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OMV Petrom Training
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CHAPTER 1

OMV Petrom

1.1 Introduction

OMV Petrom is the largest oil and gas group in Southeastern Europe. Upstream, Downstream Gas and Downstream Oil are the business segments that petrom is interested in. In Romania, OMV Petrom is the principal crude oil producer. It also supplies almost half of the internal gas production. For its maintainable growth, it has enlarged the gas value chain into power and operates the 860 MW gas fired power plant at Brazi. OMV Petrom processes crude with a refining capacity of 4.5 mn tons/year in Petrobrazi refinery, near Ploiesti. processes crude with a refining capacity of 4.5 mn tons/year in Petrobrazi refinery, near Ploiesti. OMV Petrom is available in the different distribution market for oil products like Romania, the Republic of Moldova, Bulgaria and Serbia through a system of roughly 780 filling stations, operated under two brands, Petrom and OMV. OMV Petrom is resolved to keep up and fortify a position of a vital energy player in the region, guarantying its long haul development, concentrating on circumstances that Romania still offers while improving client experience and building up its portfolio through territorial extension. OMV Petrom focuses on securing future energy supply for the present and for the future.

1.2 Safety Induction

Before starting the visits, an HSSE, health, safety, security and environment presentation was given to ensure proper and safe actions. The presentation included the HSSE's eight golden rules which are to ask when in doubt, identify hazards and evaluate risks, work permit, wear

harness at heights higher than 1.8m, stop work in case of unsafe situations, loads should be lifted by authorized people, perform regular cleaning and transport safely. It also included the types of hazards: the first due to an unsafe action and the second due to an unsafe condition. Moreover, risk assessment was mentioned in order to apply protective measures. Risk assessment includes hazards identification, risk assessment, and control measure establishment. The presentation also went through the dangerous chemicals and the three different ways in which they can penetrate into the human body. Their penetration could be through ingestion, inhalation or absorption. Detonation and deflagration, the two different types of explosion were defined. Additionally, it included electrical hazards, working in closed spaces and the fire triangle that includes oxygen, heat and fuel for fire to occur.

1.3 Targoviste and Moreni Visit

Visits to Targoviste tubular base and Moreni pump unit were scheduled on July 17, 2018. First, Targoviste visit objective was to different drilling pipes with different dimensions, raw materials, plastic drill pipe protector. Targoviste's tubular base, second visit, explained how retrieved from the well, how they come from the well and undergo inspection to check if they can be used again. It also explained the fillet's role that is joining equipment inside the packer, parts of the well head that did not pass the inspection test, and parts that did and can be used further. Also, electromagnetic inspection which is for cracks detection was shown. Following Targoviste tubular base visit, a visit to Moreni pump unit was held. Its aim was to understand how pumps work and to see the different parts of the pumps such as the cylinder being the fixed part and the piston being the mobile part. Depending on the properties of the fluid, the equipment and the well in terms of casing diameter and tubing there will be a specific pump to be used.

Measurements of the time it takes the piston to go through the pipe and the external diameter of the piston were taken. Then, the different parts of pump were put together ensuring proper handling to prevent leakage. The presence of leakages prevents the oil from arriving to the surface and results in losses in money, electricity and equipment. Grease is put on the fillet in order to enhance the assembly. Moreover, an explanation to the four different types of extracting oil that OMV Petrom uses was given. The four could be listed as the classical unit pump, progressive cavity pump, linear rod pump, and electrical submersible pump.

1.4 Dealu Batran and Gura Ocnitei Visit

Visits to Dealu Batran and Gura Ocnitei were scheduled on July 18, 2018. Steam injection high pressure generators were well explained. The sucker rod pump, the most common pumping unit, used in petrom was shown. The objective of having continuous steam injection well is to produce high pressure saturated steam which can be injected into the well to reduce oil's viscosity and enhance its flow upwards. This enhanced oil recovery method is a thermal recovery. This method uses high pressure and high temperature of 60 bars and 200°C, respectively. As soon as oil reaches the surface, it flows into manifold, where the oil flowing from each well gathers. Afterwards, it goes into a mobile calibration skid, which is a two phase separator that separates liquid from gas. Each well is tested periodically every 24 hours.

Moreover, a linear rod pump was shown. Linear rod pump (LRP) is batch, not continuous, and is used for smaller flow rates, more production. LRP was used because the well was shallow, 300-400 m yet producing good amount of oil. The LRP's status can be monitored using a well automation unit where all the parameters can be checked and a well diagram can be seen. The process of steam injection starts by pumping the water from storage tanks into filters to remove

impurities and sand, water should be cleaned because dirty water can destroy the equipment. Following the filtration, it enters a demineralization to remove oxygen which can cause corrosion then into preheaters which increases the temperature of water to 60°C. After the preheater there will be a degasser then to a triplex pump and finally water is pumped into boilers at high temperature and high pressure. The name of the two boilers seen was clayton. The second way to heat water could also be done using ICI Caldaie boilers having pressure to be the major difference. The second on that day was to Parc 295 Gura Ocnitei. There were two reservoirs for oil which come from wells. Two oil tanks having a volume of 20m³. One of the tanks is for testing and the second for storage. The testing tank can check the temperature and composition of oil. The production of parc 295 goes to parc 208.



Figure 1: Mobile Calibration Skid



Figure 2: Linear Rod Pump



Figure 3: Well Automation Unit



Figure 4: Clayton Boiler



Figure 5: ICI Caldaie Boiler



Figure 6: Parc 295

1.5 Workover Rig and Tank Farm Visit

Visits to a workover rig and a tank farm, Parc de Lucru, in Bucsani, Romania were scheduled on July 19, 2018. Well 561 and AM 12-50 rig, where the load of the hook load is 50 tons, are the names of visited well and rig, respectively. Stimulation for this well was done.

Workover rig is installed in the cases of failures in the well, or in case where modifications in the well are required. While the stimulation was being made, it went out that the casing was damaged. The purpose of doing the workover was for perforation but apparently it turned out to fix the damaged casing. After proper fixing, another stimulation will be made if everything goes right then the well will produce effectively. Before installing the workover rig, there should be a proper working space and permit. Following the workover, the production sector will start. The second visit was to Parc de Lucru, the oil reaching it, from different wells around the farm, will undergo heating in a heat exchanger, then primary separation in a three phase separator. Then some of the oil will be sent to a secondary separator for testing purposes. Oil's direction in the pipelines was shown with the valves that stop the water flow, valves for leakages, and pneumatic valves which shut down the parc when the power is depleted. Afterwards, the oil will recirculate in the tank and undergo heating if needed once again for temperature modification. Then, clean oil will be stored in one of the two tanks to be delivered to Conpet. The oil delivered to Conpet should be free of impurities. The second tank will be used as a backup in case the first tank malfunctioned. All the production is controlled by a control panel and when the tanks reach their maximum level they automatically close. Moreover, there are tanks for salt water coming from the separator, and pumps to remove the salty water to an old facility. Also there is a tank for water storage for use in case of emergency to shut down fire.



Figure 7: Workover Rig



Figure 8: Emergency Tank



Figure 9: Oil Tank



Figure 10: Three Phase Separator

CHAPTER 2

Conclusion

2.1 Conclusion

The experience at OMV Petrom was of extreme importance to me. The mentor was helpful; he explained the processes clearly in all the visits. The internship framework was well ordered. HSSE presentation was well given to ensure safety. All the visits like visits to BAT Targoviste, pump shop at Moreni, steam injection generator Dealu Batran, parc 296 Gura Ocnitei, field visit to a workover rig and a visit to a tank farm were perfectly assembled and explained.

I benefited a lot from my experience at OMV Petrom. Special thanks to OMV Petrom's group and Prof. Catalin Popescu for offering us all the help we needed.