Process protection evaluation and intelligent prevention and control technology of atmospheric tower system based on flow corrosion prediction

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Abstract: Petrochemical industry is the pillar industry of modern industry in China. As the leading device of petroleum refining industry, the equipment integrity of atmospheric distillation unit is of great significance to the safe and stable operation of subsequent process. China's crude oil resources are in short supply, and crude oil imports are large. The processing of low-quality crude oil such as high sulfur, high nitrogen, high acid and chlorine has become the development trend of the industry. As the first production process in the petroleum refining process, the atmospheric and vacuum distillation unit is affected by the processing of inferior crude oil, and the corrosion failure cases in the unit are frequent, which affects the economic benefits and the life safety of the production personnel. The types of corrosion failure in the atmospheric tower are complex, and it is difficult to form an effective corrosion prediction method. For the corrosion mechanism of the low temperature part of the atmospheric tower top system, such as the prediction and protection of ammonium salt corrosion and dew point corrosion, it has become the focus of research. In this paper, the risk prediction and corrosion mechanism of ammonium salt corrosion and dew point corrosion at the top of atmospheric tower are studied. The failure evolution law based on flow corrosion and the corrosion protection measures and intelligent prevention and control measures of the overhead system of atmospheric tower are introduced. The diagnosis process and prevention and control measures for identifying the risk of flow corrosion are proposed. It provides theoretical guidance for the study of crystallization corrosion mechanism and dew point corrosion mechanism of low temperature ammonium salt at the top of atmospheric tower and the prediction of intelligent corrosion protection.

Keywords: Atmospheric distillation column, Atmospheric top low temperature system, Flow corrosion, Crystallization corrosion, Dew point corrosion, Intelligent corrosion Protection control