

## Developing a Predicting Model for Initial Oil Droplet Size Distribution due to a Subsea Oil Release

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Received Date: November 22, 2016

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Accepted Date: June 28, 2017

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### Abstract

Regarding the important role of droplet size distribution for determination of time, location and trajectory of oil droplets in subsea oil and gas releases, in this research a model for prediction of oil droplet size distribution was presented. This paper dealt with the theoretical basis for the model first and then the model specifications were presented. The model parameters were used based on available experimental data. Effects of gas void fraction and buoyancy were also discussed. Using this research model, oil specific diameter can be calculated and then based on Rosin-Rammler ( $k=0.693$ ,  $\alpha=1.8$ ) or Lognormal ( $S=0.78$ ) distributions, oil droplet size distribution was determined. Surfacing time, location and trajectory of oil droplets can be calculated based on oil spill models. This research results can be extended to full scale oil and gas release conditions given good agreement between this research results and experimental data (Deep Spill).

Keywords: *Droplet size distribution, Subsea oil and gas releases, Gas void fraction and buoyancy.*

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