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УДК 631.1.004.18:636.22/28

MEASURES TO ENSURE SAFETY WHEN USING BIOGAS AND INSTALLATION OF BIOGAS PLANT

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Unfortunately, serious accidents also occur in the biogas industry. The biogas plant has become very popular today. But with the increase in demand for biogas plants, the number of accidents, respectively, also increased. The reason for this, most likely, lies not only in the neglect of safety precautions, but also in the lack of understanding that work is carried out with a combustible gas that is highly flammable. Proceeding from this, the main requirements for safety engineering today in biogas production have been somewhat constrained [1, 2].

When operating equipment for biogas production and its use, it is necessary to take into account the explosiveness of methane. The danger of explosion occurs when mixing methane with air in a ratio of 5 to 15% by volume. Therefore, the safety measures necessary to prevent fire and explosion must be strictly observed at the methane production plant and in the surrounding area [1, 2].

Gas tanks must be placed in sufficient capacity. distances from residential buildings, warehouses and public roads. The minimum

allowable distances are: from houses with soft roofs – 10 m; from houses with a hard roof – 5 m.

It is forbidden to smoke and light a fire near gas tanks (within a radius of 10 m). Special plates with the appropriate inscriptions are installed. Regularly check the water level in the tank of the cylindrical gas holder. In winter, it is necessary to prevent the formation of ice crust. Repairs to tanks and pipelines should only be carried out by specialists (equipment manufacturer's organization), which is especially important for all work performed with open flames and welding on gasholders and pipelines. space includes tightness of gas pipelines and ventilation of pressure reducing valves with air outlet, removal of air from gas pipelines by passing gas through them before its use [3]. Installation of fire extinguishers on gas pipelines passing nearby gas combustion plants. Provision of adequate ventilation in the area of gas pipelines Equipment of a ventilation opening under the ceiling of the room for gas outlet, the density of which is less than the air density. equipment at the lower end of the water separator line (biogas contains water vapor). Removal of all potential sources of sparking from the BSU zone and gas pipelines. Installation of a fire extinguisher in the place of gas storage. Gas storage tanks intended for charging cylinders, pressure of 170 kg/ cm² must be calculated.

Safety measures in the manufacture and installation of a methane tank of a biogas plant [4, 5].

a) During machining by cutting and grinding power tools. Type of danger: danger of electric shock; trauma with cutting metal (shavings); high content of abrasive dust in the air (when grinding); possibility of electric shock, burns. Safety measures: the metal case of the electric tool needs to be grounded; work with power tools in dielectric galoshes and gloves; work with the use of personal protective equipment (goggles, hat, respirator); do not check the roughness of the workpiece to the touch; sweep shavings and abrasive dust with a brush.

b) Welding. Type of danger: air pollution of the working area by welding aerosol; possibility of electric shock, burns, cuts. Safety measures: all connections of acetylene generators, pipelines, hoses, etc. must be sealed; the welder and improvised must be provided with individual means of protection: a mask with a light filter, tarpaulin protective clothing and footwear; the workplace must be equipped with regular dielectric boots, mat, gloves.

c) Painting.

Type of danger: severe air pollution by toxic fumes and gases (aerosol and solvent vapors). Safety measures: work in overalls (gloves, respirator and goggles); Participants in the production of painting works must be provided with fire extinguishing equipment.

d) Installing using lifting and transport equipment. Safety measures: work with the use of personal protective equipment (helmet, safety rope); to appoint a person responsible for the production of works; crane operators and slingers must have an appropriate permit for the production of works, hoisting and transport machines must be inspected.

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УДК 331:502.45

АНАЛІЗ НЕБЕЗПЕК ВТОРИННОГО ВИКОРИСТАННЯ ВІДПРАЦЬОВАНИХ ЛІ-ІОН АКУМУЛЯТОРНИХ БАТАРЕЙ ЕЛЕКТРОМОБІЛІВ

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Літій-іонні акумулятори завдяки своїм унікальним характеристикам знайшли широке застосування як у електронних пристроях, так і в потужних енергетичних тягових й накопичувальних системах. Про це свідчить зростання рівня використання літій-іонних акумуляторних батарей, що збільшився у вісім разів за період з 2010