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SAFETY AND INDUSTRIAL SANITATION TECHNIQUES FOR DANGEROUSLY EXP--ETC(U)
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FOREIGN TECHNOLOGY DIVISION

SAFETY AND INDUSTRIAL SANITATION TECHNIQUES FOR DANGEROUSLY EXPLOSIVE AND INFLAMMABLE CHEMICAL PRODUCTION

by

N. M. Gubitsyn, A. D. Artomasov

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Block	Italic	Transliteration	Block	Italic	Transliteration
А а	*А а*	A, a	Р р	*Р р*	R, r
Б б	*Б б*	B, b	С с	*С с*	S, s
В в	*В в*	V, v	Т т	*Т т*	T, t
Г г	*Г г*	G, g	У у	*У у*	U, u
Д д	*Д д*	D, d	Ф ф	*Ф ф*	F, f
Е е	*Е е*	Ye, ye; E, e*	Х х	*Х х*	Kh, kh
Ж ж	*Ж ж*	Zh, zh	Ц ц	*Ц ц*	Ts, ts
З з	*З з*	Z, z	Ч ч	*Ч ч*	Ch, ch
И и	*И и*	I, i	Ш ш	*Ш ш*	Sh, sh
Й й	*Й й*	Y, y	Щ щ	*Щ щ*	Shch, shch
К к	*К к*	K, k	Ъ ъ	*Ъ ъ*	"
Л л	*Л л*	L, l	Ы ы	*Ы ы*	Y, y
М м	*М м*	M, m	Ь ь	*Ь ь*	'
Н н	*Н н*	N, n	Э э	*Э э*	E, e
О о	*О о*	O, o	Ю ю	*Ю ю*	Yu, yu
П п	*П п*	P, p	Я я	*Я я*	Ya, ya

*ye initially, after vowels, and after ъ, ь; e elsewhere.
When written as ё in Russian, transliterate as yё or ё.

RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English	Russian	English	Russian	English
sin	sin	sh	sinh	arc sh	$\sinh^{-1}$
cos	cos	ch	cosh	arc ch	$\cosh^{-1}$
tg	tan	th	tanh	arc th	$\tanh^{-1}$
ctg	cot	cth	coth	arc cth	$\coth^{-1}$
sec	sec	sch	sech	arc sch	sech^{-1}
cosec	csc	csch	csch	arc csch	csch^{-1}

Russian	English
rot	curl
lg	log

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SAFETY AND INDUSTRIAL SANITATION TECHNIQUES FOR DANGEROUSLY EXPLOSIVE AND INFLAMMABLE CHEMICAL PRODUCTION.

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PREFACE.

In connection with entrusting the Gosgortekhnadzor's of the union republics with state monitoring of the state of safety engineering in all explosion- and the inflammable enterprises of chemical industry and in experimental production shops independent of their departmental subordination, the state committee of the chemical and petroleum industry with Gosplan of the USSR charged to institute Giprogaztopprom to develop rules on safety and industrial sanitation technique for the indicated productions.

Time/temporary rules are developed by the Giprogastopprom taking into account observations and propositions of main state sanitary inspection of USSR, central scientific-research institute of the fire protection of MOOP of the RSFSR, Kuibyshev, Krasnodar, Bashkir, Azerbaydzhan councils of professional unions, Bashkir, Kuibyshev councils of national economy, Kuibyshev oil refinery, Lisichan chemical plant, Voronezh plant of synthetic rubber, and also the design

institutes: GIAP, Giproplast, Giprokauchuk, Giprokhim, Goskhimproyekt GIPI-4, VNIIneftkhim.

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The present "time/temporary safety regulations and industrial sanitation for explosion- and inflammable chemical productions" are affirmed by the Gosgortekhnadzor's of the RSFSR, UkrSSR and KazSSR and are agreed on commission VTsSPcrs [All-Union Central Trade-Union Council] with CC trade union of the workers of petroleum and chemical industry, and also with the C.N.E. of the RSFSR and with UPO MOOP of the RSFSR.

The action of present rules is spread to everything explosion- and inflammable productions and the experimental production shops of chemical, petrochemical, medical, cellulose-paper, food and local industry.

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Section I.

GENERAL RULES.

§1. Each chemical production must have the designed documentation, affirmed in routine.

§2. The projects of explosion- inflammable chemical production must correspond to the requirements for present rules.

§3. For each production must be developed the technological regulations, affirmed by the appropriate controls of councils of national economy.

§4. Procedure into the operation of the new and reconstructed productions is produced in routine by board with the collaboration of the representatives of the local organ/controls of Gosgortekhnadzor [State Committee of the Council of Ministers for Supervision of Industrial

Safety and for Mining Inspection (cRsfsr)].

For 2 months to the procedure of the new and reconstructed productions, the corresponding organizations of councils of national economy and departments notify about this the control of the district of Gosgortekhnadzor. It is forbidden to accept into operation the new and reconstructed productions, which have deviations from present rules.

§5. The existing enterprises must be given into conformity with the requirements for present rules within the periods, matched with the local organ/controls of Gosgortekhnadzor of union republics.

§6. In all explosion- and inflammable productions and the experimental production shops, must be the commands on the safe conduct of works, comprised in accordance with present rules and affirmed by the chief engineer of enterprise.

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§7. For the newly projected enterprises, shops and installations, must be developed by planning organizations

and affirmed together with project the starting/launching regulations and instructions, which provide for the requirements for safe beam, the conduct of technological process and safe equipment maintenance.

Procedure into the operation of these objects without the presence of regulations and commands is not permitted.

§8. Working and technical-engineering workers (engineering and technical personnel), taken upon work in explosive and inflammable productions, must pass physical examination for setting of the possibility of their tolerance to work.

Periodic inspections of workers under conditions of this chemical production are carried out in the periods, provided for by the indications of the Ministry of Public Health of the USSR and matched from CC trade union of the workers of petroleum and chemical industry.

§9. All persons, who newly enter the enterprises and shifted from shop the shop, can be allowed to independent work only after instruction on the rules of the internal order of enterprise, the safety regulations and the firefighting measures, and also testing their knowledge and

probationary period on work area.

The operating time as a probationer-dual is establish/installed by the administration of shop, but it must be not less than 10 days.

§10. Besides lead-in instruction and probationary period on the work area of all workers, it is necessary periodically, but it is not less than 2 times per annum, to instruct on the rules of the conduct of works, safety and fire safety technique, or on the use of fire-fighting means and protective devices.

§11. The knowledge of workers and engineering and technical personnel in the region of technical safety and fire preventive maintenance, necessary for this work area, must check special board in routine.

§12. Those, failed during the primary or retesting of knowledge on safety engineering, cannot be left on the fulfilled by them work.

Section II.

GENERAL PLAN AND REQUIREMENTS FOR THE TERRITORY OF ENTERPRISE.

§13. Fire- and dangerously explosive productions must be furnished with respect to the nearest residential area from the lee side of the prevailing winds to disengage the boundary/interfaces of residential areas by sanitary-shielding zones.

§14. Sanitary-shielding zones are establish/installed in accordance with the requirements for the effective sanitary norms.

§15. During building of enterprises on the shore of river, it is necessary to furnish them along the flow of river lower than populated area. If for any reasons enterprise must be arrange/located higher than populated area and at a distance, which does not ensure the

self-purification of river to the boundary/interface of populated point, should provide for the branch/removal of the purified industrial and economic-fecal flows with issue their lower than populated area.

§16. In the territory of the enterprise must not be of the closed ravines, foundation areas or nonplanned excavations, which are powerful to be the place of the accumulation of heavy vapors and gases of production.

§17. In general plan/layout, as a rule, one should provide for the line building-up, which ensures good aeration, the convenient packing of communications and favorable conditions for the work of special services on the liquidation of emergencies and fires. The buildings of shops, as a rule, must not have in plan/layout П- Т-, Ш -shaped configuration.

§18. The buildings in which are carried out the production processes, connected with the possibility of isolation/liberation in the atmosphere of harmful vapors, gases or dust, must be furnished from the lee side with respect to the buildings, not connected with such isolation/liberations.

§19. The distances between quarters, the separate technological blocks of shops, shops, installations and constructions must correspond to the requirements for the effective fire-fighting and sanitary norms.

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§20. The territory of enterprise must be protect/surrounded by the sampling of any degree of refractoriness, which has not less than two travelling gates with the width of aperture and height/altitude not less than 4.5 m.

§21. Open power electrical plants, the storages of LVZh and of flammable liquids and gases, and also the production, which require by nature of isolation/insulation of other productions, which are found on the territory of enterprise, must be guarded by sampling.

§22. The territory of enterprise must be well-organized.

The tray/chutes, the deepenings, arranged in connection with technological need, must be sheltered or protect/surrounded.

§23. With the arrangement above roads and passages of different devices (conduit/manifolds, piers, drawing out, power lines, etc.) the free height/altitude above the transient part of the road and the passage must be not less than 4.5 m, and above the head of the rails of railway lines it is not less than 5.55 m.

The conduit/manifolds, laid in the territory of enterprise in the places of pass for people, must be sunk or arrange/located at height/altitude 2.2. m above the pass. Is allow/assumed also pipe laying in these places without sinking, but with the necessary device of illuminated gangways with rails.

§24. The open wells, in which are arrange/located the catches, must have enclosure/protections as height/altitude not less than 1 m, including the height/altitude of the protruding above the earth/ground walls of well.

§25. Underground cable routes must have the external identification marks, which make it possible to determine

the location of clutches and cables.

§26. In the territory of enterprise, must be the pedestrian path/tracks, which mutually connect entry to the territory of enterprise, separate shops and installations, constructions and auxiliary locations.

All pedestrian path/tracks must have hard-surfaced pavement.

§27. The packing of the roads of the common/general/total use through the territory of enterprise is not allow/assumed. Distance from the enclosure of enterprise to the roads of common/general/total use must be not less than 20 m.

§28. In the zones of the tank farms and piers, the planning marks of roads, as a rule, must be higher than planning marks of area/sites not less than on 0.3 m.

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In the case of the impossibility of fulfilling this requirement for road, they must be planned so that the

spilling products could not hit for the road.

§29. Distance from the edge of the transient part of the road to the constructions of the supports, piers, illuminating columns, masts and other constructions must be not less than 1 m.

§30. The territory of the raw, intermediate and commercial storages of the inflammable and flammable liquids, of liquefied gases, and also condition from storage they must satisfy the requirements for the effective "construction norms and rules", and also for "norms and technical specifications of the planning of storage enterprises and economies for storage of the inflammable and flammable liquids" (NiTU 108-56).

§31. Storage of the strong toxic substances on basal and expenditure warehouses of these substances must satisfy the requirements for "Norms and technical specifications of planning, building and operation of storages for storage of the strong and toxic substances".

Section III.

CONSTRUCTION UNIT.

§32. The determination of the category of production from harmfulness and the fire hazard, required the degree of the refractoriness of buildings and constructions, distance between buildings and structures, height and the size/dimension of the maximum area between fire walls is produced in accordance with the effective fire-fighting and sanitary norms.

§33. All buildings and the constructions, which are constructed in the zones of the arrangement of production plants, must be not below II degree of refractoriness.

§34. Transformer substations and distributors must be furnished taking into account the requirements for the "rules of the device of electrical devices".

Operator of KIP, the ventilation camera/chambers and the sanitary units, and also air and ammonium compressor must be furnished in annex from the end side of the building of technological installation.

It is permitted sometimes to place the indicated locations in one building with technological installation, but after anechoic fire-fighting wall.

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Locations dangerously explosive pumping and compressor must be separated the friend and other locations by the anechoic incombustible walls with the limit of refractoriness not less than 2.5 h and have independent output/yields outside.

During blocking of the locations of pumping, that operates technological processes, with other locations the latter must touch only to one of the end walls of pumping.

If apertures are within two longitudinal walls of the location of pumping and natural illumination in this case

it corresponds to the requirements for the sanitary norms of planning, is permitted the contiguity of other locations to two end walls of pumping. Between the pumping and location of another designation/purpose should not be report/communication.

§35. For the apparatuses from which in the process of operation are separated harmful vapors, gases and dust, it is necessary to provide for isolate/insulated building, cabin/compartments with independent output/yield outside or output/yields through reel-sluices, provided by ventilation backwater.

§36. In the locations of transformer substation, of distributors and KIP, window frames must be double. The hems in such locations, which have channels or pits, must be arrange/located higher than the earth's surface and sex/floors of adjacent buildings with dangerously explosive medium on 0.5 m. The bottom of cable ducts or pits must be higher than the sex/floor of adjacent dangerously explosive locations by 0.15 m.

§37. Everything indicated into §36 locations, attached to dangerously explosive shops, must be provided by plenum

ventilation with the guaranteed backwater of air.

§38. The arranged/located in building pumps, which pump over combustible products with temperature of 250° are above, must be separated by anechoic wall from the pumps, which pump over combustible products with temperature below 250°.

§39. In the production buildings, in reference on fire hazard to categories A and B, and also in the locations in which are possible the isolation/liberations into air of harmful substances, it is forbidden to build in:

a) repair and mechanical shops;

b) shop laboratories;

c) location for storage of sample/tests and inflammable reagents;

d) location for fuel storage and of lubricants;

e) location, directly the not connected with technological process productions.

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The indicated auxiliary locations it is permitted to place in complex with the block of everyday locations and locations, intended for control of production, and also to attach to shop from the production of categories C, D, E or to furnish in the separate housing confronting.

§40. With the arrangement of laboratories in the buildings of another designation/purpose, they must be separated from adjacent locations by anechoic walls with the limit of refractoriness not less than 1.5 h.

Output/yields from the working locations of laboratories must be made into the corridor of the building of which is arranged not less than two output/yields outside.

§41. In laboratory locations must be provided for the locations for washing and drying of vessels, storage of reagents, economic stock.

§42. For storage of the sample/tests of the inflammable

and fuel liquids, gas and the like in laboratory must be equipped special building, isolated from remaining locations with anechoic wall with the limit of refractoriness not less than 1.5 h with direct output/yield outside or through the sluice.

§43. The buildings of the shops, in reference to categories A and B, must have glazing and the easily jettisoned during explosion panels whose area must satisfy the requirements for fire-fighting norms.

§44. The buildings of the shops in which are applied the dangerously explosive or toxic of substances with the specific gravity/weight of less one (acetylene, hydrogen, methane, ethylene, etc.), must have aeration lamp/canopies, deflectors and another device for the distance/removal of light/lung dangerously explosive gases from under upper overlap.

§45. In floors of shops, in reference to categories A and B, not connected with the application/use of the inflammable and flammable liquids, it is necessary to provide for aeration-explosive apertures.

The area of these apertures with respect to floor space must be:

a) when, in the production locations, hydrogen, acetylene, ethylene are present, and other substances with specific gravity/weight are less than one - it is not less than 15o/o;

b) in all other cases - are not less than 5o/o.

Reference area of aeration-explosive apertures, overlapped by metallic grates, is received without taking into account of decrease in the apertures as grates.

In the presence of the open assembling apertures, their area is included in the designed area of an aeration-explosive aperture.

Aeration-explosive apertures in floors is recommended to be placed in the center section of the overlap or of anechoic walls. During the arrangement/position of apertures along the front of windows, it is necessary to provide for the coverage of apertures by grates.

the coverage of apertures by grates.

Note. In the productions, in reference on fire hazard to categories A and B, connected with the application/use of the inflammable flammable liquids, and also in the productions where according to the conditions of technological process it is necessary to avoid the propagation of harmful isolation/liberations from the ground floors to upper, the device of aeration-explosive apertures in floors it is not permitted. In such cases the necessary area of explosive apertures must be provided because of glazing of each deck.

§46. The internal walls, which divide the building within which are placed the productions, in reference on fire hazard to categories A and B, and also the internalization of the walls, which separate/liberate these locations from the locations of other categories, the staircases, the corridors and other evacuation routes, must be those who are been gas-impermeable.

§47. Is not allow/assumed the device of basements, of the not charged trenches, pits and underground channels, which are powerful of serving as the place of the

accumulation of dangerous vapors and gases in the shops, in reference to categories A and B, or under everyday, administrative-economic and auxiliary buildings.

Note. The device of the open pits indoors, in reference to categories A and B, is allow/assumed as an exception only in cases when pits are unavoidable according to the conditions of technological process. In these cases the pits must be provided by the reliable, continuously effective suction and exhaust ventilation.

§48. Floors and the area/sites of the shops, in reference to categories A and B, must exclude the possibility of the formation of the unventilated spaces.

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In this case:

a) the established/installed on the overlaps and the pads capacitance/capacities and equipment with combustible or corrosive liquids must be furnished on pan/pallets or on the anechoic part of the overlap and area/site, limited by edge with height/altitude not less than 150 mm;

b) for the plum of different products from pan/pallet or the limited by edge anechoic part of the overlap and area/site must be provided for the emergency capacitance/capacities whose volume must be not less than the volume of the greatest working capacitance/capacity;

c) the places of the possible stagnation of air under the anechoic part of the overlap or area/sites must be provided by the continuously effective exhaust mechanical ventilation.

§49. The capacitive *equipment* with aggressive, toxic and flammable liquids, arrange/located on overlaps and pads of shops, on pedestals and bookstands, must have a device for the plum of these liquids into emergency capacitance/capacity (independent of the possibility of evacuation as their pump).

§50. In the multistory buildings and bookstands for the maintenance of equipment, arrange/located at height/altitude 15 m and more, must be provided for the device of cargo-passenger elevator.

In the buildings, in reference to categories A and B, elevators one should establish/install in the isolated/insulated staircases.

The limit of the refractoriness of the walls of staircases is determined in accordance with fire-fighting norms. The limit of the refractoriness of lift wells must be not less than 1 h.

§51. Output/yield from elevator into the locations, in reference to categories A and B, must be produced through the sluice with backwater which is created continuously by working plenum ventilation. The door apertures of sluice must be shielded by the fire-fighting auto/self-closed doors with the limit of refractoriness not less than 0.75 h.

§52. Machine room and lift wells in the shops, in reference to categories A and B, must be isolate/insulated from other locations and the staircase and have plenum ventilation with the guaranteed backwater of air not less than 30 mm water column.

Walls and the overlaps of machine rooms must be those who are not combusted with the limit of refractoriness not less than 1 h.

End Section.

§ 53. The roofing of production buildings, which has skylights, and also the roofing, utilized for connection between external landings or for the maintenance of equipment and communications, must have independent of the height/altitude of buildings and gradient/drafts of the roofing of enclosure/protection (rails) as a height/altitude not less than 1 m.

§ 54. For the coating of sex/floors in the shops, in reference to category A, should be applied not sparking with impact/shocks materials. Metallic area/sites and the step/stages of staircases must be shielded not sparking with the impact/shocks by coatings.

§ 55. Floors in the locations where is feasible the overflow of considerable amount of liquid, must be from the impenetrable materials. Hems in the locations where are applied aggressive substances (acid, alkalies and the like),

must be resistant to the effect of these substances and slope not less than 0.01 to ladder or sump.

§ 56. During the arrangement/position of equipment on the open pads, it is necessary to be guided by the "Instructions on the carrying out of equipment on the open pads in chemical industry", affirmed by GosKhimkomitet.

§ 57. During the planning of buildings for the arrangement/position of the productions, connected with the application/use of metallic mercury, and also mercury rooms in laboratories, shop KIP and other places they should be guided by the requirements for "Sanitary regulations with respect to device and content of substations with mercury rectifiers also shop with respect to inspection, sorting/partition and repair of mercury rectifiers of instruments", affirmed by the main state sanitary inspection of the USSR.

Section IV.

SPECIAL FIREFIGHTING MEASURES.

Lobbies, entries and exits, staircases, fire escapes, identification marks.

§ 58. With the planning of evacuation routes, it is necessary to allow for of people's rapid output/yield from location directly outside.

Staircases and evacuation exits must correspond to the requirements for construction codes (SNIP [99sp04 - [Construction norms and regulations] II-A. 5-62 and SNIP II-M. 2-62).

§ 59. On the doors, intended for output/yield to balconies and external fire staircases, it must be

inscribed: "Exit to fire staircase".

All exits from locations must have illuminated inscriptions and must not be cut off.

§ 60. Output/yields from production buildings to the side of external installations (bookstands) can be considered evacuation, if the distance from buildings to that which was opened installations composes not less than 10 m.

§ 61. The area/sites of the external open bookstands, intended for the arrangement/position of apparatuses with inflammable and combustible fluids and gases, must have the following quantity of external staircases for the evacuation:

a) at the length of external bookstand to 12 m and in common/general/total area to 72 m² - one open staircase;

b) at the length of external bookstand of 12 to 50 m - not less than two open staircases;

c) at the length of installation (bookstand) more than 50 m a quantity of staircases is determined of the calculation of their arrangement at a distance not more

than 50 m one from another.

Note. Open operational stairs it is allow/assumed to arrange metallic with gradient/draft not more than by 45° and this device of step/stages so that would be provided the convenient evacuation of the operating installation people. The width of staircases must be not less than 0.7 m. Staircases must have enclosure/protections as height/altitude 0.8 m.

§ 62. Basic working and evacuation passes and output/yields must be constantly free. The width of basic passes (area/sites) must be not less than 1.5 m.

§ 63. For the buildings where are placed the productions, connected with the application/use of harmful gases and liquids, which are located under pressure, independent of the categories of fire hazard a quantity of evacuation output/yields is establish/installed the same as for the buildings, in reference to category A.

§ 64. For output/yield of the open pits by area it is more than 50 m^2 or by extent more than 30 m, arrange/located within locations, in reference to categories

A and B, one should provide for not less than two staircases.

§ 65. Exits from buildings must be furnished so that they would not be directed to the side of the adjacent railroad and crane runways; if this is impossible carry out, must be arranged enclosure/protections between output/yield and ways.

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Lightning protection, protection from static electricity.

§ 66. To lightning protection and protection from the secondary manifestations of lightning are subject all buildings and the constructions in which are placed the productions, in reference on fire hazard to categories A, B, C, in accordance with the effective indications on lightning protection.

§ 67. Reservoirs, technological equipment, conduit/manifolds, liquid drainage devices and so forth the

equipment, connected with procedure, processing/treatment and the displacement/movement of liquids, vapors, gases and friable substances, which are dielectrics, should be protected from static electricity in accordance with the effective "rules of protection from static electricity in the productions of chemical industry".

Equipment and devices for the quenching of fires.

§ 68. All the production and subsidiary locations, installations, constructions and storages must be provided by the primary means of fire extinguishing and by fire stock. A quantity of these means and their content must correspond to the effective "norms of the primary means of fire extinguishing for production, storage, public and living quarters".

§ 69. The location of the primary means of fire extinguishing and fire stock must be agreed with local fire protection.

§ 70. In production locations, storages and at the

open installations as the means of fire extinguishing one should apply the finely pulverized water, vapors, chemical foam, fire-extinguishing compositions in the basis ethyl bromide, carbonic acid, nitrogen and other inert gases with the aid of movable and fixed systems. Sometimes, depending on technological process and the special fire danger of the used substances, means and the methods of fire extinguishing are determined by technologists from agreement with organs of fire supervision.

§ 71. For the extinguishing of fires in locations and the apparatuses, which yield at least to time/temporary isolation/insulation from the environment, it is possible to apply vapor, carbon dioxide, nitrogen and other means of fire extinguishing, which effect the principle of lowering of oxygen concentration in air.

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Note. The use of water vapor, nitrogen and carbonic acid as the stationary means of fire extinguishing is recommended for locations (camera/chambers) with volume not more than 500 m^3.

§ 72. Installations on application/use pair for the quenching of fires one should design according to "technical specifications and norms for application/use pair for the quenching of fires in the enterprises of the petroleum industry".

§ 73. For the quenching of the ignited with boil-off or gases on open installation, they are recommended to apply technological nitrogen or another inert gas under pressure to 6 atm(gage) so that by gas jet to shoot down flame.

Standpipes from Du-40 mm one should establish/install at a distance 30 m of each other. In standpipes on each pad of the open installation, it is necessary to provide for branches Du.-19 mm with close fitting valve.

The rubber hoses by length are not more than 15 m, equipped with quick-connecting nuts, must be located on shelves on each deck of the open installation (in a quantity of 50o/o number of branches).

The sites of installation of shelves must be indicated on the drawings of the arrangement of equipment.

§ 74. In the locations where they are applied carbide of calcium, potassium, sodium and other substances, decomposing with explosion with contact with water, device of fire water pipe is not allow/assumed.

Section V.

SANITARY-ENGINEERING PART.

Heating and ventilation.

§ 75. During the planning of heating and ventilation besides present rules, one should be guided by the effective "sanitary norms of the planning of industrial enterprises", by the "indications according to the planning of heating and ventilation of industrial and auxiliary buildings of industrial enterprises", affirmed by Cosstroyem of USSR (SN [99sp5 - [sanitary norm] 112-60), and also the "technical specifications of the planning of the firefighting measures in the heating systems and ventilation" (series L-112).

During the operation of ventilation systems, one should

be guided by the "operating instructions of industrial ventilation", design-setup control of Glavsantekhmontazh of the Ministry of. Construction of the RSFSR.

§ 76. At the design of the heating systems and ventilation the temperature of air in production locations one should accept:

with the constant stay of workers +16°C;

with the sojourn of workers +10°C;

during the periodic short-term maintenance of location, and also for the systems of on duty heating +5°C.

§ 77. In the locations, which relate on fire hazard to category A, must be applied only hot-air heating, combined with plenum ventilation. In the remaining production locations of dangerously explosive shops, is allow/assumed the application/use of heating systems with heaters in accordance with the requirements for sanitary and fire-fighting codes.

Space heaters must be arranged and arrange/located so

that would be provided systematic cleaning of heating surfaces from dust and it was eliminated the possibility of the burns of workers.

§ 78. the hot-air heating, combined with plenum ventilation (independent of the volume of location), one should apply in locations:

a) where can be separated in air gases or the pairs, which self-ignite from contact with hot conduit/manifolds, the heated surfaces of radiators and the like;

b) where can be separated the dust, capable with contact with water and water vapors of spontaneous combustion or explosion (for example, dust of aluminum powder, carbide of calcium, triethyl-aluminum, etc.);

c) of training/preparation, application/uses and storage of the metallic potassium and sodium.

The application/use of recirculation of air (complete or partial) in the indicated in this paragraph locations are not allowed.

§ 79. With the device of the hot-air heating, combined with supply ventilation, one should establish/install not less than two ventilation-heating aggregate/units.

§ 80. The production locations, in which they occur of heat release and arrange/located in localities with calculated heating temperature of -5°C are below, they must be equipped with on duty heating.

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§ 81. The places of the passage of the heating conduit/manifolds through internal walls explosion- and flammable locations must be thoroughly consolidated.

§ 82. In all production locations independent of their designation/purpose must be provided for the tributary-exhaust mechanical, natural or mixed ventilation.

§ 83. In the production locations in which is possible the isolation/liberation of harmful and dangerously explosive vapors, gases and dust, the calculated winter temperature for the planning of ventilation one should accept equal calculated temperature for the planning of heating.

§ 84. The temperature of the additional air, supplied into the working zone of production location, must not be below +10 and above +30°C.

§ 85. During the compilation of the heat balance of production locations, one should consider:

a) heat release from working electric motors, equipment, communications, compressors, etc.;

b) the entrance of heat from solar radiation;

c) heat consumption for the preheating of infiltrating air (through the locking of windows, doors, gates).

§ 86. Distance/removal of surplus heat in summer one should realize/accomplish with the aid of natural ventilation.

Note. Natural aeration is allow/assumed in winter time, but under the condition of the supply of additional air at height/altitude it is not less than 4 m of sex/floor for

the dilution of the releasing harmful vapors and gases.

§ 87. During calculation by the natural drawing of ventilation in summer, an increase in the temperature in the working zone of location against external must not exceed that permissible by sanitary norms.

§ 88. In all production locations independent of a quantity of harmful isolation/liberations and presence of ventilation installations the area of the open/disclosed apertures for aeration must be not less than 50o/o common/general/total surface of glazing.

In work with the strong toxic substances whose maximum permissible concentration is 0.005 g/m^3 and less, the area of the open/disclosed apertures for ventilation must be not less than 70o/o.

The open/disclosed apertures must be both in upper and in lower the zones of location.

§ 89. In the locations where is possible the

isolation/liberation of dust (in the locations of preparation, procedure, packaging, the classifications of catalyst, grinding installations, etc.), it is necessary to arrange aspiration installations. Exhaust air from local suctions should subject to cleaning.

§ 90. The sources of harmful isolation/liberations must be equipped by the local shelters in which with the aid of exhaust ventilation it is necessary to create the evacuation/rarefaction, which prevents the isolation/liberation of harmfulness from shelters.

§ 91. In the places of harmful isolation/liberations from machines and the apparatuses, working under atmospheric pressure, one should provide for the device of local suctions.

Local suctions must be also provided for from gaskets and compressor housings, pumps, gas meters and another equipment where is feasible the passage of vapors and gases.

§ 92. The ventilation of production locations must be design/projected according to following diagram:

a) the inflow of the heated air, as a rule, to direct to working zone at height/altitude 1.5-2 m of sex/floor or laanding, in this case the supply of additional air to the places of the possible greatest isolation/liberation of harmfulness is not allowed;

b) natural drawing to provide for only from the upper zone through the lamp/canopy, or the shaft/mine with the deflectors:

1) in locations with heat releases more than 30 kcal/m^3/h;

2) during the isolation/liberation of vapors or gases, which more easily air;

3) in the locations where are separated pairs and gases, with high molecular weight, but by low volatility at the temperature of locations (vapor of naphthalene, nitrobenzine, mercury, etc.);

c) natural drawing from upper zone to provide for in

quantity 30-50o/o of additional air and mechanical - from lower zone in a quantity of 70-50o/o inflow:

1) in locations with heat releases less than 30 kcal/m³/h;

2) after entrance into the working zone of gases or vapors heavier than air;

3) in work with the volatile substances, whose vapors are heavier than air (alcohol-ether/ester mixture, acetone, etc.) or evaporation of which is accompanied by heat absorption from air (benzene, ether/ester and the like).

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§ 93. In the production locations where are possible sudden entrances into air of large quantities of toxic or dangerously explosive substances (location where there are apparatuses, working under pressure; the apparatuses and the vessels with liquefied gases, and also the pumping, compressor and other locations, in reference to categories A and B), except overall exchange suction and exhaust ventilation must be provided for the device of emergency

exhaust ventilation. Emergency ventilation one should calculate for the creation of exchange of air not less than eight exchanges in hour complete internal volume of location. Emergency ventilation by the organized inflow is not compensated for.

§ 94. The production locations, in reference on fire hazard to categories A and B, must be equipped with the light and sound communication, which notifies about the presence indoor of the dangerous concentrations of dangerously explosive substances and about the disruptions of the work of tributary-exhaust systems.

The signalling devices must be interlocked with emergency ventilation installations.

If after a lapse of preset time emergency situation is not eliminated, signalling device must disconnect production processes in this location.

Besides the automatic breaking of emergency ventilation, it is necessary to provide for also manual. The starters of emergency ventilation are provided at all intake doors outside location.

§ 95. The supply and exhaust aggregate/units, which operate the locations, in reference to categories A and B, must be establish/installed in the independent camera/chambers, which have natural aeration not less single in hour. The arrangement/position of supply aggregate/units in one camera/chamber with exhaust aggregate/units is prohibited.

§ 96. Ventilation aggregate/units and air ducts must be supplied with the sound-absorbing and sound-proofing devices, and also devices on the prevention/warning of vibration.

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§ 97. On the air ducts of supply systems (within the limits of the ventilation camera/chamber) must be provided the auto/self-closed shutter/valves, which insulate the supply camera/chamber from dangerously explosive location with the stop of supply fan.

§ 98. The locations, adjacent with dangerously explosive, in which are arrange/located the electric motors

in normal performance, must be separated from the latter in accordance with the "rules of the device of electrical devices" and are equipped with the plenum ventilation, which ensures not the less four-five times exchange of air in hour.

§ 99. In the locations of KIP and starting/launching equipment, and also in the booths of KIP with the sparking equipment, of the arranged/located in the territory dangerously explosive productions, must be provided the supply of additional air in the size/dimension of quintuple exchange of air in hour, if on the requirements for technology is not required larger exchange of air.

§ 100. Technological ejections and the ejections of the air, removed by local suctions, the dust-laden, poison gases and pairs, must be produced in accordance with requirements of the "sanitary norms of the planning of industrial enterprises" (SN [99sp5 - [sanitary norm]-245-63).

§ 101. For the opening of the transoms of lamp/canopies and upper transoms of windows, it is necessary

to provide for remote control.

§ 102. To equipment and the capacitance/capacities, which require periodic internal inspection and cleaning, it is necessary to feed pure air for operational provisions in them in hose gas mask.

§ 103. During the design of ventilation installations, it is necessary to provide for convenience in their maintenance and repair.

The ventilation camera/chambers one should furnish in the locations, easily attainable and are sufficiently free for performing of work on repair, installation, disassembly and observation of installations.

In the camera/chambers it is necessary to provide for independent output/yield outside or to staircases. In this case, the door must be open/disclosed from the chamber outside. Is allow/assumed also the entry into the ventilation camera/chambers, arrange/located in the locations, in reference to categories A and B, through special reels from the locations, in reference to category D.

The device of doors or apertures within the wall, which separate/liberates the ventilation camera/chamber from dangerously explosive locations, is forbidden.

The ventilation camera/chambers must be provided by lifting devices for removal/taking and installation of equipment.

§ 104. The installation of ventilation equipment at height/altitude more than 1.5 m is allowed only with the necessary device of area/sites and constant march staircase or u-bolts.

§ 105. Ventilation systems after the termination of building and installation must be adjusted to design capacity and are tested to effectiveness.

Maintenance and repair of ventilation installations.

§ 106. Chief and the mechanic of shop are due to

ensure a trouble-free operation of ventilation installations.

§ 107. In the those who do not charged the maintenance of ventilation devices, it is forbidden to close ventilation catches and dampers, supply and exhaust holes, or to remove/take jackets, to stop and to include fans.

§ 108. To all the ventilation installations must be brought log book, and also the journals of repair and operation. The order of the operation of ventilation installations is determined by the command, confirmed by the chief engineer of enterprise.

§ 109. In defective sheet/table/list to the repair of production plant or aggregate, it is necessary to provide for repair and testing the soundness of ventilation installations.

§ 110. The effectiveness of ventilation must periodically instrument/tool be checked. The ventilation installations, which do not give necessary effect as a result of their technical imperfection, changes in technological equipment or process, must be reconstructed and put to shop as new with regegistering of log books.

§ 111. Organizational structure of the service of operation of ventilation economy, testing, adjustment and inspection/acceptance into the operation of ventilation installations, and also their repair must correspond to the "operating instructions of the industrial ventilation" of design-setup control of Glavsantekhmontazh of the Ministry of Construction of RSFSR.

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Water pipe channelization.

§ 112. Plant area/site and production locations must be provided by water pipes for household drinking and fire-fighting needs in accordance with the requirements for the effective "Sanitary norms of the design of industrial enterprises" and "Construction norms and rules".

§ 113. The sources of the household drinking water supply, water-lifting constructions, spare reservoirs and water-distribution grid/network must provide the soundness of water.

The quality of water for household drinking needs (among other things shower devices) must correspond to requirements of GOST [99sp04 - [All-union State Standard] 2874-54.

§ 114. The connection of the grid/networks of the household drinking water pipe with the grid/networks of the water pipes, which feed drinking water, is not allow/assumed.

§ 115. Fire- dangerously explosive productions must be provided by water for household drinking needs and shower-baths from consideration:

a) for household drinking needs - 25 liters for each worker per shift;

b) for shower-baths - 500 l in hour to shower grid.

Notes. 1. In indicated norms of water supply, does not enter quantity of water for watering of territory of enterprise.

2. Duration of action of showers is received as 45 min, after each replacement.

§ 116. For the distribution of drinking water, it is

necessary to arrange drinking small fountains.

In shops, with the elevated temperature of air in production locations, one should establish/install carbonator installations for providing the workers with the gassed and added some salt water.

§ 117. In all production locations where is establish/installed technological equipment (besides the locations where is applied potassium, sodium, carbide of calcium and other substances, which are decompose/expanded with explosion with contact with water), must be provided for special water cocks with movable hoses for the washing of equipment, washing of sex/floors, etc.

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§ 118. In all places where is possible the inflammation of clothing (with backfire from furnaces, during cleaning of equipment, in laboratories, etc.), must be establish/installed emergency showers or baths with water.

In the places where are possible chemical burns (in works with acid, the alkali and other reagents), must be

emergency showers or the gas inclusions of self-help. Emergency showers, baths and the gas inclusions of self-help are establish/installed on visible, easily attainable places, through each 25 m are connected to household drinking water pipe. The device of the emergency showers productions in which is applied potassium, sodium and other substances, which are decompose/expanded with explosion with contact with water, is not permitted. The arrangement of emergency showers for the personnel of these productions of outside production locations must be agreed with the organ/controls of sanitary and fire supervision.

§ 119. Entire system of channelization must be closed. For the descent of water, must be provided for the following channelization devices:

a) for reverse/inverse conditionally pure/clean production water (from surface condensers, coolers and to that of the similar apparatuses);

b) for the contaminated industrial flows;

c) for household sewer water;

d) for downpour water.

§ 120. The channelization of sewer water must not be imparted with other systems of industrial channelization.

§ 121. Industrial effluents before jettisoning into the external grid/network of production channelization must undergo primary cleaning for the target/purpose of extraction, regeneration and utilizations of valuable products, neutralization of acids and alkalies, extraction fire- and dangerously explosive substances, oils, resins, the toxic and other substances, harmful for basins and biological cleaning constructions.

§ 122. It is forbidden to unite the different flows of the effluents, capable with mixing to form and to separate toxic or dangerously explosive mixtures.

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§ 123. The hydraulic gates must be establish/installed on all issues from shops with technological equipment from area/sites with technological installations, the groups of reservoirs from locations, from the units of catches, the

apparatuses, pumping, boiler, liquid drainage piers, etc.

Construction of hydraulic gate should provide convenience in its cleaning.

For the purpose of prevention/warning of the incidence/impingement into channelization and propagations on it of inflammable vapors and gases of production must be provided for the following devices:

a) channelization drains of apparatuses must have on conduit/manifold dismountable flanges for the setting up of plug/silencers during the stop of apparatuses on repair;

b) each issue of the channelization of the contaminated flows must have the exhaust ventilation standpipe, adjustable in the heated part of the building.

Ventilation standpipe must be derived higher than the crest/peak of the roof of production building not less than on 0.7 m and it is equipped by arms;

c) on channalization conduit/manifolds before connection to exhaust standpipe must be provided for the hydraulic gates;

d) all conduit/manifolds from the apparatuses, intended for the descent of production pure/clean and contaminated effluents, must be equipped by pet valves for the regular sampling of the flows, directed in channelization.

§ 124. The operation of channelization with the defective or incorrectly carried out water locks, and also without water locks is forbidden.

§ 125. Channels for effluents must slope, which ensures run off from most the low arranged/located points of plant territory.

§ 126. The wells of the closed grid/network of industrial channelization must be constantly closed, moreover upper pit covers it is necessary to charge by a layer of sand by thickness not less than 10 cm. To erect ventilation units on channelization wells is not permitted. The cap/covers of all wells of channelization must be removable.

§ 127. Sever systems must be periodically cleaned from

residue/settlings. Inspection and cleaning channelization wells, channels and tubes must be produced in accordance with the order of the conduct of gas-hazardous works.

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§ 128. The conditions of formation and drain of effluents into basins must correspond to the requirements for the "rules of the protection of surface water from contamination by effluents" and in each separate case be coordinated with the organ/controls of state sanitary supervision. Enterprise must ensure regular laboratory monitoring of the effectiveness of cleaning production and household sewer effluents.

Illumination.

§ 129. Natural and artificial illumination one should design/project in accordance with "construction norms and rules", the "rules of the device of electrical devices", the "rules of the manufacture of explosion-proof electrical equipment" and by the "sanitary norms of the design of industrial enterprises".

§ 130. In production locations it is necessary to provide for the following forms of illumination:

a) working;

b) emergency;

c) repair.

§ 131. The emergency light, necessary for the continuation of works, must provide on working surfaces illumination not less than 10o/o norms, establish/installed for these surfaces.

The emergency light for the evacuation of people must provide not less than 3 lux at sex/floor or the step/stages of staircases.

§ 132. The emergency light must have independent power supply.

§ 133. For illumination of the locations, in reference to categories A and B, it is permitted to apply illuminating lamps only for explosion-proof performance and

suitable for this medium in accordance with the effective "rules of the device of electrical devices".

§ 134. Group flaps and the disconnect/turned off devices in normal performance must be established in locations with normal medium or outside in hermetically sealed boxes.

§ 135. For exterior lighting of apparatuses and constructions during their inspection and repair in the effective shop, must be applied explosion-proof movable illuminating lamps by voltage/stress not more than 12 v.

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§ 136. Application/use in the dangerously explosive shops of movable electric appliances and aggregate/units, which do not correspond to requirements, imposed on electrical equipment of the explosion-proof performance, suitable for this medium, is forbidden.

§ 137. For the maintenance of lighting fixtures and rub of windows, must be provided for safe stationary or movable devices (area/site, staircases, etc.). Manual movable u-bolts and staircases by height/altitude more than 4 m to apply for these purposes is not permitted.

Section VI.

TECHNOLOGICAL PART.

Special requirements for shaping of technological processes.

§ 138. Technological processes in inflammable and dangerously explosive productions must be realize/accomplished according to continuous and periodic diagrams according to the affirmed technological regulations. In this case, must be provided for the automation of control and direction of processes, and also the measures, which eliminate the possibility of the disturbance/breakdowns of the norms of technological conditions/mode.

§ 139. Automation and mechanization of production must provide the safety of production processes and the possibility of monitoring and control of technological process, as a rule, from the central control post, isolate/insulated from production.

Control of the instruments of the apparatuses, arrange/located in cabin/compartments, must be realize/accomplished remotely from the corridors of control or another safe place. In this case, in cabin/compartments, must be created rarefaction, and in locks-chambers or corridors of control - backwater of air.

If apparatuses require constant visual observation, within the walls of cabin/compartments, it is necessary to provide for the thoroughly hermetically sealed windows.

§ 140. For conducting the technological processes during which are possible the *generation* of gas, must be provided for the instruments of automatic check of the content in air of harmful and dangerous vapors and gases with the supply of the signal with concentration above maximum permissible of sanitary norms and by the automatic breaking of emergency ventilation.

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§ 141. The open processes (draining, the sampling, etc.), calling air pollution toxic, fire- and by dangerously

explosive substances, are not allow/assumed.

It is necessary to provide for automatic check of the composition of products in flow. With the impossibility of the device of automatic check in flow for sampling, one should apply pressurized/sealed sampling instruments.

§ 142. Equipment, apparatuses, communications and fittings, used in fire- and dangerously explosive productions, must be hermetically sealed.

Sealing devices of all aggregate/units must be systematically inspected. The places of the disturbance/breakdown of sealing/pressurization one should immediately correct.

§ 143. "Lines" for the uniform and combined substances are must as far as possible to be grouped; vapors and gases, as a rule, must head for condensation, for cleaning into absorbers, scrubbers and other devices, which eliminate the contamination of atmospheric air.

If this requirement is technically impracticable, the ejection of isolation/liberations from "lines" must be

produced in accordance with requirements SN [99sp5 - [sanitary norm]-245-63.

§ 144. For the pumping of the inflammable and flammable liquids, one should apply the vacuum and pneumatic methods of the transportation or glandless and diaphragm pumps. Application/use for these purposes of pumps with stuffing-boxs seal in common performance is not allow/assumed.

§ 145. Technological ejections and ejections from the blasting of pumps and compressors must be cleaned before the issue in the atmosphere or return into system.

§ 146. For the interdepartmental and intrashop transport of bulk materials, one should apply the devices, which eliminate dust-isolation/liberation.

§ 147. Inspection/acceptance and the input/introduction into the constant or time/temporary operation of enterprises, shops, aggregate/units, which vent to the atmosphere harmful substances, without accomplishing of the measures, which ensure finishing/bringing the content of toxic cell/elements and dust in the atmosphere to the permissible sanitary norms, is forbidden.

norms, is forbidden.

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Requirements for the arrangement of equipment and work areas.

§ 148. The arrangement of equipment must provide safety and conveniences in its maintenance and repair. Overall design must satisfy the requirements for "construction codes".

§ 149. External installations must be furnished from the anechoic wall of the building of shop or in its end part. The distances between external installations and buildings must correspond to the requirements for fire-fighting norms.

§ 150. With the arrangement of external installations from window apertures, the distance between them and the building of shop must be determined in each specific case depending on the height/altitude of external installations,

character and density of the arrangement on them of equipment and special feature/peculiarities of technological process. This distance must provide the natural illumination of the shop not lower than sanitary norms, the possibility of the sampling of pure air for mechanical ventilation, or the possibility of convenient installation, disassembly and maintenance of equipment and must not be than less provided for by fire-fighting norms.

§ 151. The arrangement of the open installations, technological connected with shop on both longitudinal walls of shop is not allow/assumed.

Bilateral arrangement about the building of the open installations can be allowed as an exception. In this case, the breakage between them and the building must correspond to the requirements for fire-fighting and sanitary norms.

§ 152. During the installation of equipment, it is necessary to provide:

a) basic passes along the front of the maintenance of control boards (in the presence of constant work areas) of width are not less 2 m;

b) basic passes along the front of maintenance and among series of machines(of compressors, pumps, blowers, etc.) and the apparatuses, which have the "racks" of control, local monitoring-measuring equipment and the like (in the presence of the constant work areas), are not less than 1.5 m;

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c) the passes among compressors are not less than 1.5 m, and among pumps it is not less than 1 m;

d) the arrangement of devices and equipment in the open air and within building, that ensures free pass to apparatuses from all sides, with width is not less than 1 m.

Access to separate control assemblies of apparatuses must be free;

e) the presence of the repair area/sites, which have the size/dimensions, sufficient for dismantling and cleaning

of apparatuses and their parts, without the blocking of working passes, basic and emergency exits and the area/sites of staircases.

§ 153. Machines and the apparatuses, operated by the cranes, one should place in the zone near the hook of tap/crane. In this same zone must be provided for the area/sites or passes for the setting up of the transported parts of equipment.

§ 154. The apparatuses and aggregate/units, which require observation of the temperature, the pressure and other parameters and which are located on considerable distance from work area, must be supplied with remote instruments with readings on control board and monitoring instruments on the spot of installation.

§ 155. The arrangement of the technological equipment above auxiliary and everyday buildings and locations and hearth by them is not allow/assumed.

§ 156. Constant work areas must be equipped with convenient tables for recordings, with chair and cabinet for a working and emergency tool.

Requirements for equipment and protecting devices.

§ 157. The apparatuses, working without overpressure, but intended for storage or treatment fire- and the explosion-proof products of production, must be designed taking into account their pneumatic testing for seal by pressure not less than 0.1 atm(gage) with the capacitance/capacity of apparatus to 30 m^3 and 0.5 atm(gage) - with the capacitance/capacity of apparatus 30 m^3 and more.

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§ 158. The apparatuses, working under pressure below 0.7 atm(gage), but the intended for storage or treatments of the volatile and inflammable products in pure/clean form or in mixture with water, must be designed taking into account their testing for seal under pressure, that exceeds working not less than on 0.3 atm(gage).

The apparatuses, working in vacuum, must be designed taking into account conducting of their hydraulic test for pressure 2 atm(gage) and pneumatic - on 1 atm(gage).

§ 159. Design, manufacture and the operation of the apparatuses, working under pressure above 0.7 atm(gage), and also materials for their manufacture must correspond to requirements of the "rules of device and safe operation of the vessels, working under pressure".

For the branches and other parts of the apparatuses, manufactured from tubes, must be applied steel, seamless pipes in accordance with instructions of MN-72-62.

Materials for manufacture of equipment, intended for agressive media, one should select taking into account their life to the aggressive action of media.

§ 160. All apparatuses, working under pressure, must be equipped by locking, measuring and safety fittings in accordance with the requirements for the "rules of device and safe operation of the vessels, working under pressure".

§ 161. All apparatuses must be supplied:

a) by the close fitting valve, which ensures the complete disconnection/cutoff of apparatus from production diagram;

b) by test and drain cocks: for the sampling of procucts during operation; for the sampling of reverse/inverse conditional net water and contaminated industrial flows, directed in channalization; the descent of the forming condensate and residue/remainders of products;

c) by level indicators when is required monitoring of liquid level in apparatus.

§ 162. For flushing and blasting of apparatuses and instruments prior to repair, internal inspection and testing, must be provided for the branches for the connection of the lines of water, vapor or inert gas.

§ 163. Between the vessel and the safety valve must not be of locking device. Is permitted the setting up of the switching tap/crane or three-way switching valve/gate between safety devices and the stationary vessels, intended

for a work under the pressure of toxic, combustible either dangerously explosive gass, but under the necessary conditions that the switching tap/crane or three-way the switching valve/gate they are installed on the branch, which connects vessel with two protecting devices, and, that in any position of cock plug or shaft of valve/gate with vessel will be connected both or one of the protecting devices.

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§ 164. During installation on the apparatus of two safety valves with switching system, each valve must be designed to complete throughput capacity. In work in the medium, calling the increased driving in of valves, switching system must connect apparatus with one of the valves, the second valve at this time is standby and it must be suitable for immediate connection/inclusion.

§ 165. The equipment, connected with the processing/treatment of the liquified hydrocarbon gases must be placed outside building. The arrangement/position of this equipment within buildings is allow/assumed in the exceptional cases according to agreement with the

organ/controls of sanitary and fire supervision.

§ 166. The application/use of copper, copper alloys with the content of copper more than 70o/o and silver for the manufacture of the internal parts of equipment and fittings in which normally or in the emergency cases can be located the hydrocarbons of an acetylene series, it is not allow/assumed.

§ 167. The application/use of instruments, which are powerful of causing the direct contact of mercury with the product, impure of the hydrocarbons of an acetylene series, is not allow/assumed.

§ 168. In the work of apparatus, conduit/manifold or fittings under different operating conditions the material for their manufacture must be selected on the basis of the need for ensuring safe operation under rigorous conditions.

§ 169. Capacitive equipment for the liquified hydrocarbon gases (separators, collections, etc.) must be supplied with the signal indicators of maximum upper level, independent of the level regulator, establish/installed in apparatus.

§ 170. In apparatuses and the conduit/manifolds in which a reduction/descent in the temperature of wall is lower than calculated possibly only in the emergency cases, one should establish/install in the lower part of the apparatus or conduit/manifold the temperature indicators of wall.

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§ 171. If in the group of the apparatuses, not divided between themselves by fittings, is placed an apparatus of the type of the plate column, it must be shielded by the safety valves, located near the extreme points of apparatus.

The total quantity of safety valves is determined by calculation in accordance with the "rules of device and safe operation of the vessels, working under pressure".

§ 172. The design pressure of apparatuses and conduit/manifolds for the liquified hydrocarbon gases must be accepted to 10o/o higher than the maximum regime, if according to the conditions of technology it is not required to select higher design pressure.

§ 173. The branch/removal of combustible and toxic gases during the operation of safety valves must be

realize/accomplished depending on local conditions for flame or the absorbing system; flames must have constantly effective weapon emplacement and be furnished in accordance with the requirements for fire-fighting norms.

§ 174. During the application/use of explosive plates (diaphragm/membranes) it is necessary to take measures, which eliminate the possibility of the ejections of harmful and dangerously explosive gases into locations, and also sparkings and traumatizations fragments and the fractions of diaphragm/membranes during their operation.

Requirements for compressors.

§ 175. For transportation and compression of gases, must be applied the special-purpose compressors, which eliminate gas evolutions through gaskets, crankcases, etc.

§ 176. In the locations of compressor department/separations, is not allow/assumed to place equipment and the equipment, technologically and structurally those who were not connected with compressors.

§ 177. Translation of motion from engines to compressors and gas blowers can be realize/accomplished through the clutch, the reducer or as an exception through the V-belt device. Flat-belt transmission to dangerously explosive locations is not allow/assumed.

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§ 178. Composite headers (sucking in and plenum) must be laid outside the building of compressor; their packing indoor of compressor it is allow/assumed only with the technological need when is possible isolation/liberation and freezing of condensate, etc.

§ 179. On the suction lines, in immediate proximity of machines, must be establish/installed the special sludge pans and the filters, which prevent/warn the incidence/impingement into the cylinders of foreign objects, contamination and scales.

§ 180. Each compressor aggregate/unit must have the appropriate close fitting valve on the suction and pressure

lines, which allows reliably and it is safe to disconnect it from composite collector/receptacle. It is necessary to also allow for of stop and disconnection/cutoff of compressors outside building.

§ 181. During design, building, installation and the operation of blowing plants, must be accepted the necessary measures for preventing the vibrations of structures, machines and conduit/manifolds.

§ 182. For preventing the effect of the vibrations, caused by the work of machine, it is necessary to observe the following conditions:

a) foundations under compressors must be separated from the construction of building (foundations of walls, overlaps and of the like);

b) the area/site between the adjacent foundations of compressors they must be deposit, freely resting on foundations;

c) if necessary must be applied isolation/insulation of foundations, which prevents them from vibration;

d) the conduit/manifolds, which adjoin the machine, must not have rigid fastening to the constructions of building; with the use of such fastenings, it is necessary to provide for the appropriate compensators;

e) the conduit/manifolds, which connect the cylinder of compressor with auxiliary equipment (buffer, the intercooler and the like), during fastening of cylinder, permitting its axial displacement/movement during operation, must have the necessary flexibility during the compensation for the appearing oscillation/vibrations.

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§ 183. For preventing the vibration of conduit/manifolds, by the caused pulsation of the pressure if necessary one should provide for:

a) the extinguishing of pulsation in system by the installation of buffer and acoustical capacitance is direct of compressors or at certain distance, determined by calculation;

b) the installation of buffer capacitance/capacities for each machine in the multiple operation of several compressors, working to common/general/total collector/receptacle;

c) a minimum quantity of rotations during the design of brace conduit/manifolds; changes in the direction of the axle/axis of conduit/manifolds should be realize/accomplished with maximally possible radius of rotation;

d) the arrangement of fastening conduit/manifolds at such distances, that the natural vibration frequency of each flight/span would be 1.5-2 times the more than highest frequency of perturbing forces from the work of pulsative flow.

§ 184. After test run of piston blowing plant, all the suction and pressure lines must be tested for vibration and if necessary are additionally attached; the sites of installation of additional fastenings must be determined experimentally.

§ 185. Air pumps after installation and major overhaul undergo testing and control in accordance with the indicator diagrams which apply to the event/report of inspection/acceptance into operation.

§ 186. Compressors and the pumps, which develop pressure and the pressure higher than design pressure of the connected with it apparatuses and conduit/manifolds, they must be equipped by safety valve on bypass between forcing and suction lines; valve must be adjusted the design pressure of receivers and conduit/manifolds.

§ 187. Compressors must be equipped with the automatic device, not controlled of electric motor in the following cases:

a) at pressures on the suction line of the compressor lower than this minimum;

b) with the excess of compression pressure on the exhaust of compressor higher than permissible;

c) with an incidence/drop in the line pressure of cooling water lower than permissible;

d) with an incidence/drop in the oil pressure.

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§ 188. For the transportation of inflammable products by pressure transfer (with the aid of the Montejus) it is necessary to apply inert gas. To apply the compressed air for the pressure transfer of these products is prohibited. The permissible oxygen content in inert gas is given in section "Assurance of production by inert gas" present rules.

Requirements for conduit/manifolds and fittings.

§ 189. Conduit/manifolds by diameter to 400 mm for the transportation of combustible gases independent of operating pressure must be fulfilled only from steel seamless pipes.

For the transportation fire- and the dangerously explosive liquid products under vacuum or pressure to 100

atm(gage), also must be applied steel seamless pipes.

The selection of the mark/brands of steels for their manufacture depending on the parameters of medium should produce in accordance with requirements of NiTU KhP-1962.

The application/use of wrought pipes is allow/assumed only during their manufacture according to special technical specifications. For conduit/manifolds by diameter 400 mm, operated in pressure to 16 atm(gage) and vacuum, is allow/assumed the application/use of electric welding steel tubes with longitudinal and spiral weld, made according to the technical specifications of the corresponding Gost.

§ 190. For the transportation of neutral nonexplosive-fire hazardous liquid and gaseous products (inert gas, brine, air, water, etc.) under surplus pressure to 25 atm(gage), and also with blow-off in the atmosphere fire- and dangerously explosive products it is permitted to apply wrought pipes, designed to the corresponding operating pressure.

§ 191. The connection of loose parts of the conduit/manifolds can be produced with the aid of welding,

flanges and threaded connections depending on the construction of conduit/manifold and properties of the transported products.

§ 192. The connections of conduit/manifolds for the transportation of liquefied gases must be predominantly welded; flange joints must be provided for only in the sites of installation of reinforcement and connection for equipment, and also for the conduit/manifolds, which require periodic dismantling for the target/purpose of cleaning or replacements of the sections of tubes, which were subjected to the increased corrosion.

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§ 193. The threaded connections are allow/assumed predominantly for conduit/manifolds on which are transported neutral products, and also for the connection of the special types of reinforcement, controlling/monitoring-meter instruments, etc.

§ 194. The sealing surface of flanges for the connection of conduit/manifolds, and also material and the construction of packing for flange joints one should accept

taking into account pressure and temperature of medium in accordance with appendix 1.

In flange joints with sealing surface, "journal-groove/slot" and "projection-indentation" is recommended the applying of packing of different plastics (polyvinyl chloride, teflon, polyethylene, etc.). In this case, in each individual case, it is necessary to consider physicomechanical properties of these materials and transported substances.

§ 195. The material of flanges for gas pipes and the used in flange joints fasteners must be selected taking into account the operating conditions of conduit/manifold according to NiTU KhP-1962.

§ 196. In design and the installation of conduit/manifolds, as a rule, it is necessary to apply shaped parts and the cell/elements of the prefabrication, which ensure the more high quality of installation, reliability and the safety of the work of conduit/manifold.

§ 197. Taking into account fire- and the explosiveness of the transported media, it is necessary in each

individual case to select the reinforcement, which satisfies requirements of the increased seal of locking and gasket devices.

§ 198. On the gas pipes, working at temperature is below minus 30°C, must be applied the reinforcement, manufactured from alloy steels, special alloys or the nonferrous metals, which ensure at these temperatures the impact toughness of metal not below 2 kg/cm².

The construction of reinforcement must correspond to the requirements for its operation at low temperatures (extended shafts of close fitting valve to avoid icing over and the like).

§ 199. Conduit/manifolds and reinforcement, intended for the transportation inflammable-dangerously explosive liquids, and also for gases, liquefied gases and toxic liquids, independent of the heating temperature must be steel.

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§ 200. For the transportation fire- and the dangerously explosive substances, one should apply glandless

reinforcement. During the use of another reinforcement, it is necessary to ensure its complete seal.

§ 201. The adjustable on conduit/manifolds locking and control fitting must be easily attainable for maintenance. During the installation of reinforcement at height/altitude more than 1.8 m must be arranged the staircases and area/sites. In the sites of installation of reinforcement by the weight of more than 50 kg it is necessary to provide for the stationary or movable lifting devices, materials and construction of which must eliminate sparking.

§ 202. The close fitting valve for discovery/opening of which is required large effort/force, must be equipped with bypass and mechanical or by electric drive.

§ 203. During the input/introductions into shops and the conclusion/derivations of them of conduit/manifolds for combustible gases and other dangerously explosive products, must be establish/installed the close fitting valve with remote control. On intrashop brace conduit/manifolds a quantity of close fitting valve must provide the possibility of the reliable disconnection/cutoff of each separate aggregate/unit and apparatus; the need of applying the

reinforcement with remote control or hand drive is determined by the conditions of technological process and by the provision for safe conditions of work.

Remote control of locking devices one should furnish in dispatchers, operator and in other safe places. Control of the remote control is permitted to furnish, also, in production locations under the condition of its duplication from safe place. In the case of the malfunction of remote control, the conduit/manifolds must have shutoff devices, which are closed by hand.

§ 204. During the installation of close fitting valve on the lines of the emergency letting out of gas, remote control of this reinforcement must be realize/accomplished from safe place.

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§ 205. For the disconnection/cutoff of aggregate/units and apparatuses, working under pressure 40 atm(gage) it is above, on each branch/removal from basic collector/receptacles, must be establish/installed from two shutoff valves (catches), between which it is necessary to

provide for testers for monitoring of the density of close fitting valve.

§ 206. To utilize the gauging valve/gates as locking is forbidden; besides the gauging valve/gate it is necessary to provide for also installation of close fitting valve.

§ 207. The emergency conduit/manifolds, which connect installations with emergency capacitance/capacity, must slope to the side of emergency capacitance/capacity, be as far as possible rectilinear and to have a minimum quantity of branch/removals and rotations. Emergency conduit/manifolds over entire length must not have catches.

§ 208. Conduit/manifolds must be placed during supports and the suspensions, designed by dead weight of conduit/manifold, pressure of wind, weight of liquid, and also ice crust (for the external conduit/manifolds). Fixed supports must be designed to the additional effort/force, appearing during the thermal deformation of conduit/manifold.

§ 209. The conduit/manifolds, being subjected to thermal elongations, must be designed for the auto/self-compensation for these elongations. If necessary must be provided for

special compensators (U-shaped, U-shaped, etc.), which correspond to work conditions of conduit/manifold.

§ 210. With pipe laying for the transportation of liquified oil gases and other products in which can be contained the water, it is not possible to allow/assume the sagging/deflections of conduit/manifolds to avoid the accumulation in them of water and formation of ice plugs in winter time.

§ 211. The heating of freeze plug depending on the properties of the product, which is contained in conduit/manifold, can be produced with hot water or vapor.

The application/use of the free flame for the heating of the ice plug, which was being formed in conduit/manifold with the transportation fire- and dangerously explosive substances, is prohibited.

The heating of ice plug in the broken conduit/manifold without its preliminary disconnection/cutoff from common/general/total system and in the presence in it of product under pressure is not permitted.

§ 212. The gas pipes in which is possible the isolation/liberation of condensate, must be supplied with the appropriate drainage controllers for its distance/removal. Pipelines for the transportation of vapors to avoid hydraulic impacts and vibration must slope and removers of condensate.

§ 213. Pipe laying in the territory of enterprise must be produced in accordance with the requirements for fire-fighting norms and technical specifications of construction design.

§ 214. To lay conduit/manifolds for the transportation fire- and the dangerously explosive, toxic and caustics through everyday, subsidiary and administrative-economic locations, distributors and point/items is forbidden.

§ 215. For all conduit/manifolds, intended for the transportation of liquefied gases, fire- and dangerously explosive products, toxic and suffocating media must be provided for the possibility of the blasting of them by inert gas. The supply of inert gas to technological

conduit/manifolds must be produced with the aid of the removable sections of conduit/manifolds or flexible hoses, with the installation of close fitting valve from both sides of removable section; at the termination of blasting, these sections of conduit/manifolds or hoses must be removed, and on close fitting valve are establish/installed plug/silencers.

Other methods of connection to the conduit/manifolds of the lines of inert gas (and also the steam, water and other lines) are forbidden.

The production of any repair work on the conduit/manifolds, filled by the indicated products, is not permitted.

§ 216. All conduit/manifolds must systematically be inspected and be repaired in accordance with the graph, affirmed by the chief engineer of enterprise. For conduit/manifolds with agressive media, must be comprised and affirmed the special graph of inspection and repair.

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SAFETY AND INDUSTRIAL SANITATION TECHNIQUES FOR DANGEROUSLY EXP--ETC(U)
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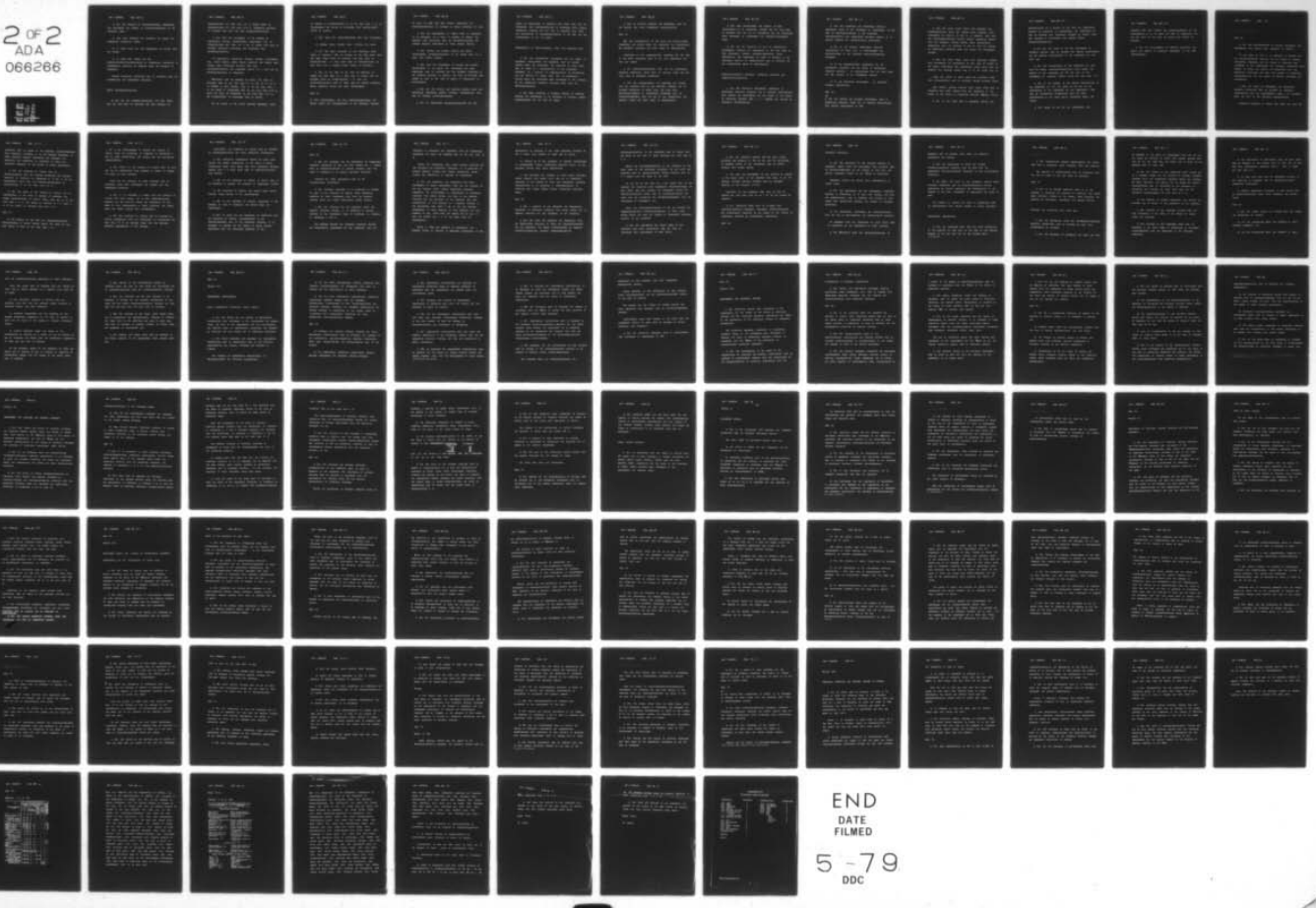

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§ 217. The surfaces of conduit/manifolds, apparatuses and instruments are subject to isolation/insulation in the following cases:

a) when this necessary for providing the normal are temperature conditions indoor;

b) to avoid burns (at the temperature of surface 60°C are above);

c) to avoid heat losses for the preservation/retention/maintaining of temperature, prevention of condensation, formation of hydrated plugs and freezing of condensate.

Thermal insulation protection must be fulfilled from the incombustible and impermeable materials.

Safety enclosure/protections.

§ 218. All the transfer/transitions, the open wells, pits the like must be sheltered and have barriers as

height/altitude not less than 0.9 m flanged below to height/altitude not less than 0.15 m. Assembling apertures in overlaps must have the same enclosure/protections.

§ 219. With the arrangement of the hatches of instruments, catches, thermocouples, apparatuses, etc. at height/altitude more than 1.8 m for an access them must be arranged stationary staircases and area/sites with enclosure/protection.

To apparatuses, reservoirs, catches, hatches, instruments, etc., which require access during operation and repair, must conduct march staircases (u-bolts with tent enclosure/protection and area/sites within 4-5 m they can be establish/installed as emergency).

Staircases must be equipped by rails. The width of staircase must be not less than 0.7 m, but if on it it is assumed to bear gravity, then it is not less than 1 m; the space of step/stages must be not more than 0.25 m, while the width of step/stage is not less than 0.12 m. The gradient/draft of staircases must be 45-50°.

For an access to the rarely serviced equipment, which

is located on height/altitude it is not more than 3 m, is allow/assumed the device of staircases with gradient/draft 60-75° or u-bolts.

§ 220. Piers for conduit/manifolds must have staircases.

a) passage piers, besides this, flooring and rails.

§ 221. The upper area/site of the staircase, which leads to reservoir, must be located on the same level with the upper angle plate of reservoir and have rails as height/altitude 1 m with lower edge by height/altitude not less than 0.15 m through entire length of staircase.

§ 222. On the edge of the roof of reservoir at length not less than 1.5 m each side of stairs must be arranged rails by height/altitude 1 m. Over the protected/surrounded area of roof, must be located measuring hatch, measuring device and other reinforcement.

If this reinforcement, and also respiratory/breathing and safety valves are arrange/located on the different sections

of roof, to them they must conduct area/sites, and enclosure/protection is arranged on entire perimeter of roof.

§ 223. The measurements of liquid level in reservoirs it is necessary, as a rule, to produce is remote; for sampling from reservoirs, must be establish/installed the lowered sampling instruments or other special devices.

§ 224. Catches and another locking and safety reinforcement, establish/installed at the height must, as a rule, have remote control.

§ 225. With the arrangement of catches and another reinforcement in the wells, the tray/chutes and other deepenings, must be provided for the extended stock/rods or the steering controls of control, and also be provided safe access to them to the case of repair or replacement of reinforcement.

§ 226. All the driving and rotating machine parts and apparatuses (flywheels, shafts, clutches, transmissions, etc.) must be reliably protect/surrounded.

§ 227. To remove/take enclosure/protections for the

repair of apparatuses is permitted only after dead lock of mechanisms. The launching/starting of mechanisms after repair, inspection, cleaning and the like is permitted only after the installation of enclosure/protection on the spot and the reinforcement of all its parts.

Mechanization of labor-consuming, heavy and dangerous work.

§ 228. For installation, disassembly and the repair of equipment, reinforcement and equipment, must be applied hauling means and mechanisms. The selection of these means must be based by a characteristic of the adjustable equipment, by a quantity of aggregate/units, by periodicity and the duration of repair work, etc. On performance hauling means and mechanisms must correspond to the category of the dangerously explosive locations where they are establish/installed.

§ 229. When selecting of gripping devices of hoisting machines and mechanisms, it is necessary to consider weight, size/dimensions and the form of loads.

§ 230. On hoisting machines and mechanisms, must be the tablets with their fundamental characteristics.

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For the transportation of the solid and finely-crushed substances, one should apply the elevators, the transporters, the pneumatic conveyers and other means of mechanization.

Operations on the transportation, unloading and the load of the dusty substances must be not only mechanized, but also are sealed.

§ 231. Displacement/movement fire- and the dangerously explosive substances, which enter in bottles, drums and the like, must be maximally mechanized.

§ 232. The transportation, the unloading and loading into the railroad cars of raw material, reagents and of finished production in piece tare, and also their delivery/procurement to intermediate warehouses must be realize/accomplished with the aid of the transporters, the forklift trucks and other means of mechanization.

§ 233. Beam reinforcement and removal of beam reinforcement of of cap/covers, hatches and the like must be produced with the aid of instruments and the mechanisms, which correspond to requirements for explosive-inflammable media.

§ 234. For the execution of work on installation, disassembly, cleaning and replacement of the tube banks of heat exchangers, coolers, condenser/capacitors, coils, regenerators, the replacement of tubes in furnaces or the individual sections of communications must be provided for the corresponding means of mechanization.

Monitoring-measuring equipment, production signaling and communication/connection.

§ 235. The electrical instruments, adjustable in dangerously explosive locations and at external installations, must satisfy the requirements for the "rules of the device of electrical devices" (PUE [Rules for setting up electrical installations]).

§ 236. The inspection and measurement electric appliances, which do not correspond to requirements of PUE, must be establish/installed in the locations, isolate/insulated from dangerously explosive medium, or in special cabinets for explosion-proof performance.

§ 237. In the external dangerously explosive installations of class V-1G, is allow/assumed the application/use of the following monitoring-measuring equipment:

a) in any explosion-proof performance for the appropriate categories and the groups of dangerously explosive mixtures - in installations with the open drain and the infusion of the inflammable liquids;

b) in the dust-proof performance - in remaining external installations.

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§ 238. The movable and portable instruments, used in dangerously explosive shops and in external installations, must satisfy requirements of PUE.

§ 239. The pulse lines, which link equipment and conduit/manifolds, which are located under pressure, with instruments in location of KIP or in cabinets, must have the established/installed outside special separating vessels with the automatic locking device, which prevent/warns penetration into the location of KIP or into the cabinet of dangerously explosive gases and vapors and inflammable liquids.

§ 240. The pulse lines, which link separating vessels with instruments and apparatuses of KIP, must be filled by the inert, nonfreezing and nonfreezing liquid which does not dissolve the measured product and it is not mixed with it.

Input and output of pulse tubes and shielding tubes with wire/conductors must be produced through external walls.

With packing through internal walls pulse tubes must be consisted into steel jackets with the observance of the "rules of the device of electrical devices" (Chapter VII-3).

§ 241. In all cases when in pneumatic devices the

application/use of a mixture of air with the combustible products of production is inadmissible, the compressed air must be replaced with compressed nitrogen or another inert gas, supplied to instruments from special buffer capacitance/capacities.

§ 242. For the needs of KIP and instruments of automatic control, must be provided for special installations and the separate grid/networks of the compressed air and inert gas.

§ 243. The grid/networks of the compressed air must have the buffer capacitance/capacities, which ensure the reserve of the compressed air for the work of the instruments of automatic control during not less than 1 h.

§ 244. In the absence of the special installations of the compressed air for the needs of the KIP of the grid/network of the compressed air for instruments, they must be disconnected automatically from all other grid/networks by the check valve, adjustable before the buffer.

§ 245. Intake of air for air compressors, the

operating KIP, must provide the prevention/warning of the contamination of it by gases and dust of production. Air for the needs of KIP must be unoiled and drained of moisture.

§ 246. All cell/elements of electric appliances and panels are subject to grounding independent of the used voltage/stress.

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§ 247. The application/use of mercury instruments and thermometers with mercury must maximally be limited.

In the shops of KIP it is necessary to provide for the isolated/insulated location for the repair of mercury instruments. Equipment and the device of locations must correspond to the requirements for "sanitary regulations with respect to device and content of substations with the mercury-arc rectifiers and shop with respect to inspection, sorting/partition and the repair of mercury rectifiers and instruments".

§ 248. All shops of inflammable and dangerously explosive productions must be provided by telephone communication, but are interdependent shops - by signaling about the work of the connected aggregate/units.

Telephone equipment or alarms from them, and also the

signal knobs or alarms for the signaling, adjustable in dangerously explosive locations, are allow/assumed only for explosion-proof performance.

§ 249. Electromagnetic hours and the signal panels of light signaling for dangerously explosive locations are establish/installed in the niches, hermetically sealed from inside of location by plate glass by thickness not less than 6 mm.

§ 250. Signaling and communication/connection for fire target/purposes and target/purposes of PVO [ПВО - Air Defense] must correspond to special rules.

§ 251. The monitoring-measuring equipment, adjustable externally, must be shielded from weather effects by the closed covers and to that by similar shelters.

Requirements for device and arrangement of locations for instruments and apparatuses of monitoring and automation.

§ 252. Instruments and equipment for monitoring and

automation must be placed in the separate, isolated/insulated from production locations or in the separate buildings. In these locations besides instruments and equipment for monitoring and automation, is permitted to place the electrical equipment of KIP stacks in normal performance.

§ 253. The locations of control must be isolate/insulated from the adjacent production and storage locations, in reference to categories A, B and C, by the incombustible walls with the repartition/conversion of refractoriness it is not less than 2.5 h.

§ 254. The depth of the location of control (it is perpendicular to the front of panels) if necessary for common survey/coverage of control board, must be: it is not less than 4 m at the length of location to 6 m even 6 m at the length of location more than 6 m.

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In the absence of the need for common/general/total survey/coverage of entire control board, the width of the pass before it must be not less than 2 m.

It is not allow/assumed to furnish the location of control above the locations, in reference to categories A and B, under shower-baths, the toilets and the ventilation camera/chambers.

§ 255. Floors in the location of control must be warm and can be manufactured from linoleum on cement or asphalt tie piece or from xylolith.

Walls and the ceilings of these locations must be plastered, while wall furthermore are covered with the nonabsorbed materials.

§ 256. It is forbidden to insert into the location of control fire water pipes, and to also establish/install cabinets for the shut-off valves and hose/pipes. As the means of fire extinguishing in these locations, one should apply the carbon dioxide fire extinguishers.

§ 257. The locations of control must be provided by natural illumination with the coefficient of illumination not less than 1.5 or by daylight lamps with the spectrum, maximally approximated to the daytime.

Furthermore, the locations of control must be provided by common/general/total and local electrical illumination.

§ 258. Electrical illumination behind the panel must provide the normal illumination of all parts of panel. Illuminating lamps after panel must have individual switches. Through each 6 m after panel must be establish/installed plug sockets.

§ 259. In the locations of control in winter time, it is necessary to support the constant of temperature 18-20°C.

In the locations of control, one should apply hot-air heating; steam heating is not allow/assumed.

§ 260. In the locations of control, especially in the presence in them of computers, one should apply air conditioners.

§ 261. To avoid the gas permeation of production into the locations of control, arrange/located in the isolated/insulated part of the production location, it is necessary to provide for the device of supply exhaust ventilation with the guaranteed backwater of air.

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§ 262. Gas analyzers and the densimeters of dangerously explosive components of gas, and also sensors PH- of meters must be establish/installed in special cabinets, near the place of sampling or in special gas-meter locations.

Cabinets for these instruments must be for explosion-proof performance.

§ 263. Gas-meter locations it is permitted to dispose of next to the locations of control under separation condition by their fundamental wall with the anechoic transom, which has double hermetically sealed glazing.

§ 264. The locations for gas analyzers, which are separate buildings (booth), it is permitted to furnish directly of the fundamental walls of buildings, in reference to categories A and B.

The breakage between the indicated buildings (booths) and technological apparatuses are not regulated, with the

exception of reservoirs and gasholders with the combustible substances for which the breakage must be not less than 10 m.

Within the fundamental wall, which divides locations for gas analyzers and production locations, it is permitted to arrange anechoic transom with double hermetically sealed glazing for observation of readings of instruments.

§ 265. Gas analyzers, the densimeters and other instruments in normal performance, used for the analysis of the gas mixture, which contain dangerously explosive components, are allow/assumed to installation in production locations with normal medium, and also in the separate lccations for gas analyzers on the condition that gas concentration in this location at a complete breakage of the gas-feeding tube (bore 6 mm) of one gas analyzer (independent of their quantity in this location) and the pressure of gas, which does not exceed 500 mm H_2O, it will not achieve for 1 h of the lower limit of explodability.

Notes: 1. With the presence of ventilation, the designed volume of location is decreased proportional to the

multiplicity of exchange of air (with quintuple exchange of air 5 times, with tenfold 10 times and so forth).

2. Setting up of gas analyzers in chemical laboratories is allow/assumed without limitations indicated above, if gas analyzers service only these laboratories.

3. Gas analyzers for analysis of inert gases (nitrogen, carbon dioxide, flue gases, etc.) and air of industrial locations on the content of toxic and dangerously explosive concentrations it is permitted to establish/install in locations with normal medium without limitations indicated above.

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§ 266. A quantity of gas analyzers and densimeters, adjustable in production locations with normal medium and in separate locations for gas analyzers, is not regulated.

§ 267. Gas after gas analyzers and densimeters from the single-stage locations in which are establish/installed the gas analyzers, one should derive/conclude by separate collector/receptacles, moreover common/general/total

conclusion/derivation in the atmosphere must be higher than the horse of the roof of these locations not less than on 2 m.

During the arrangement/position of gas analyzers in the first decks of the multistory buildings, the gas after gas analyzers must be abstract/removed through external wall on 2 m higher than the horse of the roof.

At the end of the tube for a gas bleed, must be the cap/hood for protection from atmospheric residue/settlings. On exit (after each gas analyzer and densimeter) before the collector/receptacle indoor must be establish/installed the water lock for preventing the incidence/impingement into the instruments of atmospheric air.

Note. The conclusion/derivation of the gas through the common/general/total collector/receptacle, if these gases during mixing can form the ignited or dangerously explosive mixture, is not permitted.

§ 268. The gas-feeding and outlet tubes of gas analyzers must after installation test for seal in accordance with requirements of GOST 356-53.

§ 269. The reduction devices and the water locks, providing gas pressure to 500 mm H_2O and the jettisoning of pressure excess in the atmosphere, must be placed outdoors with normal medium.

§ 270. With the arrangement of the location of control in the annex, which is not imparted with shop, or in the separate building sanitary assembly must be furnished directly in the location of KIP.

Locations for gas analyzers must have an area of glazing not less than 0.05 m^2 by 1 m^3 of the volume of location.

§ 271. Production shops must be equipped with monitoring-measuring equipment, emergency, preventive/warning and technological signaling in all points of the control of production, provided by technological regulations.

Corrosion protection.

§ 272. The protection of the external surfaces of equipment, supply lines and instruments from corrosion must be realize/accomplished by the coating of them with the paints, chemically stable to the medium of production.

Equipment indoors one should stain predominantly in bright tones.

§ 273. The apparatuses and the instruments, adjustable directly to foundations or in pits with filling, and also the communications, laid in channels with filling or into ground with channel-free packing, are subject to corrosion protection:

a) hot apparatuses, instruments and conduit/manifolds - with the aid of heat-resistant and moisture-proof material;

b) equipment with the temperature of walls below +40°C - by asphalting or the application of other coatings.

§ 274. Protective paint and isolation/insulation of

equipment must be produced only after its technical examination and testing.

§ 276. The apparatuses in which are treated corrosion-aggressive products, must be made from the appropriate corrosion-resistant materials or have anticorrosive protection.

§ 276. After the state of the equipment, working under corrosion conditions must be establish/installed special supervision by routine inspection and determination at the repairs of the wall thicknesses of apparatuses and value of wear.

The results of testing the state of apparatuses must be record/written into special journal or repair map/chart.

Conventional designations.

§ 277. All tap/cranes must have the clear designation of the position of cock plug in the form of the feature, chopped on its end part and as the painted white color/paint.

color/paint.

§ 278. Automatically operate shutter/valves and valves must have a signaling, which indicates their end position.

The position of shutter/valves must be designated with the aid of slots on the end sides of axle/axis.

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§ 279. If by methods indicated above it is not possible to designate the position of tap/crane, one should apply indicator needles or the labels, which designate the position of tap/cranes, valve/gates and shutoff devices.

Provision for production with inert gas.

§ 280. The enterprise, which has inflammable-dangerously explosive productions, must be provided by inert gas, predominantly by nitrogen.

§ 281. The necessity of enterprise for inert gas must

be designed on the basis of average/mean flow rate by its all shops and settings up taking into account maximum flow rate by its not less than two shops, one of which is the greatest user of inert gas.

§ 282. The reserve of the compressed inert stored gas of a constant volume for the blasting of systems, pressure transfer fire- and dangerously explosive media, the creation of inert "pillows", the letting out of vacuum and similar target/purposes must be determined of the necessity of enterprise for nitrogen (or other inert gas) for the indicated target/purposes not less than on 2 h.

In the presence of standby compressor, the reserve of nitrogen can be stored in the gasholders of low pressure.

§ 283. Settings up for obtaining nitrogen from air must correspond to the norms of the design of oxygen plants and stations.

§ 284. Nitrogen in the compressed state must be conducted to all basic shops of productions on stationary conduit/manifold with the observance of the following conditions:

a) the section/cut of distributing pipe and main lines must be designed to the maximum flow of inert gas by each user with consideration diversity factor - load in shops not less than 0.7;

b) on each flow main line of compressed nitrogen in the locations of equipment must be establish/installed expenditure valve/gates;

c) besides expenditure valve/gate on each branch must be establish/installed check valve, manometer and shutoff valve.

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§ 285. The oxygen content in nitrogen must not exceed (in percentages by volume):

a) for the productions where are obtained or apply peroxide compounds, 0.5;

b) for the productions where are obtained or apply

acetylene, monovinylacetylene, oxide of ethylene and carbon disulfide, 2;

c) for the productions where they obtain or apply hydrogen and carbon monoxide, it is not more than 3;

d) for all other productions, included by present rules, are not more than 5.

§ 286. Inert gas must be dried. In the inert gas, used for the needs of KIP and automation, and also for the productions where they apply triisobutylaluminum, metallic sodium, potassium, lithium and to that similar substances, residual humidity it must virtually no.

§ 287. During obtaining of inert gas by the combustion of gaseous or liquid propellant they must be provided:

a) the absence in inert gas of carbon monoxile or its content are not more than 0.02 mg/l, and the oxygen content - not more indicated in p. 285;

b) automatic check of the content in inert gas of carbon monoxide and oxygen with the supply of the signal

with the assigned/prescribed quantities of these substances.

Note. The signal must be supplied with the content in inert gas of carbon monoxide in a quantity 0.02 mg/l and is above;

c) the electrical ignition of heating upon its inclusion into work with the approach signal lighting of auxiliary burner, and then injectors;

d) automatic measurement and the signaling of the maximum permissible temperature of the wall of heating to avoid the hot spots at the damage of internal refractory lining;

e) trouble signaling (light and sonic) at the disconnection of heating as a result of end of burning of gas in injectors and excess over the permissible temperature of inert gas and wall of heating;

f) the automatic cutout of the generator of inert gas during end of burning of gas in injector or cessation of cooling-water supply with the supply of the signal about this to operator.

§ 288. Control of the technological process of obtaining inert gas must be that which was centralized and be realize/accomplished from the isolated/insulated location.

§ 289. For providing the KIP with nitrogen it is necessary to provide for the separate grid/network of gas pipes and the buffer capacitance/capacity, designed not less than for the four hour old flow rate of nitrogen.

§ 290. The branches of gas pipes, which supply inert gas to apparatuses and aggregate/units, designed to pressure are lower than in the main-line gas pipe of inert gas, they must be equipped by pressure reducer, by safety valve and manometer on low-pressure end.

§ 291. Reducer and safety valve must be adjusted to the design pressure of the apparatuses, which consume inert gas.

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Section VII.

EXPERIMENTAL INSTALLATIONS.

Pilot, experimental production, bench (pilot).

§ 292. The device and the content of experimental installations must correspond to the requirements for present rules, and also to the requirements for the fire-fighting and sanitary norms of technological regulations and commands on technical and fire safety and to industrial sanitation.

§ 293. Entire equipment and equipment for experimental installations must be manufactured only on the technical specifications and records, developed and affirmed in routine.

For building of experimental installations, is develop/processed the following documentation:

a) for the bench installations: initial laboratory data (formula, conditions/mode); the fundamental flow chart of setting and the specification of basic equipment;

b) for the pilot experimental installations: laboratory regulations; assembly diagram with the equipment specification, reinforcement of KIP, conduit/manifolds; the adjusting drawings, necessary for equipment installation; the working drawings of apparatuses or the general views of apparatuses with technological conditions for their manufacture; starting/launching command.

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If necessary for building separate building for pilot experimental installations, must be developed the drawings of the construction, sanitary-engineering (heating, ventilation, water pipe, channelization) and electrotechnical part of the project;

c) for experimental production installations (shops): designed assignments for building; working drawings.

§ 294. Experimental installations are installed in experimental production shops or separate buildings in accordance with the requirements for present rules and fire-fighting norms.

§ 295. Bringing into service of experimental installation is permitted only after its testing and the procedure by board in routine.

§ 296. All the experimental installations must have that which were affirmed: technological regulations, commands on the safe conduct of work and command on prevention/warning and liquidation of emergencies.

§ 297. Experimental installations must work under the constant observation of the responsible person, that has the appropriate technical training and that put examination on safety engineering.

§ 298. In locations for experimental installations, must be provided for the device of lifting devices (blocks and tackle, winches, etc.) for the displacements of parts during installation and repair.

installation and repair.

§ 299. In locations for experimental installations, it is forbidden to store the inflammable liquids and gases, foreign objects and materials, and to also produce the work, not connected with the action of experimental installation.

§ 300. Gas containers must be contained and operate in accordance with the "Rules of device and safe operation of the vessels, working under pressure".

§ 301. Experimental installations must be equipped by the necessary monitoring-measuring equipment and the safety devices, which prevent the possibility of an excessive increase in the temperature and pressure over norm and other disturbance/breakdowns of the established/installed technological conditions/mode.

§ 302. Equipment for the installations of high pressure must be located in the isolated/insulated location or be guarded by metallic panels (cabin/compartments).

The locations where are establish/installed the

apparatuses of high pressure, must have independent output/yields outside.

During operation of the installation of high pressure within cabin/compartment and the protected/surrounded places, no one must be located.

The opening and the closure of locking devices and other operations with equipment must be realize/accomplished remotely.

High-pressure gages must instead of the glass have the transparent plastic or glass must be equipped by strong protection from fragments.

§ 303. The electrical equipment, used in installations, must correspond to requirements of PUE.

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Section VIII.

REQUIREMENTS FOR ELECTRICAL DEVICES.

§ 304. Electrical devices must correspond to the requirements for the "rules of the device of electrical devices" and for "technical operation instructions and safety of the maintenance of the electrical devices of industrial enterprises".

The electrical equipment, adjustable in dangerously explosive shops, on its performance must correspond to category and group of dangerously explosive mixtures in accordance with the "Rules of the manufacture of explosion-proof electrical equipment".

§ 305. The determination of the class of the explosiveness of locations and external installations must be produced by technologists together with the electricians of the design/projecting or operating organization with the

collaboration of planning organization.

§ 306. Lead-in and distributive equipment (lead-in point/items, power assemblies, etc.) must be removed from dangerously explosive locations into the separate and isolated/insulated from production locations.

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§ 307. In all locations where are possible the bottling of liquid, power electrical guides must be laid in the places where is eliminated bay/molded edge by their liquid products of production, or must be provided for the corresponding protection of electric wirings.

§ 308. The current-carrying parts of the electrotechnical installations and lighting systems must be reliably isolate/insulated or arrange/located in the places, not exposed to them of the service personnel.

§ 309. The metallic equipment components and mechanisms, trackresistant (pump casing, machines, electric motors, of start-up instrumentation, flaps, assemblies and so forth), but being powerful of render/showing under voltage/stress as

a result of the damage of isolation/insulation, must be grounded in accordance with the "Rules of the device of electrical devices".

§ 310. Before inspection, repair and cleaning of equipment, must be opened the power supply to electrical receivers, are removed safety device/fuses; on starters or the levers of knife switches, must be hung out the posters: "Not to include, work people".

§ 311. On the works, connected with the danger of damage/defeat by electric current, it is necessary to apply protective agents (rod, the loads, insulating tables, instrument with the isolated/insulated knob/sticks, dielectric high overshoes, overshoes, gloves, rugs, etc.).

The use of protective agents and their testing must correspond to the requirements for the "Rules of use and testing protective agents, used in electrical plants".

§ 312. Electric motors in the air-blast performance must be blown by pure air with its ejection in the atmosphere or on closed cycle.

§ 313. Air for the blasting of electric motors must be supplied by individual (for each engine) or group systems with its preheating to winter period before the temperature, which eliminates sweating on the surfaces of air ducts and jackets of electric motors, but in summer to cool by the surface air coolers.

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§ 314. For a trouble-free operation of systems of the blasting of electric motors, it is necessary to provide for:

a) standby units, which are automatically included with the stop of working aggregate/units, and vice versa;

b) the feeding of electric motors of working and standby units from different electric substations or different sections of one electric substation;

c) installation on the air ducts of working and standby units, automatic throttle valves or the cross-over valves, which disconnect from air ducts the inoperative aggregate/unit.

§ 315. The system of blasting must be interlocked with the air-blast electric motors. In this case, the blocking must provide:

a) the impossibility of the launching/starting of the generator of excitation and air-blast electric motors before the launching/starting of the system of blasting;

b) the launching/starting of the air-blast electric motors only during the creation of pressure in the point of emergence of air from the jacket of electric motor not less than 30 mm H_2O;

c) with an incidence/drop in the air pressure in the jacket of electric motor below 30 mm H_2O must be included light or rings alarm.

§ 316. In the absence of the explosion-proof electric motors, which correspond the categories and to the group of the used in production substances and mixtures, and during the installation of electric motors in normal performance in the isolated/insulated from production dynamoelectric

department/separations must be fulfilled the following requirements:

a) the transfer of mechanical energy from engines to machines must be realize/accomplished with the aid of the shaft, passed through the wall, with the application/use of the gasket or other reliable packing/seal;

b) entire/all starting/launching equipment and distribution points must be located in engine compartment or in other location with normal medium;

c) the control knobs, adjustable in production location, must have the corresponding to this medium performance or be removed into location with normal medium.

§ 317. In the shops where on technology is provided for the application/use of the free flame, is allow/assumed the application/use of electrical equipment in normal use.

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§ 318. During the operation of electrical devices, it is necessary:

a) not to allow/assume about electric motors, panels and the assemblies of the presence of the inflammable and combustible substances;

b) to strictly observe the taken sequence of procedure and supply of the signals with control of electric motors;

c) to disconnect/turn off the feeding of starting/launching assemblies and electric motors only after the resolution of shift chief;

d) in the presence of the isolated/insulated dynamoelectric compartments to keep track of the soundness of the gasket or other packing/seals in the passes of shaft from electric motor to the machines, establish/installed in locations with dangerously explosive medium.

Section IX.

REQUIREMENTS FOR AUXILIARY AND EVERYDAY LOCATIONS.

§ 319. With design and device of auxiliary buildings and locations besides present rules, one should be guided that which effects by the "Sanitary norms of the design of industrial enterprises", and also by "Norms and the technical specifications of the design of auxiliary buildings and locations of industrial enterprises" (NiTU 125-55).

§ 320. In the buildings where are arrange/located inflammable-dangerously explosive productions, it is forbidden to place the everyday locations, the repair and mechanical shops, the laboratories, the office and other administrative locations.

§ 321. The device of closed transfer/transitions or galleries, which connect the separate buildings of auxiliary-everyday and auxiliary-production locations with the production buildings where are furnished the productions, pertaining to categories A and B, must be

realize/accomplished in the following cases:

a) when all the technological equipment and equipment for these productions, and also work areas they are located in the closed, heated building;

b) when through sanitary conditions (presence of special or toxic productions) pass in special clothing from production locations in the sanitation points through the street it is not admitted.

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§ 322. It is permitted to place auxiliary locations, controlling/monitoring- analytical laboratories, fitter's shops, which operate shop, in the annexes, which adjoin the production building from the production locations, not referred to categories A or B or from production-auxiliary locations.

In this case, must be observed the following conditions: a) the minimum distance among the building with the productions, in reference to category A or B, and the separate block of auxiliary locations, arrange/located against

building, must be not less than 20 m. The apertures from the block of auxiliary locations, turned to the side of production building, must be filled by glass blocks or reinforced glass.

With the arrangement of the block of auxiliary locations against building with the productions, in reference to categories C, D and E (directly adjoining the building with the productions, in reference to categories A and B), the distance among them must be not less than 10 m.

The separate building of auxiliary locations is recommended to place from the lowered/reduced end part of the production building;

b) gallery must abut the shop into the location of staircase (directly or it is adjacent) and be imparted with the shop through lock- sluice, provided by ventilation backwater, but in auxiliary building - to the corridor, the staircase or floor vestibule, which have doors;

c) with the annex of the slave unit of locations to shop the depth of the production locations, in reference to categories C, D, and E, or "inset" with production-auxiliary

locations must be not less than 6 m.

The report/communication of auxiliary locations with production must be realize/accomplished through the street, staircases or through lock-sluices with the guaranteed backwater of air.

§ 323. The locations of KIP, attached to dangerously explosive shop or built-in into its volume, must have independent output/yields outside; report/communication between the locations of KIP and production locations of shop is allow/assumed through lock-sluices with the guaranteed backwater of air.

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§ 324. The auxiliary and everyday locations, arrange/located on the industrial pads, to place in basements is not permitted. The calculation of everyday locations must be produced in accordance with the requirements for sanitary norms and the sanitary characteristic of production processes.

During the calculation of everyday locations (area of

wardrobe, a quantity of shower grids, wash-stands, etc.) to the workers on the payroll of workers must be accepted coefficient K, which considers:

a) the additional categories of workers in shops (studying themselves, maintenance crews, probationers, etc.), which do not enter in the listed states of shops;

b) the variable relationship/ratio of the number of men and women in states with the workers on the payroll of workers in all replacements:

(1) Списочный состав работающих, человек	(2) Коэффициент K
(3) До 50	1,40
» 100	1,30
» 150	1,25
» 200	1,20
(4) Свыше 200	1,15

Key: (1). The workers on the payroll, men. (2). Coefficient K. (3). Up to. (4). More than.

§ 325. The walls of all everyday locations must be coated to height/altitude 1.8 m with the moisture-proof materials of bright tones, which allow/assume light/lung cleaning and washing by hot water; the walls of wardrobe for contaminated special clothing one should cover/coat with the glazed slabs to entire height/altitude; the walls of shower-baths must be coated with the glazed slabs to height/altitude 2 m.

§ 326. In each production value independent of distance of the nearest building of everyday locations and number of workers must be the toilet with wash-stand in sluice.

For workers at the installations of outside buildings, the distance of toilet must not exceed 100 m.

§ 327. A quantity of wash tap/cranes in everyday locations is determined of calculation one tap/crane for 10 people in the numerous replacement.

§ 328. The part of the wash-stands should provide with the washing solutions for the washing of hands.

Hot water must enter all wash-stands.

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§ 329. Devices for the decontamination of clothing must be provided for in the mechanized laundresses both in all-factory and in the laundry productions where are applied toxic substances.

§ 330. Laundries common for the whole plant for the washing of working clothing and laundry with decontamination centers of technological installations (for the washing of the rendered harmless clothing whose carrying out beyond the limits of installation it is forbidden) they must be mechanized.

Public health stations.

§ 331. In enterprises with the number of workers from 300 people and is more necessary to arrange all-factory the medical public health station, located near the most populous shops. Composition and the areas of the locations of public health stations must correspond to the requirements for sanitary norms.

Section X.

GAS-RESCUE SERVICE.

§ 332. In all enterprises with explosive and flammable productions must be organized gas-rescue service.

The basic tasks of gas-rescue service they are:

a) the rescue of people and the liquidation of the emergencies at enterprises;

b) performing preventive work on the prevention/warning of emergencies and the creation of conditions for their successful liquidation in accordance with the "Command on performing of preventive work by gas-rescue stations", affirmed by Gosgortekhnadzor of RSFSR.

§ 333. The subdivisions of gas-rescue service must always be in the state of readiness for the execution of their responsibilities.

In enterprise they must be arrange/located so that all gas-hazardous and explosive and flammable shops could obtain timely and effective help.

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§ 334. Structure, states and the official locations of gas-rescue subdivisions must correspond to the "Position concerning the gas-rescue service of the enterprises of the chemical, metallurgical, petroleum-extracting and petroleum refining industry".

§ 335. The equipment of the subdivisions of gas-rescue service by equipment, equipment and operational transport must is produced in accordance with "Table of the equipment of gas-rescue stations", affirmed Gosgortekhnadzor.

§ 336. In each enterprise with explosion- and by flammable productions they must be comprised:

a) the plan/layout for the liquidation of emergencies in accordance with "Command on the compilation of the plan/layouts for the liquidation of emergencies in explosion- and flammable productions", the affirmed by *Gosgortekhnadzor* of union republic;

of union republic;

b) the affirmed by chief engineer enterprises of command on emergency shutdowns of aggregate/units or shops in the case of the breakthrough of toxic or dangerously explosive gases and vapors, volatile or inflammable liquids from apparatuses and communications, and also during the malfunction of ventilation installations and accumulation in air of toxic gases and vapors to dangerous for people concentration or dangerously explosive gases and vapors to the lower limit of explodability.

§ 337. All emergencies, which occurred in explosive and flammable enterprises, must be investigated in established sequence.

§ 338. In all explosion- and flammable enterprises and productions, must be determined gas-hazardous places.

The enumeration of gas-hazardous places is confirmed by the chief engineer of enterprise.

With the enumeration of gas-hazardous places, must be familiarized all the working and technical-engineering workers of enterprise.

of enterprise.

In gas-hazardous places must be hung out the corresponding labels and warning signs.

§ 339. Work in gas-hazardous places must be produced in accordance with the "Command on organization and conduct of work in gas-hazardous places", affirmed by Gosgortekhnadzor.

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Section XI.

Maintenance of territory, working locations and fire-fighting equipment.

§ 340. The maintenance of territory, working locations and fire-fighting equipment must correspond to the "Common/general/total regulations about device and maintenance of industrial institutions", affirmed by NKT of the USSR, to the "Standard rules of fire safety for industrial enterprises", affirmed by GUPO of MVD of the USSR, and the "Commands on the sanitary maintenance of industrial enterprises", by the affirmed state sanitary inspection of the USSR.

§ 341. The parts of equipment and the materials, necessary for production, and also the firefighting equipment must be placed on the diverted for this places, matched with the organ/controls of fire supervision, in the strictly established/installed quantity and with the observance of the

rules of their storage.

To the means of fire extinguishing, must be provided free access.

§ 342. The use of fire equipment and stock for the economic, production and other needs, not connected with fire extinguishing, is forbidden.

§ 343. Is not allow/assumed blocking and the contamination of roads, passages, entranceees, of staircases, passes and output/yields from buildings, approaches to fire-fighting equipment and the means of fire extinguishing and communication/connection.

§ 344. The motion of transport with the engines of internal combustion without spark arresters and fire extinguishers in the territory of enterprises is forbidden. In the places where the motion of tractors, motor vehicles and to that of similar transport is forbidden, must be hung out the preventive/warning labels: "Entrance is forbidden".

§ 345. For preventing the accidents with switching of

rail tracks in the points of the intersection of these ways with pedestrian roads it is necessary to arrange solid flooring into level with the heads of rails, and also shielding barriers, revolving doors, signaling.

§ 346. In territory of inflammable and dangerously explosive productions categorically it is forbidden to apply the matches, the cigarette lighters, the candles, the kerosene lamp/canopies and other sources of fire/light.

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If necessary it is permitted to apply only explosion-proof battery-powered illuminating lamps.

§ 347. In entire territory of enterprise and in the production locations where to smoke is forbidden, must be hung out the clear preventive/warning labels: "To smoke is strictly prohibited". Smoking can be allow/assumed only in the specially diverted and equipped places according to agreement with local fire protection.

§ 348. Floors in production locations one should daily clean by wet or other, not permitting dust, method.

§ 349. The careful retraction of production and auxiliary locations (cleaning walls, ceilings, window frames, glasses, space heaters, etc.) one should produce not thinner/less frequent than one times into week.

§ 350. To store in production locations equipment, parts, object/subjects and the materials, not provided for by technological regulations, is forbidden.

§ 351. The lubricating oils and other fuels it is permitted to store on work area in cabinets or boxes from the incombustible materials in the size/dimension, which does not exceed diurnal necessity, but it is not more than 20 l.

Lubricants in the quantity, which exceeds daily requirement, must be stored in the specially provided for for this locations.

§ 352. Technological equipment, apparatuses, mechanisms, aggregate/units, instruments and instrument, and also other facilities must be operable and be contained in purity/finish.

§ 353. The spilled production products, water and lubricating oils must be immediately removed.

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Section XII.

Maintenance, repair and cleaning of technological equipment.

Requirements for the organization of repair work.

§ 354. All forms of repairs must be fulfilled in strict conformity with the graph of regular overhaul, comprised on the basis of the "Position concerning the scheduled preventive maintenance of equipment and conveying devices in the enterprises of chemical industry" and by the affirmed chief engineer of enterprise.

§ 355. Testing the soundness of fire-fighting equipment, and also monitoring and observation of the required pressure of vapor and water in systems must be produced not thinner/less frequent than one times into replacement.

§ 356. Visual inspection and testing the soundness of the actions of ventilation installations must be produced

prior to the beginning of each shift.

§ 357. The inspection of illuminating guide and reinforcement must be produced daily, but the pressure leak test of explosion-proof reinforcement - is not thinner/less frequent than one times in month.

§ 358. The repair of explosion-proof electrical equipment, replacement and the restoration/reduction of parts must be produced in the specialized organizations. The repaired explosion-proof electrical equipment must pass monitoring tests in accordance with technical specifications for its manufacture. The results of test and the characteristic of repair will be brought in into log book.

§ 359. Inspection and testing the soundness of all water-conducting devices (wells, hydrants, catches, reserve capacities, pumping devices, etc.) must be produced one time in month.

§ 360. In all places, which constitute a threat to life and working people's health, must be hung out the corresponding preventive/warning labels.

§ 361. The work of the production equipment, norm of its load and the basic parameters of process must correspond to requirements for the established/installed technological conditions/mode and to specifications.

§ 362. The disturbances of the established/installed norms of pressure, temperature, level of the liquids and other parameters must be investigated for explaining of reasons and acceptance of the measures, which eliminate the repetition of the similar cases.

§ 363. Procedure and the delivery of shift must be accompanied by the detailed visual inspection of entire equipment with the mark of the results of inspection in journal. All the discovered malfunctions must immediately be removed.

§ 364. In each compartment or installation must be the diagram of apparatuses and conduit/manifolds in conditional colors.

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Shutoff devices in the diagram must be numbered, and

the direction of the displacement of products is shown by rifleman/pointers. The number of shutoff device and other designations in diagram must correspond to the service manual of aggregate/units.

§ 365. To each engaging of the apparatus and conduit/manifolds after stop and release from products of production must precede blasting of them by nitrogen or other inert gases.

§ 366. Apparatuses and conduit/manifolds must be switched on slowly, without allow/assuming hydraulic impact/shocks.

§ 367. All emergency sets are disconnected from workers, with installation after shutoff device of plug/silencers with the clearly visible stems.

§ 368. Catches and valve/gates on conduit/manifolds it is necessary systematically to twist and to lubricate. It is forbidden to apply crowbars, tubes and in that similar levers for opening or closure of catches and valve/gates.

§ 369. The distinctive coloration of conduit/manifolds

for common/general/total in chemical industry media to accept, as it is shown, in Appendix 2.

The coloring of basic materials of lines is establish/installed by branch rules for each production individually.

§ 370. The wall thickness of apparatuses and conduit/manifolds for fire- and dangerously explosive agressive media must be periodically checked by thickness gauges; in the absence of such instruments, is allow/assumed drilling of the walls of apparatuses and conduit/manifolds.

Method, places and the periodicity of testing wall thicknesses is establish/installed chief machine operator of plant depending on the specific conditions of the work of apparatus and conduit/manifold.

The application/use of instruments and drilling must be produced with the observance of the general requirements for safety (stop of production, the prevention of sparking, etc.).

§ 371. Reinforcement and instruments are checked against

seal on stands. Apparatuses and communications are checked against seal on the spot with the complete assembly of circuit.

The apparatuses, which did not be in work, or passed careful cleaning with the subsequent laboratory analysis of medium in apparatus, can test for seal with nitrogen or another inert gas.

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In the process of testing of vessels, apparatuses and communication, must be produced the inspection and testing all connections for the passage of gas with the aid of soap solution.

§ 372. With the detection of passages pressure must be scoured and malfunction, are removed. During in the tested aggregate/unit of working feed pressure compressed air or nitrogen cease and establish observation of a pressure drop in aggregate/unit during not less than 4 h during its periodic inspection and not less than 24 h for the newly established/installed apparatuses.

The results of leakage test are considered satisfactory, if a pressure drop for 1 h does not exceed 0.2o/o for the newly adjustable apparatuses even 0.5o/o for the apparatuses, which undergo repeated testing.

Notes. 1. Soundness test must be produced taking into account change of pressure depending on temperature of inert gas within apparatus.

2. Norms of pressure drop in gas pipes with conditional diameters of more than 300 mm are accepted according to NiTU XII-62

§ 373. All the safety valves before bringing into service must be adjusted on special stand to adjusting pressure and tested for density of gate and detachable joints.

As control medium for determining the torque/moment of the opening of valve, one should apply:

a) for the valves, intended for a work on gaseous products, air or nitrogen;

b) for the valves, intended for a work on liquid media, air or water.

The control medium, used for determining the torque/moment of valve opening, must be pure/clean, without mechanical or chemical contaminations.

§ 374. The revision of safety valves must be produced:

a) on all apparatuses of the continuously effective installations - with each stop of aggregate/unit on revision, but not thinner/less frequent than one times per annum;

b) on capacitance/capacities with liquefied gases - are not thinner/less frequent than one times in 4 months.

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§ 375. Removal/taking seals with shaping by the official logging of shift and arming they are allow/assumed by authorization of general foreman only for the replacement of protecting device, revision or for his disconnection/cutoff during transfer/transition to work in vacuum.

§ 376. For revision, repair and the control of safety valve, must be comprised the event/report over the signatures of the mechanic of shop, foreman on repair and control, and also the metal workers, who regulated valve. At the termination of work and controls, the valve must be sealed and it is equipped by number. To each safety valve must be comprisad technical log book or operational card. With technical log book must be stored the copies of log books to valve and spring from plants--suppliers and the copy of the event/reports about revision and control of valve.

The graph of repair and revision of safety valves is coordinated with master mechanic and is confirmed by the chief engineer of plant.

§ 377. All shutoff devices and reinforcement for apparatuses and the conduit/manifolds before their installation and after each repair undergo by testings for mechanical strength by hydraulic pressure and on seal - by the pressure of the compressed air or inert gas. These tests are produced after the termination of fitting and

tool making-mechanical treatment. Hydraulic pressure is produced on the norms of Gost for fittings, but it must be not lower than test hydraulic pressure of aggregate/unit. Tests take shape by event/report.

§ 378. Testing and cleaning reinforcement on the spot of installation it is necessary to produce not thinner/less frequent than testing and cleaning equipment and conduit/manifolds.

§ 379. The differential manometers, establish/installed on fire barriers, must have red feature, which indicates the ultimate strength of fire barrier.

§ 380. Fire barriers must be remove/taken by cleaning and replaced spare not thinner/less frequent than once in 3 months, or with an increase in their resistance to limiting value.

§ 381. The free ends of the standpipes of air in winter time must be inspected and be cleaned of ice and snow. To the free ends of air line must be provided convenient approach.

§ 382. Order about beginning and end of the repair of aggregate/unit or communications must be recorded by general foreman in the journal of orders on shop.

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The opening of device, machine or the disconnection of conduit/manifold must be produced only after the resolution of shift chief.

§ 383. Each apparatus, machine and the section of conduit/manifolds, stopped for repair, cleaning and inspection, are free/released from the products of production, they are disconnected from all communications with the setting up of plug/silencers, they are blown by inert gas and then (if this is possible) by acute/sharp water vapor with the blow-off of inert gas and vapor into the atmosphere they fill with water which is lowered into the channelization prior to the beginning of cleaning.

Notes. 1. During apparatus or communication, which are found in repair or cleaning, all the time of repair or cleaning is weighed preventive/warning poster "Apparatus in repair" or "Conduit/manifold in repair".

2. To remove/take preventive/warning poster is possible only by authorization of chief or mechanic of shop.

3. To switch on in work aggregate/unit, apparatus or communications, not having remove/taken preventive/warning poster, it is forbidden.

§ 384. During cleaning all surfaces of apparatuses, reservoirs and communications, covered with the deposits of resins, polymers, iron sulfide and unexplained residue/settlings, must be moistened by water or blown by the jet of nitrogen.

Cleanings must be thoroughly assembled into the vessel, poured by water, and at the termination of cleaning are immediately removed from location into safe in fire sense place.

§ 385. Repair and the corrections of compressors in motion, including the attachment of wedges and the tightening of bolts on moving parts, it is forbidden.

§ 386. The sequence of preparation of equipment and vessels for inspection and repair is determined by plant instructions.

§ 387. At the termination of the repair of machine, the apparatuses, reservoirs, communications the like must be accepted by board for event/report. The enumeration of the carried out work must be recorded into the repair book.

Organization of internal inspection, cleaning and repair.

§ 388. The apparatuses or the vessels, which are subject to opening for internal inspection, cleaning or a repair, must be freed from product, are opened and unplugged from the operating equipment. Depending on the located in them products, the vessels must be blown with inert gas, are steamed by the live steam or washed in water and are blown with pure air.

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The order of training/preparation of apparatus for inspection or repair must be presented in commands on the safe conduct of work.

§ 389. All lines, connected with apparatuses and vessels subject to opening, must be opened and unplugged with the aid of plug/silencers with stems.

§ 390. Before the setting up of the plug/silencers of line, they must be freed from product and are blown with inert gas.

§ 391. All preparatory measures are realize/accomplished by operational personnel under the guidance of the chief of installation. Without the resolution of the chief of installation (or shop) for work within apparatus and vessel to begin it is forbidden.

§ 392. Before performing of work within apparatuses, vessels, wells, etc., the workers must be instructed on the rules of the safe conduct of work and the methods of rendering of first aid to casualty. The persons, pasts of instruction, to work are not allow/assumed.

§ 393. After the termination of preparatory work, is carried out the analysis of medium in apparatus, vessel, etc. to the absence of the dangerously explosive and toxic concentrations of vapors and gases.

With the content of gases lower than sanitary norms and, if in the process of work an increase in gas concentration is impossible, is allow/assumed work without gas mask, but in the presence of the prepared operable hose gas mask.

In all remaining cases all work within apparatuses, reservoirs, vessels, wells and channels must be fulfilled in hose gas masks. At the length of hoses 10 m and more must be realize/accomplished forced air supply.

§ 394. The period of the one-time stay of worker in hose gas mask must not exceed 15 min with the subsequent

rest in pure air not less than 15 min.

§ 395. Workers, which charged work within apparatus, must be equipped by appropriate special clothing and foot-wear without iron nails and shoeings.

§ 396. Above special clothing must be put on wide belt/zone with cross-shaped straps and the fixed to them signal-rescue cord whose free end is derive/concluded outside.

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§ 397. For observation of work and rendering aid to worker, it is separated not less than two workers, trained to inversion with gasproof instruments, the method of rendering of first aid and equipped with individual protective means.

§ 398. Opening, cleaning, inspection, repair and testing apparatuses must be produced by the continuous supervision of the operating personnel of shop.

§ 399. Work within apparatuses immediately cease:

a) with the signal, which notifies about emergency;

b) during the sudden appearance of odor or visible quantity of dangerous products of production.

§ 400. During work within apparatus, are prohibited the operations, which are accompanied by the isolation/liberation of harmful gases.

§ 401. With repair within furnaces, superheaters, etc. of heating apparatuses, it is necessary:

a) to air flues and camera/chambers of furnace and to make check analyses of air in them to the content of carbon monoxide. The temperature within furnace at repair must not exceed 40°C. Inside furnace must be supplied with the aid of movable fans the air, cooled with the sprayed water;

b) supply workers with gassed added some salt water, special clothing and foot-wear;

c) work within the furnace of news with the necessary in order to rest interruptions.

§ 402. The repair and other work within apparatuses it is permitted to produce that which not only with special sparks with the impact/shocks by instrument.

Firings.

§ 403. Repair work with the application/use of the free flame in explosion- and inflammable productions must be carried out in accordance with "standard position according to the organizatien of the firings in explosion- and the inflammable productions of chemical and metallurgical industry" and by "command on the measures of fire safety when conducting of firings on industrial enterprises and for other objectives of national economy".

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Repair of KIP.

§404. Testing, control and the repair of all monitoring-measuring equipment and automatic devices must be

produced in accordance with the "rules of organization and conductings of testing measuring meters and monitoring of the state of metrology" with the observance of standards and technical specifications, affirmed by the committee of standards, measures and measuring meters.

§ 405. For the interchangeable personnel of shops is permitted to produce only emergency disconnection of instruments in accordance with special command.

§ 406. The accuracy/precision of readings must correspond to the requirements of the Gost.

§ 407. Testing and testing instruments in the shops, in reference to categories A and B, must be produced under conditions, which eliminate sparking.

§ 408. Are not allow/assumed work on control and testing of electrical instruments and communications simultaneously with conducting in this location of dangerous work (cleaning apparatuses, shift of packing and the like).

§ 409. Mercury instruments must be supplied with trap or have another protective devices in the case of the ejection of mercury.

ejection of mercury.

All work with mercury must be organized in accordance with norms and the requirements, indicated for mercury rooms.

With the repair of controlling/monitoring-preparatory instruments, are forbidden the work with mercury in the locations where are establish/installed the panels of KIP, and also in production locations.

§ 410. The liquid, which fills the pulse lines, which go from separating vessels to instruments and equipment of KIP, it is necessary systematically to check to the content in it of the measured product and depending on the results of control to replace each 1-2 months.

§ 411. The actuating mechanisms of automatic regulators it is necessary to subject to hydraulic tests as the reinforcement of apparatuses.

§ 412. Testing and the control of actuating mechanisms must take shape by the appropriate recordings in the log book of mechanism.

§ 413. For a period of time, necessary for the replacement of automatic regulator, the control or control must be produced by hand by valve/gate on shunt or by the means of control panel.

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§ 414. During each transmission of shifts, it is necessary to overhaul of sheet rubber with the recording about this in interchangeable journal.

§ 415. After monitoring-measuring equipment, automatic regulators, production signaling and remote control, must be the constant supervision, which guarantees their failure-free and correct operation.

§ 416. For the recordings of the results of inspections and marks about control and repair of instruments in each shop, one should conduct special journal.

Control and the repair of monitoring-measuring equipment must produce only workers of the shop of KIP.

Section XIII.

INDIVIDUAL PROTECTION AND PERSONAL HYGIENE OF WORKERS.

§ 417. By worker must be overhung to hands or be stored in shops the following means of the individual protection, necessary for the execution of various work, and also for a work in emergency or under the close to them conditions: the insulating or filtering gas masks the corresponding to the medium of mark/brands and hose gas masks of type PSh-1.

Notes. 1. If necessary to apply hoses by length 10 m and more (work in headers, flues, in channelization, etc.) one should use hose gas masks PSh-2 with forced air supply.

2. During systematic execution of gas-hazardous work within apparatuses air supply to hose gas masks one should realize/accomplish centralized through air duct with branches

for connection to them of hoses.

3. In shops, in reference to category A, is allow/assumed use of automatic intake type hose gas masks (PSh-1) or with blower with hand drive for air supply.

With the use of hose gas mask with the forced air supply of type PSh-2 with electric motor in normal performance, the blower and electric motor must be establish/installed outside shop or indoor with normal medium.

4. In assembly of hose gas mask, must be located safety belt with straps and cord.

§ 418. Protective agents, overhung in individual order, must be located during operation in worker or on his work area. On each work area must be the commands on inversion with protective agents taking into account the specific conditions under which they are applied.

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§ 419. Shop administration is due to keep account of

transmission/delivery and observation of the periods of action it is anti-gas, and to also provide the sanitary conditions of their storage, the disinfection of fronts it is anti-gas, testing the soundness of boxes, etc.

§ 420. In each technological shop it is necessary to store the required number of complete sets of emergency instrument and battery lamp/canopies.

Notes: 1. Emergency instrument must satisfy the requirements, presented in work in dangerously explosive conditions.

2. Hose mask/shields, self-contained oxygen breathing apparatuses, emergency instrument and battery lamp/canopies must be stored in special cabinets of entries into dangerous locations.

§ 421. The personnel of shops must be taught to the rules of inversion, departure/care and application/uses is anti-gas by the course of the necessary technical minimum and systematic instruction of workers.

§ 422. All the personnel of gas-hazardous shops must

be taught to the practical use of hose gas masks, and also to the methods of artificial respiration.

§ 423. The presence and the soundness of all gasproof means must check with the method of shift shift chief.

§ 424. Responsibility for the nonutilization of protective agents on the level with those, who directly fulfill work, is laid on foreman and shift chief of section or.

§ 425. Shielding special clothing, special boot and individual protective means must be overhung on the norms, affirmed by the state Committee of the Council of Ministers of the USSR on the questions of work and of the wages and VTsSPS.

§ 426. The order of transmission/delivery, storage and use of free special clothing, special boot and individual protective means, and also washing, disinfection and the repair of special clothing must correspond to the requirements for the special command of the Ministry of Chemical industry of the USSR.

§ 427. Overhung special clothing must answer the Gost and be suitable according to size/dimensions.

§ 428. In each shop must be the emergency reserve of special clothing and foot-wear in a quantity not less than two-three assemblies.

Note. The exchange of the emergency reserve of special clothing and foot-wear is produced with their wear.

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Section XIV.

RESPONSIBILITY FOR THE OBSERVANCE OF SAFETY REGULATIONS.

§ 429. Those, guilty of the violation of present safety regulations, and who also allowed the arbitrary renewal of the work, stopped by the organ/controls of supervision, depending on the character of disturbance/breakdowns and consequences will bear responsibility in disciplinary, administrative and judicial order.

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Appendix 1 to § 194.

(1) Материал и конструкция прокладки	(2) Пределы применения прокладок						
	по температуре среды, *град* (3)		по давлению среды (*ати*) при уплотнительной поверхности фланцев типа (4)				по вакууму (%) при уплотнительной поверхности фланцев типа ШИП—ПАЗ (5)
	(6) от	(7) до	(8) гладкая	(9) выступ—впадина	(10) под кольцевую прокладку овального сечения	(11) под линзовое уплотнение	
(12) Резина сплошная $Д_у$ = 500 *мм*	—15	+40	3	—	—	—	—
(13) То же с парусиновой прослойкой $Д_у$ = 500 *мм*	—25	+60	6	—	—	—	—
(14) То же с металлической сеткой	—40	+80	10	—	—	—	(18)
(15) Паронит марок ЛМ, ЛВ	—50	+375	25	40	—	—	До 99
(16) Паронит марки У	—50	+450	25	50	—	—	» 99
(17) Паронит марки УВ	—50	+425	25	60	—	—	» 99
(19) Асбест листовой	—	+450	15	—	—	—	» 99
(20) Фибра и дивинис	—	+80	10	15	—	—	» 99
(21) Гофрированные асбоалюминиевые	—	+300	25	100	—	—	—
(22) Гофрированные асбомедные	—	+350	25	100	—	—	—
(23) Гофрированные с асбестовой набивкой в оболочке из низкоуглеродистой стали	—	+450	25	100	—	—	—
(24) То же в оболочке из нержавеющей стали	—	+475	25	100	—	—	(19) —
(25) Свинец	—	+50	6	—	—	—	До 99
(26) Алюминий	—110	+250	15	15	—	—	—
(27) Медь	—110	+250	25	100	—	—	—
(28) Зубчатые из низкоуглеродистой стали	—40	+470	25	100	—	—	—
(29) То же из высокоуглеродистой стали	—100	+600	25	64+100	—	—	—
(30) То же медные	—100	+250	25	64+100	—	—	—
(31) Кольцевые овального сечения из низкоуглеродистой стали	—40	+550	—	—	64+100	—	—
(32) То же из высокоуглеродистой стали соответствующих марок	—100	+600	—	—	64+100	—	—
(33) Линзовые из высоколегированной стали соответствующих марок	—100	+600	—	—	—	(34) Свыше 100	—

Key: (1). Material and the construction of packing. (2). Limits of the application/use of packing. (3). according to the temperature of medium, deg. (4). on the pressure of medium (atm(gage)) with the sealing surface of flanges of the type. (5). on vacuum (o/o) with the sealing surface of flanges of the type ShIP-PAZ. (6). from. (7). to. (8). smooth. (9). projection-depression. (10). under the ring gasket of oval section/cut. (11). under lens packing/seal. (12). Rubber is solid. (13). The same with canvas layer. (14). The same with wire gauze. (15). Paronit of brands. LM, LV. (16) Paronit of brand U. (17). Paronit of brand UV. (18). To. (19). Asbestos laminated. (20). Fiber and divinyl. (21). Corrugated asbestos-aluminum. (22). Corrugated asbestos-copper. (23). Corrugated with asbestos packing in shell of low-carbon steel. (24). The same in shell of stainless steel. (25). Lead. (26). Aluminum. (27). Copper. (28). Serrated made of low-carbon steel. (29). The same made of high steel. (30). The same copper. (31). Circular of oval section/cut made of low-carbon steel. (32). The same made of high steel of the corresponding mark/brands. (33). Lens made of high-alloy steel of the corresponding mark/brands. (34). It is more than.

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Appendix 2 to § 369.

(1) Наименование веществ, транспортируемых по трубопроводу	(2) Цвет окраски трубопроводов и отличительные знаки
(3) *Вспомогательные трубопроводы*	
Вакуум-линия (4)	Белый с желтыми полосами (5)
Вода горячая (6)	Зеленый с красными полосами (7)
Вода питьевая (хозяйственная) (8)	Зеленый без полос (9)
Вода производственно-техническая промышленная) (10)	Черный без полос (11)
Вода обратная (условно-чистая) (12)	Зеленый с коричневыми полосами (13)
Вода фузельная (14)	Зеленый с черными полосами (15)
Генераторный газ (16)	Бежевый с желтыми полосами (17)
Канализация (18)	Черный с желтыми полосами (19)
Конденсат водяного пара (20)	Зеленый с синими полосами (21)
Насыщенный пар острый (22)	Красный с желтыми полосами (23)
Нефть (мазут) (24)	Темно-коричневый с красными полосами (25)
Перегретый пар острый (26)	Красный без полос (27)
Пожарный водопровод (28)	Оранжевый без полос (29)
Рассол прямой (30)	Темно-коричневый с черными полосами (31)
Рассол обратный (32)	Темно-красный с желтыми полосами (33)
Кислоты и щелочи (34)	
Кислоты крепкие (35)	Красный с белыми полосами (36)
Кислоты разбавленные (37)	Красный с двумя белыми полосами (38)
Щелочи крепкие (39)	Вишневый без полос (40)
Щелочи разбавленные (41)	Вишневый с белыми полосами (42)
Сжатые, сжиженные и растворенные (43) газы общего пользования	
Азот (44)	Черный с коричневыми полосами (45)
Аммиак (46)	Желтый (47)
Ацетилен (48)	Белый с красными полосами (49)
Водород (50)	Темно-зеленый (51)
Нефтегаз (52)	Серый (53)
Сжатый воздух (54)	Синий (55)
Углекислота (56)	Черный (57)
Хлор (58)	Защитный с зелеными полосами (59)

Key: (1). Designation of the substances, transported on conduit/manifold. (2). Color of the coloration of conduit/manifolds and distinctive signs. (3). Auxiliary conduit/manifolds. (4). vacuum-line. (5). White with yellow bands. (6). Water is hot. (7). Green with red bands. (8). Water drinking (is economic). (9). Green without bands. (10). Water production-engineering is industrial. (11). Black/ferrous without bands. (12). Water reverse/inverse (conditionally pure). (13). Green with brown bands. (14). Water fusel. (15). Green with black/ferrous bands. (16). Generator gas. (17). Beige with yellow bands. (18). Channelization. (19). Black/ferrous with yellow bands. (20). Condensate of water vapor. (21). Green with blue bands. (22). The saturated steam is acute/sharp. (23). Redder with yellow bands. (24). Petroleum (petroleum residue). (25). dark brown with redder bands. (26). The superheated steam is acute/sharp. (27). Redder without bands. (28). Fire water pipe. (29). Orange without bands. (30). Brine straight. (31). dark brown with black/ferrous bands. (32). Brine reverse/inverse. (33). Dark-red with yellow bands. (34). Acids and alkalies. (35). Acids are strong/firm. (36). Redder with white bands. (37). Acids diluted. (38). Redder with two white bands. (39). Alkalies are strong/firm. (40). Cerise without bands. (41). Alkalies diluted. (42). Cerise

with white bands. (43). Compressed, liquified and dissolved gases of common/general/total use. (44). Nitrogen. (45). Black/ferrous with brown bands. (46). Ammonia. (47). Yellow. (48). Acetylene. (49). White with red bands. (50). Hydrogen. (51). Dark green. (52). Petroleum gas. (53). Gray. (54). Compressed air. (55). Blue. (56). Carbonic acid. (57). Black/ferrous. (58). Chlorine. (59). Shielding with green bands.

Notes: 1. The coloration of conduit/manifolds in distinctive color can be produced on isolation/insulation.

2. Of shutoff devices on conduit/manifold by arrow/pointer shows direction of motion of product.

Arrow/pointer is made the same color, as band, but in the absence of bands - white or black/ferrous color.

3. Distinctive bands in all cases paint in transverse direction.

4. Width of nonferrous ring with outside diameter of conduit/manifold or isolation/insulation to 150 mm - 50 mm, from 150 to 300 mm - 70 mm, is more than 300 mm - 100

local conditions from 1 to 2 m.

5. Gas lines and blow-off in the atmosphere are painted in gay colors by the same colors, as material lines, but with winding transverse white bands.

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No typing.

мм. The distance between rings is accepted depending on local conditions from 1 to 2 м.

5. Gas lines and blow-off in the atmosphere are painted in gay colors by the same colors, as material lines, but with winding transverse white bands.

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No typing.

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