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PRODUCTION OPTIMIZATION OF LOW INFLUX WELL BY INSTALLING 'LOST PARASITE' (LOW-COST SEPARATOR ON SITE) IN WELL X-1, Y FIELD

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Abstract. Y Field is a mature field. A common problem in the mature field is that the reservoir pressure is depleted, some wells experiences low influx that the production fluid cannot reach the gathering station. Low influx wells can be produced by flowing the production fluid to TOS (Tank on Site) expecting that the fluid can come out due to changes in pressure differences. However, due to the limited number of TOS, TOS is only used for wells that have considerable potential, therefore, an alternative to TOS is needed. LOST PARASITE (Low-Cost Separator on Site) is an alternative to TOS. The LOST PARASITE itself is made of an idle vessel that have been modified so that it can be filled with liquid (oil & water) and gas. If the liquid (oil and water) in LOST PARASITE is full, then the water will flow into the flowline through the tube inside the LOST PARASITE with capillary system and the oil is trapped in LOST PARASITE. Furthermore, the oil will be transported using vacuum trucks and sent to the main gathering station. The low influx well then could be produced continuously using LOST PARASITE and it can be considered to be used in other low influx well that have been suspended because the production fluid could not reach the gathering station.

Keyword: production, optimization, low influx, oil well, mature field, separator, on site, low cost, vessel, tank, capillary

1 Introduction

Well X-1 is one of the low influx wells in the Y Field. If the well is streamed through flowline to the gathering station, the oil can not reach the gathering station. Therefore, observations were made using Tank on Site (TOS). TOS is a vessel that connected to the flowline and placed near the well to collect the production fluid. Based on the results and evaluation, oil can be obtained in TOS while well X-1 is produced by using TOS. However, due to the limited amount of TOS, the TOS which used in well X-1 was transferred to other well with higher prioritize. In consequence Well X-1 is suspended for two months and it leads to lost production opportunity. To solve this condition, a Low-Cost Separator on Site (LOST PARASITE) were made from an idle vessel to produce the fluid from well X-1.

LOST PARASITE is a vessel that used to accommodate temporary production fluid, which is designed in such a way that only oil is stored. LOST PARASITE is only used for low influx wells or production wells that require special observation.

2 Methodology

What makes LOST PARASITE is different from TOS is LOST PARASITE could separate the oil, water, and gas. Used, idle vessel was made into LOST PARASITE and designed in a such way that only produced oil is stored. Below is the detail of LOST PARASITE mechanism (Figure 1).

I. The inlet is connected to the flowline as an inlet for the production fluid from the well
II. The outlet for liquid and gas, is made separated and remains connected to the flowline. The gas that enter LOST PARASITE flow directly to the gas outlet and towards the SP flowline, if the volume of fluid in LOST PARASITE is full then the oil will remain in LOST PARASITE, the water and gas will flow from each outlet to gathering station through the flowline.
III. The fluid separation process uses the density method.
IV. The separation process in LOST PARASITE is also based on the capillary force, namely the rising or falling of the liquid through intermediaries, such as fabrics, walls, capillary pipes.

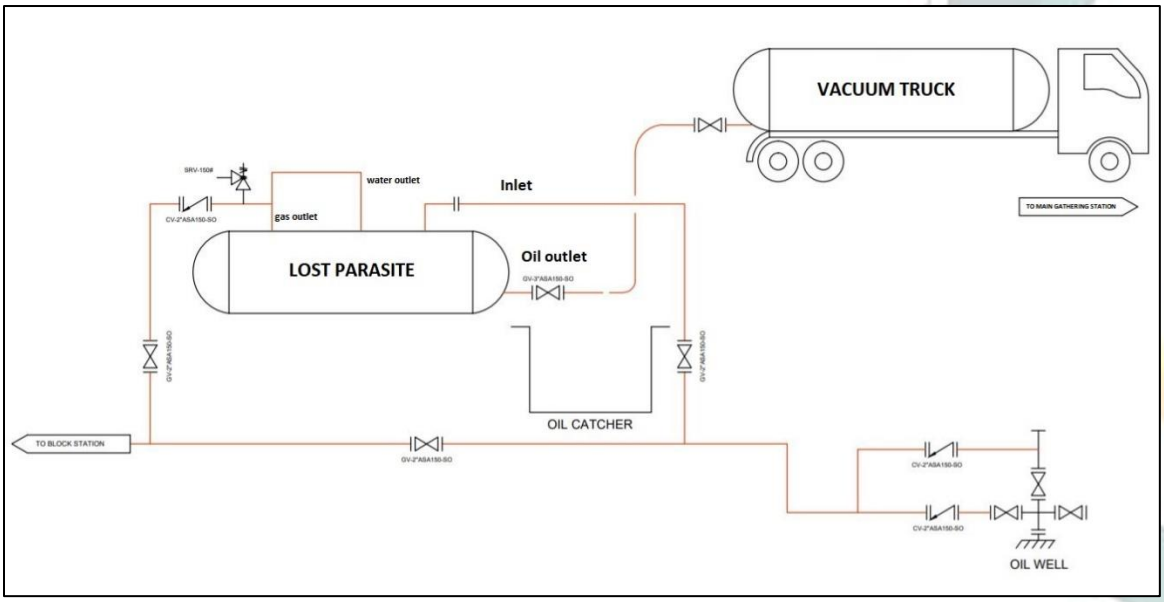

Figure 1. Piping and Instrumentation Diagram of LOST PARASITE

The flow process of LOST PARASITE (Figure 2) is flowing the production fluid (oil, water, and gas) directly to LOST PARASITE. The gas will immediately flow to gathering station through the LOST PARASITE outlet to the flowline and the oil will be stored in LOST PARASITE, while the water will flow through the flowline to gathering station if the volume of production fluid inside the LOST

PARASITE reach its capacity, then the oil will be vacuumed by vacuum truck and sent to main gathering station.

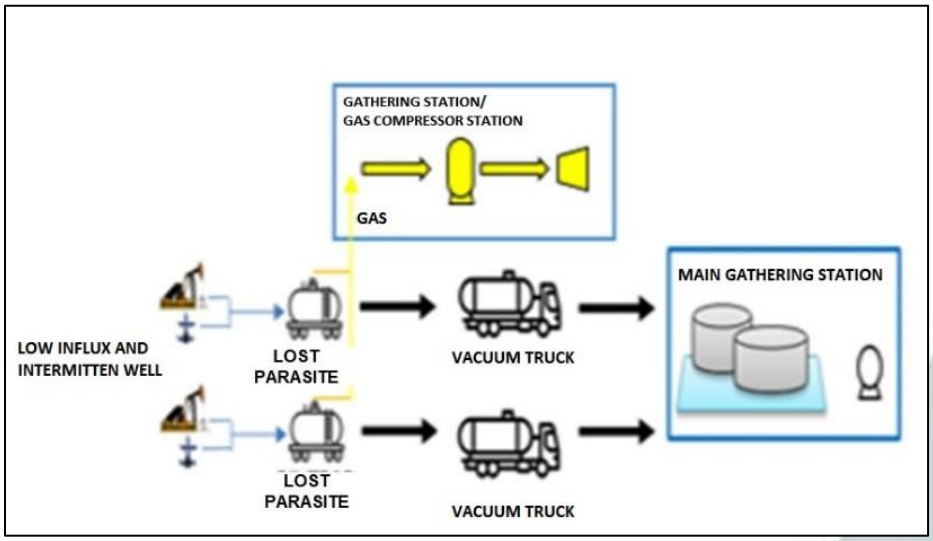

Figure 2. LOST PARASITE Flow Process

3 Result and Discussion

Before using LOST PARASITE, well X-1 was using the TOS to produce its oil because of the well itself could not flow its fluid to main the gathering station (Figure 3).

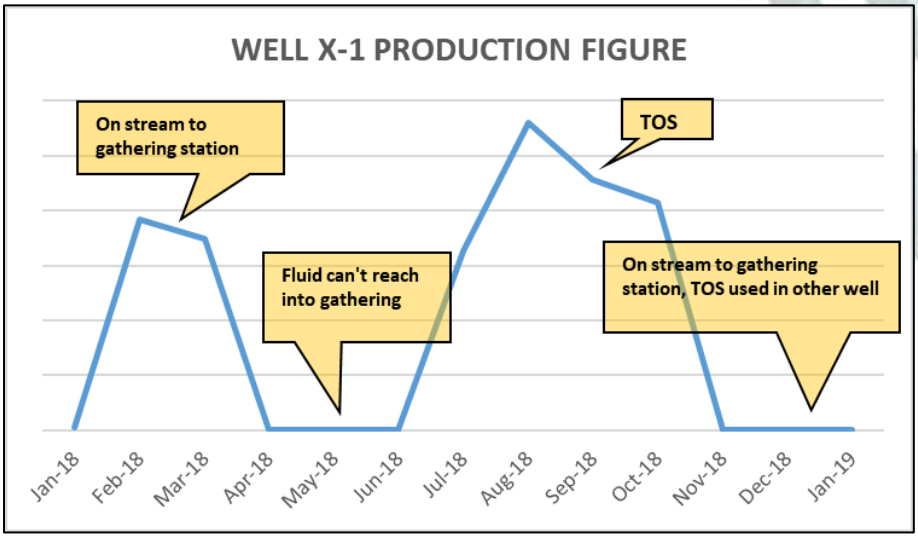

Figure 3. Well X-1 Production Figure Using TOS

After installing LOST PARASITE in Well X-1, continuous production recovery was obtained (Figure 4). LOST PARASITE separates the gas so that the gas can be streamed to the gathering station through flowline and utilized.

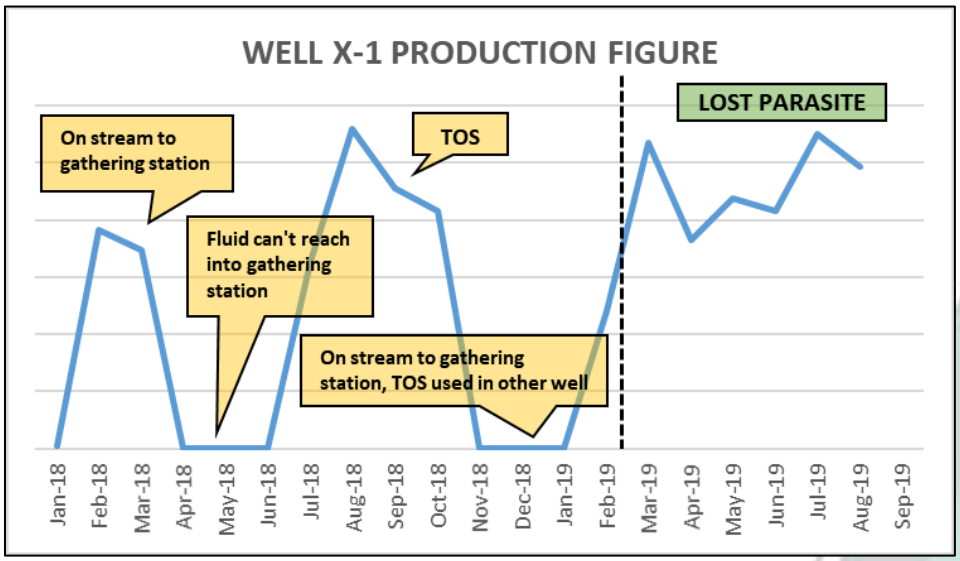

Figure 4. Well X-1 Production Figure Using LOST PARADISE

With the LOST PARASITE installed in well X-1, its no longer needs to be provided with TOS, so that the TOS can be used in other wells which needed TOS the most.

4 Conclusion

Well X-1 can be produced continuously after using LOST PARASITE. This can be a solution for low influx wells where the production fluid cannot reach the gathering station and it contains gas. In general, TOS has the same objectives as LOST PARASITE, but there is no oil, water, and gas separation mechanism in the TOS. LOST PARASITE can be used in wells that contain gas. The use of idle vessel to be utilized as LOST PARASITE is an efficient and effective alternative method to overcome problems in production operations, especially in low influx wells.

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