

Повышенная сложность, «НЕФТЕГАЗ»

PIGGING DEVICES AND PIG LAUNCHING/RECEIVING FACILITIES

Pipeline pigs come in a wide variety of sizes and designs. Pigs are inserted into the pipeline while it is operational and are carried along by the fluid being pumped. Because they are solid devices constructed of various materials including metal, plastics, and rubber derivatives, pigs must be removed before reaching the next pump. Typically, pig traps, launchers, and recovery facilities are colocated with pump stations. Pigs are designed to perform a wide array of functions. Their basic purpose is threefold: (1) provide a way to clean debris and scale from the inside of the pipe, (2) inspect or monitor the condition of the pipe, (3) or act as a plug or seal to separate products in multi-product commercial pipelines or to isolate a segment for repair without depressurizing the remainder of the pipeline. Pigs designed to clean the pipe can use mechanical means (often called scraper pigs) or chemicals. Pigs that monitor the condition of the pipe are categorized as in-line inspection tools. Monitoring pigs, also sometimes called “instrument pigs” or “smart pigs,” can perform a wide variety of functions. Geometry pigs check for deformation of the pipe (which can greatly influence throughput efficiencies, but can also be an early indicator of significant problems that could compromise pipeline integrity).

Pipeline curvature, temperature and pressure profiles, bend measurements, corrosion detection, crack detection, leak detection, and product sampling represent some of the other major functions performed by smart pigs. Magnetic flux leakage and ultrasonic technologies are employed for some of these inspections. Another type of pig recently developed is the gel pig. As the name implies, gel pigs consist of a series of gelled liquids that are introduced for a variety of purposes, including serving as a separator between products in a multi-product pipeline, collecting debris (especially after initial construction or repairs that involved opening the pipeline, and dewatering the pipeline.