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**WHAT ARE THE MAJOR ISSUES IN A NEW BUILT
GAS PROCESSING PLANT:
LESSON LEARNED IN A LARG SCALE GAS PLANT IN IRAN**

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ABSTRACT

The 4th gas processing plant (Phases 6-7-8) as a member of the South Pars Gas Complex (SPGC) in south of Iran, north of Persian Gulf is the largest plant in the world which has designed to treating and producing the dry sour natural gas for transfer and injection into Aghajari Oil Field in EOR projects. This large scale gas processing plant handed over to Operator Company (end user-SPGC) in the end of year 2009. Like other plants, the project transition phase from commissioning and start up step (by contractor) to full operational condition has had many challenges for both sides. One side was trying to close the project and cut the costs in a short time and other side was attempting to check and control of all processing requirements. Some of major issues for operator side such as; design shortages, construction punches, and performance problems were critical to pass through this transition zone and vice versa contractor had some other challenges in face of it. In this paper, all detailed challenges in hand over phase of this project has reviewed from both sides' point of view, and then the solutions, best practices and lessons learned studied. The results shows that a new road map for other gas processing plants should be developed which can provide a win – win condition for project parties.

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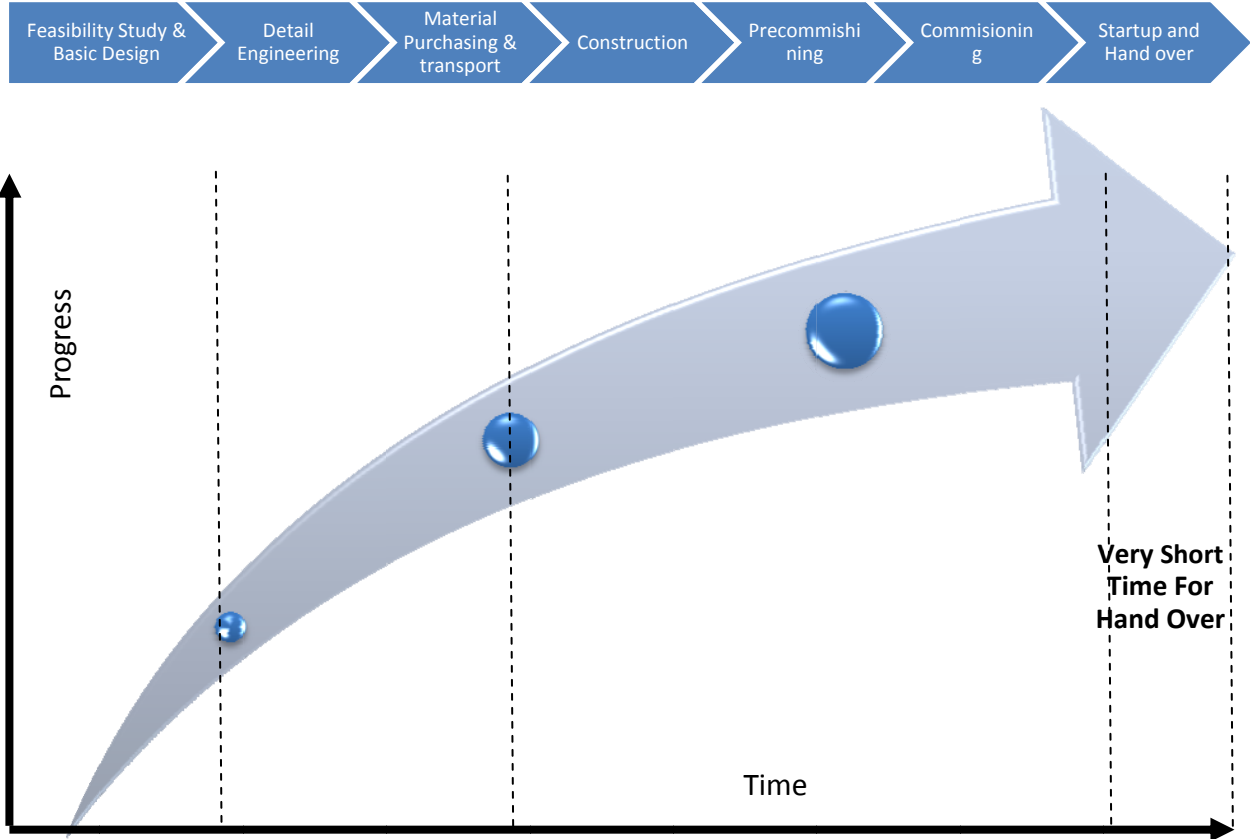
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INTRODUCTION:

Oil and gas projects, normally pass a critical phases in relation to end users who are in charge of project hand over and make sure that all requirements are provided by contractor for safe and continuous production. As Fig. 1 shows this period is very short time in comparison with other phases and it might be the first and important issue for people who are involve in. Because of some remain punches which should be cleared by contractor, it expected that in operation phase a new era will face to them.

In general view, operator companies after hand over enter to new phases to realize business targets and expected benefits based on defined responsibilities and goals. It means that company has two approaches in plant management; first should trace the major remain defect items of project and second would do process activities to gain valuable products simultaneously.

Fig. 1: A Typical Gas Plant Project Phases

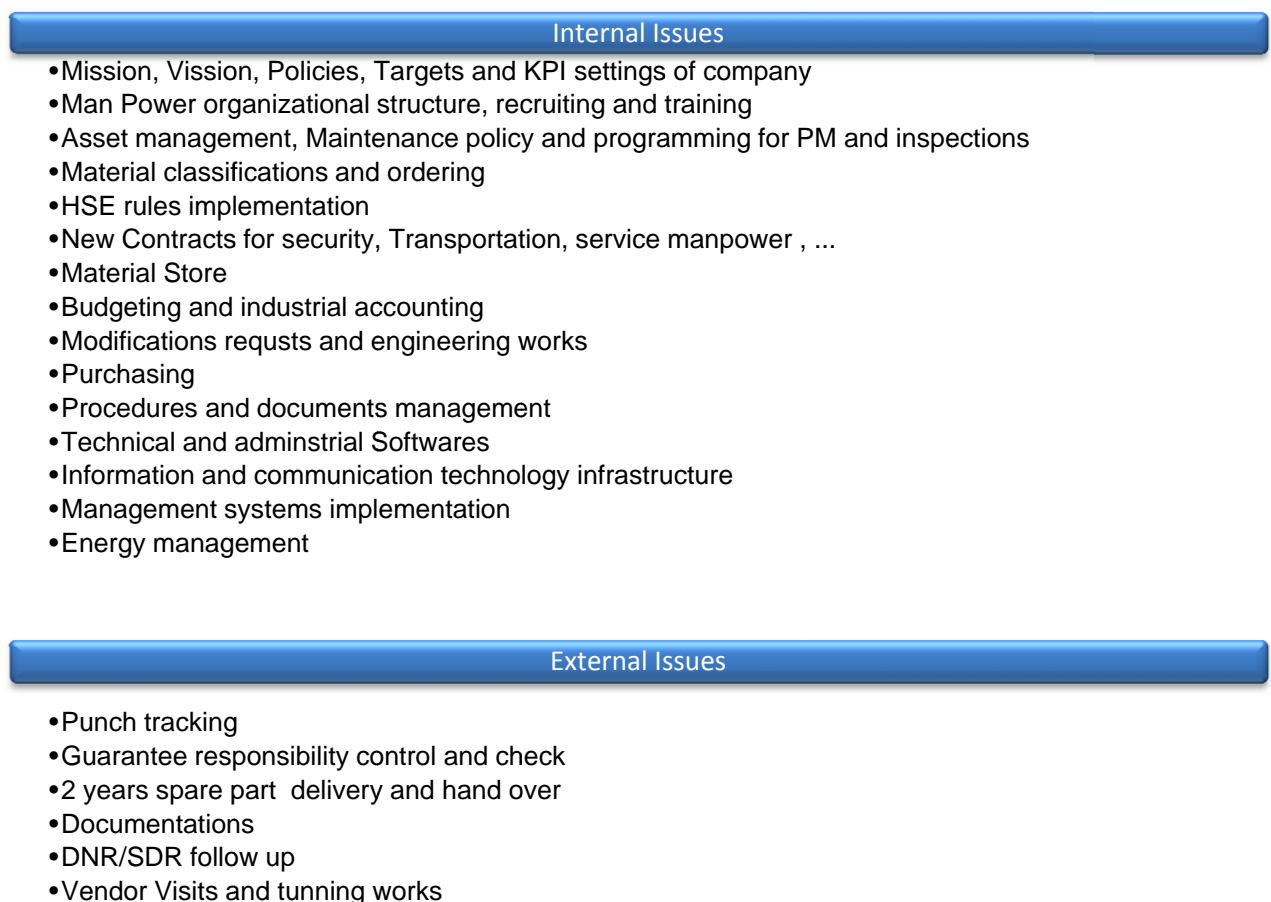


Therefore these two important areas are major challenges to manage! For addressing new built gas processing plant (Phases 6-7-8, South Pars Gas Treating Plant) issues, we need to categorize them into two internal and external items for introducing comprehensive solutions for all.

1. REVIEW OF CHALLENGES AT A GLANCE

In 4th gas plant benefits generally are classified into three key areas, production improvements, cost reduction and HSEQ. Production improvements are the results of increased throughputs and improved availability. In gas plant operations, the benefits of availability often have more impact than the incremental gains traditionally targeted by operational targets. The cost of lost production due to reliability issues are driving gas plant OpX programs to maintain and improve plant availability. What are the major challenges for a new processing plant toward operational excellence? In Fig. 2 we can see some of major internal and external management issues which are considerable items on the production way. These issues if solve, provides an industry perspective on the competitive factors that are driving continuous improvement and an understanding of which industry best practices will improve plant's performance and profits while mitigating in all situations.

Fig. 2: General internal and external management issues for 4th gas plant



2. ASSESSMENT OF PRIORITY AND RISK

We know that internal and external issues have not same weight and impact on a new born plant in sustainable and safe production. Some are critical and some may tolerable for a plant management. For assessment of impact and related risk factor of these items we preferred to make a table of calculated indexes which can help to prioritize actions and choose the suitable roadmap. Three Kind

of key factors for every issue considered in mentioned table: Impotency, complexity and time relevancy. Impotency term usually refers to criticality of challenges for plant and time relevancy term leads us to know when it will be closed. Complexity factor is related to work flow and tracking process of activities to solve issues.

Table 1 shows these factors, assigned figures and the ranking of challenges in our gas plant. Based on ranked factors, risk index can be calculated simply by multiplying of scores of all columns. It is an effective way to suppose that right now we have a classified plan to design a road map for gas plant coming years to meet sustainable and safe production concerns.

In 4th gas plant, a team work has done to develop following table of ranked challenges to quantify of production subjects. The ranked items categorized in three groups based on total scores of challenges; critical, very important, important which shown in Table 2.

Challenges Factors	Impotency	Complexity	Time Relevancy	Ranking
Mission, Vision, Policies, Targets and KPI settings	8	6	8	384
Man Power organizational structure, recruiting and training	10	10	9	900
Asset management, Maintenance policy and programming for PM and inspections	10	5	8	400
Material classifications and ordering	7	3	10	210
HSE rules implementation	10	9	8	720
New Contracts for security, Transportation, service manpower	6	2	5	60
Material Store	8	3	4	96
Budgeting and industrial accounting	6	4	5	120
Modifications requests and engineering works	6	4	6	144
Purchasing	8	4	7	224
Procedures and documents management	9	2	3	54
Technical and administrable Softwares	5	1	3	15
Information and communication technology infrastructure	8	6	5	240
Management systems implementation	5	3	8	120
Energy management	6	7	4	168
Punch tracking	9	8	9	648
Guarantee responsibility control and check	8	4	6	192
2 years spare part delivery and hand over	9	7	6	378
Documentations	4	3	2	24
DNR/SDR follow up	8	6	5	240
Vendor Visits and tuning works	8	7	6	336

Table 1. Assessment of priority and risk of challenges

Classification if major items was first step of road mapping in management of safe and productive operation but the question is ; which solution or model can help to predicting and managing of interactions between these ranked items?



Table 2. Risk index category

3. SOLUTION

The “Operational Excellence” concept is chosen as the best solution to do against major challenges in 4th gas plant. In Fig. 2 a schematic review of proposed solution for internal issues are shown.

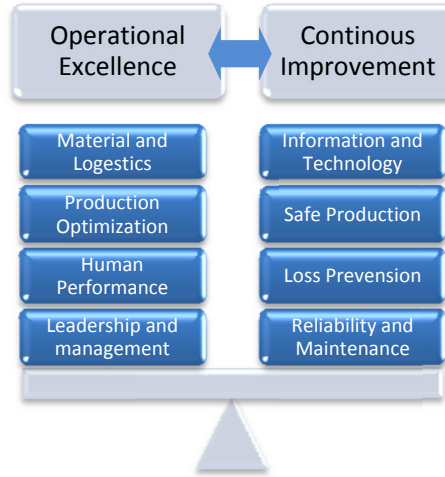


Fig. 3: Operational Excellence Concept for 4th Gas Plant

In this model, operational excellence as major strategy and continuous improvement as a management system goal, considered for defining of eight elements which are basic to implement and can cover the major challenges in. The sustainable balance of these items in this model occurs when a comprehensive and integrity management applied in organization. The 4th gas treating plant in SPGC applied it and through two years collected the outputs by introducing instructions and procedures.

4. RESULTS

For presenting of evidences on successful application of solution, Fig. 4 and Fig. 5 developed in this paper, which shows the results of two effective actions in face of major challenges. Punch clearing (or killing) always has been the most important issues for operators after handover and as you see in Fig. 4 an acceptable improvement trend has occurred through the model implementation. Reduction of more than 1400 punch items to 60 items in specified period is a considerable indicator for model evaluation.

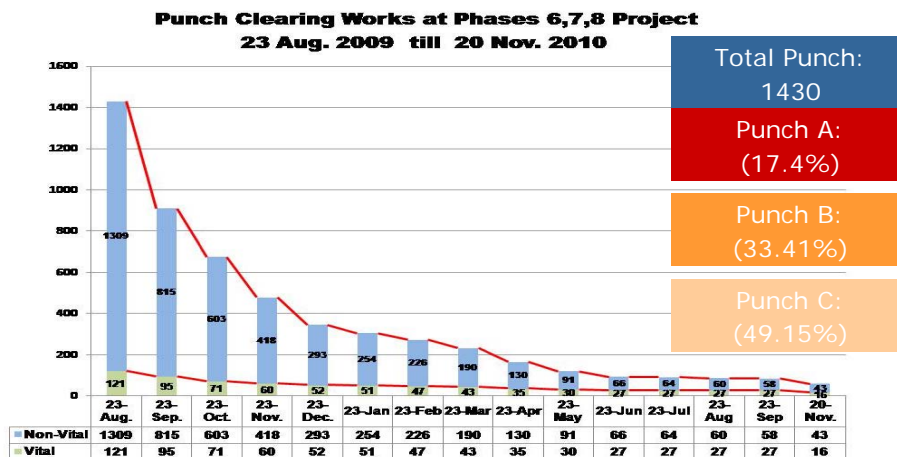


Fig. 5 shows the production figures in two years plant operation which met all scheduled programs and realized the forecasts in products throughput. Treating and transferring of more than 2bcf gas as main product to variety of customers and EOR projects have had considerable added value for 4th gas plant on the way of operational excellence.

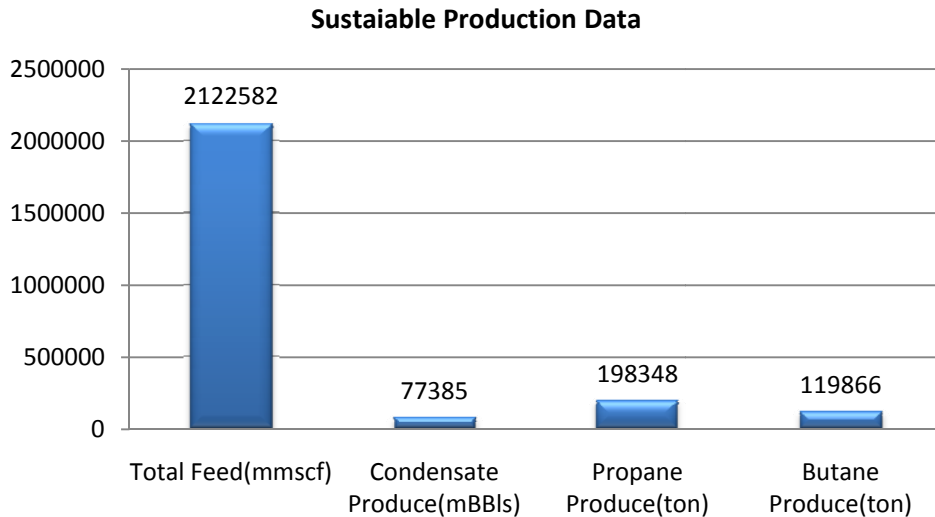


Fig. 5: Production figures of 4th gas plant after hand over

Safe operation in relation of sustainable production is a critical success factor for this plant which had good indications as well. The LTIF and TRIR indexes show that this plant has met OGP international targets simply.

5. ACKNOWLEDGEMENT

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