ABSTRACT

Lagan is a Medco E&P Indonesia gas field which has 30 wells and produces from 20 different sand layers separated by three faults. On November 2009, after 24 years production lifetime, there was an indication of sand being produced at this field, since sand accumulation was found inside the production separator, and a considerable amount of surface control equipment was being eroded due to sand abrasion. Since Lagan field produces up to 36 MMSCFD, a major contribution, sand control and management were urgently needed to maintain operational reliability.

The initial challenge of applying sand control at Lagan field was to identify which wells and which sand layers caused the sand production. To meet this challenge, four wellhead de-sanders were installed at four different wells, all of which produce from different sand layers. By installing these de-sanders, sand layers that contributed to sand production could be identified and follow-up action could be carried out. By considering several aspects, such as the urgent need to accelerate the application of sand control, poor well accessibility and rig mobility, and cost- and application effectiveness, wellhead de-sander was finally chosen as the most suitable sand control technique for this field. The design and fabrication of the wellhead de-sander was completely home-made and continuously improved and modified to enhance the quality and quantity of the sand trapping.

After one year’s application, wellhead de-sander has proven its effectiveness by reducing the amount of sand carried out to Lagan station from 20 liters/day to 2 liters/day. This means a reduction in production separator downtime for sand clean-up from 3-5 stoppages a day down to 1 stoppage every 2 days, a reduction in maintenance and repair of surface control equipment to zero cases per year, and a total saving of up to USD 340.000.

INTRODUCTION

Lagan field is one of PT Medco E&P Indonesia’s gas field producers in South Sumatera, having 30 wells (5 oil wells and 25 gas wells). Lagan started to produce in 1985. This field initially produced through high system pressure (about 650 – 700 psig), then due to the depletion of reservoir pressure, system pressure, which is represented by separator pressure, also had to be reduced to maintain gas flow up to the surface facilities. Currently, this field is being produced through 350 psig of system pressure and the plan is to reduce it more.

The reservoir formation type is sandstone divided into several sand layers. Current productive sand layers are P21, P23, AA, A0, A1, A2, and BB1. These sand layers are divided into two depth position groups by the Pangadang coal formation (2845 ft KBMD). P21, P23 and AA sand are above Pangadang coal and four others are below.

After more than 24 years of safe production, in 2009 this field started producing gas with sand. Initially about 3 to 4 litres of sand per day was produced, but after 4 months this increased to 8 litres per day. The sand was found accumulating in the production separator. In order to increase gas deliverability from Lagan field, in the 4th quarter of 2009 the pressure in the downstream system (separator pressure) of some gas wells (LN-6, LN-8, LN-12, LN-20 and LN21) was reduced from medium pressure (350 psig) to low pressure (120 psig). This effort successfully managed to increase gas delivery from Lagan by about 4 mmscf/d. But, at