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Risk assessment for a floating attitude tension leg platform by application of a hybrid fuzzy-statistical process control model

Key words:

TLP; Risk Assessment; Floating Attitude; Hybrid model; Fuzzy-SPC

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The methodology of risk assessment

The methodology of risk assessment has three parts:

The first part is risk identification, which includes:

(1) identifying the causes and source of the risk;

(2) classifying the causes and source of the risk as risk indices

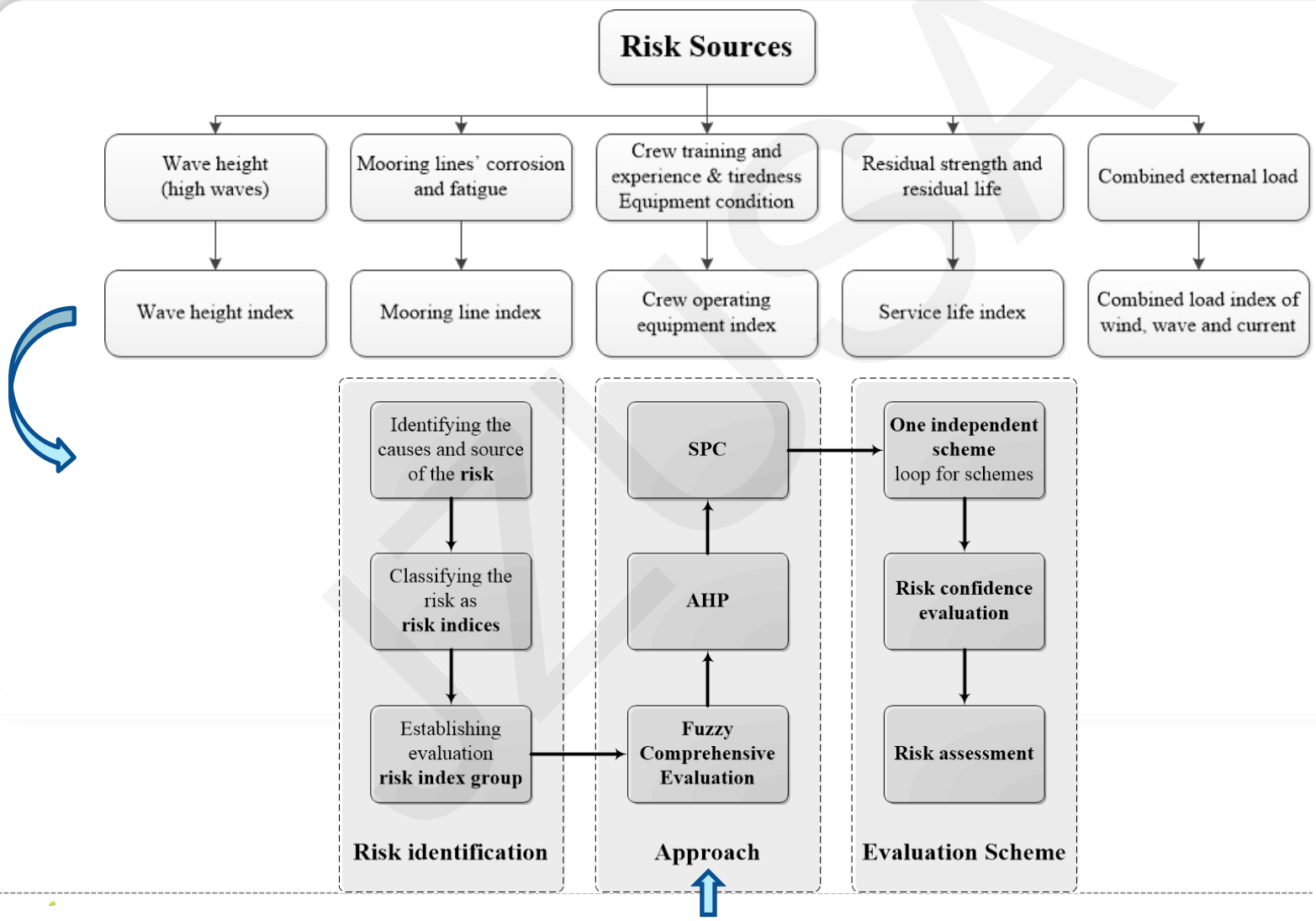
The second part is risk analysis, which includes two steps:

step one, establishing evaluation risk index group based on risk indices;

step two, proposing evaluation scheme with the approach which is suitable for the well-defined risk index group.

The last part is risk evaluation with the risk index group and the evaluation scheme.

The methodology of risk assessment



Hybrid Fuzzy-SPC Model

Hybrid Fuzzy-SPC model for confidence evaluation

Hybrid Fuzzy-SPC Model:

Combined with fuzzy theory, AHP and SPC theory.

1. Fuzzy comprehensive evaluation method

Applying the fuzzy comprehensive evaluation method to handle the 'fuzzification' of indices in assessment.

2. Analytic hierarchy process (AHP) in fuzzy evaluation

The purpose of applying AHP is to determine the weight of a criterion with a comparable uniformity. In the process of fuzzy evaluation, AHP is needed for the probability of risk occurrence.

3. Statistical process control (SPC) theory

Taking the advantage of reverse SPC theory to derive a confidence interval using the central limit theorem

Risk evaluation for one independent scheme based on the Hybrid Fuzzy-SPC Model

Risk confidence evaluation based on scheduled independent schemes