

## **Ejecting valve**

### **Executive Summary**

**Project Subject:** Ejecting valve for solid separation systems of FCC reactors

**Industry:** Petrochemistry

**Project Status:** Pre-seed

**Technology and Product Description:** Main catalytic processes in petroleum refining and petrochemistry are performed in fluidized bed reactors with continuous return of a solid catalyst. Required efficiency of the catalyst separation is 99.99%, and it is achieved with application of 2-3 cyclones in series. The separated solid particles are falling down to the catalyst layer through vertical submerged tubes - standpipes.

The subject of the proposed project is development of a special ejecting valve which is fixed on the standpipe over the catalyst level and ensures a stable negative pressure head which is not dependent on pressure fluctuations in the reactor. The ejecting effect is provided with air or steam from outside sources, e.g. from the existing air or steam pipelines. The necessary flow rate of air or steam is negligent as compared to usual gas flow rate through the separation system.

The advantages of the new discharge system are as follows:

- Discharge of solid from the cyclones does not depend on the state of the catalyst layer or the pressure fluctuations inside the reactor
- Loss of smallest fraction of catalyst particles as a result of pressure instability is reduced
- The ejector can be used for modernization of existing solid separation systems
- Patenting of the technology is possible.

**Market Opportunity:** A significant reduction of carrying out of the smallest fraction of catalyst and increase of yield by 0.3-0.4 % in a typical FCC installation (1000 thousand ton per year) will save about \$ 400,000 per year.

**Target markets:** Reactors with suspended catalyst - fluidized bed reactors or reactors-raisers - are currently usual types of equipment for catalytic cracking and other catalytic processes in petroleum refining and petrochemistry. Several thousands of such reactors are used in oil industry. Along with oil industry, a wide market for the new device is chemical industry, industry of building materials, etc.