

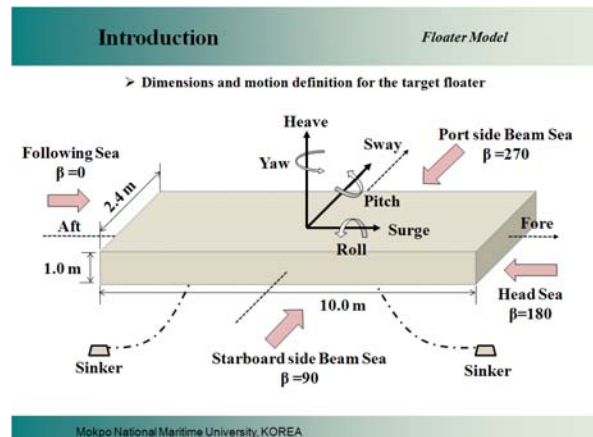
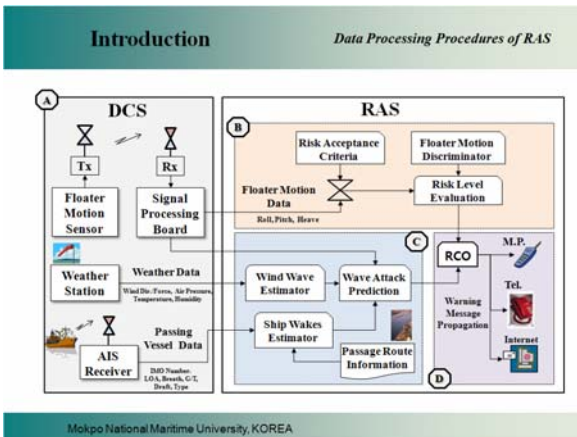
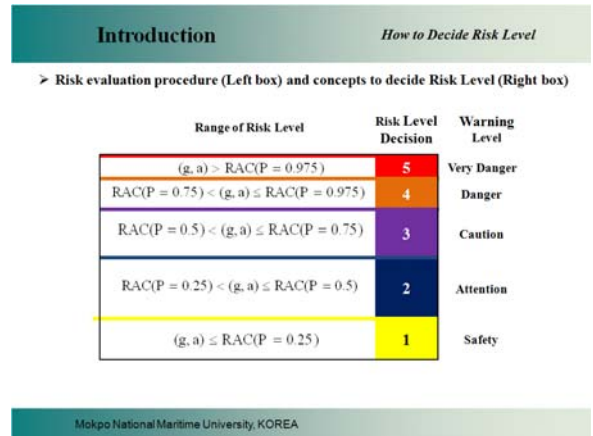
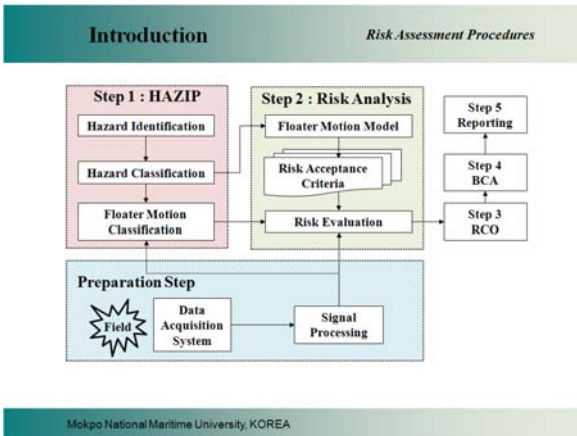
# 소형 해상 부유체의 위기허용수준 결정을 위한 최적의 누적확률분포함수 선정에 관한 연구

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**요 약** : 위기허용수준(RAC)은 시스템의 안전성 평가를 위한 확률적인 기준으로, 소형 해상 부유체의 롤, 피치, 히브 등 세 가지 동적 운동의 위험수준 평가에 적용할 수 있다. 부유체의 동적운동 값들은 모델을 통해서 획득한 후, 이에 관한 누적확률분포함수를 추론하여 상대적인 위기수준을 결정하게 된다. 이 연구는 모델에서 획득한 세가지 동적운동에 대한 최적의 누적확률분포함수 선정에 관한 것이 목적이다. Exponential, Extreme Value, Gamma, Lognormal, Normal, Poisson 등 6가지 대표적인 누적확률분포함수를 세 가지 동적운동에 적용하여 평가한 결과, 롤과 히브 운동의 경우는 Beta 누적분포함수가 최적임을 나타냈고, 피치 운동의 경우는 Gamma 누적분포함수로 대표하는 것이 최적임을 나타냈다. 아울러 향후 본 연구 결과의 적용방법에 대해서도 검토하였다.

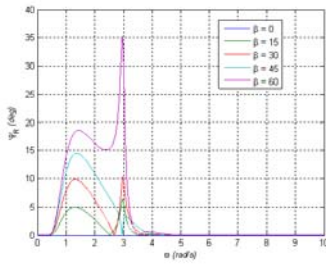
**핵심용어** : 부유체, 안전성 평가, 위기허용기준, 누적분포함수, 위기관리, 동적운동



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### Risk Acceptance Criteria

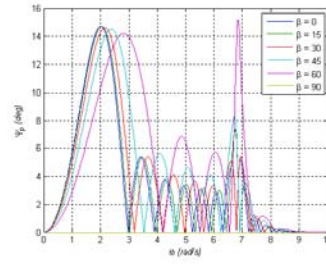
Roll Motion Data  
- Frequency v.s Degree -



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### Risk Acceptance Criteria

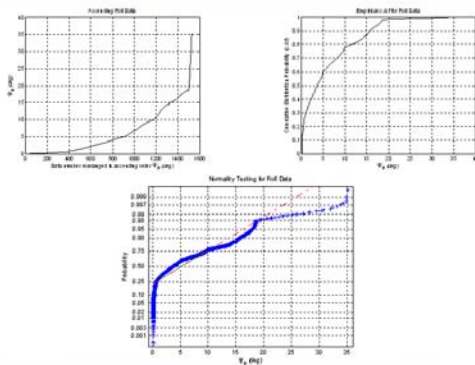
Pitch Motion Data  
- Frequency v.s Degree -



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### Risk Acceptance Criteria

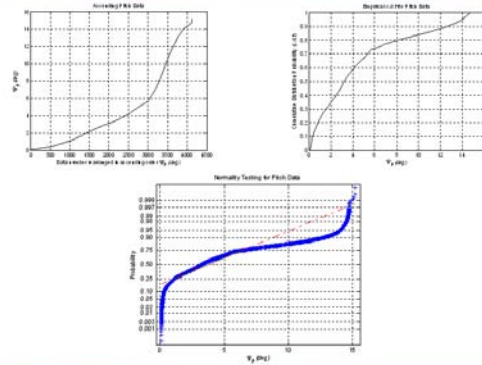
Data Characteristics  
- Roll Motion -



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### Risk Acceptance Criteria

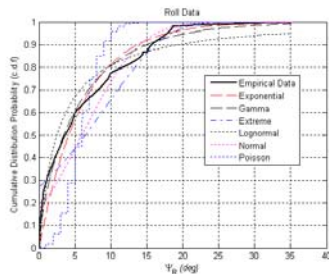
Data Characteristics  
- Pitch Motion -



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### Risk Acceptance Criteria

Choose Best-fit c.d.f  
- Roll Motion -



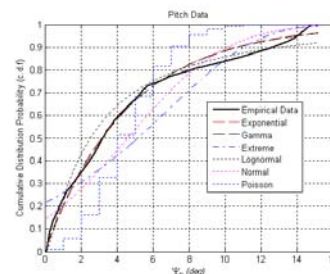
**Error and Rankings**

Exponential	: 0.061 (3)
<b>Gamma</b>	<b>: 0.031 (1)</b>
Extreme	: 0.093 (5)
Lognormal	: 0.053 (2)
Normal	: 0.080 (4)
Poisson	: 0.185 (6)

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### Risk Acceptance Criteria

Choose Best-fit c.d.f  
- Pitch Motion -



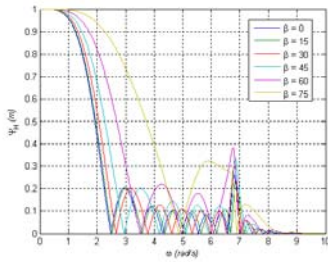
**Error and Rankings**

Exponential	: 0.019 (2)
<b>Gamma</b>	<b>: 0.018 (1)</b>
Extreme	: 0.098 (5)
Lognormal	: 0.041 (3)
Normal	: 0.079 (4)
Poisson	: 0.140 (6)

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## Risk Acceptance Criteria

Heave Motion Data  
- Frequency vs. Meters -



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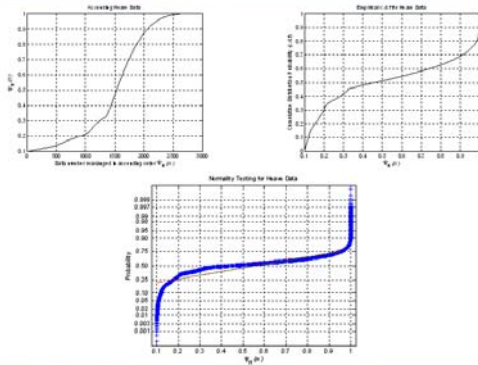
## Conclusions

- To find the best Risk Acceptance Criteria (RAC) for the Risk Assessment System of small-sized Yacht pier, the six kinds of c.d.f are compared and select best fit c.d.f for the motion data of Roll, Pitch and heave.
- The c.d.f used in this paper is as follows;
  - Exponential c.d.f
  - Extreme Value c.d.f
  - Gamma c.d.f
  - Lognormal c.d.f
  - Normal c.d.f
  - Poisson c.d.f
- The first rank of c.d.f to fit to the Roll and Pitch motion is found to be as Gamma cumulative distribution functions
- In case of Heave motion, Exponential cumulative distribution functions is best fit to the data.
- Further work, we will implement the risk assessment system for the yacht pier and yacht itself with this c.d.f.

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## Risk Acceptance Criteria

Data Characteristics  
- Heave Motion -



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## 후기

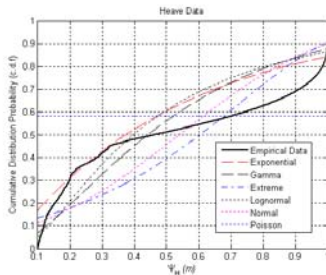
이 논문은 2013년도 해양수산부지정 호남지역 씨그랜트 센터의 연구개발사업 과제지원에 의해 수행된 연구임.

## 참고문헌

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## Risk Acceptance Criteria

Choose Best-fit c.d.f  
- Heave Motion -



**Error and Rankings**

Exponential	: 0.073 (1)
Gamma	: 0.082 (3)
Extreme	: 0.091 (5)
Lognormal	: 0.079 (2)
Normal	: 0.090 (4)
Poisson	: 0.257 (6)

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