

Approval of Safety rules for Primary Processing of Minerals

Minister of Economics regulation no. 43 of 18 June 1999

On the basis of Article 22 section 1 of the Technical Supervision Act (*Riigi Teataja* I 1998, 64/65, 1005) I herewith order:

To approve the “Safety Rules for Primary Processing of Minerals” (attached hereto).

Minister Mihkel PÄRNOJA

Chancellor Margus LEIVO

Approved by the Minister of Economics regulation no. 43 of 18 June 1999.

Safety Rules for Primary Processing of Minerals

1. General Provisions

1. This safety rule stipulates the requirements which in the case of due observance minimises the impact of hazards created upon primary processing and dressing of minerals on people, property and environment.
2. This safety rule shall apply to all persons subordinated to the national technical supervision, whose areas of activity include the design and implementation of the primary mineral processing and dressing process.
3. In order to ensure occupational safety the legal acts providing for the fire prevention, work safety and occupational safety requirements shall be observed in addition to this safety rule.
4. The primary mineral processing sites shall be built in accordance with an approved design.
5. The designs of new and refurbished primary mineral processing sites shall comply with the Planning and Building Act (*Riigi Teataja* I 1995, 59, 1006; 1996, 36, 738; 49, 953; 1999, 27, 380; 29, 398 and 399), with any other legal acts enacted thereunder and with the requirements of this safety rule in order to ensure the compliance with sanitary, ventilation and dust regime and fire prevention requirements and to minimise the pollution of environment.
6. The following documents shall be made available at the primary mineral-processing site:
 - 1) the design;
 - 2) the standards and other normative documents;
 - 3) the fire prevention and occupational safety rules and occupational safety instructions;

4) the emergency plan for fire extinguishing and rescue works;

5) general electricity supply scheme.

7. New and refurbished primary mineral processing sites may be commissioned with the consent of the Technical Supervision Inspectorate.

8. The equipment shall be handled in accordance with the manufacturer's instructions, this safety rule and the occupational safety rules of the processor. The occupational safety rules shall be drafted and enacted by the mineral processor for each and every work and worksite in accordance with this safety rule prior to the commissioning of the site. The mineral processor is the operator of the technological process involving primary mineral processing and dressing as well as of the equipment used therefor and of the sites under national technical supervision (hereinafter the site operator).

2. Personnel

9. Prior to commencing independent work the site operator shall test the professional knowledge and skills of the workers. If these prove to be insufficient, the site operator shall organise professional training in the field of occupational safety requirements.

10. Prior to commencing work each worker shall inspect the safety of his or her worksite in accordance with the occupational safety rules as well as the existence and working condition of necessary jigs and tools. He or she shall notify the person entitled to exercise supervision of any defects, which she or he is not able to eliminate independently.

11. The workers shall have necessary qualification, training and experience as well as sufficient knowledge of the equipment used.

12. The site operator shall create appropriate working conditions for the workers.

13. The victim or eyewitness shall immediately communicate any industrial accident to the person entitled to exercise supervision.

14. The person approved by the Technical Supervision Inspectorate may direct the works.

15. The intracompany work organisation shall ensure that the executives appointed are able to perform their official duties assigned to them.

16. The workers to whom the appropriate certificate of professional qualifications or competence has been issued may operate electric installations, compressors, hoisting equipment and cranes.

3. Special requirements for primary processing of minerals

Ventilation and dust regime

17. The equipment, which in any mode of operation emits dust, shall be supplied with the designed local vent or aspiration system, which shall be started prior to commencing working.

18. The site operator shall establish a procedure for the removal of dust from walls, constructions and equipment.

Fire protection

19. The belonging of all primary mineral processing and dressing sites to the respective class of inflammation and explosion risk shall be determined by the engineering design.

20. All industrial and auxiliary premises shall be equipped with the fire piping and supplied with the primary fire fighting measures and inventory. The quantity and location thereof shall comply with the general fire precaution requirements approved by the Minister of Internal Affairs, with the requirements of fire water system and with this safety rule.

21. Lubricants and cleansing agents may be stored at the worksite in closed fireproof containers in the quantity required for filling the need of 24 hours.

22. The vehicles for specific use shall be ensured access to at least two sides of the plant on the planned territory of minimum 6.0 metres in width. The distance of such access road from the building wall may not exceed 25 metres; the access road shall be approachable in any weather conditions and may not be blocked or littered.

Note. For the purposes of this regulation a plant is a complex of buildings and structures including the equipment which is required in the technological process of primary processing of minerals.

23. The plant territory shall be equipped with the fire piping. Fire hydrants shall be situated alongside the road within the maximum distance of 150 metres between the hydrants, at the crossroads within the maximum distance of 2 metres from the roadside and minimum 5 metres from the building walls.

24. Each floor of the plant as well as galleries and trestles with the length of more than 5 metres shall have two illuminated exits.

25. Each floor of the plant shall be provided with evacuation plans which must be posted in a clearly visible place.

Floors, platforms, bridges

26. All floors, platforms, bridges and stairs that facilitate working or passage of people shall be non-slippery in normal conditions.

27. When removing dust with water the flooring must be waterproof. In such case the rise and run of the floor shall be minimum 0.02, but in any event shall not exceed 0.10.

28. The width of the stairs, platforms and bridges shall be minimum 0.8 metres.
29. The platforms and bridges that are situated higher than 0.5 metres off the surrounding floor level, and the stairs shall be supplied with railing.
30. The railing shall be at least 1.1 metres high and have minimum three lengthwise rails and a floor skirt of 0.15 metres high. The railing shall be built such that at the spot load of 500 N per man and the distance of 0.5 metres in a casual pose or direction the rails are not permanently deformed.
31. The angle elevation of the servicing stairs in case of frequently used stairs shall be maximum 45° and in other stairs maximum 60° . The rise and pitch of the stairs shall be invariable on the full range of the stairs. The pitch may be maximum 0.30 meters and the tread minimum 0.25 metres.
32. The cavities, wells and channels situated in the plant shall be covered or surrounded with railing and provided with bridges for passage at crossings.
33. For servicing a manually operated compression fitting, test measuring instrument or starting device installed at the height exceeding 1.8 metres a platform shall be built such that the servicing height is 1.5–1.8 metres.
34. The service passages and equipment under or across the conveyors shall be protected against possible mineral drops.
35. The bridge across the conveyor shall be supplied with railing. The ladder for ascending to the bridge shall be fixed tight and may be vertical. The bridges shall be available in every 50 metres.
36. If the axle of the tractive drum of the conveyor or elevator is installed higher than 1.5 metres from the floor level, the platform for servicing the drive shall be built such that the servicing height is maximum 1.5 metres.

37. The rake service passages shall be equipped with:

at the tilt of 7° – 20° — crossbar ladders;

at the tilt of 21° – 60° — stairs;

at the tilt of more than 60° — ladders with the pitch of 0.25 metres.

Service passages

38. The height of service passages shall be minimum 2.0 metres, except the passage across the conveyor, the height of which may be minimum 1.6 metres.

39. The minimum widths of the service passages shall be:

- 1) between equipment — 1.0 metres;
- 2) between equipment and wall — 0.8 metres;
- 3) between tanks, vats and other containers for servicing and repairs — 0.7 metres;
- 4) between slat conveyors — 1.2 metres, between slat conveyor and wall — 1.0 metres;
- 5) from each side of worm conveyor — 0.8 meters;
- 6) between belt conveyors — 1.0 metres;
- 7) between belt conveyor and wall — 0.7 metres;
- 8) between belt conveyor and wall in the places not intended for passage of people — minimum 0.7 metres.

Railing

40. All propelling parts of machines, except the working units of conveyors (belt-, drag- chain-, slat conveyors), belt- and other drives shall be provided with solid railing to obstruct unintentional access to such parts:

- a) rotating parts (arbors, pulleys, etc.) shall be provided with full railing or net fence with the mesh size of maximum 50x50 mm;
- b) gearing and chain drives shall be provided with full railing.

41. The removal of railing in the operation mode of machines is prohibited.

42. Prior to the removal of the railing the machine shall be stopped and the starter blocked.

Electrical engineering

43. Electric installations are built and operated in accordance with the Electrical Engineering Safety Act (*Riigi Teataja* I 1999, 29, 403) and with other technical and administrative requirements the objective of which is to secure the required level of safety in electrical engineering.

44. On sites, standard electrical installations shall be used that must be installed, operated and maintained in accordance with the instructions of the manufacturer and the site operator as well as with the legal acts regulating the installation and maintenance of such installations.

Hoists and hoisting works

45. The cranes, pulleys and lifts used for raising and removing heavy loads shall comply with the safety rule for manufacture and operation of hoists as well as with the instructions of the manufacturer.

46. The safety rules for hoisting works shall be established by the site operator.

47. It is prohibited to stand under raised load or move in front of removable load.

48. Only checked slings and jaws may be used.

49. Montage holes shall be tightly closed during the intermission of their use.

50. The platforms and floors adjacent to the montage holes shall be equipped with grapples.

Compressed air management

51. Compressors and compression tanks and pipes shall comply with the requirements of the Compressors and Hoists Safety Act regulating the building and handling thereof.

Montage, repairs and maintenance of equipment

52. Montage works shall be carried out in accordance with the instructions of the manufacturer of the equipment and with the occupational safety rules drafted and approved by the site operator as well as with technological schemes.

53. Equipment or any part thereof shall be relocated by means of hoists, the lift force of which is higher than the weight of the item lifted.

54. The repairs and technical maintenance of the equipment shall be carried out in accordance with the instructions of the manufacturer of the equipment and with the occupational safety rules approved by the site operator.

55. For the repairs and technical maintenance the equipment shall be stopped, starters blocked and warning signs "Do not start - people working!" shall be put up on the starters.

56. The area of repair works shall be surrounded with railing and provided with warning signs.

57. In the event of simultaneous repairs of a mechanical unit and electric drive of the equipment, additional safety measures shall be applied in order to ensure safety.

58. During the repairs of a mill, the automatic rotation of the mill case shall be prevented.

59. The inspection or other works inside the equipment with revolving case (trommel, etc.) may be carried out only after fixing the open lids of the given case in the position which prevents incidental closing thereof.

60. A bunker or crusher may be entered into for carrying out repairs only with the consent of the person entitled to exercise supervision, provided that the following terms and conditions have been met:

- 1) the bunker is empty of minerals;
 - 2) the filling and discharge feeders as well as the equipment preceding or succeeding the feeders is switched off, blocked and provided with warning signs;
 - 3) the fall of any item in the bunker or crusher is prevented;
 - 4) the repairs are carried out by at least two people;
 - 5) the repair workers wear safety belts which have been connected by cable or rope to a rigid stand, except rails, equipment or frame of equipment;
 - 6) portable lamps with the maximum voltage of 12V are used for illumination.
61. The replacement and renewal of the working units of conveyors and elevators shall be carried out by means of the rigging appliance.
62. For vulcanisation of the conveyor belt the site operator shall draft and approve special instructions.

Works involving an Open Flame

63. Works involving an open flame (gas flame and electrical welding) shall be carried out in accordance with the fire precaution regulations on works involving an open flame as approved by the Minister of Internal Affairs (*Riigi Teataja Lisa* 1998, 214/215, 844) as well as with the regulations established by the site operator.
64. The workers with relevant qualifications certificate and appropriate means of protection may perform works involving an open flame.
65. The place where works involving an open flame are carried out shall be equipped with fire extinguisher, sand case and fire hose with nozzle connected to waterworks, or with 1.0 m³ of water.
66. All inflammable parts of the building situated within less than 5 metres to the site of works involving an open flame shall be well wet and then covered with asbestos or steel sheets prior to commencing working.
67. The sites for works involving an open flame shall be enclosed and provided with the signs warning the workers against the danger of eye and skin damage (ultraviolet radiation).

68. The use of cords with damaged insulation, self-made safety plugs, handles and cords with inadequate cross-section is prohibited.

69. The use of earth and neutral network, metal constructions of buildings, communications and equipment as return feed is prohibited.

70. The case of the welding equipment and the secondary winding terminal shall be earthed to the general earth mesh by separate leads.

71. In the plant, welding sets may be only connected to special welding points (plugs) that must be locked. No other consumer may be connected to such points.

72. The welding of closed pressurised containers (boiler, balloon, piping, etc.) containing inflammable or explosive substances is prohibited. Welding works in such containers are allowed to be carried out only after depressurisation, careful cleaning and degasification of the containers.

73. When performing welding works inside metal constructions, boilers or reservoirs, and outdoor works in wet weather, the welder shall wear dielectric boots, dielectric gloves and plastic helmet.

74. Welding works in closed tanks shall be performed by at least two people whereas one of them shall work outside the tank and inspect safety. The welder shall be equipped with a safety belt and safety rope, the other end of which is held by the person working outside the tank. During the works the tank shall be regularly aired.

75. The worksite, platforms and floors situated below the welding point shall be inspected after the end of the works involving an open flame. The person entitled to exercise supervision shall ensure the inspection of the sites for works involving an open flame within at least five hours following the end of the works involving an open flame.

Railway transport

76. The railways, railway structures, rolling stock located on the plant territory and owned by the plant, as well as the train traffic and the arrangement of loading and unloading works shall comply with the regulations established by the site operator. The site operator shall establish the foregoing regulations in accordance with requirements set out in the Railway Act (*Riigi Teataja* I 1995, 5, 41; 1998, 2, 45; 1999, 29, 405).

77. In the case of railways owned by other persons the works specified in clause 76 shall be carried out in accordance with the regulations established by such owners. In such cases, the site operator shall introduce the said regulations to the workers.

78. Wagons may be moved by locomotives, push engines or winch. In winching wagons, the winch shall be affixed to the first buffer of the first wagon.

79. Horizontal service passages shall be built on both sides of the railway.

Motor transport

80. Until the establishment of the safety rules for the use of technological motor transport in mines and quarries the motor vehicles shall be used in accordance with the applicable traffic regulations and additional restrictions imposed by the site operator. The site operator shall impose the restrictions in accordance with the requirements established for motor transport in the safety rules for open mining of mineral resources set out in the Government of the Republic regulation no. 154 (*Riigi Teataja* I 1997, 61, 1028) of 11 August 1997.

81. In the event that abnormal dust concentration is created in loading and unloading vehicles, appropriate measures for the dust adhesion shall be applied or anti-dust means of personal protection shall be used.

82. The places for loading and unloading vehicles shall be provided with lighting in the dark within the minimum area of 50 metres.

83. At the bunker, a service passage with the minimum width of 1.5 metres shall be built on both sides of the road.

Conveyor transport

84. Upon starting a technological line, the safety of workers shall be ensured. Prior to starting a line, a warning signal of minimum 10 seconds shall be given. All workers shall know the starting signals. The lists of the meanings of used signals shall be posted in a clearly visible place close to the technological line.

85. All conveyors shall be equipped with a device that allows to stop them in full length at any place.

86. The slat conveyors shall be equipped with a catching tool that prevents free down-run of the working unit in the event it should break.

87. Stationary belt or slat conveyors with the rise and run exceeding 6° shall be equipped with a brake gear that prevents rearward movement of the working unit upon the stoppage of the conveyor.

88. Elevators shall be:

1) enclosed in full length;

2) equipped with stop switches both in loading and unloading points;

3) equipped with the brake gear which prevents rearward movement of the working unit upon the stoppage of the device;

4) equipped with the catching tool that prevents free down-run of the working unit in the event it should break.

89. The belt conveyor shall be equipped with a device for cleaning the belt. The hand cleaning of the space under drums is allowed provided that the conveyor has been stopped and blocked.

90. If a drum-type discharge trolley or removable feeder has been installed to the belt conveyor, service passages shall be built on both sides of the conveyor.

91. The discharge trolley shall be equipped with a device that prevents incidental movement thereof.

92. In case there is no person permanently working at the conveyor drive, an ultimate limit switch shall be available that stops the conveyor in the case of overflowed bunker, gape or launder.

93. In case several aligned machines are operated simultaneously:

1) the drives of such machines shall be blocked such that the starting and stoppage thereof according to the technological scheme is ensured;

2) in the event of sudden stoppage of any device or conveyor, the preceding equipment shall stop automatically;

3) local interlock shall be provided to prevent, if necessary, the starting of a machine by remote control.

94. The clogging of or suspensions in the bunker, crusher, or gape may be eliminated by means of tools (spikes, rakes, vibrators, spike hammers, etc.). People are prohibited from descending upon the clogging substance or from climbing in the cave from below.

95. The conveyor belt shall not sidewise surpass the range of the rollers and drums. To prevent the lateral shift of the belt, the conveyors shall be equipped with the devices preventing the shift of the belt.

96. Stationary raking conveyors shall be provided with protective edges to prevent the dropping of materials.

97. The straining drums of conveyors and the loads of straining devices shall be positioned such that in the event of breakage of the straining cable or working unit the damage to the people or property is avoided.

Crushing and desliming of minerals

98. In order to prevent the ejection of mineral pieces from the breaker, the loading holes shall be:

- 1) covered with a removable full cover in case of gyratory breaker;
- 2) surrounded with a net fence with the height of 1.0 metres in case of jaw and drum breaker.

99. In the case of local operation the starting devices of the breakers and mills shall be positioned such that the operators can easily observe the equipment.

100. The pieces of minerals stuck in the breaker shall be removed by means of a hoist or crushed by means of a mechanical appliance.

101. The crushing equipment may be inspected inside after their stoppage and airing.

102. It is prohibited to unscrew or loosen the mill hatch in the lowered position.

103. Hand cleaning of the screen and the descending of workers into the discharge gape or breaker is allowed only with the consent of the person entitled to exercise supervision. In such case the electric motors of the appliance shall be switched off, blocked and provided with warning signs. The workers descending into the discharge gape or breaker shall wear a safety belt.

104. The service platforms of deslimers and screens shall be built at least 0.6 metres below their upper edges.

105. In case of dry screening of the minerals the screen shall be covered and aspiration device shall be used.

Mineral dressing

106. Workers may enter the washing drum, heavy suspension and gravitational concentration appliance for the inspection and cleaning thereof only when directed by the person entitled to exercise supervision. At least two persons wearing safety belts may work in a deep gravitational concentration appliance.

107. Launderers with the rise and run of more than 45° shall be covered.

Sampling

108. The sampling of minerals shall be carried out mechanically. Samples are allowed to be hand-taken only in the event of breakdown of the sampling appliance. In such case the sampling site shall be easily accessible, safe and well lighted.

109. The taking of samples from a running conveyer is prohibited.

110. Samples may be taken from the wagons only at standstill. An access platform shall be built to the wagon with necessary ladders and stairs.

111. During the sampler's stay in the wagon he or she shall turn on the red signal lamp affixed to the platform, and when the lamp is lit, the wagon loaders may not move the wagon.

112. The rooms built for preparing and processing samples shall be equipped with the necessary appliance for the mechanical processing of samples.

113. All hazardous substances that are necessary for performing analyses and work shall be stored in duly closed and marked containers.

114. The taking, processing and preparation for analysis of the samples shall be carried out in accordance with the safety rules established by the site operator.

Loading and storing of minerals

115. Tilting or vertical tubes shall be used for loading of minerals into wagons directly from the plant or bunkers. In both cases the tube end shall be:

- a) not higher than 0.4 metres from the upper edge of the wagon during the loading;
- b) at least 1.0 metres higher than the highest point of the rolling stock during the manoeuvres.

116. When loading the minerals into a store, the bulldozer may not drive closer than three metres to the point where minerals drop from the conveyor.

117. When loading the minerals with bulldozer into the wagon, the wagon loader directing the work of bulldozers shall stand at the trestle level on the other side of the railway.

118. The oil shale shoved with bulldozer shall drop into the wagon through the grid with the mesh size of 20x20 cm.

119. The trestle shall be:

- a) duly lighted in the dark;
- b) equipped with red lamps turned on by the loaders to prohibit loading;
- c) equipped with solid side rails;
- d) equipped with the railing to prevent the bulldozers from running over the trestles;
- e) empty of minerals to the minimum length of the bulldozer.

120. The rise of the bulldozer track may be maximum 25° , the run maximum 30° .

121. During the loading, unloading and other works in progress in the stores the workers must not stay within the operation area or –radius of the equipment.

122. The working units of the excavators and bulldozers may be cleaned in a fully lowered position.

123. After the end of the works the working units of excavators or bulldozers shall be fully lowered, the engine stopped, the cabin locked and the cable switched off.

4. Liability

124. The persons working on the primary mineral processing site, who are at fault for violating the requirements of these rules, are subject to disciplinary, civil, administrative or criminal charges prescribed by law.