MODERNIZATION OF THE CAT CRACKER IN THE GK-3 COMPLEX.
SECOND STAGE

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Reconstruction of the reactor unit (RU) on the cat cracker in the GK-3 complex at Angarsk Refinery is being carried out in three stages. The first* was conducted in 1993-1994, the second in 1998 - 1999, and the third stage will be executed in 2000 – 2001.

The following technical measures were implemented in the second stage:

in the reactor
- the feedstock nozzles were replaced by high-efficiency nozzles equipped with a chamber for preliminary dispersion of the feedstock and a Venturi nozzle with a slit distributing tip;
- the two-stage cyclones were replaced by highly efficient one-stage cyclones with erosion-resistant lining;
- the tubular steam distributor was replaced by an improved, more mechanically reliable unit with more uniform distribution of steam;
- in the stripping section: the bubble tube sheet was replaced by a circular steam distributor; to separate the stripping zone from the spent catalyst capture zone, a compact cylindrical chamber with a circular steam distributor inside to regulate the density of the catalyst entering the conveyor line was mounted around the special central valve;
- a new conveyor line lined inside with erosion-resistant concrete on an ironclad screen 25 mm thick was installed and a device for uniform distribution of spent catalyst in the fluidized bed of the regenerator was mounted at its end;

in the regenerator
- the sectioning grid was taken down;
- a new air distributor was installed, consisting of a tubular eight-section distributor and a circular distributor in the conical lower zone of the fluidized bed;
- several bands of modern single-layer lining coating were applied on the inner surface of the housing;
- the external cyclones for preventing erosion wear of the individual sections were modernized.
A skeleton diagram of the RU after reconstruction is shown in Fig. 1. The technical essence of the work done in the second stage of reconstruction is substantiated and stated below.

The feedstock and sludge input system in the reactor comprises twelve nozzles uniformly positioned over the perimeter of the body and directed along the radius to its center. The previous nozzles were the of swirl type. They were equipped with swirlers and a mobile rod for regulating the clearance between the nozzle tip opening and the conical tip of the rod.

As experience in using these nozzles, especially those used for introducing the sludge, showed, the tips of

Fig. 1. Diagram of the reactor-regenerator unit after reconstruction: 1) reactor; 2) sectioning grid; 3) feedstock (sludge) nozzle; 4) horizontal partition; 5) stripping section; 6) circular steam distributor; 7) tubular steam distributor; 8) cyclone; 9) pressure riser; 10) conveyor line; 11) catalyst distribution mechanism; 12) regenerator; 13) tubular air distributor; 14) circular air distributor; I) feedstock (sludge); II) steam; III) air; IV) cracking products; V) stack gases.

their body and the rod were subject to erosion wear. Strong wear of the regulator valve stems on the pressure risers positioned opposite the nozzles was noted. The steam-liquid stream at the outlet from nozzles of this type assumed the shape of a hollow cone, and the feedstock was not uniformly distributed in the fluidized bed of the