaging, to do the work in a method where beryllium does not touch worker's body.

Article 472 (Measures concerning arc furnace)

An employer shall install a sand screen or taken necessary measures to less the inserted part gap against the arc furnace which melts more than 1% of weight proportion as beryllium and medication containing its substance.

Article 473 (Extraction of heating cohesion product, etc)

An employer shall take out beryllium with heating cohesion or heating desorption through inhalation method.

Article 474 (Heating cohesion product, etc crush)

Where an employer crushes product containing beryllium with heating cohesion or heating desorption, he shall do it at an inside place separated from other workplace, and he shall take appropriate measures by installing a local ventilation equipment and preventing other workers from catching health problems at a place for crushing.

Article 475 (Sampling)

An employer shall follow the matters falling under any of the following subparagraphs in the event of sampling from beryllium manufacturing equipment.

1. The sample vessels used for sampling shall be exclusive ones.
2. Sampling shall be carried out at a designated place in advance without scattering samples.
3. An employer shall wash the vessels used for samples and store them at a designated place.

Article 476 (Work instructions)

An employer, where he has workers engaged in the work manufacturing · using beryllium, shall determine work instructions regarding the matters falling under any of the following subparagraphs to prevent beryllium dust divergence and a worker's contamination, and let them know about it.

1. To put in or take out beryllium in and out of vessel.

2. To transport a vessel containing beryllium.
3. To check a device to transport beryllium with ai.
4. To exchange a filter material of a dust collector for a filtering dust collection method.
5. To dispose of a vessel used for sampling and its work.
6. To take emergency measures, in case of abnormal accident occurrence.
7. Using · checking · storing and cleaning personal protective equipment.
8. To take other necessary measures to prevent other beryllium dust from divergence.

SECTION 6 GUIDELINES ON INSTRUCTIONS FOR WORK RELATED TO ASBESTOS MANUFACTURING · USE, DISPOSAL AND REMOVAL AND ITS MAINTENANCE · MANAGEMENT.

Article 477 (Isolation)

An employer shall isolate area using asbestos from other workplace to prevent asbestos dust from spreading.

Article 478 (Floor)

An employer shall use floor material of the workplace using asbestos with impermeable material in an easily cleaned structure.

Article 479 (Confinement, etc)

① An employer shall install equipment at a confined place that workers do not need to access regularly among equipment using asbestos.

② Where an employer needs to check equipment installed at a confined indoor pursuant to paragraph (1), he shall make it in a structure where he can check it from outside by installing a transparent glass, etc.

Article 480 (Local ventilation equipment installation, etc)

① An employer shall install and operate a local ventilation equipment where workers work with asbestos dust which might cause asbestos dust to scatter at a place for asbestos packaging or opening, asbestos instrumentation, inserting asbestos into a mixer or an opener, asbestos product packaging work,

etc.

② The capacity of local ventilation equipment standard regarding particulate matter under Article 500 shall apply mutatis mutandis to the capacity of local ventilation equipment referred to in paragraph (1).

Article 481 (Maintaining humidity using equipment of asbestos dust, etc)

① An employer shall not have workers engaged in the work where they spray and paint asbestos.

② An employer, where he uses asbestos or uses substances attached with asbestos, shall maintain humidity to keep asbestos from scattering: Provided that where it is deemed difficult to keep humidity when considering qualities of the work, he shall work after taking measures falling under any of the following subparagraphs:

1. An employer shall prepare for protective measures such as asbestos installing a confined equipment or a local ventilation equipment to prevent to prevent workers from catching health problems
2. An employer shall confine and store waste containing asbestos by confining it in an impermeable sack

Article 482 (Work instructions)

An employer, where he has workers engaged in the work manufacturing · using asbestos, shall determine work instructions regarding the matters falling under any of the following subparagraphs to prevent asbestos dust divergence and a worker's contamination, and let them know about it.

1. Cleaning method of a workshop floor using vacuum cleaner.
2. Measures to prevent dust from scattering caused by a worker's pedestrian traffic and outside air current or machine vibration.
3. Measures to prevent neglect to leave dusty mats on the workshop floor.
4. Prohibition of using a fan where dust expands or workers are exposed to dust.
5. To put in or take out asbestos in and out of vessel.
6. Transportation of a vessel containing asbestos.
7. To exchange a filter material of a dust collector for a filtering dust collection method.
8. To dispose of a vessel used for its work.
9. To take emergency measures, in case of abnormal accident occurrence.

10. Using · checking · storing and cleaning personal protective equipment.
11. To take other necessary measures to prevent other asbestos dust from divergence.

Article 483 (Working clothes management)

① An employer shall have workers take off worker's contaminated working clothes after handling asbestos in an asbestos exclusive fitting room.

② An employer shall have unauthorized person not handle working clothes contaminated by asbestos where they carry them out of the fitting room for the purpose of washing · maintenance · discards, etc.

③ An employer shall store working clothes contaminated by asbestos in a vessel with a lid not to scatter and mark it.

Article 484 (Vessel)

An employer shall furnish a vessel with a lid to keep asbestos fragments where he has workers engaged in asbestos dust scattering work such as mixing powdered state asbestos, putting it in and out of a vessel, cutting · perforation or grinding, etc.

Article 485 (Disposal of asbestos-contaminated equipment, etc)

① An employer shall dispose of asbestos-contaminated equipment, personal protective equipment or working clothes in a confined impermeable sack or vessel in the event of discarding it.

② An employer shall not remove asbestos contamination using a compressed air in the event of disposing of contaminated equipment pursuant to paragraph (1).

Article 486 (Reminding of occupational disease)

An employer shall remind asbestos-handling workers of occupational disease outbreak caused by asbestos and recurrence protective method.

Article 487 (Maintain · manage)

Where might be exposed to asbestos dust caused by damage or aging of ceiling material, wall material and insulation material, etc of a building or equipment and cause remove such material or replace or cover it with other

material.

Article 488 (Pre-survey)

① Where he wants to demolish or dismantle building or equipment which is not subject to asbestos survey object by asbestos surveying agency referred to in paragraph (1), the Act 38-2 and cause look into asbestos content using naked eye examination, engineering drawing, material history based upon sufficient methods.

② Where asbestos content of the building or equipment asbestos is not clearly revealed notwithstanding investigation referred to in paragraph (1) and cause investigate it by examining and analyzing component of asbestos.

③ The result of asbestos referred to in paragraph (1) and (2) Shall include material type, position and range of asbestos and be kept till its building or equipment is dismantled or removed.

Article 489 (Establishment of a plan concerning disbanding and removing asbestos)

① An employer shall establish and project a plan for disbanding and removing asbestos which includes the matters falling under any of the following subparagraphs to prevent workers from catching health problems in the event of dismantling or removing asbestos-contained building or equipment(Hereinafter "disbanding and removing asbestos").

1. Procedure for and method of disbanding and removing asbestos.
2. Asbestos maintaining humidity using equipment and method for disposal.
3. Worker protective measures

② An employer shall have workers be aware of the plan for disbanding and removing asbestos referred to in paragraph (1) Where it has been established.

Article 490 (Posting a warning sign)

An employer post a sign falling under any of the following subparagraphs at a workplace disbanding and removing asbestos where it is easily noticeable: Provided that it shall be posted at a place where it is easily noticeable to workers where the work is operated outside or an exit is not installed.

Article 491 (Distribution and wearing of personal protective equipment)

① An employer, where he has workers engaged in disbanding and removing asbestos, shall distribute personal protective equipment falling under any of the following subparagraphs and have them put it on: Provided that personal protective equipment under subparagraph 2 shall only be distributed where worker's eye is exposed.

1. Dust respirator or air supplied mast.
2. Goggle type of protective glasses.
3. Body-wrapping protecting suit and protective shoes.

② Workers shall put on personal protective equipment given out pursuant to paragraph (1) In accordance with instructions of an employer.

Article 492 (A restricted area)

① An employer shall fully acknowledge a plan for disbanding and removing asbestos referred to in Article 489 (1) and prevent anyone other than workers who put on personal protective equipment falling under any of the following subparagraphs under Article 491 (1) from entering workplace for disbanding and removing asbestos.

② Workers shall not enter the place which is prohibited to enter in accordance with paragraph (1) without an approval of entry from an employer.

Article 493 (Prohibition of smoking, etc)

① Workers shall be prohibited from doing smoking or food intake, etc at a place where disposal or using asbestos is prohibited, with its sign posted at a place where it is easily noticeable.

② Workers shall be prohibited from doing smoking or food intake, etc at a place where smoking or food intake pursuant to paragraph (1) Is prohibited.

Article 494 (hygiene facilities installation, etc)

① An employer shall install hygiene facilities such as fitting room · shower room and a locker room for working clothes, etc at a workplace for disbanding and removing asbestos or its neighboring place and furnish necessary articles and tools.

② An employer shall have workers engaged in disbanding and removing asbestos take off personal protective equipment referred to in each subparagraph of Article 491 (1) In a locker room for working clothes and

store it in a confined vessel.

③ An employer shall take necessary measures to remove asbestos dust by discarding or washing personal protective equipment stored pursuant to paragraph (2).

Article 495 (Measures concerning disbanding and removing asbestos)

An employer, where he has workers engaged in the work of disbanding and removing asbestos, shall take measures falling under any of the following subparagraphs:

1. Disposing of and removing sprayed asbestos or asbestos-contained insulation material or fire-proof coating material.
   A. To confine window · wall · floor with impermeable blocking medium such as vinyl acetate and maintain the place with asbestos collection(Limited to cases of indoor workplace).
   B. To take necessary measures not to scatter asbestos dust by operating asbestos dust collector equipped with a high-capacity filter (Limited to cases of indoor workplace).
   C. To work in a wet type using water or wetting agent.
   D. To install hygiene facilities such as fitting room, shower room and a locker room for working clothes, etc in connection with a workplace(Limited to cases of indoor workplace.
2. Disposing of and removing asbestos-contained wall, floor tiles and ceiling material).
   A. To confine window · wall · floor with impermeable blocking medium such as vinyl acetate.
   B. To work in a wet type using water or wetting agent.
   C. To maintain a workplace with asbestos collection(Limited to cases of physically breaking or cutting with a machine asbestos-containing wall · floor tiles · ceiling material).
3. Disposing of and removing asbestos-contained roof material
   A. Not to drop or throw dismantled roof material directly to the ground
   B. To work in a wet type using water or wetting agent(Excluding cases of potential hazard in the event of wet work).
   C. Where vent for heating or ventilation is around the roof, to confine it and stop further operation of ventilation equipment.

4. Disposing of and removing asbestos-contained other material.
   A. To confine window · wall · floor with impermeable blocking medium such as vinyl acetate(Limited to cases of indoor workplace).
   B. To take necessary measures not to scatter asbestos dust by operating asbestos dust collector equipped with a high-capacity filter (Limited to cases of indoor workplace).
   C. To work in a wet type using water or wetting agent.

Article 496 (Disposal of asbestos-containing residue, etc)

An employer shall put and confine asbestos-containing residue generated by disbanding and removing asbestos in a vinyl acetate or other similar quality burlap and dispose of it pursuant to 「Waste Management Act」 attaching a sign referred to in subparagraph 3, Table Form.

Article 497 (Prevention of residue scattering)

① An employer shall take actions to prevent asbestos dust from scattering by cleaning residue containing asbestos generated by disbanding and removing asbestos in a wet method or cleaning it with a vacuum cleaner with an attachment of a high-capacity filter.

② An employer shall not clean asbestos contamination using a compressed air in the event of cleaning pursuant to paragraph (1).

CHAPTER 3 PREVENTION OF HEALTH PROBLEMS CAUSED BY PROHIBITED HARMFUL SUBSTANCES

SECTION 1 COMMON PROVISIONS

Article 498 (Definition)

The terms used in this Chapter shall have the same meanings as follows:

1. The term "prohibited harmful substances" means harmful substances referred to in the Act 29.
2. The term "for the purpose of test or research" means the cases where they use prohibited harmful substances for reagent for the purpose of analysis of substances at a laboratory or research room or for other purpose prepare.
3. The term "laboratory, etc" means an area where they manufacture and use prohibited harmful substances for test or research.

SECTION 2 GUIDELINES ON FACILITY · EQUIPMENT AND CAPACITY, ETC

Article 499 (Guidelines on equipment, etc)

① The person who manufactures or uses prohibited harmful substances for the purpose of test or research who in accordance with the Act 37 (2) Shall take measures falling under any of the following subparagraphs:

1. The manufacturing · using equipment is in a closed structure that prevents gas, vapor or dust of prohibited harmful substances from leak: Provided that it shall be otherwise if it is deemed significantly difficult to create it in a closed structure when considering qualities of the work so that its equipment is installed on an interior of booth type hood.
2. Equipment which manufactures · stores · handles prohibited harmful substances shall have a sturdy structure that resist corrosion.
3. The mount of storing and keeping prohibited harmful substances shall be minimum necessary to test · research.
4. Fire extinguishing installations shall be furnished suitable for characteristics of prohibited harmful substances
5. Electric machine · apparatus shall be made up of suitable explosive proof structure where manufacturing · using · handling conditions are above flash point

of prohibited harmful substances

6. Where gas · liquid or residue is released at a laboratory, equipment shall be furnished for a safe disposal

② An employer shall install a local ventilation equipment at a workplace in the event of putting in and taking out prohibited harmful substances in spite of a closed structure in accordance with paragraph (1) 1 : Provided that it shall be otherwise if the work is operated without any leak or release of gas · vapor or dust of prohibited harmful substances.

Article 500 (Capacity of local ventilation equipment, etc)

Where an employer installs equipment inside a booth type hood pursuant to the proviso of Article 499 (1) 1, it shall be installed in the way that satisfies the requirements pursuant to any of falling under the following items:

1. It shall have a structure where gas · vapor or dust of prohibited harmful substances leak at the places other than opening plane of a booth type hood.
2. To install a ventilator at a suitable position of the booth type hood.
3. The ventilator capacity pursuant to subparagraph 2 shall have more capacity in the following table than capture velocity for an opening plane of a booth type hood.

State of substance	Capture velocity(Meter/sec)
Gas	0.5
Particle	1.0
Remarks: The capture velocity in this table means capture velocity when apertures of when all the booth type hoods are open.	

Article 501 (Floor)

An employer shall build the floor and wall of the place where manufacturing · using equipment for prohibited harmful substances is installed with an impermeable material, with a structure where it is easy to remove substances by cleaning it with water.

SECTION 3 MANAGEMENT, ETC

Article 502 (Reminding of harmfulness, etc)

Where workers are engaged into manufacturing or using prohibited harmful

substances and cause inform workers of the matters falling under any of the following subparagraphs:

1. Physical · chemical characteristics
2. Carcinogenicity, etc effect to human body and its symptoms
3. Precautions for handling
4. Personal protective equipment to put on and its wearing method
5. Emergency response procedures and first aid
6. Matters related to other to prevent workers from catching health problems

Article 503 (Vessel)

① An employer shall use a vessel of prohibited harmful substances not leaking in the way that satisfies the requirements pursuant to any of falling under the following items:

1. Not to be damaged by overturning as for quality.
2. The lid shall be sturdy and no leak from overturning as for structure.

② The vessels referred to in paragraph (1) Shall exclusive ones and be washed and stored cleanly.

③ The vessels referred to in paragraph (1) Shall have a warning sign in accordance with Article 41 (3) Of the Act.

Article 504 (Storage)

① An employer shall store prohibited harmful substances at a designated place to prevent unauthorized workers from handling, and its notice shall be posted a place where it is easily noticeable.

② Keeping and posting pursuant to paragraph (1) Shall satisfy the requirements pursuant to any of falling under the following items:

1. To store it at designated place such as laboratory or additional exclusive place.
2. To post the matters falling under the following items at a place which stores prohibited harmful substances.
   A. Titles of prohibited harmful substances.
   B. Effect to human body.
   C. Emergency response procedures and first aid method.
3. To prevent from taking it out for the purposes of other than test or research by installing a locking device at a place which stores prohibited harmful substances.

Article 505 (A restricted area, etc)

① An employer shall prevent unauthorized person from entering a laboratory where equipment manufacturing · using prohibited harmful substances is installed and post a sign referred to Article 4, Table Form.

② An employer shall discards · store prohibited harmful substance or its contaminated substance at a certain designated place and prevent unauthorized worker from entering the place, with its sign posted at a place where it is easily noticeable.

③ Workers shall not enter the place which is prohibited to enter in accordance with paragraph (1) and (2) without an approval of entry from an employer.

Article 506 (Prohibition of smoking, etc)

① Workers shall be prohibited from doing smoking or food intake, etc at a place where manufacturing · using harmful substances is prohibited, with its sign posted at a place where it is easily noticeable.

② Workers shall be prohibited from doing smoking or food intake, etc at a place where smoking or food intake pursuant to paragraph (1) Is prohibited.

Article 507 (Measures against leak)

An employer shall take necessary measures to prevent prohibited harmful substances from scattering at a laboratory by removing it with an absorbent.

Article 508 (Eye-washing equipment, etc)

An employer shall install emergency washing equipment and eye-washing equipment at a laboratory, etc so that workers can use them in an emergency.

Article 509 (Keeping records)

An employer shall mark and keep the records of matters related to names, use, test and research content, leak measures of the prohibited harmful substances in the event of manufacturing or using them.

SECTION 4 PERSONAL PROTECTIVE EQUIPMENT, ETC

Article 510 (Protecting suit, etc)

① An employer shall prepare for impermeable protecting suit · protective gloves for exclusive individuals to prevent skin exposure where a worker treats prohibited harmful substances.
② An employer shall have an exclusive storage box which can separate protecting suit and protective gloves distributed pursuant to paragraph (1) from ordinary clothes, and take necessary measures by washing it to remove contamination if necessary
③ Workers shall put on personal protective equipment given out pursuant to paragraph (1) In accordance with instructions of an employer.

Article 511 (Personal protective equipment for breathing)

① An employer shall have workers put on a distributed exclusive personal protective equipment for breathing furnished with an additional canister where a worker treats prohibited harmful substances.
② Workers shall put on personal protective equipment given out pursuant to paragraph (1) In accordance with instructions of an employer.

CHAPTER 4 PREVENTION OF HEALTH PROBLEMS CAUSED BY NOISE AND VIBRATION

SECTION 1 COMMON PROVISIONS

Article 512 (Definition)

The terms used in this Chapter shall have the same meanings as follows:

1. The term "noise work" means a work which generates 85 decibels or more noise based upon 8-hours work per day.
2. The term "strong noise work" means the work which refers to any of the following cases:
   A. Which generates 90 decibels or more noise for more than 8 hours per day.
   B. Which generates 95 decibels or more noise for more than 4 hours per day.
   C. Which generates 100 decibels or more noise for more than 2 hours per day.
   D. Which generates 105 decibels or more noise for more than 1 hour per day.
   E. Which generates 110 decibels or more noise for more than one hour and a half per day.
   F. Which generates 115 decibels or more noise for more than 15 minutes per day.
3. The term "impulsive noise work" means the work which refer to any of the following cases noise where noise is generated between one second or more gaps.
   A. Which generates 120 decibels or more noise for more than 10,000 times per day.
   B. Which generates 130 decibels or more noise for more than 1,000 times per day
   C. Which generates 140 decibels or more noise for more than 100 times per day
4. The term "vibration work" machine · apparatus work means which refer to any of the following cases.
   A. Drill.

B. Power-driven hammer.
C. Chain saw.
D. Engine cutter.
E. Power-driven grinding machine.
F. Impact wrench.
G. Other machine · apparatus which might cause health problems by other vibration.

5. The term "hearing conservation program" means a universal plan to prevent and manage hearing loss from noise such as noise exposure assessment, engineering control in the event of exceeding noise exposure, hearing distribution and wearing of personal protective equipment, training to prevent harmfulness of noise, regular hearing examination, record · management, etc.

SECTION 2 GUIDELINES ON MANAGEMENT OF STRONG NOISE WORK, ETC

Article 513 (Noise reduction measures)

An employer shall take measures to reduce noise regarding strong noise work or impulsive noise work place by applying replacement of a machine · apparatus, confinement of equipment · sound absorption or isolation: Provided that it shall be otherwise if it is deemed significantly difficult to reduce noise technically · economically according to professional's opinions when considering qualities of the work.

Article 514 (Reminding of noise level, etc)

An employer, where workers are engaged in noise work, strong noise work or impulsive noise work, shall inform workers of the matters falling under any of the following subparagraphs:

1. Noise level of the workplace.
2. Effect to human body and its symptoms.
3. Personal protective equipment selection and its wearing method.
4. Other matters related to health problems due to noise.

Article 515 (Measures concerning hearing loss occurrence)

An employer shall take measures falling under any of the following

subparagraphs if it is deemed to generate health problems related to noise-induced hearing loss, etc.

1. Investigation of cause of noise-induced hearing loss occurrence at a workplace
2. Preparation for counter-measures to reduce hearing loss and prevent hearing loss from recurrence
3. Confirmation of carrying out counter-measures referred to in subparagraph 2
4. Measures taken in accordance with doctor's opinion such as job transfer

SECTION 3 PERSONAL PROTECTIVE EQUIPMENT, ETC

Article 516 (Hearing distribution of personal protective equipment, etc)

① An employer shall have workers put on a distributed personal hearing protective equipment where workers are engaged in noise work, strong noise work or impulsive noise work.

② An employer shall provide workers with an exclusive personal one referred to in paragraph (1) Regarding personal hearing protective equipment.

③ Workers shall put on personal protective equipment given out pursuant to paragraph (1) In accordance with instructions of an employer.

Article 517 (Carrying out hearing conservation program, etc)

An employer shall establish and carry out hearing conservation program where refers to any of the following cases.

1. Workplace where noise level exceeds 90 decibels as a result of measuring working environment of noise referred to in Article 42 of the Act .
2. Workplace where noise causes health problems to workers.

SECTION 4 VIBRATION WORK CONTROL

Article 518 (Distribution of personal protective equipment for vibration, etc)

① An employer, where he has workers engaged in vibration work, shall distribute vibration personal protective equipment such as vibration proof gloves.

② Workers shall put on vibration personal protective equipment given out pursuant to paragraph (1) In accordance with instructions of an employer.

Article 519 (Reminding of harmfulness, etc)

Where workers are engaged into vibration work and cause inform workers of the matters falling under any of the following subparagraphs:

1. Effect to human body and its symptoms.
2. Personal protective equipment selection and its wearing method.
3. Vibration machine · apparatus management method.
4. Vibration hazard prevention method.

Article 520 (Placement of vibration machine · apparatus user manual, etc)

An employer shall place vibration machine · apparatus user manual in a workplace where workers are engaged in vibration work.

Article 521 (Vibration machine · apparatus management)

An employer shall manage vibration machine · apparatus to ensure its normal operation by regularly checking and repairing it.

CHAPTER 5 PREVENTION OF HEALTH PROBLEMS CAUSED BY ABNORMAL AIR PRESSURE

SECTION 1 COMMON PROVISIONS

Article 522 (Definition)

The terms used in this Chapter shall have the same meanings as follows:

1. The term "abnormal air pressure" means air pressure whose pressure is 1kg or more per square cm.
2. The term "high pressure work" means a work which is operated by caisson method or other pressurized work at a abnormal air pressure.
3. The term "submerging work" means a work that is operated underwater using an air compressor or air cylinder for the respiratory protection.
4. The term "air control room" means a place for pressurization or decompression when the workers concerning high pressure work enter the chamber.
5. The term "pressure" means gauge pressure.

SECTION 2 EQUIPMENT, ETC

Article 523 (Chamber air volume)

An employer shall keep air volume of the chamber 4 cubic meters or larger per one worker where workers are engaged in high pressure work.

Article 524 (Air volume and ventilation in air control room, etc)

① An employer shall maintain floorage and air volume of air control room at the level of 0.3 square meters or more and 0.6 cubic meters or larger per one person who is under pressurization or decompression at its air control room.

② An employer shall take necessary measures to keep partial pressure of carbonic acid gas below 0.005kg/square cm through ventilation to prevent carbonic acid gas of an air control room from catching health problems.

Article 525 (Air cleaner equipment)

① An employer shall install air cleaner equipment in the middle of an airpipe that supplies the workers engaged in working chamber, air control room or submerging with air by an air compressor(Hereinafter "Submerging workers").

② Fire-proof material shall have at least the capacity which shall satisfy the criteria referred to in Korean Standard pursuant to the 「Industrial Standardization Act」 air cleaner equipment capacity referred to in paragraph (1) Shall satisfy compressed air standard for scuba referred to as the criteria in Korean Standard pursuant to the 「Industrial Standardization Act」.

Article 526 (A vent pipe)

① An employer shall install an exclusive vent pipe at a working chamber or an air control room.

② A vent pipe of an air control room to keep down air pressure for high pressure workers shall be 53ml or less inside diameter.

Article 527 (Pressure gauge)

① Where an employer installs outside a valve or a cock that discharges air into a working chamber, he shall also install a pressure gauge that marks pressure in the chamber at its place.

② An employer, where he installs a valve or a cock referred to in paragraph (1) at an interior part, shall have a controller carry a portable pressure gauge.

③ Where an employer installs a valve or a cock for pressurization or decompression for high pressure workers outside of an air control room, he shall also install a pressure gauge that marks pressure in the chamber at its place.

④ An employer, where he installs a valve or a cock referred to in paragraph (3) at an interior part of an air control room, shall have a controller carry a portable pressure gauge.

⑤ The pressure gauge referred to the provisions of paragraph (1) Through (4) Shall have square 0.2kg or less per cm for each marking.

⑥ An employer shall install a pressure gauge in the event of supplying compressed air for submerging workers.

Article 528 (Automatic alarm device, etc)

① Where the temperature of the air in an air compressor supplied into a chamber or an air control room or the air passing through the cooling system attached onto its air compressor abnormally increases and cause install an automatic alarm device to notify its air compressor operator or other staff of

the event.

② An employer shall furnish equipment where he can observe interior of an air control room by installing windows through which inner state of air control room can be identified from outside.

Article 529 (Shelter supplies)

Where workers are engaged in high pressure work and cause furnish as well as personal protective equipment for breathing, fiber rope, supplies to evacuate or rescue high pressure workers in an emergency.

Article 530 (Air tank)

① An employer shall install air tank(Hereinafter "Reserved air tank") To store air for an accident as well as air tank to modulate air volume supplying air to the submerging workers.

② Reserved air tank referred to in paragraph (1) Shall satisfy the requirements pursuant to any of falling under the following items:

1. Air pressure inside an air tank shall be 1.5 times or more than maximum submerging depth pressure
2. Inner volume of an air tank shall be more than the value estimated with this formula

V=60(0.3D+4)/P V: interior volume of an air vessel (Unit: liter) D: maximum submergence depth (Unit: meter) P: air pressure inside an air vessel (Unit: kilogram/square centimeter)

Article 531 (Pressure regulator)

Where an employer supplies submerging workers with air of air cylinder for the respiratory protection whose air pressure is 10kg or more per square cm and cause have them use a pressure regulator applying 2-stage or more decompression type.

SECTION 3 WORKING METHODS, ETC

Article 532 (Speed of pressurization)

An employer shall pressurize high pressure workers in an air control room at the speed of 0.8kg or less per square cm for a minute.

Article 533 (Decompression speed)

An employer shall depressurize high pressure workers in an air control room in accordance with the criteria determined and announced by the Minister of Employment and Labor.

Article 534 (Special occasions of decompression, etc)

① An employer may quicken decompression speed or reduce decompression suspension hours than the criteria determined by the Minister of Employment and Labor in accordance with Article 533 if necessary where he evacuates high pressure workers in an accident or rescues high pressure workers who happens to have an abnormal symptoms in health.

② Where an employer quickens decompression speed or reduces decompression suspension hours pursuant to paragraph (1), he shall evacuate the worker to an air control room an and keep the pressure pressurized to the level of high pressure in the chamber where its worker worked.

Article 535 (Measures concerning decompression)

① An employer shall take measures falling under any of the following subparagraphs where he decompresses high pressure workers in an air control room.

1. To keep intensity of illumination of surface floor of an air control room above 20lux.
2. To hand out appropriate insulation supplies such as blanket to high pressure workers where the temperature inside an air control room is 10 degrees C or lower.
3. To give out chairs or other resting supplies to high pressure workers where it takes more than one hour to decompress,

② In the event of decompressing high pressure workers in an air control room decompression and cause inform high pressure workers of time need to decompression in advance.

Article 536 (Recording of decompression status, etc)

① In the event of applying high pressure work to workers at an abnormal air pressure and cause furnish automatic recording pressure gauge in an air control room.

② An employer shall record the documents that keep the recording of decompression status for every decompression applied to high pressure workers, names of its high pressure workers, and date of decompression and keep it for 5 years.

Article 537 (Up lift speed, etc)

Where an employer has submerging workers up lift, its speed may be administered in accordance with the criteria determined and announced by the Minister of Employment and Labor.

Article 538 (Special occasions of up lift, etc)

① Where an employer has submerging workers up lift due to accident, an employer might be able to adjust its speed notwithstanding the provisions of Article 537.

② Where an employer has submerging workers having an accident up lift, he shall evacuate those submerging workers to the air control room as soon as possible and pressurize them to the level of pressure at maximum depth of its submerging work, or submerge those submerging workers to the maximum dept of its submerging work.

Article 539 (Contact)

① Where a worker operates high pressure work and cause regularly place a guardian around the air control room to make him contact high pressure workers and air compressor operator in the course of carrying out work or to take other necessary measures.

② An employer shall install a communication device through which high pressure workers and air compressor operator and a guardian can communicate one another.

③ Where the communication device referred to in paragraph (2) Is out of function and cause furnish equipment to communicate with another method, its equipment with it placed where it can be easily noticeable to high pressure workers, air compressor operator and a guardian.

Article 540 (Measures concerning ventilation · settlement)

① Where an employer sinks structure(Hereinafter "caisson") which is made for underwater work, he shall evacuate high pressure workers outside of a caisson and discharges inner air to outside.

② In the event of sinking caisson pursuant to paragraph (1)and cause check harmful gas generation or other matters and start the work after confirming that it is not deemed to cause any health problems to high pressure workers.

Article 541 (Measures concerning blasting)

An employer shall not have any worker enter high pressure chamber till air pressure in a chamber reaches the same level of state prior to blasting in the event of blasting inside a chamber.

Article 542 (Prevention of burn)

① An employer, in the event of high pressure work, shall inform workers of combustion risk of flammable substance at an air pressure exceeding atmospheric pressure and take measures to prevent high pressure workers from burn or other risk falling under any of the following subparagraphs:

1. To use an electric lamp attaching an arrestor or the one which is not deemed to cause any fire due to damaged light bulb's falling to flammable substance.
2. Not to use a current-flowing breaker which creates sparks.
3. In the event of heating, to use substances which are not deemed to cause ignition of flammable substance due to its heat temperature.

② An employer, in the event of high pressure work, shall not operate the work related to welding · gas cutting work or fire or arc work(Hereinafter referred to as "welding-related work"): Provided that it is deemed to operate welding-related work if the pressure in the chamber is 1kg or less per square cm.

③ An employer, in the event of high pressure work, shall prevent workers from carrying things which might cause fire and entering, with its notice be posted an outside of the air control room where it is easily noticeable: Provided that it shall be otherwise to operate welding-related work at a place whose pressure in the chamber 1kg or less per square cm when considering qualities of the work.

④ An employer shall prevent workers from carrying things which might cause fire and entering high pressure workplace.

Article 543 (Restriction on caisson chamber excavation)

An employer shall dig out more than 50cm underground of caisson chamber for the prevention of hazard to workers in a high pressure chamber caused by sudden settlement of a caisson.

Article 544 (Air supply volume)

Where an employer supplies air to submerging workers through air compressor or a manual pump, he shall maintain air supply volume per minute for each submerging worker at least 60 liters for below the pressure for depth of water.

Article 545 (Submerging work using air cylinder for the respiratory protection)

An employer shall take measures falling under any of the following subparagraphs where he has submerging workers furnished with air cylinder for the respiratory protection(Excluding emergency. Hereinafter the same will apply).

1. To inform submerging workers of air supply capacity and state for air cylinder for the respiratory protection.
2. To place a guardian to monitor submerging worker's problems.

Article 546 (Restriction on high concentration oxygen use)

An employer shall not have submerging workers breathe in only high concentration oxygen: Provided that it shall be otherwise if he has submerging workers breathe in oxygen to cure those who have a serious problem such as sudden up lift.

Article 547 (A guardian)

Where an employer operates submerging work where he supplies air with an air compressor or a manual pump or where he supplies air with a compressed air cylinder(Excluding the one carried by submerging workers), he shall place at least one guardian to communicate with submerging workers(Hereinafter and

in this Article 548 referred to as "a guardian") for two submerging workers and have a guardian observe the matters falling under any of the following subparagraphs:

1. To appropriately submerge or up lift submerging workers
2. To supply air volume necessary to submerging workers by contacting a person who is in charge of contacting a valve or a cock to regulate air supply to submerging workers
3. Quickly to contact submerging workers if it is deemed to cause hazard or health problems to submerging workers due to air supply equipment mal-function or other accident
4. To confirm whether submerging a worker's helmet is tightly bound to main body prior to submerging in the event of using a helmet type of diving apparatus

Article 548 (Submerging a worker's belongings, etc)

① Where workers are engaged in submerging work supplying air through air compressor and manual pump, or submerging work supplying air through a compressed air cylinder(Excluding the ones carried by emergency and submerging workers)and cause have submerging workers carry signal ropes, underwater watch, underwater pressure gauge and sharp knife: Provided that where a communication device is set up between submerging workers and a guardian to communicate each other, signal ropes, underwater watch and underwater pressure gauge might not be obligatory to carry.

② An employer, where submerging workers operate submerging work while carrying a compressed air cylinder, shall have submerging workers wear a lifesaving vest in addition to underwater watch, underwater pressure gauge and sharp knife, etc.

SECTION 4 MANAGEMENT, ETC

Article 549 (Supervisor's portable apparatus)

An employer shall have a supervisor of high pressure work carry emergency signal apparatus such as portable pressure gauge, harmful gas indicator, etc.

Article 550 (A restricted area)

① An employer shall prevent a place where air control room is installed and he controls from unauthorized person from entering, with its sign posted at a place where it is easily noticeable.

② Workers shall not enter the place which is prohibited to enter in accordance with paragraph (1) without an approval of entry from an employer.

Article 551 (High pressure work equipment checkup, etc)

① An employer shall check it pursuant to the following items before using it with regard to equipment or apparatus for high pressure work.

1. To check facility or device in the following items more than once everyday.
   A. A vent pipe referred to in Article 526 and communication device referred to in Article 539 (2).
   B. A valve or a cock chamber to regular air in an air control room.
   C. A valve or a cock to regulate ventilation in the chamber and air control room.
   D. A cooling system attached to an air compressor to supply air to a chamber or an air control room air compressor.
2. To check a device and an apparatus in the following items more than once every week.
   A. Automatic alarm device referred to in Article 528.
   B. Tools referred to in Article 529.
   C. To supply air to a chamber or an air control room air compressor.
3. To check a device and an apparatus in the following items more than once every month.
   A. A pressure gauge referred to in Article 527 and Article 549.
   B. Air cleaner equipment referred to in Article 525.

② An employer shall repair, replace, or shall take other necessary measures where problems are found as a result of check up referred to in paragraph (1).

Article 552 (Submerging work equipment checkup, etc)

① An employer shall check submerging apparatus falling under any of the following subparagraphs prior to starting submerging work.

1. Diving apparatus, airpipe and signal ropes(Referring to submerging work that supplies air by an air compressor).
2. Diving apparatus, airpipe, signal ropes and a pressure regulator under Article

531 whose air is supplied by air cylinder for the respiratory protection(Excluding emergency and the one carried by submerging workers).

3. A diving apparatus and a pressure regulator under Article 531 where submerging workers carry air cylinder for the respiratory protection(Excluding emergency).

② An employer shall check equipment pursuant to the following items before using it for submerging work.

1. Submerging work to supply air by an air compressor.
   A. To check an air compressor or a hydraulic pump more than once every week.
   B. To check an underwater pressure gauge referred to in Article 548 more than once every month.
   C. To check an underwater watch referred to in Article 548 more than once every three months.
2. Submerging work to supply air by air cylinder for the respiratory protection(Excluding the one carried by submerging workers).
   A. To check an underwater pressure gauge referred to in Article 548 more than once every month.
   B. To check an underwater watch referred to in Article 548 more than once every three months.
   C. To check an oxygen generator more than once every six months.

③ An employer shall repair, replace, or shall take other necessary measures where problems are found as a result of check up referred to in paragraph (1) and (2).

Article 553 (Checkup prior to use, etc)

① Where an employer firstly uses an air supply equipment after installation, where he operates an air supply equipment again after disassembling, remodelling, or repairing it, or where he reuses an air supply equipment that has not been used for more than one month, he shall check the air supply equipment and use it.

② An employer shall repair, replace, or shall take other necessary measures where problems are found as a result of check up referred to in paragraph (1).

Article 554 (Measures concerning in the event of accident happening)

① Where an employer shall evacuate high pressure workers outside if it is deemed that air supply equipment mal-function or other accident might cause health problems to high pressure workers.
② Where an accident referred to in paragraph (1) Happens and cause check mal-function, caisson, etc or more settlement or tilted state of air supply equipment and allow high pressure workers to enter after confirming that there is no anticipation of health problems occurrence.

Article 555 (Keeping check records)

An employer shall check the provisions of Article 551 through 553 and keep the recording of the matters falling under any of the following subparagraphs for 5 years.

1. Inspection date.
2. Inspection method.
3. Inspection classification.
4. Inspection report.
5. Supervisor's name.
6. Measures referred to in inspection report.

Article 556 (Working hours for high pressure)

An employer, where a worker operates high pressure work, shall follow the time in accordance with the criteria determined and announced by the Minister of Employment and Labor.

Article 557 (Submerging hours)

An employer, where a worker operates submerging work, shall follow the time in accordance with the criteria determined and announced by the Minister of Employment and Labor.

CHAPTER 6 PREVENTION OF HEALTH PROBLEMS FROM TEMPERATURE · HUMIDITY

SECTION 1 COMMON PROVISIONS

Article 558 (Definition)

The terms used in this Chapter shall have the same meanings as follows:

1. The term "high temperature" means high temperature that can trigger health problems such as heat cramps · heat collapse or heat stroke, etc such as heating source.
2. The term "low temperature" means cold temperature that might cause health problems such as frostbite to workers due to cooling source.
3. The term "humid" means humid state where humidity might cause health problems such as skin disease, etc to worker.

Article 559 (High temperature work, etc)

① The term "high temperature work" means a work operated at a place which refers to any of the following cases.

1. A place for smelting or refining mineral or metal using a blast furnace, an open hearth furnace, an electric pathway or an electric furnace.
2. A place for dissolving mineral · metal or glass using a cupola, etc.
3. A place for mineral · metal or glass using a heating furnace.
4. A place for firing pottery or roofing tile.
5. A place for roasting or sintering mineral.
6. A place for transporting · rolling or processing heated metal.
7. A place for transporting or injecting melt metal.
8. A place for molding melt glass into a glass product.
9. A place for heat-treatment by putting sulfur in a rubber.
10. A place for drying object using heat source.
11. A place where high temperature is generated in a mine.
12. A place where a heated furnace is repaired.
13. Other places where the Minister of Employment and Labor deems it necessary.

② The term "low temperature work" means a work at a place which refers to any of the following cases.

1. A place for handling plenty of liquid air · dry ice.

2. Interior part of a refrigerator · refrigeration warehouse · ice bunker or freezer, etc.
3. Other places where the Minister of Employment and Labor deems it necessary.

③ The term "humid work" means a work at a place which refers to any of the following cases.

1. A place for dyeing in a dyeing bath with plenty of vapor.
2. A place for washing or plating metal · non-metal using plenty of vapor.
3. A place for humidification at a spinning or napping process.
4. A place for grease-removing leather using plenty of vapor.
5. Other places where the Minister of Employment and Labor deems it necessary.

SECTION 2 GUIDELINES ON EQUIPMENT AND CAPACITY, ETC

Article 560 (Temperature · humidity regulation)

① An employer shall install an appropriate temperature · humidity controller for the purpose of cooling/heating or ventilation where hot · low temperature or humid work is operated indoors: Provided that when considering qualities of the work, it shall be otherwise where it is deemed difficult to install a temperature · humidity controller and therefore take measures to prevent an additional health problems.

② Where an employer installs an air-conditioner referred to in paragraph (1), he shall not keep the temperature significantly lower than that of outside atmospheric temperature: Provided that when considering qualities of the work, it shall be otherwise if it is deemed necessary to take measures to insulate the place in order to maintain a certain level of temperature by operating an air-conditioner.

Article 561 (Ventilation system installation, etc)

An employer shall take necessary measures including ventilation system installation, heat source isolation, radiation heat shut off, etc to reduce indoor high temperature work.

SECTION 3 WORKING CONTROL, ETC

Article 562 (Precautionary measures concerning heat disorders)

An employer shall take measures falling under any of the following subparagraphs to prevent health problems including heat cramps · heat collapse, etc where a worker operates high temperature work.

1. Where an employer places a new worker, he shall take necessary measures to increase high temperature work house step by step everyday till the worker gets familiar with high temperature.
2. An employer shall constantly furnish equipment at a place such as thermometer, etc with which the worker can easily identify temperature · humidity.

Article 563 (Precautionary measures concerning low temperature hazard)

An employer shall take measures falling under any of the following subparagraphs to prevent health problems including frostbite, etc where a worker operates low temperature work prevention.

1. To instruct exercise for a smooth blood circulation.
2. To instruct nutritional guidance for taking in appropriate fat and vitamin.
3. To make preparations for hot water to keep the body temperature constant.
4. To exchange wet working clothes without delay.

Article 564 (Precautionary measures concerning humid hazard)

① An employer shall take appropriate measures such as ventilation to remove humidity, where a worker operates humid work: Provided that when considering qualities of the work it shall be otherwise where it is difficult to remove humidity.

② Where it is deemed difficult to remove humidity when considering qualities of the work humid removal pursuant to the proviso of paragraph (1)and cause take necessary measures such as personal hygiene management not to cause health problems due to humidity.

③ An employer shall take necessary measures such as regular disinfection or cleaning to keep down multiplication of microorganism, where a worker operates indoor humid work.

Article 565 (Humidification)

An employer shall use a clean water for humidification not to harm worker's body where it is deemed necessary to humidify when considering qualities of the work.

Article 566 (Resting, etc)

An employer, where a worker operates high temperature · low temperature · humid work, shall take necessary measures such as resting appropriately, to prevent workers from catching health problems.

Article 567 (Resting facility installation)

① An employer, where a worker operates high temperature · low temperature · humid work, shall furnish workers with resting facility used during break.

② An employer, where he installs resting facility referred to in paragraph (1), shall install it at a place separated from that for high temperature · low temperature or humid work

Article 568 (Mine temperature)

The temperature of a mine referred to in Article 559 (1) 11 shall be maintained at 37 degrees C or lower: Provided that it shall be otherwise if measures are taken to prevent workers from catching health problems caused by high temperature in the event of lifesaving work or harm and hazard prevention work.

Article 569 (A restricted area)

① An employer shall prevent unauthorized worker from entering the places which refer to any of the following cases, with its sign posted at a place where it is easily noticeable.

1. A place a hot place for handling plenty of high temperature object or a high temperature place.
2. A place or very cold place for handling plenty of low temperature object.

② Workers shall not enter the place which is prohibited to enter in accordance with paragraph (1) Without an approval of entry from an employer.

Article 570 (Washing equipment, etc)

An employer shall furnish facilities such as bathhouse, bath facilities, washing facilities and a working clothes at a workplace where workers get their uniforms soaked in the course of carrying out worker's working.

Article 571 (Placement of salt and beverage, etc)

An employer shall place salt and clean beverage at a place where a worker sweat much in the course of carrying out work.

SECTION 4 PERSONAL PROTECTIVE EQUIPMENT, ETC

Article 572 (Distribution of personal protective equipment, etc)

① An employer shall the workers under the conditions prescribed by the following items have and put on appropriate personal protective equipment.

1. Workers handling plenty of high temperature object or working at a very hot place: heat protective gloves and heat protective gear.
2. Workers handling plenty of low temperature object or working at a very cold placer: coldness protective cap, coldness protective shoes, coldness protective gloves and coldness protective gear.

② An employer shall provide workers with an exclusive personal protective equipment in the event of giving out personal one referred to in paragraph (1).

③ Workers shall put on personal protective equipment given out pursuant to paragraph (1) In accordance with instructions of an employer.

CHAPTER 7 PREVENTION OF HEALTH PROBLEMS FROM RADIATION

SECTION 1 COMMON PROVISIONS

Article 573 (Definition)

The terms used in this Chapter shall have the same meanings as follows:

1. The term "radiation" means electron beam which has an energy of a-ray, deuteron ray, proton beam, ß-ray, other heavy charged particle ray, neutron ray, gamma ray, X-ray and 50,000 electron bolt or more (5,000 electron bolt or more in the case of X-ray generator) Holding a capacity that ionizes directly or indirectly air among electromagnetic wave or particle beam.
2. The term "radioactivity substance" means nuclear fuel substance, after-use nuclear fuel, radioactivity radio isotope and nuclear fission product.
3. The term "radiation controlled area" means a place where radiation might be exposed at work.

SECTION 2 RADIOACTIVITY SUBSTANCE CONTROLLING FACILITIES, ETC

Article 574 (Confinement of radioactivity substance, etc)

An employer, where a worker operates radiation work falling under any of the following subparagraphs, shall take necessary measures to prevent workers from catching health problems by installing confinement of radioactivity substance, placing blockage, or installing a local ventilation equipment or an alarm equipment.

1. To manufacture · use an X-ray device or inspect a device which generates X-ray.
2. To inspect a device to manufacture · use a device which accelerates charged particle (Hereinafter "particle accelerator") Such as linear accelerator, cyclotron and synchrotron or a device which generates radiation.
3. To remove gas between X-ray conduit and kenotron or inspect equipment which generates X-ray.
4. To handle equipment where radioactivity substance is equipped.
5. To handle radioactivity substance and substance contaminated by radioactivity

substance.

6. To generate power using nuclear reactor.
7. To mine nuclear source material.
8. To handle others related to equipment which might cause other radiation exposure.

Article 575 (Designation of a radiation controlled area, etc)

① An employer, where a worker operates radiation work, shall designate radiation controlled area to prevent workers from catching health problems and post the matters falling under any of the following subparagraphs:

1. Warning involved with wearing radiation dose measurement tools
2. Precautions against radiation work
3. Matters regarding emergency measures in an accident such as radiation exposure
4. Matters regarding prevention of other radiation health problems

② An employer shall prevent unauthorized radiation worker from entering radiation controlled area.

③ Workers shall not enter the place which is prohibited to enter in accordance with paragraph (2) without an approval of entry from an employer.

Article 576 (Radiation apparatus chamber)

An employer shall install a device or equipment(Hereinafter "radiation apparatus chamber") falling under any of the following subparagraphs(Hereinafter "radiation device") In an exclusive chamber: Provided that it shall be otherwise where it is appropriately blocked, confined structured radiation device is installed, a radiation device should be used by regularly transferring, or it is deemed difficult to install such radiation device in a radiation apparatus chamber when considering qualities or the purpose of the work.

1. X-ray device.
2. Particle accelerator.
3. Extraction gas of X-ray conduit or kenotron and inspection device using X-ray.
4. Equipment equipped inside with radioactivity substance.

Article 577 (Radioactivity substance processing room)

An employer, where a worker handles radioactivity substance without being confined, shall have him operate the work at a radioactivity substance processing room: Provided that falling under any of the following subparagraphs it shall be otherwise.

1. Investigation of water leak.
2. Dynamic investigation using insects.
3. Investigation of movement in a raw material manufacturing process.
4. Mining nuclear source material.
5. Other dispersion or temporary use of radioactivity substance.

Article 578 (Radioactivity substance processing room structure)

An employer shall build the part which might be contaminated such as wall or desks in a radioactivity substance processing room in the same structure falling under any of the following subparagraphs:

1. To build it with a quality for any gas or liquid to infiltrate or corrode.
2. To refine surface flat and polished.
3. To have no bump, digging, or big chasm in its structure.

SECTION 3 FACILITIES AND A WORKING CONTROL

Article 579 (Posting, etc)

An employer post the classification of radiation generator or equipment falling under any of the following subparagraphs at a workplace where they are easily noticeable.

1. Particle accelerator.
   A. Device type.
   B. Radiation type and energy.
2. Equipment mounted with radioactivity substance.
   A. Equipment type.
   B. Radioactivity radio isotope type and amount contained in the mounted radioactivity substance(Unit: becquerel).
   C. Date of mounted radioactivity substance.
   D. Owner's name or title.

Article 580 (Blockage installation, etc)

An employer shall take necessary measures such as installing shielding wall, guard or other blockage where a worker regularly enters radiation apparatus chamber, radioactivity substance processing room, radioactivity substance storing equipment or radioactivity substance storing · disposal facility.

Article 581 (Local ventilation equipment, etc)

An employer, where radioactivity substance might be generated by gas · vapor or dust, shall confine an emitter or install a local ventilation equipment.

Article 582 (Protective equipment)

An employer, where a worker does a work which might attach radioactivity substance to a body or clothes, shoes, protective gear, shall install protective equipment such as a plank or a curtain: Provided that it shall be otherwise where it is difficult to install protective equipment when considering qualities of the work and appropriate protective measures are taken.

Article 583 (Radioactivity substance handling tools)

① An employer shall mark its exclusive use on the tools such as dipper, tongs, etc used for treating radioactivity substance and shall not used them for other purposes.

② An employer shall remove contamination after using tools referred to paragraph (1) and store it using an exclusive tool hanger and installation plate.

Article 584 (Vessel, etc)

An employer shall not use rusted or leaked vessel while storing or transporting radioactivity substance, and mark a sign on outer part of a vessel which contains radioactivity substance.

Article 585 (Measures at a contaminated place)

An employer shall take measures to prevent any further contamination, mark a sign as a contaminated area, and remove it where a place is contaminated by powdered or liquid state of radioactivity substance.

Article 586 (Waste disposes of radioactivity substance)

An employer shall confine radioactivity substance waste in a vessel without

leak of any radiation and dispose of it after marking a sign on outer part of a vessel.

SECTION 4 PERSONAL PROTECTIVE EQUIPMENT, ETC

Article 587 (Distribution of personal protective equipment, etc)

① An employer, where a worker operates at a place which is contaminated by powdered or liquid state of radioactivity substance, shall have workers put on a distributed exclusive personal protective equipment for sufficient breathing.

② An employer, where he handles radioactivity substance, shall have workers put on a distributed personal protective equipment including protecting suit, protective gloves, shoes cover, protective helmet, etc if it is deemed to cause contamination to worker's body due to radioactivity substance scattering.

③ Workers shall put on personal protective equipment given out pursuant to paragraph (1) In accordance with instructions of an employer.

Article 588 (Discarding contaminated personal protective equipment, etc)

An employer shall immediately and appropriately discard protecting suit, protective gloves, personal protective equipment for breathing, etc contaminated by radioactivity substance.

Article 589 (Washing equipment, etc)

Where a worker treats radioactivity substance and cause install equipment and tools for wash up · bath · washing and drying.

Article 590 (Prohibition of smoking, etc)

① Workers shall be prohibited from doing smoking or food intake, etc at a radioactivity substance processing room or other place which could cause works to breathe in or take in other radioactivity substance with its sign posted at a place where it is easily noticeable.

② Workers shall be prohibited from doing smoking or food intake, etc at a place where smoking or food intake pursuant to paragraph (1) Is prohibited.

Article 591 (Reminding of harmfulness, etc)

An employer, where a worker does a radiation work, shall let workers know

about effect of radiation to human body, safe working methods, health and fitness.

CHAPTER 8 PREVENTION OF HEALTH PROBLEMS CAUSED BY PATHOGEN

SECTION 1 COMMON PROVISIONS

Article 592 (Definition)

The terms used in this Chapter shall have the same meanings as follows:

1. The term "blood-borne communicable disease" means communicable disease which is infected by others by means of blood or body fluid such as Human Immune Deficiency Syndrome, hepatitis B and hepatitis C, syphilis.
2. The term "air-borne infection" means communicable disease which is infected through respiratory organ tuberculosis · chickenpox · measles by means of air or droplet nuclei.
3. The term "insects and animal-borne infection" means communicable disease which is infected by animals's excretion such as tsutsugamushi fever, leptospirosis, epidemic hemorrhagic fever with renal syndrome and communicable disease between men and beasts where human being is infected by domestic animal or wild animals such as anthracnose, brucellosis, etc.
4. The term "insects and animal-borne infection high-risk work" means the works listed in the following items.
   A. Outdoor work at wet lands.
   B. Work having a direct contact to wild rodents direct contact and have an indirect contact to excretion.
   C. Domestic animal breeding or butchering, etc work.
5. The term "exposure to blood" means exposure to blood which is deemed to have damaged blood or pathogen by invasive damage by eyes, mouth, mucous membrane, damage skin or injection syringe, etc.

Article 593 (Range of application)

The provisions of this Chapter shall apply to a business or a workplace, which carries out a business falling under any of the following subparagraphs where a worker might be exposed to pathogen such as germ · virus · mold, etc referred to in the Act 24 (1) 1.

1. Medicare activities under「Medical Act」
2. Blood inspection work

3. Disposal of materials collected from a patient materials
4. Treatment of pathogen for research, etc
5. Working at a concentration facility such as childcare facilities
6. Insects and animal-borne infection high-risk work

SECTION 2 GUIDELINES ON GENERAL MANAGEMENT

Article 594 (Precautionary measures against communicable disease, etc)

An employer shall take measures falling under any of the following subparagraphs to prevent worker's blood-borne communicable disease, air-borne infection, insects and animal-borne infection(Hereinafter "Communicable disease).

1. Establishment of a plan for the prevent of communicable disease
2. Giving out personal protective equipment, taking measures to prevent communicable disease such as vaccination
3. Investigating the cause of communicable disease in the event of its outbreak and taking counter-measure against it
4. Taking appropriate measures for a worker who contracts communicable disease

Article 595 (Reminding of harmfulness, etc)

An employer, where a worker does a hazardous work where he might be exposed to pathogen, shall inform workers of the matters falling under any of the following subparagraphs:

1. Type and cause of communicable disease
2. Spreading and infection process
3. Symptom and incubation period of communicable disease
4. Infectious work type and its prevention method
5. Report in the event of exposure and measures to take after exposure and infection

Article 596 (Contamination preventive measures concerning patients' materials)

① An employer, where a worker disposes of patients' materials(Inspection · transportation · cleaning and discarding), shall take necessary measures to prevent contamination by having him wear personal

protective equipment such as protective apron, protective gloves and protective mask, etc.

② Workers shall put on personal protective equipment given out pursuant to paragraph (1) In accordance with instructions of an employer.

SECTION 3 GUIDELINES ON INSTRUCTIONS FOR BLOOD-BORNE INFECTION EXPOSURE HAZARDOUS WORK

Article 597 (Precautionary measures against exposure to blood)

① An employer, where a worker operates exposure to blood hazardous work, shall take measures falling under any of the following subparagraphs:

1. Intake or smoking, makeup and contact lens exchange shall be prohibited at a place which might cause exposure to blood food.
2. Do not store any food in a refrigerator where blood contaminants(Hereinafter "blood contaminants) Such as materials, injection syringe, each medical apparatus, cotton, etc contaminated by blood or patients' blood are kept.
3. A place contaminated by blood or blood contaminants shall be disinfected in an appropriate method.
4. Blood contaminants shall be transported in a separately marked vessel.
5. Exposure to blood worker shall be washed with disinfection medicine without delay

② An employer, where a worker operates injection and blood-gathering work, shall take measures falling under any of the following subparagraphs:

1. To provide a place for injection and blood-gathering in a stable and comfortable position.
2. To prevent using injection syringe in the event of transferring sampled blood into inspection vessel.
3. To prevent bending, cutting, or putting a lid on a used injection syringe(In case of putting a lid unavoidably, put it on with one hand).
4. Used injection syringe shall be discarded using a sturdy vessel by collecting them in a safe exclusive collecting vessel.

③ Workers shall be prohibited from doing smoking or food intake, etc at a place where smoking or food intake pursuant to paragraph (1) Is prohibited.

Article 598 (Exposure to blood investigation, etc)

① An employer, where an accident related to exposure to blood happens, shall investigate the matters falling under any of the following subparagraphs and shall record and keep them.

1. Exposed person's personal information
2. Exposure status
3. Exposure contributor(Patient)'s state
4. Treatment content for an exposed person
5. Inspection report for an exposed person

② An employer shall identify immunity condition of a worker exposed to blood in accordance with an accident investigation result referred to in paragraph (1) and take measures pursuant to Table 14, and the work who might catch blood-borne infection shall be taken measures in accordance with Table 15.

③ An employer shall notify a relevant worker of result from investigation referred to in paragraph (1) and (2) and its follow-up measure.

④ An employer shall not use result from investigation referred to in paragraph (1) and (2) and its follow-up measure for the purpose of harming others other than for the prevention of communicable disease.

Article 599 (Washing equipment, etc)

Where workers carry out the work which might cause blood-borne infection and cause install equipment for wash up · bath · washing and drying.

Article 600 (Distribution of personal protective equipment, etc)

① An employer, where a worker operates exposure to blood hazardous work, shall have workers put on a distributed personal protective equipment in the following items.

1. Work where blood might be effused or sprayed: goggles and protective mask
2. Work handling blood or blood contaminants: protective gloves
3. Work where plenty of blood soak clothes and be exposed to skin: protective apron

② Workers shall put on personal protective equipment given out pursuant to paragraph (1) In accordance with instructions of an employer.

SECTION 4 GUIDELINES ON INSTRUCTIONS FOR AIR-BORNE INFECTION EXPOSURE HAZARDOUS WORK

Article 601 (Precautionary measures concerning)

① An employer, where a worker contacts a patient with an air-borne infection, shall take measures falling under any of the following subparagraphs to prevent infection.

1. To distribute and supply a worker with protective mask that he can prevent tubercle bacillus
2. To restrict a worker who is mostly like to catch infection due to lower immunity capacity on contacting infectious patient
3. To operate or treat a tuberculosis patient who can spit out phlegm in an isolated room with appropriate ventilation
4. To restrict a pregnant worker on contacting a communicable disease patient which might cause congenial malformation such as German measles · chickenpox

② An employer shall identify immunity condition of a work to the communicable disease exposed to air-borne infection and give a vaccination to him if deemed necessary in medicine.

③ Workers shall put on personal protective equipment given out pursuant to paragraph (1) 1 in accordance with instructions of an employer.

Article 602 (Management after exposure)

An employer shall take necessary measures to suspend a worker exposed to air-borne infection patient falling under any of the following subparagraphs.

1. To inspect whether infection is positive or not as soon as air-borne infection symptom occurs
2. To take measures to cure infection appropriately if proved positive
3. To take a deformation test against a fetus where a worker who catches German measles, chickenpox, etc is pregnant
4. To restrict on contact of infected workers to colleague to prevent spreading for a certain period of time

SECTION 5 GUIDELINES ON INSTRUCTIONS FOR INSECTS AND ANIMAL-BORNE INFECTION EXPOSURE HAZARDOUS WORK

Article 603 (Precautionary measures concerning)

An employer, where a worker operates insects and animal-borne infection hazardous work, shall take measures falling under any of the following subparagraphs:

1. To have workers put on long sleeve clothing and long pants as working clothes
2. To prevent workers from food intake at a place which might cause insects and animal-borne infection
3. To provide food and resting place at a place near workplace isolated from pollution source
4. To instruct workers to take a bath after work
5. To check whether they got a bite from insects or animals and have them consult with doctors in the event of symptoms outbreak

Article 604 (Management after exposure)

An employer shall have workers who have done insects and animal-borne infection high-risk work consult a doctor where they have symptoms falling under any of the following subparagraphs symptom.

1. High temperature · chill · headache
2. Skin rash · skin ulcer · abscess and scabs
3. Hemorrhagic lesion

CHAPTER 9 PREVENTION OF HEALTH PROBLEMS CAUSED BY DUST

SECTION 1 COMMON PROVISIONS

Article 605 (Definition)

The terms used in this Chapter shall have the same meanings as follows:

1. The term "dust" means refined powdered state material generated or scatter at a place where a worker carries out his job.
2. The term "dust work" means the work referred to in Table 16.
3. The term "respiratory organ protective program" means universal plan for preventing and controlling respiratory organ disease including, but not limited to, assessment about exposure to dust, engineering control referred to in excessive exposure to dust standard, distribution and wearing of personal protective equipment for breathing, training about harmfulness and prevention of dust, regular health examination, record · management, etc.

Article 606 (Exceptions for application)

① The provisions of this Chapter shall not apply to the work that prevents dust from scattering by watering or refueling equipment with watering equipment or refueling equipment as a work which refers to any of the following cases:

1. Work at a place where earth rock · rock · mineral, etc(Hereinafter "rock, etc") Is sifted at mine referred to in subparagraph 3, Table 16 in the course of carrying out work
2. Work referred to in subparagraph 5, Table 16
3. Work at a place where rock · mineral or metal is grinded or cut out using abrasive material or power-driven in the course of carrying out work referred to in subparagraph 6, Table 16
4. Work at a place where material is sifted which uses rock or carbon as main component using power referred to in Table 16, subparagraph 7 in the course of carrying out work
5. Work at a place where material is crushed which uses rock or carbon as main component using power outside referred to in Table 16, subparagraph 7 in the course of carrying out work

6. Work at a place where rock · carbon material or aluminum foil material is sifted or crushed in water or in oil which uses rock or carbon as main component using power referred to in Table 16, subparagraph 7 in the course of carrying out work referred to in subparagraph 7, Table 16 in the course of carrying out work

② In the case of a temporary dust work whose working hours is less than 24 hours per month, the provisions of this Chapter shall not apply where an employer has workers put on their personal protective equipment for sufficient breathing: Provided that it shall be otherwise where temporary dust work is done for 10 to 24 hours every month.

③ The provisions of this Chapter shall not apply to the cases of working in an office pursuant to the provisions of Article 11.

SECTION 2 EQUIPMENT, ETC STANDARD

Article 607 (Local ventilation equipment installation)

An employer shall install a confined equipment or a local ventilation equipment to reduce dust referred to in dust work in an indoor workplace in the event of dust work under the provisions of paragraph 5 through 25 Table 16.

Article 608 (Installing a general ventilation system)

An employer, where it is deemed difficult to install equipment under Article 607 due to large dust release area, might install a general ventilation system in the event of doing dust work.

Article 609 (Capacity of local ventilation equipment)

Local ventilation equipment installed pursuant to the proviso of Article 607 or Article 617 (1) Shall have its capture velocity more than that referred to in Table 17.

Article 610 (Maintaining humidity using equipment of dust)

An employer shall take necessary measures such as watering seriously scattering workplace to prevent hazard to workers caused by dust scattering.

Article 611 (Maintaining humidity using equipment)

An employer, where he installs humidifying equipment pursuant to the proviso of Article 617 (1) at a dusty workplace, shall maintain humid state using such equipment during dusty work.

SECTION 3 MANAGEMENT, ETC

Article 612 (Inspection prior to use, etc)

① In cases of firstly using local ventilation equipment pursuant to the proviso of Article 607 and 617 (1) Or firstly using it after disassembling, remodelling, or repairing it and cause check it pursuant to the following items before using it.

1. Local ventilation equipment
   A. To check duct and ventilator dust
   B. To check duct connect loosening
   C. To check inhalation and ventilation capacity
   D. Other matters necessary to maintain capacity of local ventilation equipment
2. Air filter
   A. Inner dust state of an air filter
   B. Filter material damage of a dust collector
   C. Capacity of disposing of dust by an air filter
   D. Other matters necessary to maintain capacity of an air filter

② An employer shall repair, replace, or shall take other necessary measures where problems are found as a result of check up referred to in paragraph (1).

Article 613 (Cleaning)

① An employer shall clean the indoor workplace carrying out a dust work every day before starting to work.

② An employer shall clean accumulated dust of indoor workshop floor · wall and equipment and resting facility floor, etc(Limited to indoors) at least once a month with a regular vacuum cleaner or water without scattering dust: Provided that it shall be otherwise where it is difficult to clean the dust without being scattered and personal protective equipment for sufficient breathing is supplied to the cleaning workers.

Article 614 (Reminding harmfulness of dust, etc)

An employer, where a worker does a regular dust work, shall inform workers of the matters falling under any of the following subparagraphs:

1. Harmfulness of dust and exposure process
2. Prevention of dust divergence and ventilation method for a workplace
3. Workplace and individual hygiene management
4. Personal protective equipment for breathing use method
5. Prevention method of disease related to dust

Article 615 (Washing equipment, etc)

An employer, where workers do a dust work, shall install a washing equipment necessary to bath facilities.

Article 616 (Executing a respiratory organ protective program, etc)

An employer shall establish and perform a respiratory organ protective program which refers to any of the following cases.

1. Workplace which exceeds guidelines on exposure as a result of measuring dust at a working environment referred to in Article 42 of the Act
2. A workplace which causes health problems to workers due to dust work

SECTION 4 PERSONAL PROTECTIVE EQUIPMENT

Article 617 (Distribution of personal protective equipment for breathing, etc)

① An employer, where workers do a dust work, shall distribute personal protective equipment for sufficient breathing to the workers and have them put them on: Provided that it shall be otherwise if measures are taken by installing equipment or local ventilation equipment which confines dust source at a workplace or furnishing equipment to maintain humid state at a dusty workplace.

② An employer, where he gives out personal protective equipment pursuant to paragraph (1), shall take necessary measures to prevent contamination by suppling workers with exclusive personal protective equipment and installing storage boxes, etc.

③ Workers shall put on personal protective equipment given out pursuant to paragraph (1) In accordance with instructions of an employer.

CHAPTER 10 PREVENTION OF HEALTH PROBLEMS CAUSED BY CONFINED SPACE WORK

SECTION 1 COMMON PROVISIONS

Article 618 (Definition)

The terms used in this Chapter shall have the same meanings as follows:

1. The term "confined space" means places referred to in Table 18 which have danger of fire · explosion, etc due to lack of oxygen, harmful gas.
2. The term "harmful gas" means the gas produced in the air as gas state in a confined space in a form of harmful substances such as carbonic acid gas · hydrogen sulfide, etc.
3. The term "optimum air" means air whose oxygen concentration ranges between 18% 23.5%, carbonic acid gas concentration less than 1.5%, hydrogen sulfide concentration less than 10ppm.
4. The term "lack of oxygen" means state of the air that oxygen concentration of the air is less than 18%.
5. The term "lack of oxygen" means a symptom that occurs by breathing in the air lacking in oxygen.

SECTION 2 MEASURES TO TAKE DURING CONFINED SPACE WORK

Article 619 (Establishment · performance of a confined space occupational health work program, etc)

An employer, where a worker operates exposure work in Table 18, establish and perform a program for confined space occupational health work falling under any of the following subparagraphs:

1. Measurement · assessment to confirm whether the air state is relevant before starting to work
2. Education and training of safety occupational health such as emergency measures
3. Wearing and management of an air respirator or air supplied mast, etc(Hereinafter in this chapter "Air supplied mast, etc")

4. Other matters with reference to confined space worker's prevention of health problems

Article 620 (Ventilation, etc)

An employer, where a worker operates exposure work, shall ventilate optimum air state at a workplace before starting to work and in the course of carrying out work: Provided that it shall be otherwise where it is deemed impossible to ventilate due to danger of explosion or oxidation, etc or it is deemed difficult to ventilate when considering qualities of the work and distribute air supplied mast to workers.

Article 621 (Personnel checkup)

An employer, where a worker operates exposure work, shall check up the personnel every time the work enters and gets out of its place.

Article 622 (A restricted area)

① An employer, where a worker operates exposure work, shall prevent unauthorized person from entering its confined space, with its sign posted at a place where it is easily noticeable.

② Workers shall not enter the place which is prohibited to enter in accordance with paragraph (1) without an approval of entry from an employer.

Article 623 (Contact)

An employer, where a worker operates exposure work, shall install equipment with which its workplace and a guardian outside can communicate each other regularly.

Article 624 (Evacuation due to accident, etc)

① Where it is deemed that workers might lack in oxygen or high concentration of harmful gas might explode in the course of carrying out exposure work and cause stop the work and make the worker evacuate its place where.

② Where an employer evacuate the worker pursuant to paragraph (1), he shall take necessary measures to prevent unauthorized person from entering the place till he confirms optimum air state, with its sign posted at a place where it is easily noticeable.

③ Workers shall not enter the place which is prohibited to enter in accordance with paragraph (2) without an approval of entry from an employer.

Article 625 (Placement of evacuation apparatus)

An employer, where a worker operates exposure work, shall furnish apparatus necessary to evacuate or rescue workers in an emergency such as air supplied mast, ladder and fiber rope, etc.

Article 626 (Using air supplied mast for rescue operation)

① An employer shall provide workers with air supplied mast where he has workers rescue other workers at an emergent risk to exposure.

② Workers shall put on personal protective equipment given out pursuant to paragraph (1) In accordance with instructions of an employer.

SECTION 3 GUIDELINES ON INSTRUCTIONS FOR A PLACE WHERE HARMFUL GAS OCCURS

Article 627 (Disposal of harmful gas, etc)

An employer, where a worker operates tunnelling · mining work, shall investigate its concentration to prevents workers from exposure to harmful gas in advance and do the work in accordance with the period set for disposal of harmful gas method, tunnel · mine digging.

Article 628 (Measures concerning fire extinguishing installations, etc)

An employer shall take measures falling under any of the following subparagraphs where he uses carbonic acid gas for fire extinguisher or fire extinguishing installations such as basement, engine room, wharf, other places where ventilation are not enough ventilation.

1. To make sure that a fire extinguisher or fire extinguishing installations won't be turned upside down and straps won't work easily
2. To prevent a fire extinguisher or fire extinguishing installations from being randomly operated except for the cases where workers extinguish fire and to post a sign where it is easily noticeable

Article 629 (Measures to take concerning welding)

① An employer, where a worker welds at a place such as inner part of a tank · a boiler or a reacting top where ventilation is not enough, shall take measures falling under any of the following subparagraphs:

1. To maintain a workplace with optimum air state
2. To have workers put on distributed air supplied mast

② Workers shall put on personal protective equipment given out pursuant to paragraph (1) In accordance with instructions of an employer.

Article 630 (Inert gas leak)

An employer shall take measures falling under any of the following subparagraphs, where a worker does a work at a place such as a boiler · a tank · a reacting top or wharf, etc which has a piping sending out gas (Hereinafter "Inert gas") Referred to in subparagraph 13, Table 18.

1. To lock a valve or a cock, or install a cutoff valve
2. To install a locker on a valve or a cock, or a cutoff valve referred to in subparagraph 1, post a notice that says random opening is prohibited a place where it is easily noticeable
3. To put a sign regarding manipulation method such as direction of opening and closing as well as attaching inert gas titles inside the piping on a valve or a cock of the piping sending out inert gas or switch or button to control it so that inert gas may not leak due to wrong control

Article 631 (Prevention of inflow of inert gas)

An employer, where a worker does a work which could cause a safety value of a tank or a reacting top to release inert gas, shall take necessary measures by installing equipment that sends inert gas released by the safety valve directly outside to prevent such inert gas from remnant to the workplace.

Article 632 (Refrigerator, etc work)

① An employer, where a worker works at an inner part of a refrigerator · a freezer, etc, shall take measures to prevent equipment from randomly locking the gate: Provided that it shall be otherwise where there is an alarm device installed connecting inner and outer part of equipment.

② An employer, where he locks up facility or equipment such as a refrigerator · a freezer used in confinement, shall check whether there is a

worker inside or not.

Article 633 (Prevention of random locking of the exit)

An employer, where a worker works at a tank · a reacting top or other confined facilities, shall take measure to prevent the entering lid or a gate from randomly locking up during the work.

Article 634 (Measures concerning gas piping work)

① An employer shall take measures falling under any of the following subparagraphs, where a worker dismantles or attaches piping to supply gas at a place where ventilation is not enough such as in a basement or a manhole.

1. An employer shall keep gas from flowing into a workplace where piping is dismantled or attached
2. An employer shall ventilate the workplace or have workers put on a distributed air supplied mast

② Workers shall put on personal protective equipment given out pursuant to paragraph (1) 2 in accordance with instructions of an employer.

Article 635 (Measures concerning pressurized work)

① An employer, where a worker does a pressurized work at a stratum or its and neighboring place referred to in subparagraph 1, Table 18, shall examine oxygen concentration in the air as well as possibility of harmful gas leak during the work.

② An employer, where he finds any harmful gas leak as a result of investigation referred to in paragraph (1) Or lack of oxygen in the air, shall stop the work and prevent him from entering.

③ Workers shall not enter the place which is prohibited to enter in accordance with paragraph (2) without an approval of entry from an employer.

Article 636 (basement, etc work)

① An employer, where a worker does a work in a basement or pit where piping is stalled connected to a stratum or a well referred to in subparagraph 1, Table 18, shall take measures to prevent its piping from releasing the air lacking in oxygen or harmful gas.

② Where the air lacking in oxygen or harmful gas releases, an employer shall

install equipment to send it outside or maintain optimum air state.

Article 637 (Equipment remodel, etc work)

An employer, where a worker disassembles · remodels · repairs or cleans contaminated pump · piping or other auxiliary installations for night soil · wastewater · pulp liquid and perishable substance, shall take measures falling under any of the following subparagraphs:

1. To arrange a working method and an order and let workers know about it in advance
2. To designate a person who is well aware of knowledge regarding prevention of hydrogen sulfide addiction as a supervise which controls the work

SECTION 4 MANAGEMENT, ETC

Article 638 (Follow-up measures)

An employer, where a supervisor finds out and report the result of measurement or checkup under the provisions of item A through D, Article 19, Table 2, shall immediately take necessary measures by giving out ventilation or personal protective equipment or repairing equipment.

Article 639 (Placement of a guardian, etc)

① An employer, where a worker operates exposure work, shall designate and place a guardian at an outside place of confined space to monitor regular work status.

② A guardian referred to in paragraph (1), where he finds any abnormal worker who is engaged in confined space, shall immediately inform a supervisor of its event after taking necessary actions such as asking for a rescue.

Article 640 (Emergency rescue training)

An employer shall regularly provide workers engaged in confined work with training such as emergency contact system operation, rescuing equipment use, air supplied mast wearing, and first aid at least once per every 6 months to respond to emergency and record and keep its result.

Article 641 (Reminding safe working methods, etc)

An employer, where a worker operates exposure work, shall inform him of the matters falling under any of the following subparagraphs every time he starts work in advance.

1. Matters related to measuring oxygen and harmful gas concentration
2. Accident emergency measures
3. Matters related to safe working methods such as ventilation equipment operation
4. Matters related to wearing of personal protective equipment and its method
5. Matters related to emergency rescue such as rescuing equipment use

Article 642 (Medical examination)

An employer, where a worker has a symptom of lack of oxygen or is addicted to harmful gas, shall take an immediately medical examination or treatment.

Article 643 (Oxygen concentration, etc measurement)

① An employer, where a worker operates exposure work, shall have a person who refers to any of the following cases measure oxygen concentration and assess whether optimum air is maintained in advance.

1. A supervisor
2. A safety manager referred to in of the Act 15 (1) and a health manager referred to in 16 (1) Of the Act
3. A safety management service organization referred to in the Act 15(4)
4. Article 16(3) Of the Act shall apply mutatis mutandis pursuant to occupational health service institute referred to in Article 15(4) Of the Act.
5. A designated inspection institute referred to in Article 42(4) Of the Act

② An employer, where it is not deemed that optimum air is not maintained in accordance with the result of measurement of oxygen concentration pursuant to paragraph (1), shall take appropriate measures such as ventilation of workplace, distributing · wearing of air supplied mast to prevent workers from catching health problems.

SECTION 5 PERSONAL PROTECTIVE EQUIPMENT, ETC

Article 644 (Distribution of personal protective equipment, etc)

An employer, when he gives out air supplied mast, shall gives out a worker his own exclusive one where it is deemed to cause disease infection.

Article 645 (Safety harness, etc)

① An employer, where a worker engaged in confined space might fall due to lack of oxygen or harmful gas, shall give out him safety harness, lifesaving ropes and air supplied mast to put on.

② An employer, where he has a worker wear safety harness or lifesaving ropes pursuant to paragraph (1), shall install equipment, etc where he can wear them.

③ Workers shall put on personal protective equipment given out pursuant to paragraph (1) In accordance with instructions of an employer.

CHAPTER 11 PREVENTION OF HEALTH PROBLEMS IN AN OFFICE

SECTION 1 COMMON PROVISIONS

Article 646 (Definition)

The terms used in this Chapter shall have the same meanings as follows:

1. The term "office" means indoor space (Including space such as lounge · auditorium · meeting room, etc) Where a worker does office work.
2. The term "office contaminants" means substances that might cause health problems to workers while floating in the air in an office including, but not limited to gas · vapor · dust referred to in the Act 24 (1) 1 and mold · germ · virus.
3. The term "air purification equipment, etc" means air supply · ventilation system which sends out office contaminants or sends in outside fresh air into indoors, filter material which removes or reduces contaminants, cooling/heating device which regulates temperature · humidity · air current, or other its corresponding.

SECTION 2 EQUIPMENT CAPACITY, ETC

Article 647 (Operation of air purification equipment, etc)

① An employer, where a worker works in an office where central management type of air purification equipment is built, shall appropriately operate air purification equipment to prevent office contamination.

② An employer shall take measures to keep the air blown into the office by an air purification equipment from directly contacting a worker, with its air current speed being less than 0.5m per second.

Article 648 (Maintenance management such as air purification equipment)

An employer shall take appropriate measures such as cleaning or remodeling or repair if deemed necessary, while regularly checking up an air purification equipment referred to in Article 646.

CHAPTER 12 PREVENTION OF HEALTH PROBLEMS CAUSED BY MUSCULOSKELETAL SYSTEM-RELATED WORK

SECTION 1 COMMON PROVISIONS

Article 656 (Definition)

The terms used in this Chapter shall have the same meanings as follows:

1. The term "musculoskeletal system-related work" means the work determined and announced by the Minister of Employment and Labor in accordance with working volume · working speed · intensity of work and a workplace structure as a work referred to in the Act 24 (1) 5.
2. The term "musculoskeletal disorders" means a disease that outbreaks in a neck, a shoulder, a waist, an arm · a leg nerve · a muscle and its neighboring bodily tissue as a health hazard caused by repetitive operation, inappropriate good working posture, immoderate power use, contact between a sharp phase and a body, vibration and temperature, etc.
3. The term "prevention and management program for musculoskeletal disorders" means an universal plan to prevent and management of musculoskeletal disorders including matters related to investigation of harmful factors, improvement of working environment, medical management, education · training, assessment, etc.

SECTION 2 INVESTIGATION AND IMPROVEMENT OF HARMFUL FACTORS, ETC

Article 657 (Investigation of harmful factors)

① An employer, where a worker does a musculoskeletal system-related work, shall investigate harmful factors regarding the matters falling under any of the following subparagraphs every three years: Provided that newly established workplace shall investigate harmful factors within the first year of the establishment.

1. Matters related to a workplace including, but not limited to equipment · work process · working volume · working speed
2. Working conditions including working hours · good working posture · working methods, etc

3. Symptoms of musculoskeletal disorders related to work

② An employer shall investigate harmful factors without delay notwithstanding paragraph (1) If the causes which refer to any of the following cases happen: Provided that the case of subparagraph 1 shall include the cases which is not generated by the work other than musculoskeletal system-related work.

1. Where a person catches musculoskeletal disorders as a result of a temporary health examination pursuant to the Act or where a worker is proved to have musculoskeletal disorders in accordance with subparagraph 2 A · D and 6, Table 3, 「the Enforcement Decree of the Industrial Accident Compensation Insurance Act」.
2. Where new work · equipment applicable to musculoskeletal system-related work is introduced.
3. Where working environment such as work volume and a work process applicable to musculoskeletal system-related work is changed

③ An employer shall have representative of workers or workers participate in the investigation of harmful factors.

Article 658 (Investigation of harmful factors method, etc)

An employer, where he investigates harmful factors, shall taken consideration of interview with a worker, symptom survey investigation, ergonomic section in an appropriate method.

Article 659 (Improvement of working environment)

An employer shall take necessary measures to improve working environment by installing ergonomically designed laborpower work assistance equipment and convenient equipment if it is deemed to cause musculoskeletal disorders as a result of investigation of harmful factors .

Article 660 (Notification and follow-up measures concerning)

① Where a worker suffers from symptoms including hypometria, grp strength lowering, function loss, etc due to musculoskeletal system-related work, he shall notify his employer of the occurrence.

② An employer shall take medical measures against a work who contracts symptoms referred to in paragraph (1) Due to musculoskeletal system-related work and take appropriate measures such as improvement of working

environment referred to in Article 659 .

Article 661 (Reminding of harmfulness, etc)

① An employer, where a worker does a musculoskeletal system-related work, shall inform workers of the matters falling under any of the following subparagraphs:

1. Harmful factors of musculoskeletal system-related work
2. Signs and symptoms of musculoskeletal disorders
3. Reactions to musculoskeletal disorders outbreak
4. Accurate good working posture and a working tools, and accurate use method of working facility
5. Other matters with reference to prevention of musculoskeletal disorders

② An employer shall notify workers of investigation of harmful factors and its result referred to in Article 657 (1) and (2), and investigation method referred to in Article 658.

Article 662 (Carrying out prevention and management program for musculoskeletal disorders)

① An employer shall establish and perform a program for prevention and management for musculoskeletal disorders which refers to any of the following cases.

1. Where a workplace has more than 10 workers per year who have been acknowledged as musculoskeletal disorders in accordance with subparagraph 2 A · D and 6, Table 3,「the Enforcement Decree of the Industrial Accident Compensation Insurance Act」 or where a workplace has more than 5 workers per year whose outbreak percentage exceeds 10% of its total number of workers at a workplace
2. As a workplace between labor and management in relation with prevention of musculoskeletal disorders, where it is determined and ordered at its own discretion by the Minister of Employment and Labor that the workplace shall establish and perform a program for prevention and management for musculoskeletal disorders

② An employer shall go through labor-management conference where he draws up · carries out prevention and management program for musculoskeletal disorders.

③ An employer, where he draws up · carries out prevention and management program for musculoskeletal disorders, might consult or get some advices from specialists in each field such as ergonomics · industrial medicine · industrial hygiene · industrial nursery.

SECTION 3 SPECIAL MEASURES RELATED TO RAISING HEAVY MATERIAL

Article 663 (Restriction on heavy material)

An employer, where a worker raises load with his own power, shall relieve workers of immoderate burden caused by excessive weight applied to worker's musculoskeletal system such as neck · waist.

Article 664 (Working conditions)

An employer shall appropriately allot working hours and break in accordance with working conditions applied to human body including, but not limited to product weight · handling frequency · transportation distance · moving speed handled by the worker.

Article 665 (Display of weight, etc)

An employer, where a worker raises a heavy material which is heavier than 5kg, shall take measures falling under any of the following subparagraphs:

1. To display information about weight of product and the centroid which is mainly handled by a worker at a place near the workplace so that he can easily identify it
2. To make use of appropriate assistance tools such as strap adhesion, hook, vacuum sucker as far as items which are hard to handle are concerned

Article 666 (Good working posture, etc)

An employer, where a worker raises a heavy material, shall let him know the way that he keeps the centroid low or adheres to the object to reduce the burden applied to the body.

SECTION 3 OFFICE AIR MANAGEMENT AND STANDARD OF WORK, ETC

Article 649 (Office air assessment)

An employer shall measure · assess the office air if deemed necessary for the prevention of worker's health problems, and shall take necessary measures such as installing or remodelling · repairing air purification equipment in accordance with its result.

Article 650 (Prevention of inflow of outdoor contaminants)

An employer, where it is deemed possible that vehicle exhaust and other contaminants blow in from outside, shall take appropriate measures such as rearrangement of vent · window · gate, etc air inlet, etc.

Article 651 (Microorganism contamination control)

An employer shall take measures falling under any of the following subparagraphs to prevent office air from being contaminated by microorganism:

1. To periodically inspect and repair the place where microorganism might grow such as water leaking area
2. To immediately drying · removal or cleaning the area where microorganism multiplies
3. To remove microorganism contaminated by a building surface and an air purification equipment

Article 652 (Air contamination control in the event of building remodeling · repair)

An employer, where air quality might be deteriorated while remodeling · repairing the building, shall inform workers of its event and shall take appropriate measures such as separation the construction place or controlling and cleaning office contaminants.

Article 653 (Office cleanliness management)

① An employer shall maintain and manage the office cleanly and keep it clean by using a method that controls dust occurrence utmost.

② An employer shall take appropriate measures such as disinfecting bath

facilities · makeup room where microorganism causes contamination and vermin generates.

SECTION 4 MEASURES TO TAKE IN THE EVENT OF REMODELING · REPAIRING AIR PURIFICATION EQUIPMENT

Article 654 (Distribution of personal protective equipment, etc)

① An employer, where a worker cleans, remodels, and repairs air purification equipment, shall have workers put on distributed an appropriate personal protective equipment including goggles, dust respirator.

② An employer shall provide workers with an exclusive personal protective equipment in the event of giving out personal one referred to in paragraph (1).

③ Workers shall put on personal protective equipment given out pursuant to paragraph (1) In accordance with instructions of an employer.

Article 655 (Reminding of harmfulness, etc)

An employer, where a worker cleans, remodels, and repairs air purification equipment, shall inform workers of the matters falling under any of the following subparagraphs:

1. Type and harmfulness of generated office contaminants
2. Working methods to control office contaminants generation
3. Personal protective equipment to put on and its wearing method
4. Emergency measures
5. Other matters with reference to prevent workers from catching health problems

CHAPTER 13 PREVENTION OF HEALTH PROBLEMS CAUSED BY OTHER HARMFUL FACTORS

Article 667 (Measures concerning computer terminal control)

An employer, where a worker controls a computer terminal, shall take measures falling under any of the following subparagraphs:

1. Indoor structure shall have no significant difference between light and shade and have no direct light
2. Low brightness type of lighting apparatus shall be used and windows · surface of a wall shall reflect
3. The chairs and desks where computer terminals and keyboards are installed shall have the structure that can be regulated in their height depending on the workers
4. An employer shall allow break time to the workers who continue to work at a computer terminal

Article 668 (Precautionary measures against health problems caused by non-ionizing radiation wave)

An employer shall take measures falling under any of the following subparagraphs where it is deemed that non-ionizing radiation wave(Excluding electromagnetic wave generated at a computer terminal) Harmful rays · ultrasonic waves generated at a workplace might cause serious health problems to workers:

1. To take appropriate measures such as isolation · shielding source of outbreak or wearing personal protective equipment
2. To display a warning sign at a place where non-ionizing radiation wave breaks out
3. To inform workers of the harmful effect of non-ionizing radiation wave to human body, and its safety working method

Article 669 (Precautionary measures against health problems caused byjobstress)

An employer, where a worker is engaged in a work requiring a high level of physical fatigue and psychological stress(Hereinafter "job stress") Such as working for a long time, shiftwork including night duty, vehicles operation

[limited to full-time job] and precision machine control work, an employer shall take measures falling under any of the following subparagraphs to prevent health problems in accordance with the Act 5 (1):

1. To take actions to improve reducing working hours, long · short-term shiftwork and carry them out working as well as to assess causes of job stress such as environment · details of work · working hours
2. To reflect on worker's opinion at time of establishing a work plan including work plan and a working volume
3. To appropriately allot working hours and break to improve working conditions
4. To pay close attention to support to worker's welfare in addition to worker's activities other than working hours
5. To properly place workers by referring to health examination result, counseling material and give a full explanation causes of job stress, health problems outbreak possibility and preparation to workers
6. To assess cerebrovascular and cardiac disease outbreak risk and carry out a program to improve health including, but not limited to non-smoking, hypertension control, etc

Article 670 (Measures concerning controlling raw material of an agricultural pesticide)

① An employer, where a worker scatters · fumigates · injects raw material of an agricultural pesticide, etc shall take measures falling under the following items.

1. Before starting to work, to train how to control an agricultural pesticide and safety measure to take
2. To take actions against overflowing or flowing backward where he puts agricultural pesticide in a controlling equipment
3. To check whether there is any risk including chemical reaction where he mixes raw material of an agricultural pesticide
4. To stop smoking or ingesting food where he handles raw material of an agricultural pesticide
5. To keep a worker from blowing a nozzle with a mouth blow in order to pierce a nozzle of a controlling equipment
6. To leave a vessel and equipment containing raw material of an agricultural pesticide closed

7. To take measure to prevent a compression vessel containing raw material of an agricultural pesticide from explosion, etc where he handles such vessel
8. To keep harmful gas from leaking where raw material of an agricultural pesticide fumigates.

② An employer shall minimize dust or mist occurrence of raw material of an agricultural pesticide where a worker mixes raw material of an agricultural pesticide, shall inform workers of use and mixing proportion of apparatus measurement vessel, funnel, mixing devices.

③ An employer, where he transfers raw material of an agricultural pesticide into another vessel, shall use the same vessel in which the same raw material of an agricultural pesticide was contained, use a vessel whose safety is confirmed, and a suitable warning sign shall be posted on a container.

ADDENDA <Article No 30, Jul. 6, 2011>

Article 1 (Enforcement date)

This Act shall enter into force on the date of its promulgation.

Article 2 (Repealing other Acts)

「Local Rule on Occupation Safety and Health Standard」 shall be repealed.

Article 3 (Applicability concerning inspection period of a safety valve)

The amended provisions of Article 288(4), partial revision, Regulations on Korea Occupational Safety prescribed by the Ordinance of the Ministry of Employment and Labor No. 25 shall apply to cases where the first inspection period returns after this partial revision of this Regulation enters into force.

Article 4 (Interim measures concerning lighting rod installation)

The lighting rod which has been installed in accordance with former regulation before January 16, 2008, the enforcement day(Referring to 「Regulations on Korea Occupational Safety」 prior to executing the same regulation) Of the partial revision(Hereinafter referred to as "the same regulation"), Regulations on Korea Occupational Safety, Article 293, the Ordinance of the Ministry of Labor shall be regarded as the same lighting rod installed in accordance with the amended provisions of Article 357 of the same Regulation.

Article 5 (Amendment of other Acts)

① The Enforcement Regulation of the Occupation Safety and Health Act shall be amended as follows.

Where in Article 2 (3), "「Regulations on Korea Occupational Safety」(Hereinafter "Safety Regulation") and 「Local Rule on Occupation Safety and Health Standard」(Hereinafter "Health Regulation")" amended to "「Local Rule on Occupation Safety and Health Standard」(Hereinafter "Safety and Health Regulation")."

Where in Article 11, "Safety Regulation and Health Regulation" amended to "Safety and Health Regulation."

Where in Article 28 (1) 1, “Article 3, Article 4, Article 6, Article 8 through 17, Article 19 through 21, Article 24, Article 31 through 37, Article 41, Article 45 through 47, Article 51 and Article 53 through 55, Health Regulation” amended to “Article 5, Article 7, Article 8, Article 33, Article 72 through 81, Article 83 through 85, Article 422, Article 429 through 435, Article 439, Article 442 through 444, Article 448, Article 450 and Article 451, Safety and Health Regulation.”

Where in Article 28 (1) 2, “Article 3, Article 4, Article 6, Article 8 through 17, Article 19 through 21, Article 57 through 59, Article 64, Article 66, Article 68 through 70, Article 73 through 80, Article 83 through 87, Article 89 and Article 90, Health Regulation” amended to “Article 5, Article 7, Article 8, Article 33, Article 72 through 81, Article 83 through 85, Article 453 through 455, Article 459, Article 461, Article 463 through 465, Article 468 through 474, Article 477 through 481, Article 483 and Article 484, Safety and Health Regulation.”

Where in Article 30 (5) 9 A, “Article 292, Safety Regulation” amended to “Article 273, Safety and Health Regulation.”

Where in Article 30 (5) 9 C, “subparagraph 4 of Article 254, Safety Regulation Article” amended to “subparagraph 4 of Article 254, Safety and Health Regulation.”

Where in Article 30 (5) 10, “subparagraph 1 of Article 229, Health Regulation ” amended to “subparagraph 1 of Article 618, Safety and Health Regulation.”

Where in Article 30 (5) 12, “Table 1, Safety Regulation” amended to “ Table 1, Safety and Health Regulation.”

Where in Article 30 (5) 13, “ subparagraph 7 of Article 22, Health Regulation” amended to “ subparagraph 7 of Article 420, Safety and Health Regulation.”

Where in Article 30(6), “Safety Regulation, Health Regulation” amended to “Safety and Health Regulation.”

Where in Article 78 (2) 2, “ Article 105 through 118, Health Regulation” amended to “Article 33 and Article 499 through 511, Safety and Health Regulation.”

Where in Article 79 (2) 2, “ Article 57 through 92, Health Regulation” amended to “ Article 33, Article 35 (1), Safety and Health Regulation(Limited to cases of subparagraphs 16 and 17, Table 2, the same Regulation) and Article 453 through 486, the same Regulation.”

Where in Article 81 (2) 6, “subparagraph 1, Article 22, Health Regulation” amended to “ subparagraph 1, Article 420, Safety and Health Regulation.”

Where in Article 82, “ subparagraph 8, Article 22, Health Regulation” amended to “ Article 420(Subparagraph 8, Safety and Health Regulation.”

Where in Article 93 (1) 1, “subparagraph 8, Article 22, Health Regulation” amended to “Article 420(Subparagraph 8, Safety and Health Regulation.”

Where in Article 93 (1) 2, “subparagraph 1, Article 22, Health Regulation” amended to “subparagraph 1, Article 420, Safety and Health Regulation.”

Where in Article 93 (1) 3, “subparagraph 2, Article 215, Health Regulation” amended to “subparagraph 2, Article 605, Safety and Health Regulation.”

Where in subparagraph 3 1), Table 12-2, “subparagraph 1 through 3, Article 119, Health Regulation” amended to “subparagraph 1-3, Article 512, Safety and Health Regulation.”

Where in subparagraph 3 2), Table 12-2, “subparagraph 4, Article 119, Health Regulation” amended to “subparagraph 4, Article 512, Safety and Health Regulation.”

Where in subparagraph 3 3), Table 12-2, "subparagraph 1, Article 183, Health Regulation" amended to "subparagraph 1, Article 573, Safety and Health Regulation."

Where in subparagraph 1 C 1, Table 13, "subparagraph 1 through 3, Article 119, Health Regulation" amended to "subparagraph 1 through 3, Article 512, Safety and Health Regulation."

Where in subparagraph 1 C 2, Table 13, "subparagraph 4, Article 119, Health Regulation" amended to "subparagraph 4, Article 512."

Where in subparagraph 1 C 3, Table 13, "subparagraph 1, Article 183, Health Regulation" amended to "subparagraph 1, Article 573, Safety and Health Regulation."

② part of the Enforcement Regulation of the Industrial Accident Compensation Insurance Act shall be amended as follows.

Where in Article 32, " 「Local Rule on Occupation Safety and Health Standard」 Article 215 (Subparagraph 2, Health Regulation" amended to "「subparagraph 2, Article 605, Local Rule on Occupation Safety and Health Standard」."

③ Part of Local Rule on Restriction on Employment to harm・hazardous work shall be amended as follows.

Where in Article 2, "「Regulations on Korea Occupational Safety」(Hereinafter "Safety Regulation") and 「Local Rule on Occupation Safety and Health Standard」" amended to "「Local Rule on Occupation Safety and Health Standard」."

[Table 1]

Types of dangerous material(Article 16・17 and 225)

1. Explosive materials and organic peroxide
   A. Nitric ester
   B. Nitro compound
   C. Nitroso compound
   D. Azo compound
   E. Diazo compound
   F. Hydrazine derivatives
   G. Organic peroxide
   H. Other explosive materials having the same level as materials in item A through G
   I. Materials containing materials in item A through H

2. Water-reactivity materials and flammable solid
   A. Lithium
   B. kalium・natrium
   C. Sulfur
   D. Yellow phosphorus
   E. Phosphorus sulfide・red phosphorus
   F. Celluloid
   G. Alkylaluminium・alkyllithium
   H. Magnesium dust
   I. Metal powder(Excluding magnesium dust)
   J. Alkali metal(Excluding lithium・kalium and natrium)
   K. Organic metal compound(Excluding alkylaluminium and alkyllithium)
   L. Metal hydride
   M. Metal phosphide
   N. Calcium carbide, aluminium carbide
   O. Other ignitable or flammable materials having the same level as materials in item A through N
   P. Materials containing materials in item A through O

3. Oxidative liquid and oxidative solid
   A. Hypochlorous acid and its salts
   B. Chlorous acid and its salts
   C. Chloric acid and its salts
   D. Perchloric acid and its salts
   E. Bromic acid and its salts
   F. Iodic acid and its salts
   G. Hydrogen peroxide and inorganic peroxide
   H. Nitric and its salts
   I. Permanganic acid and its salts
   J. Dichromic acid and its salts

K. Other oxidative materials having the same level as materials in item A through J
L. Materials containing the materials in item A through K

4. Flammable liquid
A. Ethyl ether, gasoline, acetaldehyde, oxidation catalyst, or other materials whose flash point is below 23 degrees C and whose first boiling point is less than 35 degrees C
B. Normal hexane , acetone, methylethylketone, methyl alcohol, ethyl alcohol, carbon disulfide, or others materials whose flash point is below 23 degrees C and whose first boiling point is over 35 degrees C
C. Xylene, xylene, kerosene, diesel, turpentine, isoamyl alcohol, acetic acid, hydrazine, other materials whose flash point is more than 23 degrees C and less than 60 degrees C

5. Flammable gas
A. Hydrogen
B. Acetylene
C. Ethylene
D. Methane
E. Ethane
F. Propane
G. Butane
H. Flammable gas referred to in Table 10

6. Corrosive materials
A. Corrosive acids
(1) Hydrochloric acid, sulfuric acid, nitric whose density is more than 20%, or other materials of the same or higher level of corrosiveness
(2) Phosphoric acid, acetic acid, hydrofluoric acid, whose density is more than 60%, or other materials of the same or higher level of corrosiveness
B. Corrosive basesSodium hydroxide, potassium hydroxide, whose density is more than 40%, or other bases of the same or higher level of corrosiveness

7. Acute toxicity materials
A. Amount of materials which might kill 50% of laboratory animals in the test of oral administration into a mouse, in other words, where LD50(Oral, mouse) Is chemical materials which is less than 300milligrams-(Weight) Per kilogram
B. Amount of materials which might kill 50% of laboratory animals in the test of percutaneous absorption into a mouse or a rabbit, in other words, where LD50(Sclerite, rabbit or mouse)is chemical materials which is less than 1,000milligrams-(Weight) Per kilogram
C. Density of materials which might kill 50% of laboratory animals in the test of inhalation test, in other words, where gas LC50(A mouse, inhaling for 4 hours) Is chemical materials which is less than 2500ppm, where vapor LC50(A mouse, inhaling for 4 hours) Is chemical materials which is less than 10mg/ℓ, where dust or mist is chemical materials less than 1mg/ℓ

[Table 2]

Supervisor's harm · hazard prevention(Article 35 (1))

Work type	Duties and responsibilities
1. Work using a press, etc (Section 3, Chapter 1, Part 2)	A. To inspect protective equipment including a press B. To take immediate measures necessary to protective equipment including a press, if any abnormality is found, C. To manage a changeover switch key where they install a changeover key on protective equipment including a press D. To directly supervise mold attachment · dismantlement or adjustment
2. Work handling machine for wood processing (Section 4, Chapter 1, Part 2)	A. To supervise the work handling machine for wood processing B. To inspect machine for wood processing and its protective equipment C. To immediately report and take measures if any abnormality is found in machine for wood processing and its protective equipment D. To supervise use of jig and tools, etc in the course of carrying out work
3. Work using a crane (Sub-section 2 and 3, Section 9 and 4, Chapter 1, Part 2)	A. To determine and supervise an operation method and worker placement B. To inspect material defect or apparatus and tools function and remove defective products C. To monitor status of safety harness or safety helmet wearing in the course of carrying out work
4. Work manufacturing and handling hazardous substance (Section 1, Chapter 2, Part 2)	A. To supervise work B. To regularly inspect temperature · humidity · shielding and ventilation state auxiliary installations of equipment and its equipment which manufactures and handles hazardous substance, if problems are found, and take immediate necessary measures C. To record and keep the measures taken in accordance with item A
5. Work drying machinery (Section 5, Chapter 2, Part 2)	A. Where a worker firstly uses drying machinery or changes drying method or drying material type, to train him how to operate it in advance and directly supervise operation B. To keep a place around drying machinery clean all the time and keep flammable substance off
6. Work using metal welding · gas cutting or heating with acetylene welding equipment (Sub-section 1, Section 6, Chapter 2, Part 2)	A. To determine and supervise an operation method B. To have a worker engaged in acetylene welding equipment handling observe the following working methods (1)to keep tools which might cause spark off from operating generator or not to give a shock on its

	generator (2) where a worker inspects gas leak of acetylene welding equipment, use a safe method such as using soapy water (3) to keep exit of a generator room closed (4) where a worker exchanges a carbide of a generator of a mobile acetylene welding equipment, he shall do it at a safe place outside C. Where a worker starts acetylene welding work, to inspect an acetylene welding equipment and exclude mixed gas of air and acetylene from a generator interior D. To place a safety device at a location where its level is easily checked in the course of carrying out work its with it check at least once every day E. Where a worker insulates or heats acetylene welding equipment to prevent water in an acetylene welding equipment from freezing F. To maintain the state where water and remanent carbide don't contact each other in the event of stopping a generator G. Where a worker repairs · processes · transports or stores a generator, to maintain the state where it doesn't touch acetylene and carbide H. To monitor status of wearing of concerned's goggles and safety gloves
7. Work handling gas aggregation welding equipment (Sub-section 2, Section 6, Chapter 2, Part 2)	A. Determine and directly supervise an operation method B. To have a worker engaged in gas aggregation apparatus handling observe the following working methods (1) To remove oil · residue adhering to a stopper and a piping connecting piece of a gas vessel to attach (2) In the event of exchanging a gas vessel, to inspect any gas leak in a stopper and a piping connecting piece of the its vessel and to keep gas in the piping from mixing together (3) Gas leak inspection shall be done in a safe method using soapy water (4) To slowly open/close a valve or a cock C. To supervise a gas vessel exchange work D. To inspect, when staring to work, apparatus including a hose · a blowpipe · a hose bank, etc and repair or exchange it where it is deemed necessary to do so due to damage · abrasion E. To locate a safety device at a place where its function is easily check in the course of carrying out work and check it at least once every day F. To monitor wearing of a worker's goggles and safety gloves

8. Work related to form timbering anchoring・assembly or dismantlement work/natural ground excavation/sheating timbering anchoring・assembly or dismantlement work/tunnel excavation/building, etc dismantlement work (Sub-section 2, Section 1, Chapter 4, Part 2・Sub-section 1, Section 2, Chapter 4・Clause 1, Sub-section 3, Section 2, Chapter 4・Section 4, Chapter 4)	A. To determine a safe operation method and supervise it B. To inspect material・apparatus defect and remove defective products C. To monitor wearing of personal protective equipment such as safety harness and safety helmet in the course of carrying out work
9. Work related to assembly・dismantlement or change of hanging scaffolding or more than 5m in height scaffolding(in case of dismantlement work, A is an exception for its application) (Section 2, Chapter 7, Part 1)	A. To inspect material defect and remove defective products B. To inspect function of apparatus・tools・safety harness and safety helmet, etc and remove defective products C. To determine working methods and worker placement and monitor its working progress D. To monitor wearing of safety harness and safety helmet, etc
10. Work related to blasting (Sub-section 2, Section 2, Chapter 4, Part 2)	A. To instruct workers to evacuate prior to ignition B. To instruct ignition workers about evacuation shelter and process C. To confirm whether workers evacuated in a hazard zone prior to ignition D. To instruct ignition order and method E. To give an ignition signal F. To give ignition workers evacuation signal G. To inspect, after blasting, whether this is any unexploded charge or remaining charge existence, spring existence and rock・earth and sand falling H. To designate an igniter I. To inspect whether air compressor safety valve operates or not J. To monitor wearing of personal protective equipment such as safety helmet

11. Stone-cutting excavation(Sub-section 5, Section 2, Chapter 4, Part 2)	A. To train evacuation method in advance B. Before starting to work or after a heavy rainfall, to inspect rock・earth and sand falling・fissure existence or contained water・spring and freezing C. After blasting, to inspect blasting place and its neighboring rock・earth and sand falling・fissure
12. Handling cargo (Section 1, Chapter 6, Part 2)	A. To determine an operation method and order and supervise it B. To check up apparatus and tools and remove defective products C. To prevent unauthorized worker from entering the workplace D. In the event of disbanding a rope, etc, to check cargo falling hazard and instruct to start a work
13. cargo work at a wharf and ship(Section 2, Chapter 6, Part 2)	A. To determine and supervise an operation method B. To inspect and maintain and monitor the use of a pass equipment・unloading machine・personal protective equipment and apparatus・tools C. To adjust contact between neighboring workers
14. Work related to installation, inspection, repair and painting, etc of electric work of the electric pathway or its support (Chapter 3, Part 2)	A. To inspect all charge facilities including charge electric pathway, etc in a working section B. To determine working methods and order(Including worker training) and supervise its operation C. To monitor wearing of worker's personal protective equipment or personal protective equipment for insulation and remove factors regarding electric shock accident D. To inspect defect and function of work tools, insulation isolator, etc and remove defective products E. To prevent unauthorized person from entering the workplace, adjust contact between neighboring workers, supervise and monitor traffic control of vehicles and passengers in the event of road construction F. To monitor maintenance of safety distance in the event of work using a live wire apparatus G. To train workers to provide a swift first aid referred to in each industrial accident including electric shock accident
15. Work related to handling harmful substances requiring management (Chapter 1, Part 3)	A. To determine a working method and supervise its operation so that workers handling harmful substances requiring management do not contact substance B. To check the place or equipment at least once per month which handles harmful substances requiring management and take necessary measures after checking the matters falling under any of the following subparagraphs regarding ventilation equipment including a local ventilation equipment, etc. Provided that inspection of ventilation equipment shall include the

	following matters (1) State and degree of abrasion · corrosion, other damage of hood or duct (2) Refueling and cleanliness state of fan and ventilator (3) Duct connect loosening (4) Operating state of a belt connecting a motor and a ventilator (5) Inhalation and ventilation capacity state C. Monitoring wearing of personal protective equipment D. To check if the following measures are taken where a worker handles harmful substances requiring management inner part of a tank (1) To let a supervisor with knowledge of harmful substances requiring management do the work (2) To open all openings of the working equipment where no harmful substances requiring management is deemed to carry in (3) To wash it immediately where worker's body is contaminated by harmful substances requiring management or the work is finished (4) To make preparations for apparatus and other equipment to evacuate or rescue workers in equipment in an emergency (5) To measure concentration of harmful substances requiring management regarding inner part of equipment or measure serious health problems which could cause workers in accordance with other methods (6) To ventilate an inner part of equipment with a ventilation system where there is significant amount of harmful substances requiring management in an inner part of equipment under subparagraph 5 (7) To take measures against the tank where organic compound is put in falling under the following items: (A) To prevent organic compound which is released from a tank from flowing back to a inner part of a tank after release (B) To wash an inner part of a tank with water or vapor and release the water or the vapor out of the tank (C) To fill a tank with air whose volume is three times bigger than that of the tank and fill the tank with water and release it E. To records and manage the result of checkup and measures referred to in item B
16. Handling permission-required	A. To instruct and supervise a worker not to breathe in permission-required harmful substances or be

harmful substances (Chapter 2, Part 3)	contaminated by permission-required harmful substances B. To check a local ventilation equipment installed at a workplace or a unit once per month to prevent matters with reference to prevent workers from catching health problems C. To check a worker's wearing of personal protective equipment
17. Work related to asbestos dismantlement · removal (Section 6, Chapter 2, Part 3)	A. To determine and supervise a working method in order for a worker not to breathe in asbestos dust or get contaminated by asbestos dust B. To check operation status of equipment of asbestos dust collector, asbestos collector, etc installed at a workplace C. To check a worker's wearing of personal protective equipment
18. High pressure work (Chapter 5, Part 3)	A. To determine a working method and supervise high pressure workers directly B. To check an apparatus measuring harmful gas concentration C. To check the number of high pressure workers where they get in and out of the chamber D. To maintain a proper pressure in a chamber by contacting a person who controls a valve or a cock to regulate air tank in a chamber E. To follow pressurization or decompression in the following manners by contacting a person who controls a valve or a cock to send air into an air control room or send air out of an air control room (1) To pressurize at the speed of 0.8kg or less per square cm per minute (2) Decompression shall satisfy the criteria determined and announced by the Minister of Employment and Labor F. To take necessary measures against high pressure workers in a chamber and air control room , if any abnormality is found
19. Confined space work(Chapter 10, Part 3)	A. To supervise a worker's duty before starting to work so that he won't lack in oxygen or get exposed to harmful gas B. To measure whether the air of working place is appropriate before starting to work C. To check measurement equipment · ventilation system or air supplied mast before starting to work D. To guide and check workers to put on a distributed air supplied mast.

[Table 3]

Checkup list before starting to work(Article 35 (2))

Work type	Checkup items
1. Work related to using a press(Section 3, Chapter 1, Part 2)	A. Clutch and brake function B. Crank shaft · fly wheel · slide · coupling rod and connecting screw loosening C. One stroke one suspension · emergency stop device and emergency stop device function D. Hazard prevention apparatus function using slide or knife-blade E. Press mold and anchoring bolt state F. Protective equipment function G. Knife-blade and table state of shearing machine
2. Work to confirm a robot within a robot's operating range(Excluding where robot's power source is shut off) (Section 13, Chapter 1, Part 2)	A. Coating or exterior damage of an outside cable B. Manipulator's mal-function C. Brake and emergency stop device function
3. Operating an air compressor(Section 7, Chapter 1, Part 2)	A. Outer form state of air storing pressure vessel B. Control and drainage of drain valve C. Pressure relief device function D. Unloading valve function E. Lubricant state F. A cover or a fence of a rotating part G. Other connect part mal-function
4. Work using a crane (Sub-section 2, Section 9, Chapter 1, Part 2)	A. Over winding protector · brake · clutch and operation device function B. State of a rail where upper part of a runway and a trolley traverses C. State of a place where a wire rope passes
5. Work using a mobile crane(Sub-section 3, Section 9, Chapter 1, Part 2)	A. Over winding protector or other alarm device function B. Brake · clutch and regulating device function C. Natural ground state of a place where a wire rope passes and a workplace
6. Work using a lift(Including a small lift)(Sub-section 4, Section 9, Chapter 1, Part 2)	A. Protective equipment · brake and clutch function B. A place where a wire rope passes state
7. Work using a gondola(Sub-section 5, Section 9, Chapter 1, Part 2)	A. Protective equipment · brake function B. State of a wire rope · sling wire, etc
8. Hitch work using a wire rope · hanging chain · fiber rope · fiber belt or hook · shackle · ring, etc	Mal-functions in connection with wire rope

steel-ware of lifting machinery(Hereinafter "Wire rope, etc")(Sub-section 7, Section 9, Chapter 1, Part 2)	
9. Work using a fork lift(Sub-section 2, Section 10, Chapter 1, Part 2)	A. Mal-functions in connection with brake and manipulating device B. Mal-functions in connection with unloading device and hydraulic system C. Wheels mal-function D. Mal-functions in connection with headlamp · tail light · direction indicator and alarm device
10. Work using a platform truck(Sub-section 3, Section 10, Chapter 1, Part 2)	A. Mal-functions in connection with brake and manipulating device B. Mal-functions in connection with unloading device and hydraulic system C. Mal-functions in connection with Wheels D. Mal-functions in connection with headlamp · tail light · direction indicator and horn E. Mal-functions in connection with a holder bonding state including charging equipment
11. Work using an aerial work platform(Sub-section 4, Section 10, Chapter 1, Part 2)	A. Mal-functions in connection with emergency stop device and emergency anti-fall device B. Anti-overload device operating (In case of a wire rope or a chain driving) C. Outrigger or wheels mal-function D. Working surface tilt or bumpy road E. In case of live wire work device, dent · fissure · damage
12. Work using a cargo truck(Chapter 1, Part 2Section 10Sub-section 5)	A. Brake and manipulating device function B. Mal-functions in connection with unloading device and hydraulic system function C. Mal-functions in connection with wheels
13. Work using a conveyor(Section 11, Chapter 1, Part 2)	A. Mal-functions in connection with prime mover and pulley B. Mal-functions in connection with Prevention from breakaway device C. Mal-functions in connection with emergency stop device D. Mal-functions in connection with a cover or a fence of a prime mover · rotation shaft · gear and pulley, etc
14. Work using a vehicle type construction machinery(Chapter 1, Part 2Article Section 12Sub-section 1)	Brake and clutch, etc function
15. Work using a mobile explosive proof structured	Cable and connector state

electric unit・apparatus(Section 1, Chapter 3, Part 2)	
16. Work where worker continuously handle heavy material(Chapter 5, Part 2)	A. Good working posture and costume handling heavy material B. Wearing of personal protective equipment due to hazardous substance scattering in the air C. A method to handle heavy material such as carbide・caustic lime(Calcium oxide) whose risk happens due to temperature increase or humidity D. Other appropriate application of unloading and transporting machinery
17. Cargo work loading/unloading onboard lifting equipment(Section 2, Chapter 6, Part 2)	A. Operation status of onboard lifting equipment B. Checking if there is overload on an onboard lifting equipment
18. Work using a sling (Section 2, Chapter 6, Part 2)	A. Hanging state of a sling・a wire sling with a hook B. State of a sling・a wire sling, etc (Regularly checking before starting to work and in the course of carrying out work)

[Table 4]

Pre-survey and a work plan(Article 38 (1))

Name of work	Pre-survey	Work plan
1. Installing · assembling · dismantling a tower crane	-	A. Tower crane type and type B. Installation · assembly and dismantlement procedure C. Working tools · equipment · temporary construction equipment and protective equipment D. Organizing working personnel and set up a range for a worker's role E. Supporting method referred to in Article 142
2. Unloading and transporting machinery of vehicle type, etc	-	A. Prevention of hazard caused by fall accident · falling · tripping · constriction and collapse, etc depending upon a work B. Unloading and transporting machinery of vehicle type routing and a working methods
3. Vehicle type construction machinery work	Workplace topology and natural ground state to prevent a worker's hazard such as machine's falling down, natural ground collapse, etc	A. Type and capacity of vehicle type construction machinery used B. Routing of vehicle type construction machinery C. Working methods using vehicle type construction machinery
4. Using chemical equipment and its auxiliary installations	-	A. Controlling a valve · a cock(limited to the case where a worker supplies chemical equipment with raw material or takes out product from a chemical equipment) B. Controlling cooling system · heating device · agitating machine and compressing unit C. Monitoring and regulating measuring instrument and control unit D. Adjusting a safety valve, emergency shut-off device, other protective equipment and automatic alarm device E. Checking hazardous substance, etc leak out of a cover plate · flange · valve · cock joint connection F. Sampling G. Working methods where operation

		of chemical equipment temporarily or partially stopped or where operation is resumed H. Emergency measures where abnormality state occurs I. Measures to take in the event of hazardous substance leak J. Other measures necessary to prevent explosion · fire
5. Electric work referred to in Article 318	–	A. Objective and contents of electric work B. Electric worker's qualification and appropriate personnel C. Appointing work range, work manager, identifying electric hazardous factors including electric shock · arc flash · arc explosion, identifying minimum approach distance, carrying a live wire access alarm device before starting to work D. Safety work methods related to working plan for shutting off electric pathway and power reclosing procedure under Article 328 E. Preparing · checking · wearing · for personal protective equipment for insulation and isolator, live wire work apparatus · device, etc F. Matters temporary operation or stopping the work for checkup · test operation G. Matters related to transferring work for shift work H. Matters regarding preventing unauthorized worker from entering the electric workplace I. A method to train workers about electric safety work plan and a plan for assessment · management drawn-up electric safety work plan J. Matters related to electric blueprint, equipment details
6. Excavation	A. Shape · geological features and stratum state B. Fissure · contained water · spring and freezing existence	A. A method to excavation method and order, carrying out earth and sand B. A plan for necessary personnel and to use equipment C. Transferring · protective of buried structure

	or state C. State of buried structure D. Underground water state of the natural ground	D. In-the-workplace contacting method and signaling method E. Sheating timbering installation method and instrumentation plan F. Supervisor's placement plan G. Other matters with reference to safety · occupational health
7. Tunnel excavation	Investigating topology · geological features and stratum state in advance to prevent workers from hazard caused by rock falling · water eruption and gas explosion in an appropriate method including boring, etc	A. Excavation method B. Construction method of a tunnel timbering and lining and a spring processing method C. Installation method of ventilation or lighting equipment
8. Bridge work	-	A. Working methods and order B. A method to prevent Member falling · tripping or collapse C. Safety measure method to prevent the worker's fall accident hazard D. A method to review safety of installation · application · dismantlement of temporary construction steel structure, etc used for construction E. Type and capacity, working methods of the used machine, etc F. Supervisor placement plan G. Other matters with reference to safety · occupational health
9. Stone-cutting work	Workplace topology · geological features and stratum state to prevent workers from hazard caused by natural ground collapse · excavator falling down	A. Differentiation between open cut excavation mine excavation and stone-cutting method B. Cutting surface height and tilt C. Position and width of cutting surface banquette D. A method to prevent rock falling and collapse at a Mine E. Blasting method F. Rock division method G. Rock processing place H. Type and capacity of used excavator · dividing machine · loading machine or transporting machine(Hereinafter "Excavator, etc) I. Method and transportation process of earth rock or rock loading and

		transportation J. Topsoil or spring processing method
10. Building, etc dismantlement	Dismantled building, etc structure, surroundings, etc	A. Dismantlement method and dismantlement procedure blueprint B. A method related to temporary construction equipment · protective equipment · ventilation equipment and watering · fire-prevention equipment, etc C. In-the-workplace contacting method D. A plan for disposing of dismantlement E. A work plan for machine · apparatus, etc for dismantlement work F. An application plan for explosives, etc for dismantlement work G. Other matters with reference to safety · occupational health
11. Heavy material handling work	-	A. Safety measures to prevent fall accident hazard B. Safety measures to prevent falling hazard C. Safety measures to prevent tripping hazard D. Safety measures to prevent constriction hazard E. Safety measures to prevent collapse hazard
12. Repairing · checking railway and other related equipment 13. Shunting	-	A. Appropriate work personnel B. Working volume C. Working order D. Safety measure method related to working methods and hazardous factors

[Table 5]

Assembly gap of a steel tube scaffolding(Article 59(4))

Steel tube scaffolding type	Assembly gap(Unit: m)	
	Vertical direction	Horizontal direction
Pipe scaffolding	5	5
Build-up type scaffolding(Excluding the one with below 5m in height)	6	8

[Table 6]

Vehicle type construction machinery(Article 196)

1. Dozer type of construction machinery(Bull dozer, straight dozer, tilt dozer, angle dozer, bucket dozer, etc)
2. Motor grader
3. Loader(including changes of use type referred to in extraneous matter type including a fork)
4. Scraper
5. Crane type of excavator(Clam shell, drag line, etc)
6. Excavator(including changes of use type referred to in extraneous matter type such as breaker, crusher, drill)
7. Pile driver and pile extractor
8. Perforation construction machinery(Earth drill, earth auger, crawler drill, jumbo drill, etc)
9. Construction machinery for natural ground consolidation settlement(Sand drain machine, paper drain machine, pack drain machine, etc)
10. Construction machinery for natural ground compaction(Tire roller, macadam roller, tandem roller, etc)
11. For dredge construction machinery(Bucket dredger, clam shell dredger, pump dredger, etc)
12. Concrete pump car
13. Dump truck
14. Concrete mixer truck
15. Construction machinery for pavement of a road(Asphalt sprinkler, concrete sprinkler, asphalt finisher, concrete finisher, etc)
16. Construction machinery which is used for construction work whose structure or capacity is similar to that referred to paragraph 1 through 15

[Table 7]

Chemical equipment and its auxiliary installations type

(Article 227 through 229, Article 243 and, Section 4, Chapter 2, Part 2)

1. Chemical equipment
   A. Chemical substance reaction or mixed device including batch reactor · mixing chamber
   B. Chemical substance separator such as distillation tower · absorption tower · extraction tower · decompression tower, etc
   C. Chemical substance storing equipment or instrumentation equipment such as storage tank · instrumentation tank · hopper · silo
   D. Heat exchangers such as condenser · cooler · heater · evaporator
   E. Heat exchangers directly using source of ignition including a shaft furnace
   F. Chemical product processing equipment including a calender · mixer · foam-maker · press · extruder, etc
   G. A device handling fission chemical substance including Crusher · fission separator · molten pot
   H. Fission chemical substance separator including crystallizer · running tower · dehumidifier · drier
   I. Equipment carrying and compressing chemical substance such as pumps · compressor · ejector, etc
2. Auxiliary installations of chemical equipment
   A. Equipment carrying and compressing chemical substance such as piping · valve · pipe · accessories
   B. Automatic control related equipment guiding and recording temperature · pressure · oil gauge
   C. Emergency measures related equipment safety such as a valve · a safety valve · an emergency shut-off or a release valve
   D. Equipment related to gas leak detection and alarm
   E. Waste gas disposal plant such as washing machine, condenser, bent stack, flare stack
   F. Dust disposal plant such as cyclone, bag filter, electric dust collector, etc
   G. Electric related equipment attached to operate equipment referred to in item A through F
   H. Safety related equipment such as electrostatic removal device, emergency shower equipment, etc

[Table 8]

Safety distance(Article 271)

Classified	Safety distance
1. The distance between unit process facility · equipment, and other unit process facility · equipment	10 meters or more from outer part of equipment
2. The distance between flare stack, and unit process facility · equipment, hazardous substance storage tank or hazardous substance unloading equipment	Within a 20-meter radius from flare stack: Provided that it shall be otherwise if is installed under the roof where unit process facility is constructed with non-combustible material .
3. The distance between hazardous substance storage tank, and unit process facility · equipment, boiler or heating furnace	20 meters or more from outer part of storage tank: Provided that it shall be otherwise where protective wall of a storage tank, remote control equipment or watering equipment is installed.
4. The distance between office · research room · laboratory · maintenance room or restaurant, and unit process facility · equipment, hazardous substance storage tank, hazardous substance unloading equipment, boiler or heating furnace	20 meters or more from outer part of an office, etc: Provided that it shall be otherwise in the case of heating boiler or where protective structure is installed onto a wall of an office.

[Table 9]

Standard amount of hazardous substance(Article 273)

Hazardous substance	Standard amount
1. Explosive materials and organic peroxide	
A. $R-ONO_2$ Nitroglycol · nitroglycerin · nitrocellulose, etc	10kg
B. Nitro compound Trinitrobenzene · trinitrotoluene · picric acid, etc	200kg
C. Nitroso compound	200kg
D. Azo compound	200kg
E. Diazo compound	200kg
F. Hydrazine derivative	200kg
G. Organic peroxide Per acetic acid, methylethylketone peroxide, benzoyl peroxide, etc	50kg
2. Water-responsive substance and flammable solid	
A. Lithium	5kg
B. Kalium · natrium	10kg
C. Sulfur	100kg
D. Yellow phosphorous	20kg
E. Phosphorus sulfide · red phosphorus	50kg
F. Celluloid	150kg
G. Alkylaluminium · alkyllithium	10kg
H. Magnesium powder	500kg
I. Metal powder (Excluding magnesium powder)	1,000kg
J. Alkalimetal(Excluding lithium · kalium and natrium)	50kg
K. Organic metal compound(Excluding alkylaluminium and alkyllithium)	50kg
L. Metal hydride	300kg
M. Metal phosphide	300kg
N. Calcium carbide, aluminium carbide	300kg
3. Oxidizing liquid and oxidizing solid	
A. Hypochlorous acid and its salts	

(1)Hypochlorous acid	300kg
(2)Kalium Hypochlorite, other $Ca(OCl)_2$	50kg
B. Chlorous acid and its salts	
(1)Chlorous acid	300kg
(2)$NaClO_3$, other $NaClO_3$	50kg
C. Chloric acid and its salts	
(1)Chloric acid	300kg
(2)Potassium chlorate, sodium chlorate, ammonium chlorate, other $NaClO_3$	50kg
D. Perchloric acid and its salts	
(1)Perchloric acid	300kg
(2)Potassium perchlorate, sodium perchlorate, ammonium perchlorate, other per$NaClO_3$	50kg
E. Bromic acid and its salts Bromate	100kg
F. Iodic acid and its salts Iodate	300kg
G. Hydrogen peroxide and inorganic peroxide	
(1)Hydrogen peroxide	300kg
(2)Potassium superoxide, sodium peroxide, barium peroxide, other inorganic peroxide	50kg
H. Nitric acid and its salts Potassium nitrate, sodium nitrate, ammonium nitrate, other nitrates	1,000kg
I. Permanganic acid and its salts	1,000kg
J. Dichromic acid and its salts	3,000kg
4. Flammable liquid	
A. Ethyl ether · gasoline · acetaldehyde · propylene, or other substance whose flash point is lower than 23℃ and first boiling point is lower than 35℃.	200 liters
B. Normal-hexane · acetone · methylethylketone · methylalcohol · ethylalcohol · carbon disulfide, other substance whose flash point is lower than 23℃ and first boiling point is higher than 35℃.	400 liters
C. Xylene · amyl acetate · kerosene · diesel · turpentine · Isopropyl alcohol · acetic acid · hydrazine, other substance whose flash point is higher than 23℃ and first boiling point is	1,000 liters

lower than 60℃.	
5. Flammable gas	
A. Hydrogen	
B. Acetylene	50m_3
C. Ethylene	
D. Methane	
E. Ethane	
F. Propane	
G. Butane	
H. Flammable gas referred to in Table 10	
6. Corrosiveness substance which refers to any of the following cases) Substance	
A. Corrosive acids	
(1)Hydrochloric acid · sulfuric acid · nitric acid, other substance having more than 20% of concentration which has the equal or higher corrosiveness	300kg
(2)Phosphoric acid · acetic acid · hydrofluoric acid, other substance having more than 60% of concentration which has the equal or higher corrosiveness	
B. Corrosive bases Sodium hydroxide · potassium hydroxide, other base having more than 40% of corrosive base concentration which has the equal or higher corrosiveness	300kg
7. Acute toxicity substance	
A. Toxicants such as cyan hydrogen · fluoreacetic acid and sodium salt · dioxine whose LD50(Oral, mouse) is less than 5milligrams per kg	5kg
B. Toxicants whose LD50(Sclerite, rabbit or mouse) is less than 50milligrams(Weight) per kg	5kg
C. Toxicants such as decaborane · diborane · phosphine · nitrogen dioxide · methylisocyanate · dichloro acetylene · fluoroacetamide · keten · 1,4-dichloro-2-butene · methylvinyl acetate keton · benzotrichloride · cadmium oxide · methyl silicate · diphenyl methane diisocyanate · dimethyl sulfate whose gas LC50(A mouse, 4 hours inhalation) is less than 100ppm chemical substance,	5kg

vapor LC50(A mouse, 4 hours inhalation) is less than 0.5mg・ℓ chemical substance, dust or mist is less than 0.05mg・ℓ toxicant	
D. Toxicants such as Mercuricoxide・Cyan natrium・Cyan kalium・polyvinyl acetatealcohol・2-chloroacetaldehyde・mercury(Ⅱ) chloride whose LD50(Oral, mouse) is between 5milligrams(Weight) and 50milligrams(Weight) per kg	20kg
E. Toxicants whose LD50(Sclerite, rabbit or mouse) is between 50milligrams(Weight) and 200milligrams(Weight) per kg	20kg
F. Toxicants such as hydrogen sulfide・sulfuric acid・nitric acid・tetraethyllead・diethylene triamine・carbonyl fluorine・hexafluoroacetylacetone・chlorine trifluoride・furfurylalcohol・aniline・fluorine・carbonylfluoride・fuming sulfuric acid・methylethylketone peroxide・dimethylether・phenol・benzil chloride・phosphorus pentoxide・benzil dimethylamine・pyrrolidine whose gas LC50(A mouse, 4 hours inhalation) is between 100ppm and 500ppm, whose vapor LC50(A mouse, 4 hours inhalation) is between 0.5mg・ℓ and 2.0mg・ℓ, whose dust or mist is between 0.05mg・ℓ and 0.5mg・ℓ	20kg
G. Toxicants such as isopropylamine・cadmium chloride・cobalt oxide(II)・cyclohexylamine・2-aminopyridine・azodiisobutyronitril whose LD50(Oral, mouse) is between 50milligrams(Weight) and 300milligrams(Weight) per kg	100kg
H. Toxicants such as ethylenediamine whose LD50(Sclerite, rabbit or mouse) is between 200milligrams(Weight) and 1,000milligrams(Weight)	100kg
I. Toxicants such as Hydrogen Fluoride・ethylene oxide・triethylamine・ethylacrylic acid・hydrogen bromide・acetic anhydride・fluorine sulfide・methyl propyl ketone・cyclohexylamine whose gas LC50(A mouse, 4 hours inhalation) is between 500ppm and 2,500ppm, whose vapor LC50(A mouse, 4 hours inhalation) is between 2.0mg・ℓ and 10mg・ℓ, whose dust or mist is between 0.5mg・ℓ and 1.0mg・ℓ.	100kg

Remarks

1. Standard amount shall means the quality manufactured or handled at the maximum level for a day by the manufacturing and handling equipment.

2. The figure of standard amount items shall be estimated based upon purity 100%.

3. Where a worker handles or manufacturer class 2 or higher hazardous substance, it shall be deemed to exceed standard amount if R estimated in according with the following formula is more than 1 after calculating amount of manufacturing and handle of each hazardous substance.

$$R = \frac{C_1}{T_1} + \frac{C_2}{T_2} + \cdots + \frac{C_n}{T_n}$$

Cn: Each manufacturing or handling amount of hazardous substance
Tn: Each standard amount of hazardous substance

4. Where hazardous substances are divided into two or more hazardous substance and have different standard amount therewidth, the smallest value of value standard amount shall the standard amount of hazardous substance.

5. Standard amount of flammable gas shall be the value of operation temperature and operation pressure state.

[Table 10]

Guidelines on use of steel(Article 329)

Steel type	Tensile strength (kg · ㎟)	Coefficient of expansion(%)
Steel tube	34 or more below 41	25 or more
	41 or more below 50	20 or more
	50 or more	10 or more
Steel sheet, section steel, flat steel, light weight section steel	34 or more below 41	21 or more
	41 or more below 50	16 or more
	50 or more below 60	12 or more
	60 or more	8 or more
Bar steel	34 or more below 41	25 or more
	41 or more below 50	20 or more
	Below 50	18 or more

[Table 11]

Cutting surface tilt standard(Article 338 (1))

Classified	Natural ground type	Tilt
Ordinary earth	Wetland	1: 1～1: 1.5
	Dryland	1: 0.5～1: 1
Bedrock acquifer	Weathered rock	1: 0.8
	Soft rock	1: 0.5
	Slickensides	1: 0.3

[Table 12]

Harmful substances requiring management type

(Article 420, Article 439 and Article 440)

1. Organic compound(113 types)
   - AA. Glutaraldehyde
   - AB. Nitroglycerin
   - AC. Nitromethane
   - AD. Nitrobenzene
   - AE. P-nitroaniline
   - AF. P-nitrochlorobenzene
   - AG. Dinitrotoluene
   - AH. Dimethylaniline
   - AI. Dimethylamine
   - AJ. N,N-dimethylacetamide
   - AK. Dimethylformamide
   - AL. Diethanolamine
   - AM. Diethylenetriamine
   - AN. 2-Diethylamino ethanol
   - AO. Diethyl amine
   - AP. Diethyl ether
   - AQ. 1,4-dioxane
   - AR. DiisoButhylKetone
   - AS. Dichloromethane
   - AT. O-dichlorobenzene
   - AU. 1,2-dichloroethylene
   - AV. Dichlorofluoromethane
   - AW. 1,1-dichloro-1-fluoroethane
   - AX. Dihydroxybenzene
   - AY. 2-Methoxyethanol
   - AZ. 2-Methoxyethyl acetate
   - BA. Methylene di(Bis)phenyl diisocyanate
   - BB. Methyl amine
   - BC. Methyl alcohol
   - BD. Methylethylketone
   - BE. Methyl isobutylketone
   - BF. Methyl chloride
   - BG. Methyl n-ButhylKetone
   - BH. Methyl n-amyl ketone
   - BI. O-methylcyclohexanone
   - BJ. Methylcyclohexanol
   - BK. MethylChloroform
   - BL. Maleic anhydride
   - BM. Phthalic anhydride
   - BN. Benzene(Carcinogenic)
   - BO. 1,3-butadiene(Carcinogenic)
   - BP. 2-Butoxyethanol
   - BQ. N-butylalcohol
   - BR. Sec-butylalcohol

BS. 1-Bromopropane
BT. 2-Bromopropane
BU. Bromination methyl
BV. Vinyl acetate
BW. Carbon chloride(Carcinogenic)
BX. Stoddard solvent
BY. Styrene
BZ. Cyclohexanone
CA. Cyclohexanol
CB. Cyclohexane
CC. Cyclohexene
CD. Aniline and its homologue
CE. Acetonitrile
CF. Acetone
CG. Acetaldehyde
CH. Acrylonitrile
CI. Acrylamide
CJ. Allyl glycidyl ether
CK. Ethanolamine
CL. 2-ethoxyethanol
CM. 2-ethoxyethylacetate
CN. Ethylene glycol
CO. Ethyleneglycol dinitrate
CP. Ethyleneglycol mono butyl acetate
CQ. Ethyleneimine
CR. Ethylene chlorohydrin
CS. Ethylbenzene
CT. Ethylamine
CU. Ethyl acrylate
CV. 2,3-epoxy-1-propanol
CW. 1,2-epoxypropane
CX. Epichlorohydrin
CY. Methyl iodide
CZ. Isobutyl alcohol
DA. Isopropyl alcohol
DB. Isopropyl alcohol
DC. Ethylenedichloride
DD. Carbon disulfide
DE. Methyl acetate
DF. N-butyl acetate
DG. Ethyl acetate
DH. Propyl acetate
DI. Isobutyl acetate
DJ. Isopropyl acetate
DK. Isopropyl acetate
DL. Cresol
DM. Xylene
DN. Chlorobenzene
DO. 1,1,2,2-tetrachloroethane
DP. 1,1,2-trichloroethane

DQ. 1,2,3-trichloropropane
DR. Tetrahydrofuran: THF
DS. Toluene
DT. Toluene-2,4- diisocyanate
DU. Toluene-2,6- diisocyanate
DV. Triethylamine
DW. Trichloromethane
DX. Trichloroethylene
DY. Perchloroethylene
DZ. Phenol
EA. Pentachlorophenol
EB. Formaldehyde(Carcinogenic)
EC. Propyleneimine
ED. Pyridine
EE. Hydrazine
EF. Hexamethylene diisocyanate
EG. N-haxane
EH. Heptane
EI. Sulfuric acid dimethyl
EJ. Medication which contains more than 1% capacity rate of substances in item AA through AQ

2. Metal(23 types)
EK. Copper and its compound
EL. Lead and its inorganic compounds
EM. Nickel and its compound(only insoluble compound meaning carcinogenic)
EN. Manganese and its inorganic compounds
EO. Barium and its soluble compounds
EP. Platinum and its compound
EQ. Magnesium oxide
ER. Selenium and its compound
ES. Mercury and its compound
ET. Zinc and its compound
EU. Antimony and its compound(Antimony trioxide meaning carcinogenic)
EV. Aluminium and its compound
EW. Iodine
EX. Silver and its compound
EY. Titanium dioxide
EZ. Tin and its compound
FA. Zirconium and its compound
FB. Iron and its compound
FC. Vanadium(V) oxide
FD. Cadmium and its compound(Carcinogenic)
FE. Cobalt and its inorganic compound
FF. Chrome and its compound(hexavalent chromium meaning carcinogenic)
FG. Tungsten and its compound
FH. Medication which contains more than 1% capacity rate of substances in item EK through FG

3. Acid・alkali(17 types)
   FI. Formic acid
   FJ. Hydrogen peroxide
   FK. Acetic anhydride
   FL. Hydrogen Fluoride
   FM. Hydrogen bromide
   FN. Sodium hydroxide
   FO. Potassium hydroxide
   FP. Cyan natrium
   FQ. Cyan kalium
   FR. Cyan calcium
   KS. Acrylic acid
   KT. Hydrogen chloride
   KU. Phosphoric acid
   KV. Nitric acid
   KW. Acetic acid
   KX. Trichloroacetic acid
   KY. Sulfuric acid
   KZ. Medication which contains more than 1% capacity rate of substances in item FI through KY

4. Gas state material(15 types)
   LA. Fluorine
   LB. Bromine
   LC. Ethylene oxide(Carcinogenic)
   LD. Arsine
   LE. Cyan hydrogen
   LF. Ammonia
   LG. Chlorine
   LH. Ozone
   LI. Nitrogen dioxide
   LJ. Sulfurdioxide
   LK. Nitric oxide
   LL. Carbon monoxide
   LM. Phosgen
   LN. Phosphine
   LO. Hydrogen sulfide
   LP. Medication which contains more than 1% capacity rate of substances in item LA through LO

[Table 13]

Capture velocity of local ventilation equipment hood concerning harmful substances requiring management(Article 429)

State of substances	Hood type	Capture velocity(M · sec)
Gas state	Enclosing hood	0.4
	Exterior lateral exhaust hood	0.5
	Exterior canopy type hood	0.5
	Exterior canopy type hood	1.0
Particulate matter	Enclosing hood	0.7
	Exterior lateral exhaust	1.0
	Exterior canopy type hood	1.0
	Exterior canopy type hood	1.2

Remarks

1. The term "gas state" means state of gas or vapor when harmful substances requiring management are sucked into a hood.
2. The term "particulate matter " state of fume, dust or mist when harmful substances requiring management are sucked into a hood.
3. The term "Capture velocity" means wind speed referred to in the following items as capture velocity when all the hoods of a local ventilation equipment are open.
   A. Wind speed on a hood opening plane in the case of enclosing hood
   B. Win speed at a working location farthest from hood opening plane within a range that the hood sucks harmful substances requiring management in the case of exterior hood

[Table 14]

Measures concerning exposure-to-blood worker(Article 598 (2))

1. Measures concerning hepatitis (Type) B

Worker's state[1]		Treatment of exposed blood state		
		HBsAg positive	HBsAg negative	Where it is possible to inspect but blood type is not available
Unvaccinated[2]		HBIG[3] One time medication and treating hepatitis B vaccination	Treating hepatitis B vaccination	Treating hepatitis B vaccination
Vaccinated	Antibody formation HBsAg(+)	Uncured	Uncured	Uncured
	Antibody not formed HBsAg(-)	Two times of HBIG medication[4] Or HBIG one time medication and hepatitis B vaccine reinoculated	Uncured	The case of high-risk source of infection shall be treated in the same way as that of HBsAg positive
	Unknown	Antibody(HBsAb) Inspection : 1. Appropriate[5]: uncured 2. Inappropriate: HBIG once medication and hepatitis B vaccine additionally vaccinated	Untreated	Antibody(HBsAg) Inspection : 1. Appropriate: uncured 2. Inappropriate: hepatitis B vaccine additionally vaccinated and antibody titer inspection in one or two months

Remarks

1. A person who caught hepatitis B in the past won't need further vaccination.
2. Vaccination refers to reinoculating hepatitis B vaccine 3 times.
3. 0.06 ml · kg of HBIG(hepatitis B immunoglobulin) shall be injected into a muscle within 24 hours.
4. Two times of HBIG medication means medication administered where a person has no antibody even after two times of vaccination, who has not been vaccinated, or who has not completed two times of vaccination.
5. What it means by having appropriate antibody is that 10mIU · ml or more antibody(Anti HBs) in serum.
6. HBsAg(Hepatitis B Antigen): hepatitis B antigen

2. Measures related to HIV

<table>
<tr><th rowspan="2">Exposure type / Blood infection development</th><th colspan="2">Invasive exposure</th><th colspan="2">Mucous membrane and skin exposure</th></tr>
<tr><th>Serious exposure[5)]</th><th>Light exposure[6)]</th><th>Large doze of[7)]</th><th>Small dose of exposure[8)]</th></tr>
<tr><td>HIV positive-class 1[1)]</td><td colspan="2">Expansion 3-system prevention therapy[9)]</td><td>Expansion 3-system prevention therapy</td><td>Basic 2-system prevention therapy</td></tr>
<tr><td>HIV positive-class 2[2)]</td><td>Expansion 3-system prevention therapy</td><td>Basic 2-system prevention therapy</td><td colspan="2">Basic 2-system prevention therapy[10)]</td></tr>
<tr><td>Blood-borne HIV infection development unknown[3)]</td><td colspan="4">Prevention therapy not necessary. However, where there is HIV hazardous factors, basic 2-system prevention therapy shall be considered</td></tr>
<tr><td>Exposed blood unconfirmed[4)]</td><td colspan="4">Prevention therapy not necessary. However, where it is pr to be a patient's blood infected by HIV, basic 2-system prevention therapy shall be considered.</td></tr>
<tr><td>HIV negative</td><td colspan="4">Prevention therapy not necessary</td></tr>
</table>

Remarks
1. Where there is plenty of virus(1,500 RNA copies · ml or more), symptom of infection, AIDS, etc.
2. Subclinical or small dose of virus.
3. In cases where inspection is deemed hard where a person's blood belongs to the dead or it is impossible to keep track of the record.
4. Where source of blood is hard to be confirmed due to exposure by discarded blood or injection syringe.
5. Injection syringe or tools used for patients' muscle or blood vessel are stained with blood as a result of naked eye checking.
6. Where it is superficially damaged or no blood is seen on injection syring.
7. Blood scattering or spilling.
8. Stained with a few drops of blood.
9. Shall be determined in accordance with professionals in each field.
10. Shall be determined in accordance with professionals in each field.

[Table 15]

After exposure-to-blood tracking management(Article 598 (2))

Communicable disease	Tracking management contents and time
Hepatitis B virus	HBsAg: 3 months, 6 months after exposure
Hepatitis C virus	Anti HCV RNA : 4~6 weeks Anti HCV : 4~6 months
HIV	Anti HIV : 6 weeks, 1 2 weeks, 6 months

Remarks
1. Anti HCV RNA: hepatitis C virus RNA inspection
2. Anti HCV: hepatitis C antibody inspection
3. Anti HIV: human immune deficiency antibody inspection

[Table 16]

Dust work type(Subparagraph 2, Article 605)

1. The work at a place digging out earth rock · mineral · rock(Hereinafter "rock, etc", excluding the one of a humid state. The same shall apply): Provided that the work referred to in the following items shall be excluded.
   A. The work at a place where a worker drills surface rock by wet process
   B. The work at a place where a worker digs out outdoor rock without power source or blasting
2. The work at a place where a worker loads or unloads rock
3. The work at a place where a worker transports, shatters, crushes or sifts, or piling up or unloading rocks at mine(Excluding underwater work)
4. The work where an employ transfers · demolishes · checks or repairs machine equipment or electric equipment where dust is adhered or piled up at a place near the places pursuant to subparagraph 1 through 3 at mine
5. The work at a place where a worker cuts out · carves or finishes rocks, etc(Excluding work referred to in subparagraph 12 and the work at a place where he cuts out or manufacturers using flame)
6. The work at a place where a worker grinds using an abrasive material injection or grinds · casts or cuts out rock · mineral or metal using abrasive material or power(Excluding the work referred to in subparagraph 5)
7. The work at a place where a worker shatters, crushes or sifts rock · carbon material or aluminum foil (Excluding the work referred to in subparagraph 3 · 14 or 18)
8. The work at a place where a worker dries cement · arsenic acid ash · powder ore · carbon material or carbon product, piles up or unloads, mixes · scatters · packs.
9. The work at a place where a worker mixes · scatters · packs powdered aluminium or titanium oxide
10. The work at a place where a worker mixes · adulterates or scatters powdered ore, carbon material and its substance in the process where he manufactures · processes powdered state of ore, carbon material or its substance for raw material or material(Excluding the work under the provisions of paragraph 11 through 13)
11. The work to mix raw material in the process where a worker manufactures glass or enamel or to put in raw material or mixture into a melting furnace(Excluding the work at a place to mix raw material underwater)
12. The work at a place to mix or mold raw material, dry raw material or semi-product, load or pile up semi-product in a car or inside a furnace

in the process where a worker manufacturers pottery, refractory, molding sand product or abrasive material: Provided that the work falling under the following items shall be excluded.

A. The work at a place to put in or mold raw material and complete semi-product or unload and pile up semi-product in the process where a worker manufactures pottery
B. The work at a place where a worker mixes raw material underwater

13. The work at a place where a worker mix or mold carbon material, put semi-product into a furnace or take the product or semi-product out of the furnace to manufacture pottery in the process of manufacturing it.
14. The work at a place where a worker dismantles or sand cutting mold and cuts casting product or does roll mixing rolling or regenerates casting sand in the process of manufacturing cast using mold(Excluding the work referred to in paragraph 6)
15. The work to drop or gather rocks at a wharf of rock-exclusive vessel which transports rocks
16. The work at a place where a worker puts · sinters or injects earth rock or mineral into an open-hearth furnace in the process of smelting or melting metal or other inorganic material(Excluding the work at a place sintering at an electric furnace or at a place injecting mold.)
17. The work at a place where a worker scraps off or gathers or puts into a vessel mineral residue or ash attached or piled at furnace · chimney or stack in the process of combusting powdered mineral or smelting or melting metal or other inorganic material,
18. The work to build, repair, dismantle, or crush kiln or furnace using refractory
19. The work to weld or gas cut in an indoor · mine · tank · ship · pipe or vehicles, etc
20. The work at a place where a worker melts and sprays metal
21. The work at a place where a worker cuts · grinds and crushes wood using power
22. The work at a place where a worker mixes or taps on cotton
23. The work at a place where a worker crushes dye and pigment or instruments · inserts · packs powdered dye and pigment
24. The work at a place where a worker crushes grains or instruments · inserts · packs powdered grains
25. The work at a place where a worker cuts out · crushes · grinds fiber optics or rock wool.

[Table 17]

Capture velocity of a local ventilation equipment at a dust workplace installation
(Article 609)

1. Capture velocity of a local ventilation equipment installed pursuant to the proviso of Article 607 and Article 617 (1) (Excluding the one installed at a dust working place in relation to machine having a rotator grinding machine, drum sander(Drum sander), etc rotator)

Dust work place	Capture velocity(M · sec)			
	In case of enclosing hood	In case of exterior hood		
		Side draught	Down draught	Upper draught
A place sifting rock or carbon material or aluminum foil	0.7	–	–	–
A place regenerating casting sand	0.7	–	–	–
A place breaking down mold and sand cutting	0.7	1.3	1.3	–
Other dust workplace	0.7	1.0	1.0	1.2

Remarks
1. Capture velocity shall be measures in the following manners as capture velocity where all hoods of a local ventilation equipment are open.
   A. In case of enclosing hood, at a hood opening plane
   B. In case of exterior hood, at a working site farthest from its hood opening plane where hood sucks dust

2. Capture velocity referred to installation method of a hood of local ventilation equipment related to local ventilation equipment having a rotator including grinding machine, drum sander, etc installed at a dust working place in accordance with the provisions of Article 607 and Article 617 (1).

Hood installation method	Capture velocity(M · sec)
A method wholly enclosing equipment with a rotator	0.5
A method covering scattering of dust generated by a rotator rotation with a hood opening plane	5.0
A method only enclosing a rotator	5.0

Remarks
Capture velocity, as a capture velocity where all hoods of a local ventilation equipment are open, means a minimum wind speed at an opening plane of the hood with a rotator movement suspended.

[Table 18]

Confined space(Subparagraph 1 of Article 618)

1. Well · vertical mine · tunnel · caisson · pit contacting or linking the following stratum or interior of other similar things
   A. Area where contained water or spring is not available or hardly available out of conglomerate bed with a stratum whose upper bed has no water flowing
   B. Stratum which contains ferrous iron salts or manganous salts
   C. Stratum containing methane · ethane or butane
   D. Stratum which is causing or could cause erupt carbonated water
2. Interior of a well that has not been used for a long time
3. Interior of closed conduit · manhole or pit installed underground to accommodate cable · gas pipe or underground buried structure
4. Interior of container · closed conduit · manhole or pit where rainwater · stream water or spring is or used to be
5. Interior of heat exchanger · pipe · closed conduit · manhole · bank or pit where sea water is or used to be
6. Interior of facility whose boiler · tank · reacting top or inner wall of the steel is liable to oxidation due to long-term confinement(Excluding the one with its inner wall made up of stainless steel, or its inner wall prevented from oxidation)
7. Interior of storing equipment or wharf such as a tank or a hopper containing coal · lignite · sulfide ore · steel · log · drying oil · fish oil or other substances absorbing oxygen out of the air
8. Interior of facility without enough ventilation such as confined basement · warehouse or tank where ceiling · floor or wall is painted with a point containing drying oil and the paint is not dried, yet.
9. Interior of warehouse or pit storing grains or feed, interior of warehouse or pit ripening fruits, interior of warehouse or pit germinating seeds, silo used for cultivating mushrooms, or interior of a wharf loading feed seeds or grains
10. Interior of tank · warehouse or brewage which contains or used to contain soy sauce · alcohols · yeasts its fermenting items
11. Interior of sewage disposal tank · settling tank · water holding tank · tank · closed conduit · manhole · pipe or pit which contains night soil, contaminated soil, rotten water, sewage water, wastewater, other decaying or easily decomposable substances
12. Interior of refrigerator · freezer · cooling cargo truck or cooling container using dry ice
13. Interior of facility such as a boiler · a tank or a reacting top which has or used to have helium · argon · nitrogen · freon · carbonic acid gas or other inert gas

14. Interior of a place where oxygen concentration is less than 18% or more than 23.5%, carbonic acid gas concentration is more than 1.5%, hydrogen sulfide concentration is more than 10ppm.
15. Interior of concrete curing place and temporary construction lodging using lignite・charcoal・briquette stove
16. Interior of a batch reactor and a tank which used to have chemical substance.
17. Interior of a piping or a dust collector which used to have harmful gas.

Article 6 (Relation to other Acts)

Where at time of enforcement of this regulation, former「Regulations on Korea Occupational Safety」 or its provisions and 「Local Rule on Occupation Safety and Health Standard」 or its provisions are quoted from other Acts and any of this regulation is deemed to effective, it shall be deemed to quote the relevant provisions of this regulation or this regulation itself substituted for former 「Regulations on Korea Occupational Safety」 or its provisions and former 「Local Rule on Occupation Safety and Health Standard」 or its provisions.