ICCGS 2023

International Conference on Collision and Grounding of Ships and Offshore Structures

9TH EDITION

11 – 13 SEPTEMBER 2023
NANTES, FRANCE

Website
ICCGS 2023 !

Programme

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SCHEDULE AT A GLANCE

Sunday, 10 September 2023
Registration (O Deck Restaurant – from 17h00 onwards)
18h00 – Welcome Reception at O'Deck restaurant located on the river Loire (Nantes center)

Monday, 11 September 2023
Registration (Icam School of Engineering – from 8h00 onwards)
Opening Session – Amphi 1 (09h00 – 09h15) H. Le Sourne and C. Guedes Soares
Plenary Lectures – Amphi 1 (09h15 – 10h45) (3 presentations) Chairmen: H. Le Sourne and C. Guedes Soares
Coffee-break (10h45 – 11h15)

Amphi 1	Amphi 2
Session 1.1 (11h15 – 12h45) **Collision and grounding experiments**	Session 2.1 (11h15 – 12h45) **Collision avoidance**
Lunch (12h45 – 14h00)	
Session 1.2 (14h00 – 15h45) **Material Properties**	Session 2.2 (14h00 – 15h45) **Traffic modelling**
Coffee-break (15h45 – 16h15)	
Session 1.3 (16h15 – 18h00) **Hull girder response under severe dynamic loadings**	Session 2.3 (16h15 – 18h00) **Risk assessment 1**

Tuesday, 12 September 2023
Registration (Icam School of Engineering – from 8h00 onwards)

Amphi 1	Amphi 2
Session 1.4 (09h00 – 10h45) **New designs for resistance to collisions and grounding**	Session 2.4 (09h00 – 10h45) **Risk assessment 2**
Coffee-break (10h45 – 11h15)	
Session 1.5 (11h15 – 12h45) **Collision and grounding in Arctic conditions**	Session 2.5 (11h15 – 12h45) **Prediction & measures for reduction of collision and grounding**
Lunch (12h45 – 14h00)	
Session 1.6 (14h00 – 15h30) **Collision between ships and bridges**	Session 2.6 (14h00 – 15h30) **Dynamics of vessels 1**
Coffee-break (15h30 – 16h00)	
Session 1.7 (16h00 – 17h30) **Ultimate strength of ship structures**	Session 2.7 (16h00 – 17h30) **Dynamics of vessels 2**
19h45 – Conference Dinner (Onboard ship on the river Erdre)	

Wednesday, 13 September 2023
Registration (Icam School of Engineering – from 8h00 onwards)

Amphi 1	Amphi 2
Session 1.8 (9h00 – 10h45) **Collision between ships and offshore structures 1**	Session 2.8 (9h00 – 10h45) **Dynamics of vessels 3**
Coffee-break (10h45 – 11h15)	
Session 1.9 (11h15 – 12h45) **Collision between ships and offshore structures 2**	
Lunch (12h45 – 14h00)	
End of the ICCGS 2023 Conference	

SESSIONS IN ALPHABETICAL ORDER

Collision avoidance
Monday, 11/9/2023, Session 2.1
11h15-12h45, Amphi 2

Collision and grounding experiments
Monday, 11/9/2023, Session 1.1
11h15-12h45, Amphi 1

Collision and grounding in Arctic conditions
Tuesday, 12/9/2023, Session 1.5
11h15-12h45, Amphi 1

Collision between ships and bridges
Tuesday, 12/9/2023, Session 1.6
14h00-15h30, Amphi 1

Collision between ships and offshore structures 1
Wednesday, 13/9/2023, Session 1.8
09h00-10h30, Amphi 1

Collision between ships and offshore structures 2
Wednesday, 13/9/2023, Session 1.9
11h15-12h45, Amphi 1

Dynamics of vessels 1
Tuesday, 12/9/2023, Session 2.6
14h00-15h30, Amphi 2

Dynamics of vessels 2
Tuesday, 12/9/2023, Session 2.7
16h00-17h30, Amphi 2

Dynamics of vessels 3
Wednesday, 13/9/2023, Session 2.8
09h00-10h30, Amphi 2

Hull girder response under severe dynamic loadings
Monday, 11/9/2023, Session 1.3
16h15-18h00, Amphi 1

Material Properties
Monday, 11/9/2023, Session 1.2
14h00-15h45, Amphi 1

New designs for resistance to collisions and grounding
Tuesday, 12/9/2023, Session 1.4
9h00-10h45, Amphi 1

Prediction & measures for reduction of collision and grounding
Tuesday, 12/9/2023, Session 2.5
11h15-12h45, Amphi 2

Risk assessment 1
Monday, 11/9/2023, Session 2.3
16h15-18h00, Amphi 2

Risk assessment 2
Tuesday, 12/9/2023, Session 2.4
9h00-10h45, Amphi 2

Traffic modelling
Monday, 11/9/2023, Session 2.2
14h00-15h45, Amphi 2

Ultimate strength of ship structures
Tuesday, 12/9/2023, Session 1.7
16h00-17h30, Amphi 1

DETAILED PROGRAMME

Monday, 11 September 2023

09h00 to 09h15
Opening Session
Amphi 1
Chairs: H. Le Sourne and C. Guedes Soares

Opening addresses

Welcome – Pays de la Loire Region
To Be Defined

09h15 to 10h45
Plenary Lectures
Room: Amphi 1
Chairs: H. Le Sourne and C. Guedes Soares

Damage stability regulation: limitations and evolutions towards global risk assessment
Rodolphe Bertin, Chantiers de l'Atlantique, France

A complete calculation method to assess a ship's behavior under collision
Natacha Le Coq, Principia, France

Motivations of using composite materials for large vessels
Stéphane Paboeuf, Bureau Veritas M&O, France

11h15 to 12h45
Session 1.1
Collision and grounding experiments
Amphi 1
Chair: Ling Zhu

Grounding Model Test over a Sharp Rock for Ship Bottom Plating with and without Transverse Stiffeners
L. Zhu, Z.H. Zhou & K.L. Guo

Experimental investigations on the scale effects of steel unstiffened plates under lateral mass impacts
S.-H. Park, S.-R. Cho, D.U. Kim & D. Jeong

Model test design method for ship-ship collision based on damage energy similarity
Y.J. Zhao, T.T. Guo, L.P. Zhang & J.H. Liu

11h15 to 12h45
Session 2.1
Collision avoidance
Amphi 2
Chair: Spyros Hirdaris

Effect of timely manoeuvre execution on the collision probability in head-on and crossing encounter scenarios
E. Lotovskyi & A.P. Teixeira

Statistical analysis of collision risk indicators in ship evasive manoeuvres
H. Rong, A.P. Teixeira & C. Guedes Soares

Research on multimodal ship interaction collision avoidance method based on worth-oriented negotiation
X. Wang, Y. Zhang, S. Wang & A. Liu

14h00 to 15h45
Session 1.2
Material properties
Amphi 1
Chair: Sang-Rai Cho

Research on deep-sea collision of titanium alloy submersible pressure shell
T.T. Guo, L.P. Zhang & Y.J. Zhao

Study on ductile fracture behavior of welded joints of highly ductile steel for shipbuilding
T. Okawa, K. Nakashima & Y. Yamada

Investigation on tensile impact properties of MAG T-joints with different basic materials
D. Zhang, L. Zhang, J. Wang, Y. Zhao, J. Tang & J. Dong

Session 2.2
Traffic modelling
Amphi 2

Chair: Angelo Teixeira

Relationship between estimated ship collision frequency and observed near misses in real traffic environment
H. Itoh, R. Miyake & S. Kawashima

Data driven traffic flow extraction and analysis around Leixões Port
D. Liu, H. Rong, C. Guedes Soares

Research on change of traffic safety accompanying the successive implementation of new traffic rules
R. Miyake & H. Itoh

Vessel traffic behaviour near newly established offshore wind farms based on AIS data analysis
A. Nowy, L. Gucma & M. Perkovic

Session 1.3
Hull girder response under severe dynamic loadings
Amphi 1

Chair: Ye Pyae Sone oo

Whipping design of a surface ship using an equivalent beam model
M. Le Garrec, S. Paroissien & A. Sotty

Numerical investigation of rigid body loads acting on an Ultra Large Containership in high sea states
P.P. Vijith, S. Rajendran, S. Wang & C. Guedes Soares

A simplified method to assess the impact of ship-to-ship collision on the risk of tanker ship hull girder breaking accounting for the effect of ageing
K. Woloszyk, J. Montewka & F. Goerlandt

Dynamic load identification of a typical cantilever beam using Green's Kernel Function
Zareei, X.Q. Zhou, Y.H. Jiang, C.F. Li & S.L. Sun

Session 2.3
Risk assessment 1
Amphi 2

Chair: Hiroko Itoh

Identification of hazardous encounter scenarios using AIS data for collision avoidance system testing
S. Guo, V. Bolbot, A.B. Toroody, O. A. Valdez Banda & C.-L. Siow

Allision modelling in IWRAP Mk II – A verification and sensitivity study
A. Hörteborn

Super element method based ship collision tool and risk assessment approach
L. Kaydihan & Y. Koldenhof

Causation analysis of collision accidents using Chi-squared test and Bayesian network
X. Liu, X. Shen & Q. Yu

Tuesday, 12 September 2023

Session 1.4
New designs for resistance to collisions and grounding
Amphi 1

Chair: Pentti Kujala

Auxetic-inspired side structures for enhanced collision resistance
C. Jiang & N.Z. Chen

Design criteria of collision & grounding in small FRP LNG fueled ship using FSI analysis technique
S.G. Lee, J.S. Lee, C.B. Park & Y.G. Chung

On the simplified method to estimate critical grounding velocity for the prevention of cargo tank rupture in grounding accidents
Y. Yamada, T. Okawa & K. Nakashima

An analytical model to study the tearing behavior of a stiffened plate under oblique ship side collisions
Y. Zhang, J. Zhou & Y. Yuan & W. Tang & Z. Hu

Session 2.4
Risk assessment 2
Amphi 2

Chair: Yvonne Koldenhof

Detection and analysis of near collision scenarios in Malacca strait
D. Liu, C.-L. Siow, H.-S. Kang, C. Guedes Soares

Deep learning for risky encounter prediction: leveraging LSTM networks and AIS data
M. F. Oruc & Y. C. Altan

Towards updated crashworthiness guidelines for safe transport of hazardous cargo on inland waterways
N.P.M. Werter, O.J. Coppejans, M.L. Deul, M.G. Hoogeland, R.P. Sterkenburg & A.W. Vredeveldt

A machine learning method for the evaluation of probabilistic grounding risk reflecting ship motion uncertainties
M. Zhang, P. Kujala & S. Hirdaris

Session 1.5
Collision and grounding in Arctic conditions
Amphi 1

Chair: Zhiqiang Hu

Ice belt weight reduction of ships operating in ice floe infested waters with the direct calculation method
M. P. Bobeldijk, M. G. Hoogeland, A. Nedaei & P. Groes-Petersen

The dynamic repeated impact response of rectangular plates under rounded and blunt impactors
X. He & C. Guedes Soares

Prediction of the residual deformation evolution of steel plates subjected to repeated lateral impacts
D.D. Truong, V.V. Huynh, X.-P. Dang & S.-R. Cho

Session 2.5
Prediction and measures for reduction of collision and grounding
Amphi 2

Chair: Carlos Guedes Soares

Safe navigation routing using mesh-based encounter frequency
S. Kawashima, H. Itoh & R. Miyake

Model predictive control and artificial potential field based collision avoidance path planning method with ship manoeuvrability
H. Li, X. Wang & T. Wu

A novel approach using ship manoeuvring database for ship trajectory prediction
A. Zhang, S. Hong & Q. Yu

Session 1.6
Collision between ships and bridges
Amphi 1

Chair: Yasuhira Yamada

Dynamic response analysis of pontoon interception system under ship collision for protecting bridge
Y. Chen, Q. Xiao, J. Pan & M. Xu

Impact force analysis of ship-bridge collision considering fluid influence
Y. Chen, O. Xiao, J. Pan & M. Xu

Ship impact from a general cargo vessel on the Bergsøysund floating bridge in Norway
M. E. Eidem, Y. Sha

Session 2.6
Dynamics of vessels 1
Amphi 2

Chair: Smiljko Rudan

The influence of crashworthiness on passenger ship damage stability probabilistic analysis including grounding damages
F. Conti, J-P. Pineau, M. Cardinale, R. Bertin & D. Lindroth

Real-time collision damages for the flooding risk assessment of passenger ships
F. Mauro, D. Vassalos, D. Paterson, H. Bae, F. Mauro & F. Conti

Safety evaluation of bottom cutting rescue technology of capsized vessels using FSI analysis technique
S.G. Lee, J.S. Lee, C.B. Park & Y.G. Chung

Session 1.7
Ultimate strength of ship structures
Amphi 1

Chairs: Thomas Lindemann

In-service effects on the mechanical and fracture properties of steel from the Royal Canadian Navy ship ex-HMCS IROQUOIS
A.Y. Elruby, B.W.T. Quinton & John R. MacKay

Ultimate longitudinal bending strength of damaged box girder in upright and inclined conditions – Model experiment and numerical analysis
Y. Komoriyama, Y. Tanaka, T. Ando, Y. Hashizume, A. Tatsumi & M. Fujikubo

Residual ultimate strength assessment of damaged columns of the Bjørnafjorden floating bridge after ship collisions
Z. Yu, X. Wang, T. Moan, J. Amdahl & Y. Sha

Session 2.7
Dynamics of vessels 2
Amphi 2

Chairs: Jorgen Amdahl

Cause investigation for hull damage of ferry Sewol by submarine collision using FSI analysis technique
S.G. Lee, J.S. Lee, C.B. Park & Y.G. Chung

Comparison of a simplified FSI models for the rapid evaluation of accidental loads following ship hard grounding
G. Taimuri, H. Le Sourne, J.-P. Pineau, T. Mikkola, S-J. Kim, P Kujala & S. Hirdaris

External dynamics modelling in ship collision analysis
S. Rudan, S. Sviličić 1, P. Prebeg & I. Ćatipović

Wednesday, 13 September 2023

Performance of large diameter steel tubes from a floating offshore wind turbine under lateral impact loads
Y. Ren, Z. Yu, X. Hua, J. Amdahl, Z. Chen

Numerical simulations of ship collision with offshore UHPC structures
Y. Sha

A simplified method to assess the elastoplastic response of standalone tubular floating offshore wind turbine supports subjected to ship impact
G. Vandegar, Y.P. Sone Oo, I. Ladeira, S. Echeverry & H. Le Sourne

Hydrodynamic and Vibration Analysis of Specific Offshore Engineering Vessels with Time-varying Wet Surface and Longitudinal Inclination Characteristics
Y. Zhang & Z. Hu

Cause investigation for hull damage of ferry Sewol sinking accident using FSI analysis technique
S.G. Lee, J.S. Lee, C.B. Park & Y.G. Chung

Numerical assessment procedure for the bottom contact of MV Estonia
K. Tabri, H. Naar, A. Šults, M. Heinvee, M. Mäesalu, J. Matusiak, M. Jakobsson, S. Varushkin, M. Kaldoja & T. Roosipuu

Numerical study on the effects of bulbous bow on the damages of side structure in ship collision
X. Wang, L. Zhu & S. Zhang

Sensitivity analysis of the hydrodynamic interaction for the manoeuvring of two ships in calm water
C. Xu, X.Q. Zhou, H.L. Ren, S. Sutulo & C. Guedes Soares

Not under command drifting vessels and tug adequacy
M. van der Wel, C. van de Vrie & C. de Ridder

Collision simulations between a floating offshore wind turbine and a tanker considering ductile fracture and hydrodynamics of FOWT
D.H. Yoon & J. Choung

Impact of forms of anti-collision fender on structural safety of monopile foundation subjected to ship collision
T. Zheng, N. Z. Chen

IMPORTANT INFORMATION

- The technical sessions of the ICCGS 2023 Congress will run in amphitheaters 1 and 2 of ICAM School of Engineering, located near ICAM main entrance (ground floor).

  o Address: Institut Catholique d'Art et Métiers (ICAM) - 35 avenue du champ de manœuvres, Carquefou

  o Telephone (ICAM reception): +33 240 524 052

- From Nantes railway station:

  o Take tramway line 1 direction *Beaujoire* or *Ranzay*

  o Get off at bus stop *Haluchère- Batignole*

  o Take bus n° 95 (direction *Bois-St-Lys*)

  o Get off at bus stop ICAM

  o Walk up to ICAM (300m)
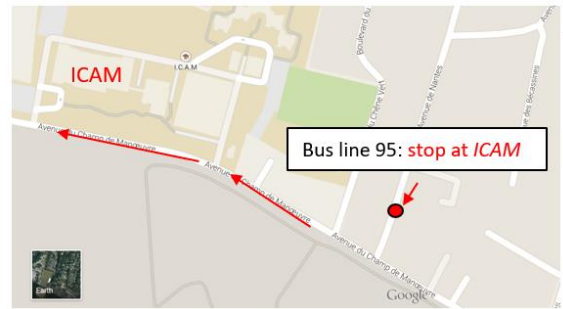
- From Nantes city center:

  o Take bus n° C6 either in *Saint Nicolas* bus stop or in *Place du Cirque* bus stop or in front of Nantes Cathedral -> Direction *Chantrerie - Grandes Ecoles*

  o Get off at bus stop: *Moulin de Porterie*

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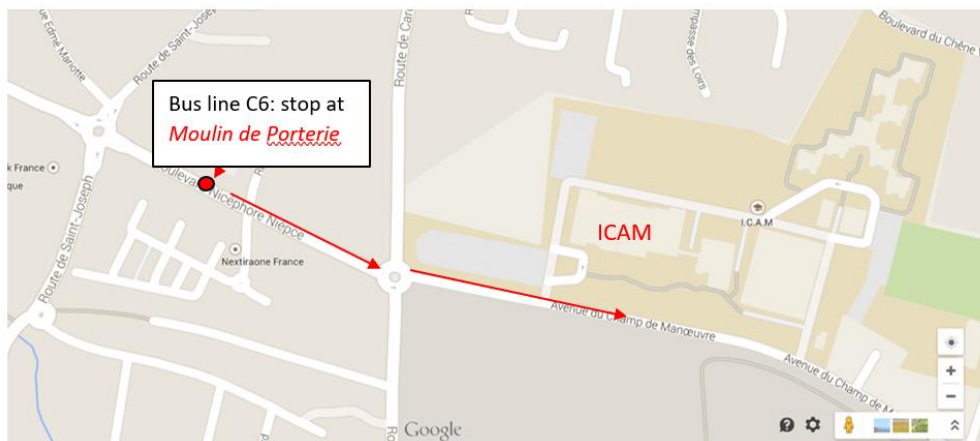
  o Wireless access: **ICCGS** - password: **N@ntes1109**

Guidelines for presentations, questions and answers:

- Each paper will have a timeslot of 25 minutes (15 minutes for the presentation and 10 minutes for Questions & Answers).

- Make sure you follow the timetable set out in the programme and the order of presentations.

- Please present yourself to the Chair 10-15 minutes before the start of the session.

- Missing presence prior to the session means no show, and the presentation will be skipped.

- Make sure that the oral presentation is not too long to comply with the 25 minutes scheme for presentation and Q&A.

General responsibilities of the session chair

- Please join the session 10-15 minutes in advance.

- Introduce the session and the presenters.

- Make sure the time is strictly adhered to and does not extend past the allocated time. (This may impose problems for the start-up of the following session)

- Conclude the session.

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Advances in the Collision and Grounding of Ships and Offshore Structures

Editors:
Hervé Le Sourne
C. Guedes Soares

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