An overview on the activities of Razi Petrochemical company Research Center in 1393 (2014-2015)

Ongoing projects

1. The technical and economic studies on the ammonium nitrate fertilizer production:

The raw material needed to produce this substance is ammonia fertilizer. The Nitric acid must be produced in accordance with the following reaction:

 $\mathsf{NH3} + \mathsf{2} \ \mathsf{O2} \xrightarrow{} \mathsf{HNO3} + \mathsf{H2O}$

Then with the combination of nitric acid and ammonia, ammonium nitrate is produced. NH3 (g) + HNO3 (I) \rightarrow NH4NO3 (I)

The project will examine the feasibility of the construction of the two plants.

The project is in the process of reviewing the report submitted by the presenter. Contractor: CFIt Co.

2- Technical and economical evaluation of using higher dosage of domestic phosphate rock with foreign soil for producing Phosphoric Acid in Arya Phosphoric plant:

The goal of this project is the investigation the possibility of usage greater dosage of domestic phosphate rock (Chador Maloo) with foreign phosphate soil. The project is in the lab test stage. Advisor: Ahvaz University of Oil industry

3- -Developing technical knowledge of producing sulfuric acid resistant cast iron parts and making an elbow on the Acid Sulfuric plant circulation pump outlet.

Since the parts which were made by domestic sources were not resistant enough against Sulfuric acid, this project were defined to develop the knowledge of making such parts with higher resistancy against Sulfuric acid in different temperature.

The project is in the stage of testing the submitted pump casing by the contractor. Contractor: Energy and Kar Sepahan Co.

4- Determining a suitable formulation for making O-rings used in M.I.S sour gas pipe line

The goal of this project is to supply suitable diaphragms with adequate material which can be used in a place with more than 200° C. in M.I.S water absorption's plant heaters. In this way some diaphragm and O-rings are made and delivered to the plant and installed in POV#5.

Contractor: N.I.O.C Institute of Polymer science

Finalized Projects:

1- Making non-metallic bucket elevator for Urea plant:

With the aim of reducing Urea plant elevator load, making non-metallic bucket elevator project contract was signed. Bucket made of non-metallic had 1/4 of metal weight and successfully passed the

performance tests in plant operating conditions for 3 months. Thus, it was decided to replace this kind of buckets instead of metallic ones in future purchases.

Contractor: Pars Mehr Ara Sepahan Co.

2- Investigation on the effect of pressure reduction of the M.I.s Jurassic gas wells on the complex feed gas:

This project was defined and signed with the contractor with the aim of determining periodical possible recovery from Masjed Soleiman Jurassic gas wells, also determination of scenarios that may occur in this period ,such as increasing gas liquids and how it affects the amount of available gas for the company considering studies and forecasts made by the N.I.O.C and investigating the possibility of removing some restrictions on the gas flow from the wells to the output of the gas treatment plants.

Contractor: Abadan Oil University

Under contract projects:

1-Technical and economic study of the construction of desalination unit

Due to the reduction in rainfall in the country and lack of fresh water in Khuzestan the establishment of a desalination unit to produce sweet water with the same Karun River water characteristics can help when deciding about this issue. The capacity of this unit would be 45000 MT/d.

2- Study of the effect of a comprehensive nutrition education program on lipid and Glysymy control profile of Razi Petrochemical Co. staff with hyperlipidemia

According to the information gathered by the medical center, the most important metabolic disease is dyslipidemia. The results of this project can help to control and reduce the effects of the death results from cardiovascular diseases.

3- Determination a suitable index for the sour gas pipe line corrosion inhibitor

Currently there is not a specific chemical index for evaluation of sour gas pipe line corrosion inhibitor and just some corrosion test are being made to investigate characteristics of inhibitors.

The aim of this project is to attain suitable chemical index for this purpose.

R&D most important activities

- 1- Power plants cooling towers blow down measurement:
- 2- Reduction of Sulfur dust by using polymeric meshes
- 3- Measuring the concentration of dissolved oxygen in water (ppb)
- 4- Measurement of carbon iodine number in gas treating unit carbon actives
- 5- Measurement of band amine in all amines used in the company (DEA, mDEA, MEA)
- 6- Investigation of the causes of corrosion of the sulfuric acid tank (TK3) and analysis of sediment formed at the bottom of the tank
- 7- Investigation of the Semnan Energy Company proposed corrosion inhibitor flash point and flammability assessment for sour gas pipelines and their effect on non-metallic materials such as O-rings used in M.I.S pipe line.

- 8- Measuring the amount of heat resistant salts available in consumable Amines in the company such as MEA, DEA & MDEA
- 9- Measuring the DEA , aMDEA and Cations in Ammonia plant (No. 3) cooling towers.