CLEANING OF OIL FIELD EQUIPMENT FROM RADIATION-DANGEROUS DREGS

A.ZH. TULEUSHEV, V.N. GLUCHSHENKO, A.N. POLESHKO
Institute of Nuclear Physics of the National Nuclear Center of the Republic of Kazakhstan (INP NNC RK), vik@inp.kz

Radiation safety providing problem is very urgent in Kazakhstan in connection with natural radionuclides accumulation in human environment due to hydrocarbon raw materials mining. Problem scale can be estimated on the basis of the fact that for example only at Zhetybay oil field in Mangystau region at present time 6 millions pump-and compressor pipes (PCP) with 600 thousands tones total weight are accumulated each of which fall under ionizing radiation source definition in compliance with radiation standards. Quite often the method of this problem solution is unsystematic burial or warehousing of contaminated materials (equipment) on spontaneous dumps what leads to creation of uncontrolled territory radioactive contamination seats.

Institute of nuclear physics NNC RK in common with kazakh-czech company "Asia-Clean" in course of several years carry out work package for development of effective and ecologically safe technology of oil field equipment cleaning from radiation dangerous dregs and accumulated wastes utilization.

The basis of used technology is certain type of work solutions used in special technological

plants by means of which the contaminated and radioactive surfaces absolute cleaning and decontamination is executed.

As a result of executed processing PCP become absolutely free from excess radioactivity, operating characteristics of cleaned pipes majority conform to requirements producible to work PCP what allow returning earlier hopelessly lost inventory holdings into production. Subject to the fact that pipes kept during 15-25 years outdoor conditions were cleaned, we have all grounds to suppose that due to opportune cleaning the number of returning into production pipes could reach 80-90% from their total number.

As a result of experimental-laboratory tests conclusions that current technology allows to absolutely surely practically 100% remove surface radioactivity contamination caused by technological radio nuclides fallouts were drawn.

Foregoing technology practical use is executed by creation and operation of chemical-technologic complex for cleaning and radioactivity removal. Approximate cost of creation and installation of proposed complex is 7.35 million euro with payback in the course of several months of its operation.

Characteristics of the main stationary module:

- possibility of cleaning and decontamination up to 500 tones of PCP-73 type pipes per day;
- service by 8-10 workers, semiautomatic; built-up area including delivery and shipping lines is equal 50x120 m;
- technical flow quantity is 3-5 m^3 per day;
- complex equipped by air-conditioning system (15-25^{0}C);
- implementation: stainless steel and plastic, including all sanitary equipment;
- packaging arrangement contains chemical mini-laboratory including dosimetry control;
- complex operation life is 10-15 years.