



APPROVED
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INSTRUCTION # 105
SAFE HOT WORK ARRANGEMENTS
AT CPC FACILITIES

Version # 3

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1. PURPOSE

This Instruction determines safety requirements to hot work performance at CPC-R explosion and fire hazardous facilities.

2. FIELD OF APPLICATION

The requirement of this Instruction covers performance of hot work at hazardous process facilities done by CPC as well as contractors staff subject to service Agreement concluded between legal entities in compliance with legislation of Russian Federation and Republic of Kazakhstan being available.

3. REGULATORY REFERENCES

References to the following regulatory documents were used herein:

Table 1. List of regulatory documents

##	Regulatory documents
1	External
1.1	Federal norms and rules in the field of industrial safety. Rules of safe conduct of gas hazardous, hot and repair works. approved by RTN Resolution No. 485 of 25.11.2017
1.2	Fire-prevention regulations in Russian Federation approved by government resolution No. 390 of April 25, 2012
1.3	Federal norms and rules in the field of industrial safety. Requirements for the production of welding at hazardous production facilities, approved by RTN Resolution No. 102 of 14.03.2014
1.4	Federal norms and rules in the field of industrial safety. Safety regulations for hazardous production facilities of trunk pipelines, approved by RTN Resolution No. 520 of 06.11.2013
1.5	Rules on labor protection in the performance of electric welding and gas welding works, approved. by order of the Ministry of Labor of Russia dated 12.23.2014 N 1101n
1.6	Rules of ensuring industrial safety for hazardous process facilities of oil and gas industries, Order of minister of investments and development of Republic of Kazakhstan No. 355 of December 30, 2014
1.7	Rules of ensuring industrial safety during operation of trunk pipelines approved by Order of minister of investments and development of Republic of Kazakhstan No. 354 of December 30, 2014
1.8	Order of government of Republic of Kazakhstan No. 1077 of October 9, 2014 On approval of Fire safety regulations
1.9	SNiP of RK 1.03-05-2001 Occupational safety and labor safety in construction
2	Internal
2.1	A02-OD-HSE-052, Permit-to-Work Procedure for Arrangements of Hot Works, Gas-Hazardous, Excavation, Repair and Other Hazardous Works
2.2	Safety rules during operation of CPC oil pipeline system, CPC VRD 111-12-2012
2.3	Instruction No. 104 on organization of air control at CPC facilities
2.4	VRD 34.09.2014, Regulations for execution of work in oil pipeline safeguard zone

4. TERMS, DEFINITIONS AND ACCEPTED ACRONYMS

Terms and acronyms used herein are set forth in Table 2.

Table 2. Terms and acronyms

##	Term / Acronym	Term description / interpretation of acronym
1	Terms	
1.1	Permit-to-work	task for execution of work issued on special set form and defining contents, place of work, time of its beginning and termination, conditions of safe conduct, membership of crew and persons responsible for safe execution of work and so forth. Permit-to-work should include confirming information that all risks were revealed and control measures taken to ensure safe performance of work.
1.2	Hot work	electric-welding, gas-welding, soldering and other works connected with the use of open flame, new formation and heating to temperature capable to cause ignition of materials and structures
1.3	Hazardous work	works prior to execution of which, it is necessary to carry out a number of obligatory organizational and technical actions ensuring safety of workers during execution of these work
1.4	Customer	CPC, its regional division or, depending on a context, its responsible representative.
1.5	Contractor	organization that signed with CPC Contract for Works / Agreement for Services at CPC facilities or, depending on a context, its responsible representative
1.6	Person in Charge of Work Preparation from Contractor	engineer/technician knowing order and rules of carrying out preparatory activities and hazardous work at fire and explosion hazardous facilities that passed training and certification in industrial safety, labor protection, fire safety basics in scope necessary to service CPC facilities and was admitted to manage these works. Person in charge is assigned by order (resolution) of relevant company under which authority contractors belong.
1.7	Work Supervisor	engineer/technician knowing conditions and order of carrying out the work, assigned by order (resolution) of relevant company carrying out the work
1.8	Work Team Leader	engineer/technician knowing order and rules of carrying out hazardous work at fire and explosion hazardous facilities that passed training and certification in industrial safety, labor protection, fire safety basics in scope necessary to service CPC facilities and was admitted to manage these works. Work team leader is appointed by order (resolution) of relevant company under which authority contractors belong.
1.9	Worker	worker having qualification certificate, subject to availability of examination report (certificate) in labor protection within implementation of professional duties, directly performing work under issued hazardous Permit-to-work
1.10	Work execution plan	document defining persons in charge, order and sequence of performance of work, HSE and fire safety measures, and also steps to ensure safety of CPC oil pipeline system facilities, developed according to requirements of CPC normative documents
1.11	Procedure	A02-OD-HSE-052, Permit-to-Work Procedure for Arrangements of Hot Works, Gas-Hazardous, Excavation, Repair and Other Hazardous Works

5. DESCRIPTION OF HOT WORK PROCESS

5.1. Electric-welding, gas-welding, soldering and other works connected with use of open flame, sparking and heating to temperature capable to cause ignition of materials and constructions set forth in Attachment 6 to Procedure (hereinafter hot work) belong to hot work at CPC hazardous process facilities.

5.2. Carrying out of hot and gas hazardous work at the same time at one facility, building, structure is forbidden.

5.3. Hot work should be carried out only in the daytime (day shift), except for cases of elimination or localization of possible accidents according to the plan of measures on localization and mitigation of consequences of accidents at facility.

5.4. Hot work at CPC operating fire and explosion hazardous process facilities is allowed in exceptional cases when there is no possibility of conducting the work in specially designated areas for this purpose.

5.5. Places of execution of hot work in the territory of hazardous process facility are divided into designated safe hot work areas and temporary ones.

5.6. Designated safe hot work areas are equipped in accordance with project requirement.

5.7. Fire safety measures for the entire period of performance of work are provided in the designated hot work areas.

5.8. The list of designated hot works areas is determined by the Order for the Region.

5.9. The binding of each designated safe zone of hot work to the premises of the object is indicated in the list of safe zones of hot work when performing hot work, also types, quantity of emergency firefighting equipment and person responsible for fire-prevention status of specified places and safe carrying out of hot work are defined.

5.10. Designated safe hot work areas are labeled: "Hot work exclusion zone".

5.11. Places where hot work is performed periodically belong to temporary places and are connected with repair of equipment, pipelines, communications, buildings and constructions, and also with connection to operating communications of constructed facilities.

5.12. Hot work in temporary places is performed under Permit-to-work for execution of hot work, the organization and registration of which is set forth in A02-OD-HSE-052, «Permit-to-work Procedure for arrangements of Hot works, Gas-Hazardous, Excavation, Repair and other hazardous works».

5.13. Persons at least 18 years old that passed medical examination in accordance with the established procedure and do not have conditions preventing to execution of this type of works are allowed to execute hot work at CPC facilities.

5.14. The requirement for CPC and all contractor personnel to be allowed to execute hot work includes availability of basic fire safety training certificate (off-the-job training), examination on labor protection requirements, electrical safety, certification in the field of industrial safety according to assigned functions and duties.

5.15. Training and certification of CPC and contractors' persons in charge appointed by order is carried out according to the Provision on organization of training and examination of workers of companies under supervision of Federal Service for Environmental, Technological and Nuclear

Supervision approved by order of Federal Service for Environmental, Technological and Nuclear Supervision of January 29, 2007 N 37, Standards of fire safety "Fire safety Training of employees of organizations" approved by order of Emercom of Russia of December 12, 2007 No. 645.

5.16. All contractors' officials in charge of organization and performing hot work at CPC facilities shall undergo examination on safety requirements when performing hot, gas hazardous, repair, earth and other hazardous work at CPC facilities.

5.17. Examination is carried out by CPC regional standing commissions.

5.18. Hot work at CPC facilities shall be forbidden/suspended should circumstances or conditions set forth in Attachment 1 hereto occur.

5.19. Preparation of hot works and/or hot work activities can be suspended by representatives of state supervisory authorities, CPC persons in charge, including employee's interventions to suspend works in case of revealing dangerous actions or working conditions, violation of actions specified in Permit-to-work, violation of corresponding Rules, CPC approved instructions, normative and technical documents concerning this type of works.

6. SAFETY REQUIREMENTS TO HOT WORK ACTIVITIES

6.1. Hot Permit-to-work Issue

6.1.1. Hot work at CPC explosion and fire hazardous facilities can be carried out only subject to Permission of the set form and Permit-to-work being available.

6.1.2. The list of persons responsible for arrangement and performance of hazardous work at CPC facilities is set forth in section 10 of A02-OD-HSE-052, «Permit-to-work Procedure for arrangements of Hot works, Gas-Hazardous, Excavation, Repair and other hazardous works».

6.1.3. Permit-to-work to perform hot work at CPC facilities is made out according to Attachment 2 to A02-OD-HSE-052, «Permit-to-work Procedure for arrangements of Hot works, Gas-Hazardous, Excavation, Repair and other hazardous works».

6.1.4. Making "Hot work" Permission and other Permissions set forth in Attachment 14 to A02-OD-HSE-052, «Permit-to-work Procedure for arrangements of Hot works, Gas-Hazardous, Excavation, Repair and other hazardous works» depending on a type of the performed works is obligatory.

6.1.5. Stage-by-stage scheme of Permit-to-works making is set forth in Attachment 1 to A02-OD-HSE-052, «Permit-to-work Procedure for arrangements of Hot works, Gas-Hazardous, Excavation, Repair and other hazardous works».

6.2. Hot Work Preparation

6.2.1. Work preparation includes all types of work related to preparation of equipment, supply lines and structures for hot work performance, as well as minimization of influence of risks while performing hot work at CPC explosion and fire hazardous facility.

6.2.2. Preparation of facility for hot work is performed by CPC operations employees and, in cases provided by Permit-to-work, contractor employees being guided by Contractor and Customer persons in charge for work preparation.

6.2.3. During the preparation for hot work, the site manager, together with the head of the working group responsible for the preparation and execution of these works, determine the danger zone, the boundaries of which are indicated.

6.2.4. Weld, cutting, heating areas are marked by chalk, paint, label or other clearly visible identification marks.

6.2.5. Devices, machines, vessels, pipelines and other equipment subject to hot work shall be shut down, cleared from hazardous products, isolated from operating equipment, piping and supply lines using standard end caps as per chart attached to Permit-to-work and prepared for hot work

6.2.6. Safety measures should be stated and implemented prior to work commencement according to "Lock out. Tag out" Permission.

6.2.7. Installation and removal of end caps should be registered in caps installation/removal log indicating their numbers and positions on end cap installation chart attached to Hot Permit-to-work.

6.2.8. Electric drives of moving mechanisms of devices, machines and other equipment in hot work zone should be switched-off from power sources, disconnected from these mechanisms by a visible gap. The tags "DO NOT OPERATE – WORK IS IN PROGRESS!" and locks which are removed upon termination of work by instructions of person in charge of hot work should be hung out on starting devices.

6.2.9. Disconnection (connection) of electric drive from (to) power source is carried out by authorized operations electrical personnel only.

6.2.10. Platforms, metalwork, constructive elements of buildings in hot work zone should be cleared of fire and explosion hazardous products (dust, tar, combustible liquids and materials). In case of welding works scaffolds, staging, equipment etc. shall be covered with fireproof materials. The use of asbestos at CPC facilities is forbidden.

6.2.11. If combustible materials are present in specified zone they should be protected from ignition by screens made of non-combustible materials.

6.2.12. It is necessary to check tightness of sewerage hatches within 7-meter radius zone from the place of hot work. Lids should be filled up with at least 10 cm layer of sand in steel or concrete ring.

6.2.13. When doing hot work indoors it is necessary to provide measures of protection from sparks scattering and penetration into floor openings, as well as in trays and pits where the remains of combustible liquids, vapors and gases can accumulate.

6.2.14. Indoors in hot work zone, it is necessary to ensure uninterrupted operation of ventilation (input and output) and natural airing by opening of doors and windows.

6.2.15. Indoors in hot work zone, it is necessary to provide measures to prevent penetration of sparks in output ventilation systems.

6.2.16. Drainage ditches and other devices connected with sewage, systems where combustible gases and vapors can be available, should be sealed.

6.2.17. Place of hot work should be provided with fire extinguisher and other emergency firefighting equipment, as well as fire watch, if set forth so in Hot Permit-to-work.

6.2.18. When planning hot work in tanks and wells, it is necessary to perform preparatory work with the issue of gas hazardous Permit-to-work and Permission to work in confined space.

6.2.19. Before hot work in a confined space, it is necessary to fully open the hatches and provide adequate ventilation to ensure air balance in the hot working area.

6.3. Ensuring safety during hot work

6.3.1. It is allowed to start hot work only after execution of all preparatory activities and measures - to ensure fire safety at work site - set forth in hot Permit-to-work, as well as in Permit.

6.3.2. Before hot work, it is necessary to conduct pre-work medical assessment (ask each worker about his/her condition).

6.3.3. It is not allowed to change content of hot work set forth in hot Permit-to-work.

6.3.4. It is not allowed to perform simultaneously hot work and gas work in one premise or close to one another in open area in case of potential emissions of explosion and fire hazardous substances into the working area.

6.3.5. It is necessary to perform air monitoring before starting hot work, after the breaks, on the demand of Workers as well as during hot work, at least once an hour at the hot work site.

6.3.6. Air monitoring should be performed in compliance with requirements of Instruction No 104 Arrangement of Air Monitoring at CPC Facilities.

6.3.7. Frequency of air monitoring should be in compliance with Hot Permit-to-work.

6.3.8. If hazardous substances during hot work exceed the maximum permissible explosive concentration (gas content), hot work shall be instantly discontinued and resumed only after the cause of gas contamination is found and eliminated.

6.3.9. Resume hot work when hazardous substances are absent in the ambient air of hot work or do not exceed maximum permissible concentration level that should be confirmed by atmospheric test.

6.3.10. When concentration level of hazardous substances in the hot work area exceeds maximum permissible concentration, hot work should be suspended. Subsequent work should be performed using respiratory protective devices and under constant control of ambient air.

6.3.11. While performing hot work in confined spaces it is required to ensure air monitoring at least once per half an hour.

6.3.12. Hot work in confined spaces is permitted only when concentration of hazardous substances does not exceed maximum permissible explosive concentration.

6.3.13. To perform hot work inside tank (apparatus) gas Permit-to-work should be issued additionally to hot Permit-to-work in compliance with Instruction # 104 (registered numbers of Permit-to-works should be specified in hot and gas Permit-to-works).

6.3.14. Hot work inside tanks (apparatuses) should be performed with fully open hatches and forced ventilation ensuring normal air balance in the hot work area.

6.3.15. In course of the whole process of hot work, the workers involved therein shall take measures to prevent emissions of hazardous substances into the ambient air including explosive and fire hazardous (vapors, gases).

6.3.16. It is not allowed to open hatches and covers of devices containing hazardous substances,

carry out any technical operations related to discharging, recharging and drain of products, loading via open hatches, as well as other operations that may result into gas and dust pollution of hot work areas.

6.3.17. Persons not engaged in work are not allowed in hot work area.

6.3.18. After completion of the hot work, the team leader should organize the cleaning of workplaces.

6.3.19. Tools, stock, materials should be removed from the place of hot work and the workers who completed hot work should move out.

6.3.20. Hot Permit-to-work should be closed according to Procedure and Attachment No. 1 to A02-OD-HSE-052, Permit-to-Work Procedure for Arrangements of Hot Works, Gas-Hazardous, Excavation, Repair and Other Hazardous Works.

6.3.21. The team leader should inform the site manager of the completion of the hot work.

6.3.22. After the end of hot work the team leader, together with site manager, check hot work area in order to rule out possibility of ignition.

6.3.23. The site manager ensures control (supervision) over the point of potential fire break-out for three hours by facility operating personnel.

6.3.24. The works may be suspended by employees, both participating in the work process and observing it, who have used the Stop Work authority if such work is performed, in their opinion, in unsafe conditions or in unsafe manner and there is a danger to personnel, equipment or the environment.

6.3.25. The works should be continued only after the revealed violations are eliminated. These observations should be recorded.

6.4. Safety requirements in emergency situations

6.4.1. In case of emergency or circumstances threatening the safety of employees, the work should be immediately stopped and all employees should act in accordance with the Plan of measures for localization and liquidation of consequences of accidents at the facility where the work is being done.

6.4.2. The team leader must immediately report the emergency situation to the site manager and the shift supervisor.

6.4.3. The team leader is not entitled to resume work until the emergency situation has been eliminated, and unless an agreement has been received to continue the work from the site manager.

7. LIST OF ATTACHMENTS

List of attachments to the procedure is set forth in Table 3

Table 1. List of attachments

Attachment	Description
1.	HOT WORK PERFORMANCE CONDITIONS AT CPC FACILITIES
2.	LIST OF REGISTRATION OF CHANGES

ATTACHMENT 1 CONDITIONS FOR HOT WORK PERFORMANCE AT CPC FACILITIES

CONDITIONS FOR HOT WORK PERFORMANCE AT CPC FACILITIES

1. The following main preparatory work should be done prior to the hot work commencement at CPC facilities:
 - ensure risk assessment for the scope of planned work and actions to exclude or minimize their impact when carrying out hot works;
 - arrange atmospheric testing;
 - enclose work site by warning or protective fence installing caution signs;
 - remove from the work site highly combustible, fire-hazardous materials and substances within at least 8 m. If it is not possible to remove the materials being the part of process equipment from the work site, apply protective screens made of fireproof material;
 - ensure first-aid kit and firefighting primary equipment is available at the work site (scope depends on the work type with possibility of reference to apply firefighting primary equipment located near the work site);
 - check operability of equipment and tools;
 - make sure personnel have permits, work approvals, certificates on occupational safety and Fire Safety Basics and electrical safety certificates;
 - establish a two-way communication with OCC dispatcher and PS shift supervisor;
 - carry out briefing on the work being done and safe methods of hot work performance;
 - check availability and operability of personal protective equipment, tools, devices and other appliances ensuring workers' safety;
 - ground the equipment and devices planned to be used during execution of works;
 - check crew members' mobile phones are switched off;
2. If any of the following circumstances or conditions arise, it is forbidden at CPC facilities to:
 - start hot works before Permit-to-work is approved and available at the work site;
 - employ women as gas welders or manual electrical welders in case of performing work in confined locations (tanks, boilers etc.);
 - start work with faulty equipment and tools;
 - perform simultaneous gas and electric welding inside an apparatus, vessel, tank, well etc.;
 - perform hot work on newly painted structures and items;
 - use coveralls and gloves stained with oils, fats, petrol, kerosene and other inflammable liquids;
 - move with a burning torch outside the working place;
 - allow contact of electric cables with compressed, liquefied and dissolved-under-pressure gas bottles;
 - connect welding cables by twisting;
 - worker during a break leave a live electric holder, electric tools at the working place;
 - bend and break welding hoses, cables;
 - perform work on the devices and supply lines filled with combustible and toxic substances, as well as those under pressure and energized;

- perform concurrent hot work during arrangement of water and vapor proofing on the roof, installation of panels with combustible and fire-retardant heat insulators, gluing of flooring and finishing of premises with inflammable varnishes, glues, mastics and other combustible materials;
- lay welding cables within less than 0.5m from gas welding hoses and pipelines and 1 m from pipelines with acetylene and other combustible gases;
- allow independent activities of trainees and workers who do not have qualification certificate, fire safety ticket (for welder), electrical safety group 2 at least (when working with electrical tools), off-the-job fire safety basics certificate;
- warm metal by a torch using only acetylene without oxygen in order to prevent poisoning with carbon oxide and formation of an explosive gas/air mixture;
- use non-insulated cables;
- use metal structures of buildings, process equipment, sanitary and technical network pipes (water pipe, gas pipe etc.) as a grounding network return circuit;
- perform electric welding in the open air during rain, snowfall without use of special shelters;
- open hatches and covers of devices, unload, transship and drain products, load via open hatches, as well as perform other operations that may result in fire and explosions due to gas and dust pollution of hot work locations.

The above list is not complete and additional requirements forbidding hot work at CPC facilities may be submitted to Workers, depending on local conditions, type or nature of work to be performed.

3. Hot work shall be discontinued and Permit-to-work suspended, if any of the following circumstances arise:

- adverse/hazardous conditions (leak, faulty operation etc.);
- performance of other (not agreed) maintenance, repair and/or project activities in the given area or section;
- lack of reliable radio (telephone) communications with the OCC dispatcher / contractor's dispatcher (if any), PS shift supervisor;
- Directly on the oil pipeline when pressure therein exceeds the values indicated in VRD 61.10.2015 "Regulations for Replacement of Defective Sections, Connecting Parts, Pipeline Fittings of CPC Oil Pipeline System", VRD 09.09.2014 "CPC Oil Pipeline System Operation Rules";
- exceeding concentration of harmful substances in the working area;
- change of labor conditions in the working area;

4. Before resuming work, it is necessary to repeat inspection of the work site, perform gas analysis of the air and make sure that it is safe to continue hot work.

5. In case work is discontinued for lunch or any reason, other than emergency, Permit-to-work remains valid if the following conditions are observed:

- Requirements set forth in Permit-to-work remain unchanged;
- List of workers in Permit-to-work reflects actual current status;
- Results of a repeat gas analysis show safe conditions to continue hot work.

6. In case of infringement of safe working conditions, emergence of hazard (leak, spill of hazardous products, faulty operation or other deficiencies within the working zone of equipment or systems) posing a threat for workers, Permit-to-work shall be immediately suspended and work may be resumed subject to safe working conditions restoration.