

AIR PROTECTION - SUSTAINABLE DEVELOPMENT PRINCIPLES IN THE PETROLEUM INDUSTRY

Z. Spiric

INA-Naftaplin, Environmental Protection Department, Zagreb, Croatia

Natural gas from Croatian Podravina gas fields, beside other impurities, contains hydrogen sulfide and mercaptans, which have to be (safely, timely and efficiently) removed in order to protect human health and the environment and to meet the sales gas specifications. In addition, removed impurities (as well as sulfur) need to be treated and disposed in a safe and economic way without any harmful influences to the environment. The problem of sulfur purification/removal of hydrocarbon raw material is one of the most complicated problems of development of oil and oil-gas deposits. This problem is equally important from the point of view of hydrocarbon raw material quality, internal energy consumption, as well as from the safety and ecological point of view. Namely, to protect human health and the environment as well as the processing plants/gas transmission system during the exploration, production/ treatment of natural gas, and to secure the quality of gas for sale, hydrogen sulfide must be removed from natural gas. Gas treatment plant GTP Molve III was put into operation in 1993. and the facility is designed for treatment of 5×10^6 m³/day of sour gas. Hydrogen sulfide is separated and converted to ecologically harmless elemental sulfur by catalytic oxidation and desulfurizing in the LO-CAT unit in INA's state-of-the-art gas treatment plant. Wet sulphur cake is the product of Lo-CAT process where conversion of hydrogen sulfide into elementary sulfur is done. It turned out that with the air being almost fully protected against H₂S pollution the problem arose of material discharge and of its reuse as a secondary raw material in other technological processes (about 400 tons of material per year). By a joint effort of Croatian scientist and INA-Naftaplin's experts the technologically optimal and very acceptable economic, and simultaneously significant ecological solution has been found according to which the elemental sulfur (sulfur slurry) is transported to petrochemical industry. Elemental sulfur is used in the technological processes as raw material for sulfuric acid production, which is a raw material in the technological process of mineral fertilizer production. Upgrading the GTP Molve III processing plant with sulfur removal system and the dry sulfur production unit is in the harmony with the new tendencies towards clean energy production and resource management and would provide the means for realization of sustainable development principles in the petroleum industry.