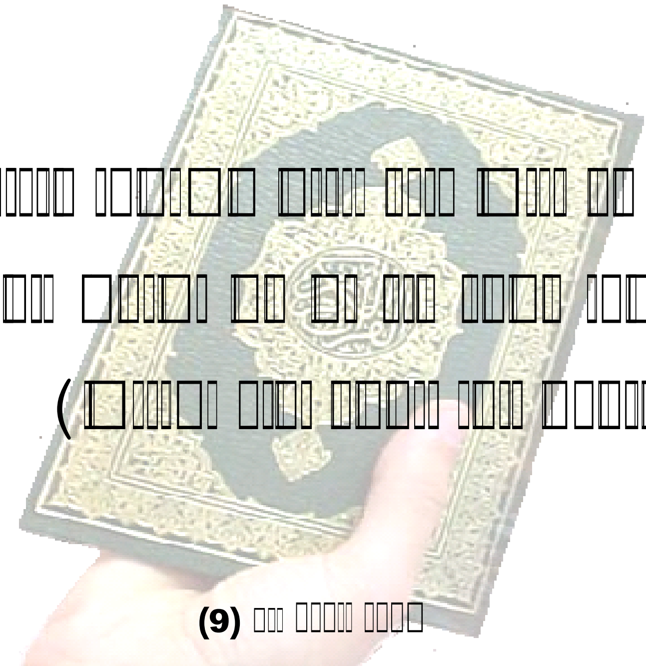

(9)

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التجريدة

أجريت هذه الدراسة في ولاية الوحدة وشملت خمس حقول لمعالجه النفط الخام وهي حقول الوحدة و منقا والنار والتور وحقل توما جنوب التي تمتلكها شركه النيل الكبرى لعمليات البترول المحدودة (GNPOC).تهدف هذه الدراسة لتقليل تكلفه الإنتاج من خلال إيقاف محطة الضخ المساعدة للحقول الخمسة .

تم تصميم نموذجي محاكاة :النموذج الأول حيث المضخة المساعدة في حاله الخدمة ,بينما في النموذج الثاني تم إيقاف المضخة المساعدة .تم تسجيل كل من ضغط التفريغ لكل مضخة وضغط الأنبوب الخاص بكل حقل والإنتاج الكلي من كل حقل . تمت مقارنه النتائج المتحصل عليها من النموذجين بالقراءات الفعلية للعوامل الثلاثة المتمثله في ضغط التفريغ لكل مضخه وضغط الأنبوب والإنتاج لكل من الحقول الخمسة .

أوضحت هذه الدراسة أنه لا توجد فروقات معنوية للثلاثة عوامل بين القراءات الفعليه ونتائج النموذجين عدا ضغط التفريغ للمضخات. بناء علي هذه النتائج تم الحصول علي التوصية التالية : إيقاف المضخة المساعدة لتقليل التكلفة السنوية المقدرة بمبلغ 868,580.88 دولارامريكي مع زيادة ضغط الأنبوب لكل حقل للتغلب علي الضغط الخلفي للحفاظ علي المستوي الطبيعي للإنتاج.

ABSTRACT

This study is carried out in Unity State at five Field Processing Facilities of crude oil (FPFs): UNITY, MUNGA, ELNAR, ELTOOR and TOMA SOUTH that belong to Greater Nile Petroleum Operating Company (GNPOC). The objective of this study was to reduce the cost of production through the removal of the assisting booster pump of the five mentioned transfer pumps of FPFs.

Two simulation models were built in this study. In the first model, the booster pump was running whereas in the second model the booster pump was stopped. Three parameters values: pipeline pressure, discharge pressure and total production were recorded for each of the five FPFs. Then the previous results were compared with the actual three parameters readings for the five fields.

This study shows that the differences between the simulation and actual values are not significant except for discharge pressure values for all fields' pumps. According to these findings the following recommendations are suggested: the assisting booster pump should be stopped to reduce the estimated annual cost of production around 868,580.88 USD, but the pressure of each of the five FPFs pipeline should be increased to overcome and maintain the production at the normal level.

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No	Symbol	Unit	Designation
1	ρ	Kg/ m3	Density
2	P	KN/m2	Pressure
3	μ	N.s/m2	Dynamic viscosity
4	L	m	Length
5	u	m/s	Velocity
6	v	St	Kinematic viscosity
7	γ	N/m³	Specific weight
8	τ	N/m²	Shearing stress
9	g	m/s²	Gravitational acceleration
10	Q	M³/s	Volume Flow Rate
11	d	m	Diameter
12	SG		Specific Gravity

ABBREVIATIONS LIST

1	Re	Reynolds number
2	f	Friction Coefficient factor
3	k/D	Relative Roughness
4	K	Thermal conductivity factor
5	hf	Head lost due friction
6	ΔP	Piezometric pressure
7	ΔPz	Pressure drop due to elevation
8	wt	Weight
9	PSV	Pressure Safety Valves

10	PRV	Pressure Relief Valves
11	Cv	Flow coefficient
12	KL	Losses coefficient
13	SC	Sudden contraction
14	SE	Sudden expansion
15	FPF	Field Production Facilities
16	CPF	Central Processing Facilities
17	NPSH	Net Positive Suction Head
18	NPSHR	Net Positive Suction Head Required
19	FKOD	Flare Knock Out Drum
20	PWT	Produce Water Tank
21	RVP	Reid Vapor Pressure
22	TVP	True Vapor Pressure
23	API	American Petroleum Institute
24	St	Stokes
25	cSt	*Centistokes)*
26	pH	Potential Hydrogen
27	ESDV	Emergency Shutdown Valve
28	TEMA	Tubular Exchanger Manufacturers Association
29	PCV	Pressure Control Valve
30	COST	Crude Oil Storage Tanks
31	PPD	Pour Point Depressant
32	LPG	Liquefied Petroleum Gas
33	NP&T	Normal Pressure and Temperature
34	CGS	Centimeter-Gram-Second
35	ASME	American Society of Mechanical Engineers
36	$H\ geo$	Geodetic head
37	H dyn	dynamic head