

Seok Ki Moon

Education

Norwegian University of Science and Technology (NTNU), Trondheim, Norway

Master of Science in Chemical Engineering

Class of Jun. 2018

Cumulative GPA: **3.64 / 5.0**

Current Project:

Experimental Investigation of the Break-up and Coalescence of Crude Oil Drops in Produced Water

University of Houston, Houston, TX, USA

Master of Science in Subsea Engineering

Class of May. 2016

Cumulative GPA: **3.601 / 4.0**

Korea Maritime and Ocean University, Busan, South Korea

Bachelor of Science in Energy Resources Engineering

Class of Aug. 2013

Cumulative GPA: **3.78 / 4.0** Major GPA: **3.90 / 4.0**

Graduation Paper:

3D Visualization of the Petroleum Production Process under a Three-Dimensional Subsea Production System



Area of Interest

Subsea Field Development Concept, Subsea System Safety and Reliability, Flow Assurance, Produced water treatment

Work and Academic Experience

Summer Internship

Jun. 2017-Jul. 2017

- SUBPRO, a research-based innovation center at NTNU, Trondheim (Norway)
- Worked on the project "Break-up and coalescence of crude oil drops in a stirred tank"
- Literature survey of the studied topic
- Risk assessment, development and upgrade of the experimental setup, designed to follow the evolution of droplet size distribution
- Experimental setup testing and procedure development

Teaching Assistant

Aug. 2015-Dec. 2015

- Department of Subsea Engineering at the University of Houston
- Preparation and assistant flow assurance coursework and initiate online course platform
- Provide PIPESIM software tutoring session for course project (Subsea field development scheme)
- Organizing field trip for oil and gas industry (Schlumberger fluid laboratory, Houston)

Laboratory Volunteer

May. 2015-Aug. 2015

- Department of Chemical and Biomolecular Engineering at the Rice University
- Literature review on asphaltene precipitation and deposition and need for asphaltene phase behavior modeling
- Figure out mitigation method for asphaltene flow assurance issues (Deposition / Flocculation)
- Investigate and compare asphaltene flow assurance strategies between past and present

Korea Institute of Geoscience and Mineral Resources (KIGAM)

Jun. 2012-Aug. 2012

- Research Assistant at Gas Hydrate Department, Petroleum & Marine Research Division
- Conducted formation and dissociation experiment of CH₄+CO₂ mixed gas hydrates
- Literature review of offshore gas hydrate development as energy resources
- Assist to model behavior of hydrate bearing sediment through various experimental measurement
- Investigated gas hydrate's physical properties and formation environment

Korea National Oil Corporation (KNOC)

Jul. 2011-Nov. 2011

- Worked at Ankor Energy at New Orleans, LA, USA
- Maintained offshore production equipment of platform at Gulf of Mexico (Ship Shoal Block 229)
- Managed platform workers according to their jobs (Ship Shoal Block 229)
- Assist to analyze core sample to detect and determine pay zone in corporation with Weatherford Core Lab
- Installed onshore production tubing cooperative with Schlumberger
- Supervise completion work-over to install downhole tubing gas lift valve in corporation with Schlumberger
- Assisted to manage onshore field drilling and completion work-over

Republic of Korea Army

Mar. 2008-Feb. 2010

- 2-year Military Service at Seoul, Republic of Korea
- Worked as administrative clerk with main job of logistics and supply
- Discharged from the army with the rank of Sergeant

Projects

1. Subsea Blowout Preventer Design Project

- 18 3/4" – 20K Ram block design with body, door closure and bolting
- Pipe Ram / Variable Bore Ram / Blind Shear Ram / Casing Shear Ram with single cavity body type
- API design specification requirement (API 16A)
- Rectangular ram block and body stress analysis with FEA (ABAQUS)

2. Subsea Riser Design Project

- Top Tensioned Riser using Hydro-pneumatic Tensioner
- Sizing accumulator based on riser stack up and stress theory
- Overall stress analysis was conducted by using DeepRiser software

3. Subsea Pipeline Design Project

- Submerged weight and total pipeline weight calculation and buckle arrestor design
- Friction factor decision by Pipe-Soil interaction analysis and On-bottom stability analysis
- Pipeline thermal expansion and global buckling FEA analysis by using ABAQUS software
- Installation load calculation and pipeline span analysis
- Various design code application (DNV-OS-F101, API RP 1111, 49 CFR 192 etc.)

4. Optimization of manifold location in subsea multi-well system

- Length calculation of the HIPPS fortified section automatically by MATLAB coding
- Cost analysis by the effect of subsea manifold location in multiple production well architecture
- Definition of the grid with the wells and riser location and possible manifold location
- Simscape was used to construct the MATLAB code

5. Threaded Connector stress analysis

- Pipe Threaded connector stress analysis under different pressure and temperature condition
- FEA was performed to investigate stress distribution and determine maximum stress location
- Grid sensitivity analysis was performed to improve accuracy in location and value
- ABAQUS software was used to analyze
- Optimize the result statistically by using JMP pro software

6. Multiphase Manifold Piping Project

- Fracking manifold piping system design using parasolid model
- Sand accumulation and velocity field analysis under different particle loading, inlet velocity and orientation
- CFD simulation under multi-phase system (liquid, gas and solid) using Star CCM+
- Run CFD simulation and select best case by calculating mass flow rate and velocity field
- Optimize the result statistically by using JMP pro software

7. Subsea Field Development Project

- Recommend the location of the host facility and the subsea field layout with given production and injection well location
- Minimize the pressure losses and optimize the production rate by properly sizing flowline, pipeline and riser diameter
- Determine flowline diameter using steady state multiphase simulator (PIPESIM)
- Application of gas lift in the system to improve productivity and fluid flow
- Design properly to avoid slugging, corrosion, erosion and appearance of wax, hydrate and asphaltene in the system
- API RP 14E design code was used to ensure water injection and gas lift

8. Subsea Separator Design Project

- Performed separator sizing in simple PFD of separation and liquid boosting system
- Estimate the output power of the pump and determine the input Real, Reactive and Total Power to motor
- Estimation of the required minimum diameter for the gas flowline to ensure the required arrival pressure
- Calculate required minimum diameter for the oil line to ensure the required arrival pressure and to limit pump discharge pressure
- Set up a feasible power system configuration with cable size and transformer ratio

9. Experimental Investigation of the Break-up and Coalescence of Crude Oil Drops in Produced Water

- Measurement of crude oil drop sized distribution using laser diffraction method (O/W emulsion)
- Setup experimental system with purpose-built mixing tank and impeller (Rushton turbine)
- Different kinds of crude oil and continuous phase were investigated
- Maximum droplet size fitting with existing model
- In collaboration with modelling group (Population Balance Model)

Presentations

Title: "State-of-the-art of use of Microfluidics to study Electrocoalescence"

JIP meeting (Nalco Champion at Aberdeen)
31/05/2017

Conference Paper

Title: "PBE model regression applied to water and petroleum dispersion"

PBM 2018 (Ghent, Belgium)

Author: Sindre B. Øyen, Seok Ki Moon, Marcin Dudek, Christoph J. Backi, Gisle Øye, Sigurd Skogestad, Brian A. Grimes

(Accepted)

Software Skills

MATLAB

Aspen HYSYS (Chemical process simulator)

Mathcad

ABAQUS (FEA tool)

DeepRiser (Riser design tool)

Star CCM+ (CFD)

JMP pro (Design of Experiment)

PIPESIM (Multiphase simulator)

Relevant Courses**Basic Courses**

Linear Algebra	Engineering Mathematics I, II	Engineering Statistics
Fluid Mechanics	Thermodynamics	Numerical Analysis and Practice

Major Courses

Petroleum Engineering & Lab	Drilling Engineering	Subsea System
Subsea Controls and System Engineering	Subsea Process and Artificial lift	Design of Subsea Blowout Preventer
Process Control	Process Design, Project	Flow assurance
Riser Design	Pipeline Design	Reaction Kinetics and Catalysis
Surface and Colloid Chemistry	Polymer Chemistry	Multiphase Transport
Colloid and Polymer Chemistry, Specialization Course	Computational Methods and Design of Experiments	

Extracurricular Activities**Mentoring Program**

Sep. 2012-Aug. 2013

- Volunteer program provided by KMOU and community middle school
- Tutoring middle school student 10 hours a week to inspire engineering spirit
- Interact with middle school teachers with workshop to learn teaching skills and communication with student

Exchange Student

Jan. 2011-Jun. 2012

- Study abroad at University of Oregon, Eugene, OR, USA
- Experience American and international commingling culture and environment
- Take a geology course relevant to future study such as petroleum reservoir engineering

Korean Offshore Petroleum Exploration

Aug. 2010

- Worked at research vessel Tamhae II, Korean Institute of Geoscience and Mineral Resources
- In charge of Multi-Beam and Chirp System and measurement of accurate water depth
- Maintenance of Air gun equipment and hydrophone for offshore seismic exploration

Overseas Challenge and Experience Program

Jul. 2010

- Field investigation to the Singapore fully sponsored by KMOU
- Investigate the political, social and cultural background as Asian oil and gas logistics hub
- Figure out to benchmark the possibility of Busan and Ulsan harbor, South Korea as a future East-Asia oil and gas logistics hub

Affiliation

Young Generation Director of Korean-American Scientists and Engineers Association South Texas Chapter	2015-2016
President of Korean Graduate Student Association at University of Houston	2015-2016
Society of Underwater Technology – Subsea Engineering Society	2014-present
Society of Petroleum Engineers	2014-present
Vice president of Energy Resources Engineering student council	2011-2012

Honors

Korea Gas Corporation (KOGAS) Scholarship	Mar. 2013
Mentoring Scholarship	Mar. 2013
Merit Based Scholarship	Mar. 2013
Korea Resources Corporation(KORES) Scholarship	Sep. 2012
Merit Based Scholarship	Sep. 2012
Korea National Oil Corporation(KNOC) Scholarship	Mar. 2012
Korea National Oil Corporation(KNOC) Scholarship	Sep. 2010
Merit Based Scholarship	Sep. 2010
Korea Resources Corporation(KORES) Scholarship	Mar. 2010
Merit Based scholarship	Mar. 2007