

การควบคุมการผลิตปีโตรเลียมเพื่อนำขึ้นมามีความเหมาะสมที่สุด

นาย โกวิท สัจจวิเศษ



วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาดูตามหลักสูตรปริญญาวิศวกรรมศาสตรมหาบัณฑิต

สาขาวิชาวิศวกรรมปิโตรเลียม ภาควิชาวิศวกรรมปิโตรเลียม

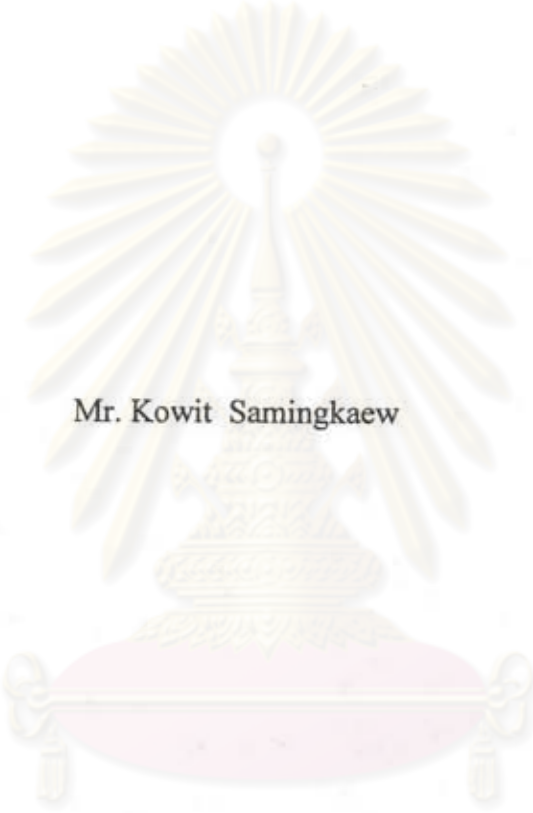
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ลิขสิทธิ์ของบัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย

PETROLEUM PRODUCTION CONTROL
FOR OPTIMUM RECOVERY



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พิมพ์ต้นฉบับบทคัดย่อวิทยานิพนธ์ภายในกรอบสี่เหลี่ยมนี้เพียงแผ่นเดียว

โกวิทย์ สมิงแก้ว: การควบคุมการผลิตปิโตรเลียมเพื่อการนำขึ้นอย่างเหมาะสมที่สุด (PETROLEUM PRODUCTION CONTROL FOR OPTIMUM RECOVERY) อ.ที่ปรึกษา: ผศ.ดร. โยธิน ทองเป็นใหญ่, อ.ที่ปรึกษาร่วม: นายนิทร อิศรางกูร ณ อยุธยา, 148 หน้า. ISBN 974-636-639-4

ศึกษาความสัมพันธ์ระหว่างอัตราการผลิตน้ำมันสูงสุดที่เป็นไปได้กับ Ultimate Oil Recovery จากการผลิตน้ำมันจากแหล่งปิโตรเลียมแบบ Solution Gas Drive การศึกษานี้ได้รวมถึงผลของคุณสมบัติของน้ำมันและก๊าซที่อยู่ในแหล่งปิโตรเลียมและ Reservoir Heterogeneity ที่มีต่อความสัมพันธ์ระหว่างสองตัวแปรนี้ ข้อมูลที่ใช้สำหรับการศึกษาดังกล่าวได้มาจากการใช้โปรแกรมจำลองการไหลของของไหลในแหล่งปิโตรเลียม จากการศึกษาพบว่าอัตราการผลิตน้ำมันสูงสุดไม่มีผลต่อ Ultimate Oil Recovery และคุณสมบัติของน้ำมันและก๊าซที่อยู่ในแหล่งปิโตรเลียมและ Reservoir Heterogeneity ไม่มีผลต่อความสัมพันธ์ระหว่างสองตัวแปรนี้ อย่างไรก็ตามในกรณีที่อัตราการผลิตน้ำมันสูงสุดต่ำกว่า Threshold rate เวลาที่ใช้ในการผลิตก่อนที่จะถึง Ultimate Oil Recovery จะขึ้นอยู่กับอัตราการผลิตน้ำมันสูงสุด การศึกษานี้ได้ครอบคลุมถึงการสังเกตข้อมูลที่ปากหลุม โดยการเพิ่มส่วนสำหรับการคำนวณการไหลในท่อเข้าไปในแบบจำลอง เมื่อได้วิเคราะห์ข้อมูลอย่างละเอียดแล้วพบว่าอนุพันธ์ของอัตราการผลิตที่ Threshold Rate จะมีลักษณะเฉพาะซึ่งสามารถนำมาใช้เพื่อปรับอัตราการผลิตให้เข้าสู่ Optimum Plateau Rate ได้หลังจากที่มีข้อมูลจากการผลิตแล้ว ในการศึกษาครั้งนี้ได้มีการยกตัวอย่างการใช้วิธีการนี้ให้เห็นด้วย

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

ภาควิชา วิศวกรรมเหมืองแร่และปิโตรเลียม
สาขาวิชา วิศวกรรมปิโตรเลียม
ปีการศึกษา 2539

ลายมือชื่อนิติ
ลายมือชื่ออาจารย์ที่ปรึกษา
ลายมือชื่ออาจารย์ที่ปรึกษาร่วม

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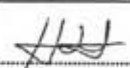
The investigations of the relationship between maximum allowable oil rate and ultimate oil recovery of a solution gas drive reservoir are made. The effects of fluid PVT properties and reservoir heterogeneity on the relationship between maximum allowable oil rate and ultimate oil recovery are also investigated. Data generated from a numerical black oil reservoir simulator are used for the investigations. It is found that maximum allowable oil rate has no effect on the ultimate oil recovery for any set of fluids and reservoir properties. However, times to reach ultimate oil recovery are affected by maximum allowable oil rates provided that the maximum allowable oil rate is lower than a threshold maximum allowable oil rate. By incorporating a tubing lift table into the study model in order to simulate flow behavior in tubing, surface data can be generated. Using these data, the unique shape of the derivative of flowing tubing head pressure of the threshold plateau rate has been identified and can be used to specify optimum plateau rate after having some production data. An example of use of the technique is given.

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

ภาควิชาวิศวกรรมเหมืองแร่และปิโตรเลียม

สาขาวิชาวิศวกรรมปิโตรเลียม

ปีการศึกษา 2539

ลายมือชื่อนิสิต 

ลายมือชื่ออาจารย์ที่ปรึกษา 

ลายมือชื่ออาจารย์ที่ปรึกษาร่วม 

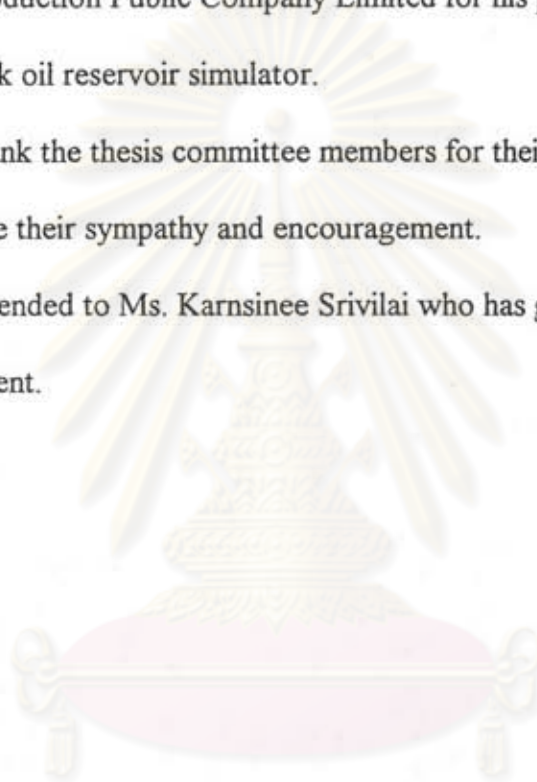
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ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

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