

Development of a New Total Risk Indicator for the Trends in Risk Level Project (RNNP)

By utilizing DFU, Barrier Performance and Survey Results Data and incorporating Uncertainty

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Introduction

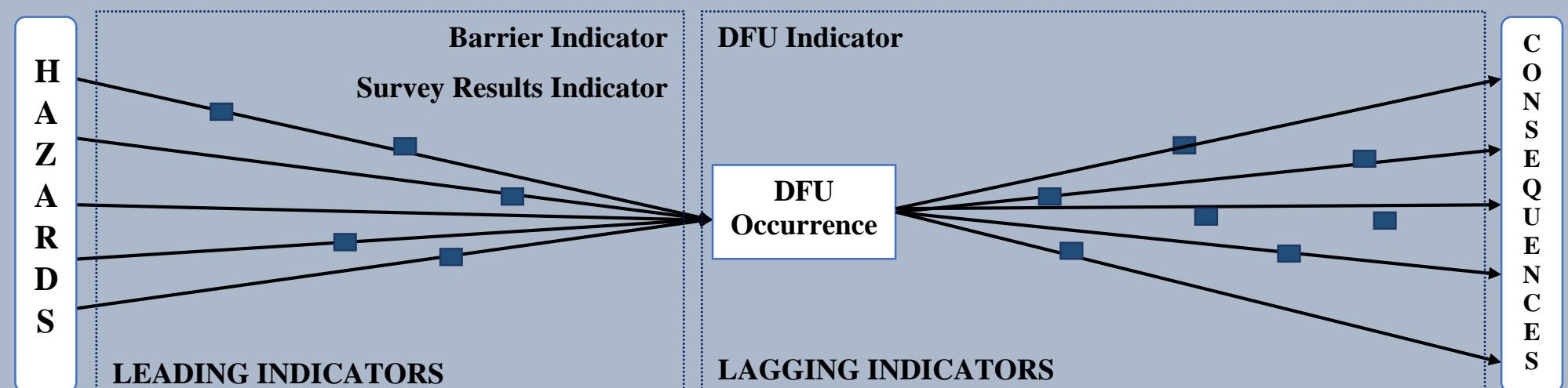
The Trends in Risk Level Project (RNNP) is annually conducted by the Norwegian Petroleum Safety Authority (PSA). RNNP objectively presents offshore major accident risk levels and risk trends on the Norwegian continental shelf (NCS).

The decline in reported precursor events (DFU) in RNNP has reduced the data basis for quantitative risk assessment (QRA) considerably. Single precursor events currently dominate the total risk indicator results. The total indicator presents the combined major accident risk indicator development and overall risk level trends.

IV) Uncertainty Indicator

- Nine uncertainty variables affecting indicator quality evaluated by knowledge strength and robustness of indicators
- Presented as a correctional factor for indicators I-III

The New Total Indicator presents the leading and lagging indicators separately on a relative scale. The base year value is set at 100, excluding the uncertainty contribution which is additional.



Case Study Results

The case study establishes individual indicator and New Total Indicator results for fixed production installations between 2008-2014. The results are established using existing RNNP data.

Objective

- 1) To develop a New Total Indicator which comprises DFU data, a selection of barrier performance data, uncertainty parameters and questionnaire results to give a more holistic presentation of risk levels.
- 2) Establish New Total Indicator results by the new methodology and compare these results with the total indicator methodology used in RNNP today through a case study.

Method Development

The New Total Indicator is based on existing and newly developed methodology utilizing RNNP data. The New Total Indicator consists of the contribution of four individual indicators;

I) DFU Indicator

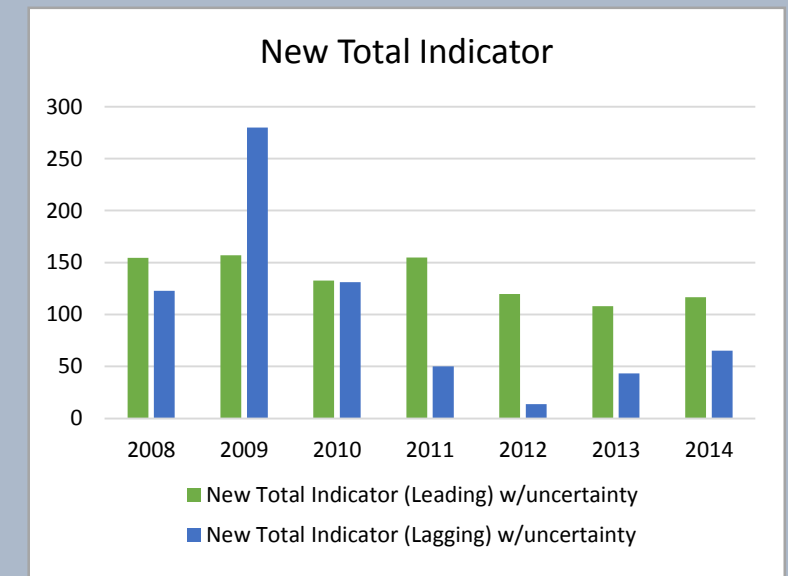
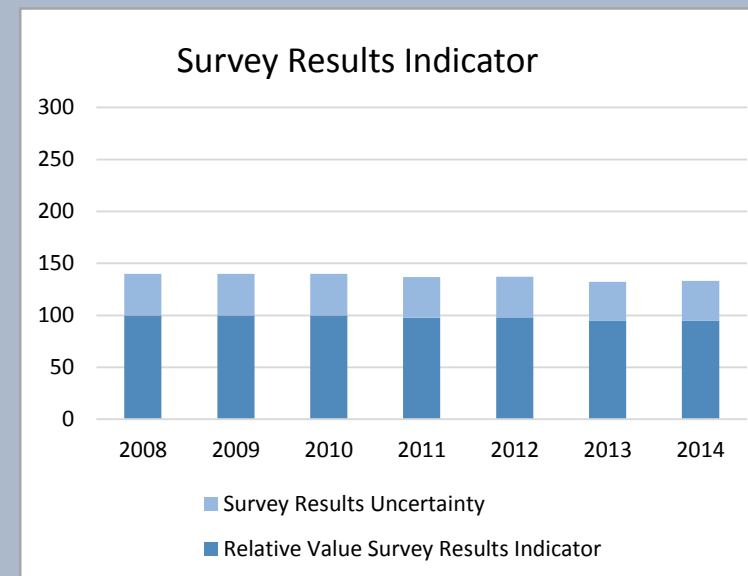
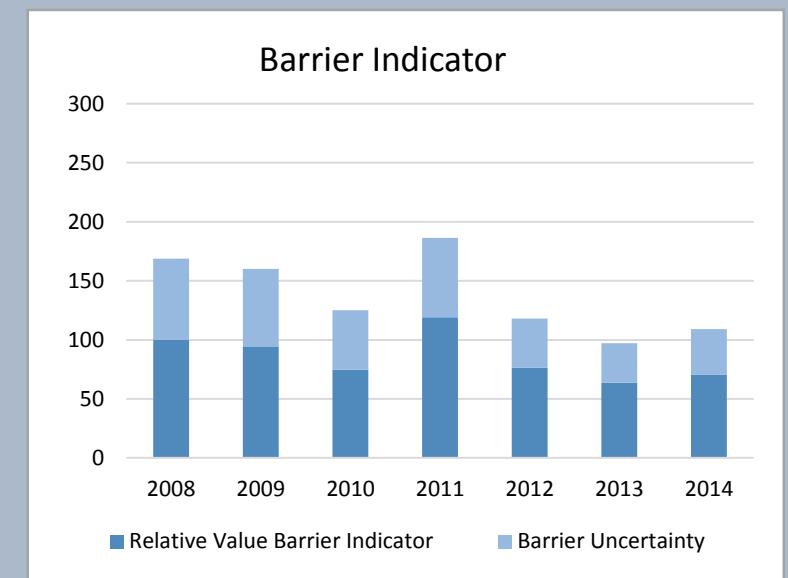
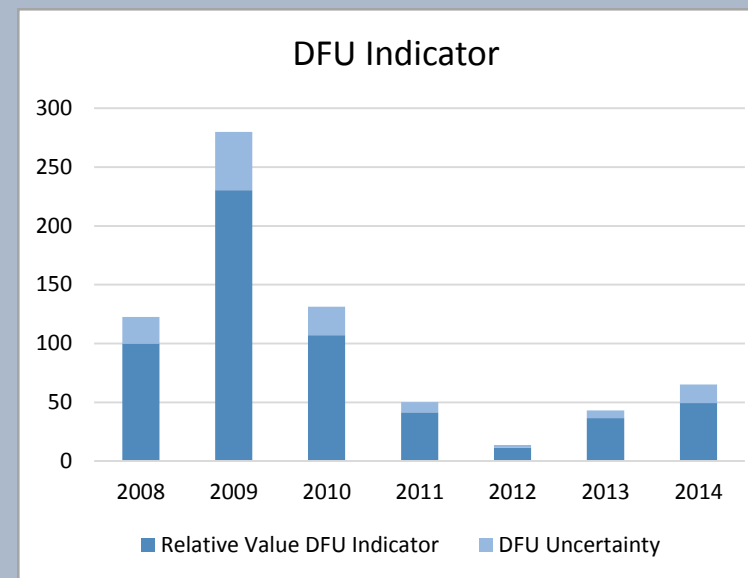
- Based on existing total indicator methodology
- DFU 12 (Helicopter incidents) is incorporated
- Presented as one indicator on a relative scale

II) Barrier Indicator

- Consists of two individual indicators
 - i. Barrier failure/DFU relation indicator
 - ii. Lagging HSE critical maintenance indicator
- Presented individually on relative scale

III) Survey Results Indicator

- The safety climate is established through a factor analysis of the survey results
- Presented as one indicator on a relative scale



Conclusions and Further work

- Satisfactory case study results
- Methodology is not recommended for implementation, as it is in need of further development
- DFU Indicator is advised to replace current RNNP total indicator to reflect helicopter risk in major accident risk levels.

References

- PSA. (2015a). *Risikonivå i Norsk Petroleumsvirksomhet - Hovedrapport - Utviklingstrekk 2014 Norsk Sokkel*.
- PSA. (2015b). *Risikonivå i Norsk Petroleumsvirksomhet - Metoderapport - Utviklingstrekk 2014 Norsk Sokkel*.
- Vinnem, J. E. (2010). Risk indicators for major hazards on offshore installations. *Safety Science*, 48(6), 770-787.