



# ASME AIM-ALE 2021

Asset Integrity Management -  
Ageing and Life Extension Conference

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# Program

CONFERENCE  
November 30 – December 3, 2021

Virtual Conference,  
Online

<https://event.asme.org/AIM-ALE>



# ASME AIM-ALE 2021

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# ASME AIM-ALE 2021

## Welcome from the Conference Chair

*On behalf of ASME and the organizing committee, it is with great pleasure to welcome you to the conference on Aging and Life Extension (ALE) with focus on offshore facilities. This conference is the second in a new ASME conference series that focuses on Asset Integrity Management (AIM). The 3<sup>rd</sup> AIM conference is being planned for 2023.*

*The main objective of this conference is to present in one venue the regulatory, current industry practices, and technological challenges associated with extending the life of offshore facilities that are passing their original design life. In addition to the technical program that includes 30 presentations covering the scope of the conference, we have arranged for a panel session at the end of the conference to discuss the remaining gaps in life extension assessments. While the papers and the presentations in the conference are available to the participants, the official publication of the final papers will be produced by ASME as an edited book that will be published mid-2022 and it will be provided to the participants in the conference. This means that any author who wants to update his/her paper based on the discussion in this conference still can do so. The results of the panel session will also be included in the book.*

*The organization of this conference was not possible without the support of the conference co-chairs Dr. Gerhard Ersdal and Dr. Alex Stacey and ASME staff Jamie Hart and her team. I would like to express our sincere thanks to the authors, the reviewers, the session chairs, the panel members, and all the participants.*

*I sincerely hope that you enjoy both the technical presentation and the discussions. Please feel free to contact Jamie or I if there is anything we can do to make your experience an enjoyable one.*


Dr. Mamdouh M. Salama

AIM-ALE 2021 Conference Chairman



# ASME AIM-ALE 2021

## Schedule at a Glance

	<b>ASME® AIM-ALE 2021</b> Asset Integrity Management - Ageing and Life Extension Conference	CONFERENCE Nov. 30–Dec. 02, 2021  <b>Online, Virtual</b>
	<b>TUESDAY, NOVEMBER 30, 2021</b>	
Time (All Times Are In U.S. EST)		
7:00am - 7:30am	AIM ALE Conference Opening	
7:30am - 10:00am	Session 1 - Life Extension - Regulatory and Class Considerations	
10:00am - 10:30am	BREAK	
10:30am - 1:00pm	Session 2 - Ageing & Life Extension of Offshore Structures	
<b>WEDNESDAY, DECEMBER 1, 2021</b>		
7:00am - 10:00am	Session 3 - Extreme Environmental Loading Conditions	
10:00am - 10:30am	BREAK	
10:30am - 1:00pm	Session 4 - Ageing of Production and process Facilities	
<b>THURSDAY, DECEMBER 2, 2021</b>		
7:00am - 10:00am	Session 5 - IMR of Marine Structures	
10:00am - 10:30am	BREAK	
10:30am - 12:30pm	Session 6 - Ageing & Life Extension of Pipelines	
<b>FRIDAY, DECEMBER 3, 2021</b>		
7:00am - 8:30am	Panel discussion - Ageing and life extension, remaining gaps	



# ASME AIM-ALE 2021

## AIM-ALE 2021 Organizing Committee

**AIM-ALE 2021 Conference Co-Chair**



Alexander Stacey  
Health & Safety Executive, UK

**AIM-ALE 2021 Conference Chair**



Mamdouh Salama  
MMS4AIM, USA

**AIM-ALE 2021 Conference Co-Chair**



Gerhard Ersdal  
Petroleum Safety Authority, Norway



# ASME AIM-ALE 2021

## Program Detail

### **Tuesday, November 30, 2021**

#### **Opening Session**

**7:00 AM ET**

Thomas Costabile, Executive Director – ASME

Mamdouh Salma, Gerhard Ersdal and Alex Stacey, Conference Chairs

#### **Session 1. Life Extension - Regulatory and Class Considerations (5)**

**7:30 AM ET – 10:00AM ET**

Chairman: John Sharp, Cranfield University, UK

Co-Chairman: Adel Younan, ExxonMobil Upstream Integrated Solutions, USA

Structural Integrity Management of Ageing Offshore Structures: A Regulatory Perspective. Alexander Stacey (HSE, UK) and Gerhard Ersdal (Petroleum Safety Authority, Norway) **(AIM-ALE2021-76973)**

Offshore Industry Initiatives on Ageing and Life Extension. Cameron Stewart (Energy Institute, UK), Steve Temple (Total E&P UK Limited, UK), Ramsay Fraser (BP, UK), and Alexander Stacey (Health & Safety Executive, UK) **(AIM-ALE2021-77742)**

UK Regulatory Initiative on Extreme Weather Loading of Offshore Installations in the North Sea. Alexander Stacey (Health & Safety Executive, UK) **(AIM-ALE2021-76757)**

Learnings From the Performance of Fixed Steel Structures in Gulf of Mexico Hurricanes. Frank Puskar (FJP Consultant, USA) **(AIM-ALE2021-77757)**

Production Riser Life Extension – A Class Perspective. Hao Sing and Suqin Wang (ABS, USA) **(AIM-ALE2021-76201)**

#### **Session 2. Ageing & Life Extension of Offshore Structures (4)**

**10:30 AM ET – 1:00 PM ET**

Chairman: Cameron Stewart, Energy Institute, UK

Co-Chairman: Gerhard Ersdal, Petroleum Safety Authority, Norway

Integrity Management of Ageing Offshore Structures: Technical Developments and Challenges. Alexander Stacey (Health & Safety Executive, UK) and John V. Sharp (Cranfield University, UK) **(AIM-ALE2021-76756)**



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Life Extension of Mooring Chains - Including Effects of Mean Load and Corrosion Condition to Fatigue Capacity. Øystein Gabrielsen, Per Erlend Voie, and Solfrid Molid, (Equinor, Norway) **(AIM-ALE2021-75116)**

Lifetime Extension of Mooring Anchors. Øystein Gabrielsen, Turid Liengen, Solfrid Molid (Equinor, Norway) **(AIM-ALE2021-75876)**

Digital Transformation by the Implementation of the True Digital Twin Concept and Big Data Technology for Structural Integrity Management. Ulf T. Tygesen (Ramboll Energy, Denmark) **(AIM-ALE2021- 76217)**

A Framework for Estimating Stress Intensity Factor for Semi Elliptical Circumferential Cracks Using Weight Functions. Ayodele Fajuyigbe (University of Strathclyde, UK) **(AIM-ALE2021- 77155)**

## Wednesday, December 1, 2021

### **Session 3. Extreme Environmental Loading Conditions**

**7:00 AM ET – 10:00 AM ET**

Chairman: Frank Puskar, FJP Consultants, USA

Co-Chairman: Alexander Stacey, Health & Safety Executive, UK

Extreme Environmental Loading Part II: Long-Term Distributions of Crests, Kinematics and Loads. Richard Gibson (Offshore Consulting Group, UK) and Chris Swan (Imperial College London, UK) **(AIM-ALE2021-77776)**

Implications of the Loads JIP on Extreme Wave Conditions in the North Sea. Graham Feld (Shell Global Solutions UK), David Randell (Shell Global Solutions International, Netherlands), and Philip Jonathan (Shell Global Solutions UK) **(AIM-ALE2021-77749)**

An Improved Method of Establishing Extreme Metocean Conditions in Gulf of Mexico. Oliver Jones (BP, UK), Hans Fabricius Hansen (HAW MetOcean ApS, Denmark), and Michael Zhang (BP, USA) **(AIM-ALE2021- 77758)**

Establishing unmanning criteria for a jacket structure on the NCS. Gunnar Lian, Øistein Hagen (Equinor, Norway) and Sverre K. Haver (University of Stavanger, Norway) **(AIM-ALE2021- 74944)**

A probabilistic Structural Reliability Assessment of Existing North Sea Platforms. Graham Feld (Shell, UK), David Randell (Shell, Netherlands), John Kent (Worley Parsons, UK), Stephen Rose (Shell, UK), and Emmanuel Fakas (Shell, UK) **(AIM-ALE2021-76076)**

ISO 19901-1 Petroleum and Natural Gas Industries — Specific Requirements for Offshore Structures — Part 1: Metocean Design and Operating Considerations. Donald Smith (ENI, UK) **(AIM-ALE2021-77759)**



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## Session 4. Ageing of Production and process Facilities (5)

**10:30 AM ET – 1:00 PM ET**

Chairman: Agnes Marie Horn, DNV, Norway

Co-Chairman: Mamdouh Salama, MMS4AIM, USA

New Guidelines on Fatigue Life of Ageing Pressure Vessels. John Wintle (University of Strathclyde, UK) and Emilie Buennagel (TWI, UK), **(AIM-ALE2021-77756)**

Impact of Changes in Fluid Composition Due to Presence of Mercury on Integrity Management of Gas Pipelines. Rohana Jaafar, M. Hawari Hasan, Azmi M Nor, Noraina Suyanti M Aris, M Firdaus Sohor, Christina Asong Lenjau, and Khalid Zaid (Petronas, Malaysia) **(AIM-ALE2021- 75277)**

Piping PE Lining Failure at Cooling Water System in Floating LNG. M. Hawari Hasan, Rohana Jaafar and M Baki Mansor (Petronas, Malaysia) **(AIM-ALE2021- 75274)**

Challenges in Surface Facilities Sand Management and Approach in Mature Oil Field. Wan Mahsuri Wan Hashim, Rohana Jaafar, Amira A Rasib, Maryam Seth, Rohazad M Norpiah, and Hawari Hasan (Petronas, Malaysia) **(AIM-ALE2021- 75314)**

Evaluation of Flange Leakage due to Thermal Bowing. Yuqing Liu, Philip Diwakar and Ismat Eljaouhari (Bechtel, USA) **(AIM-ALE2021- 74234)**

## Thursday, December 2, 2021

### Session 5. IMR of Marine Structures (6)

**7:00 AM ET – 10:00AM ET**

Chairman: Jens Tronskar, DNV Singapore Pte. Ltd., Singapore

CO-Chairman: John Wintle, University of Strathclyde, UK

Inspection-Based Life Extension of Offshore Jacket Fleets. Adel Younan and Doug Angevine (ExxonMobil Upstream Integrated Solutions, USA) **(AIM-ALE2021- 76994)**

Reliability-Based Inspection Intervals of Offshore Jacket Fleets. Adel Younan and Doug Angevine (ExxonMobil Upstream Integrated Solution, USA) **(AIM-ALE2021-77044)**

Underwater inspection and repair for ageing offshore structures. John V. Sharp (Cranfield University, UK), Gerhard Ersdal (University of Stavanger, Norway) **(AIM-ALE2021-66580)**

Inspection, Maintenance, and Repair of Ageing Concrete Oil and Gas Installations on the Norwegian Continental Shelf. N John O'Malley (DNV, Canada), Andreas Lervik and Tim Wiley (DNV, Norway), and Gerhard Ersdal (Petroleum Safety Authority, Norway) **(AIM-ALE2021-74969)**





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Repair methods for loadbearing steel structures operating on the Norwegian continental shelf. Arne Fjeldstad, Einar Landet (DNV, Norway), Lars Bjørheim and Gerhard Ersdal (Petroleum Safety Authority, Norway) **(AIM-ALE2021- 76219)**

Crack Arrestor Enhanced Offshore Structures (Oral Presentation). Mayuresh Paradkar, Xiaolong Xu, and David Hua (ABS Group, USA) **(AIM-ALE2021-75308)**

## **Session 6. Ageing & Life Extension of Pipelines (5)**

**10:30 AM ET – 12:30 PM ET**

Chairman: John Wintle, University of Strathclyde, UK

Co-Chairman: Mamdouh Salama, MMS4AIM, USA

Lifetime extension of the Norpipe oil transportation system (Oral Presentation). Anne-Berit Kobbeltvedt (ConocoPhillips, Norway) **(AIM-ALE2021-76358)**

Re-Qualifications of Existing Pipelines for CO<sub>2</sub> and H<sub>2</sub> Transport, Structural Integrity Challenges. Agnes Marie Horn, Erling Østby, Bente Leinum, Gustav Heiberg, and Bjørn-Andreas Hugaas (DNV, Norway) **(AIM-ALE2021-77600)**

Inspection and Remaining Life Assessment of Subsea Pipelines Exposed to Various Forms of Internal Corrosion Degradation Mechanisms. Jens Tronskar and Lee Kit Wui (DNV Singapore Pte. Ltd., Singapore) **(AIM-ALE2021- 76193)**

Life extension and integrity management of ageing export pipelines. John V. Sharp (Cranfield University, UK), Gerhard Ersdal (University of Stavanger, Norway), Mamdouh Salama (MMS4AIM, USA), and Alexander Stacey (Health & Safety Executive, UK) **(AIM-ALE2021-74399)**

## **Friday, December 3, 2021**

**Panel Discussion on: Ageing and life extension, remaining gaps**

**7:00 AM ET – 8:30 AM ET**

Leader: Mamdouh Salama, MMS4AIM, USA

Panelist:

Gerhard Ersdal, Petroleum Safety Authority, Norway

Emmanuel Fakas, Shell, UK

Graham Feld, Shell, UK

Ramsay Fraser, BP, UK

Oliver Jones, BP, UK

Frank Puskar, FJP Consultants, USA

Donald Smith, Eni, UK



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Alexander Stacey, Health & Safety Executive, UK  
Jens Tronskar, DNV Singapore Pte. Ltd., Singapore  
John Wintle, University of Strathclyde, UK  
Adel Younan, ExxonMobil Upstream Integrated Solutions, USA



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*Thank you for attending  
AIM-ALE 2021!*

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*March 2023*



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