IOGP / ISO TC 67 / SC 7 / WG 7 for ISO 19905 Site-Specific Assessment of Mobile Offshore Units

Status Report to City, University of London International Conference: The Jack-Up Platform, 2021

Mike Hoyle, Noble Denton marine services, Energy systems

04 November 2021

Outline

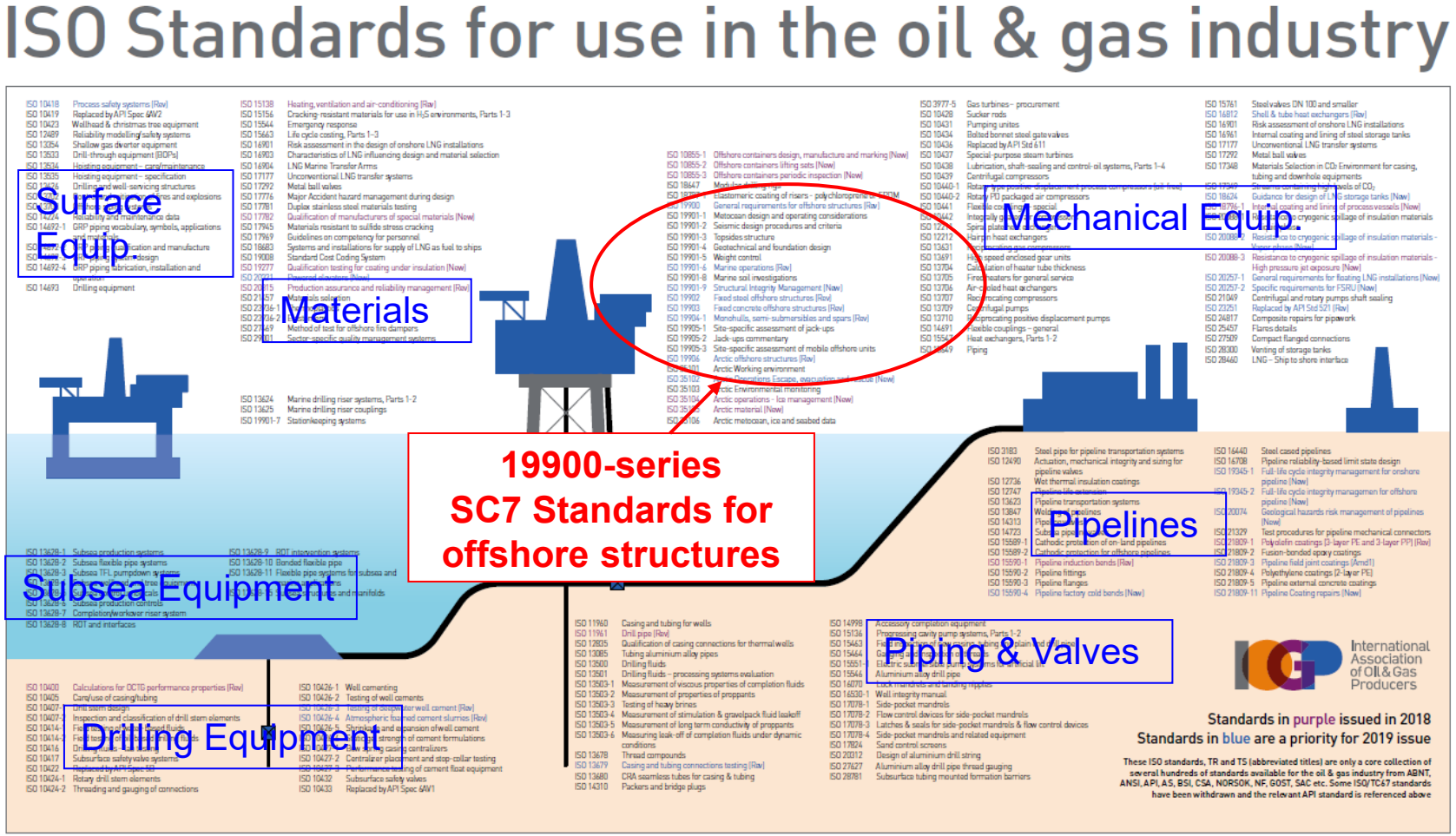
Aim:

- To provide a brief update on WG7's standards ISO 19905-1, -2, -3 and -4 and their status.

Content:

- Some background
- WG7's standards
- ISO 19905-1 – Timeline and status
- ISO 19905-1 – Third edition updates
- Status of ISO/TR 19905-2
- Status of ISO 19905-3
- Status of ISO 19905-4

Background



19900-series is part of a much larger suite of standards for the Petroleum & Natural Gas Industries – soon to become: Oil & gas industries including lower carbon energy

WG7 and its standards:

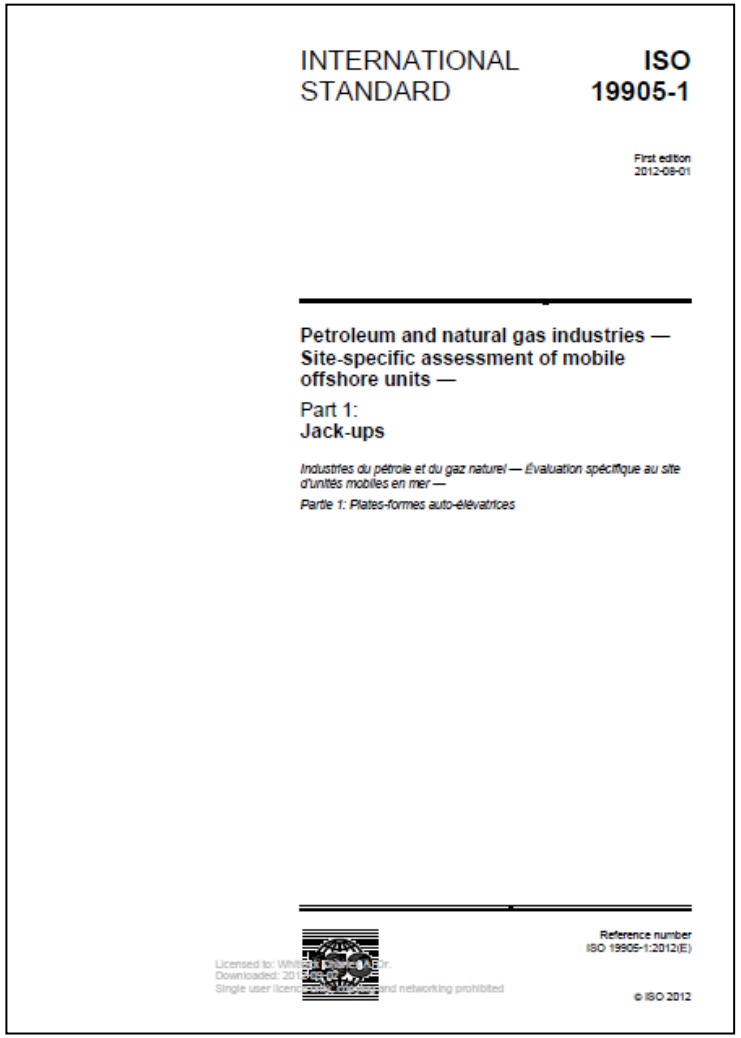
WG7 & its technical panels have met biannually for many years; 49th WG7 meeting this month.

- 19905-1 – Site Specific Assessment (SSA) of mobile jack-up units.
- 19905-2 – Technical Report, including a Go-By (or “detailed example calculation”).
- 19905-3 – SSA for Mobile floaters. P53: Leader John Stiff)
- 19905-4 – Installation and removal of jack-ups. (P54: Leader Mike Hoyle)

- For further details on the development of 19905-1 see:
  - ISOPE 2006-PM-06 Jack-Up Assessment Past Present & ISO Hoyle, Stiff, Hunt, Morandi
  - OMAE2011-50056 Jack-Up Assessment – The Voyage to an ISO Hoyle, Stiff, Hunt

19905-1 – SSA of jack-ups Time Line & Status

- ISO 19905-1 First Edition published August 2012
- OTC2012 launch session - the series of papers discussed a good number of technical advances.


INTERNATIONAL STANDARD

ISO 19905-1

First edition
2012-08-01

Petroleum and natural gas industries — Site-specific assessment of mobile offshore units —

Part 1:
Jack-ups

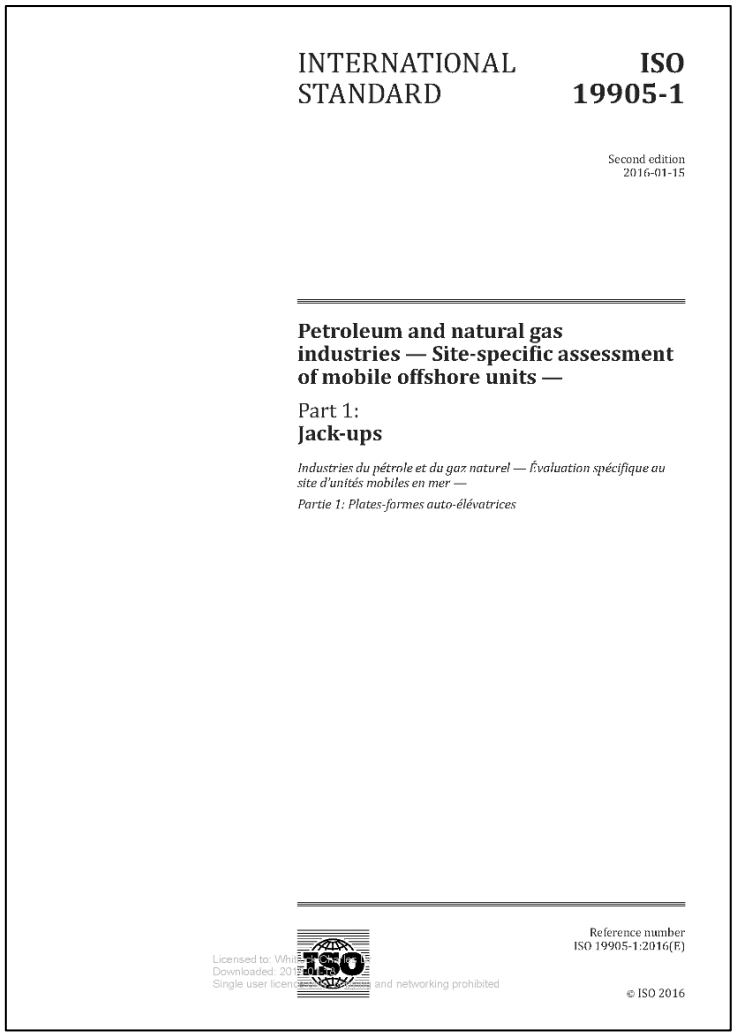
Industries du pétrole et du gaz naturel — Évaluation spécifique au site d'unités mobiles en mer —

Partie 1: Plates-formes auto-élévatrices

Reference number
ISO 19905-1:2012(E)

19905-1 Time Line & Status (cont.)

- Errata was originally planned for 2012, but further topics were embraced and it became a Minor Revision, capturing typos and editorial issues as well as some technical updates.
- Eventually the Second Edition was published in January 2016.
- The updated areas and some new glitches were presented at this conference four years ago.
- Project initiation for 3rd Edition was approved by IOGP at the end of 2017.



INTERNATIONAL STANDARD **ISO 19905-1**

Second edition
2016-01-15

Petroleum and natural gas industries — Site-specific assessment of mobile offshore units —

Part 1:
Jack-ups

Industries du pétrole et du gaz naturel — Évaluation spécifique au site d'unités mobiles en mer —

Partie 1: Plates-formes auto-élévatrices

Reference number
ISO 19905-1:2016(E)

ISO 19905-1 – Third edition updates

The DIS of the 3rd edition was recently submitted to IOGP for processing prior to onward transmission to ISO.

In this we have addressed a list of carry-forwards from the first edition that were not covered in second addition and a list of new/updated topics that has grown with time. The more significant updates include:

- Interaction/alignment with ISO19900:2019, includes updates to many definitions; added definitions and deletion of Consequence and life-Safety text with exposure Levels to be taken according to ISO:19900.
- Improved interaction with 19906:2019 for Artic regions and updates across the standard regarding ice loads/management. This was done in liaison with WG8 for 19906.
- Requirements and information on earthquake response analysis gathered in 10.7 and A.10.7 respectively and referenced from their original locations (8.6, 8.7, 8.8, A.8.6.3, A.8.7).

ISO 19905-1 – Third edition updates (cont.)

- Option for foundation capacities and stiffnesses to be based on strength parameters rather than applied preload. Annex E.4 added to provide the details.
- Normative text on cyclic mobility expanded to address liquefaction and liquefaction-induced lateral flow and informative expanded accordingly. Added E.5 providing an example of a simplified free-field liquefaction assessment calculation method.
- Clarification that the H_{max} to H_{srp} relationships are defaults in the absence of site-specific data and that the application of kinematics reduction should no longer be by means of wave height reduction.
- Most probable peak enhancement factor is now given as a range, with the most conservative to be used in the absence of site-specific information.
- Revision of the default current profile.

ISO 19905-1 – Third edition updates (cont.)

- Allowing alternative wind profiles.
- Updates to GoMex Annex H.3 for latest metocean data – links to a US 2nd Edition comment. Deletion of superseded data hurricane data and referencing latest in API-RP-2MET, with some adjustment of requirements to meet API approach.
- Revision of the requirements for the geotechnical report and expansion especially in respect of shear strength.
- Updating penetration in clays to address strain rate dependency and strain softening.
- Major update to the ultimate vertical/horizontal/rotational capacity interaction function for spudcans in sand and clay due to the addition of a caveat on the need to consider the effects of cyclic loading on foundation capacities.

ISO 19905-1 – Third edition updates (cont.)

- Revised guidance on the selection of shear modulus for clay following clarification from and discussion with NGI on the latest published knowledge.
- Revision of Step 2a foundation capacity and sliding checks and the correction of the figures.
- Clarification of guidance on non-circular prismatic member classification and of guidance for reinforced components, in respect of slender components.
- Updating guidance on strength of tubular members to align with ISO 19902:2020 (combined axial and bending loading now of cosine interaction form instead of previous form using linear interaction) and addition of simplified combined axial, bending, beam shear and torsion checks.

ISO 19905-1 – Third edition updates (cont.)

- Updating beam shear area formulations for chord cross sections.
- Revisions to Table B.2: Less conservative partial resistance factor for horizontal foundation capacity for total stress (clay/undrained); addition of partial resistance factors for vertical-horizontal foundation bearing capacity when considering material factored soil strength and for calculated foundation capacities.

In addition there are a number of text clarifications and corrections to figures and tables

ISO 19905-1 – Third edition updates (cont.)

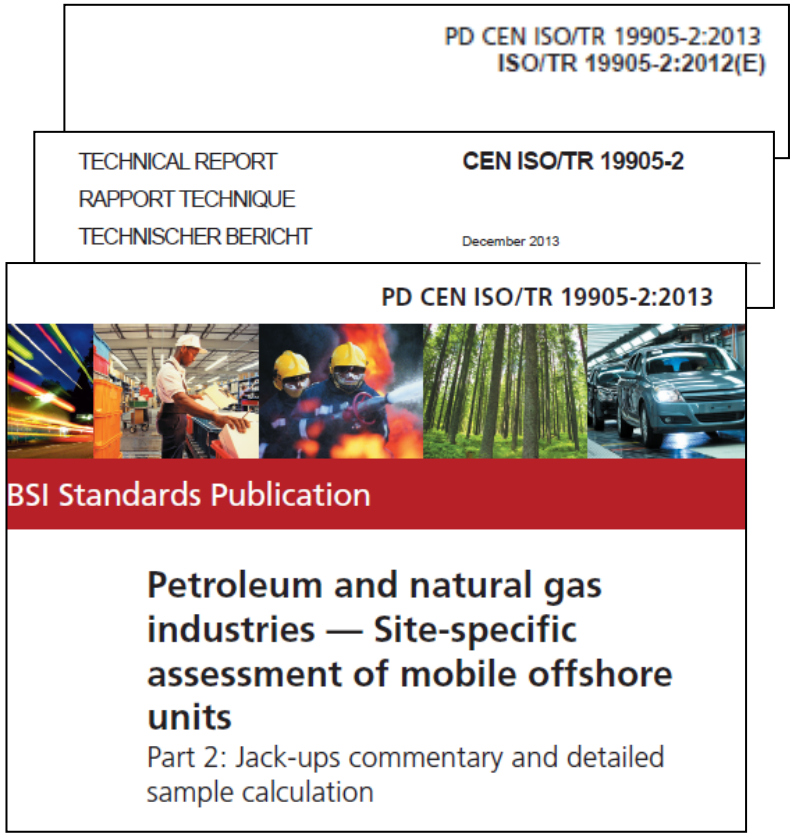
- Some of the updates that depended on funding could or will carried forward to the 4th next edition:
  - Updates on H & M soil capacity for deeper penetrations – initial justification presented by Jack Templeton at SNAME symposium in February 2019, however P4 requested some further cases – for which funding was needed. This was granted by the IADC Jack-Up Committee and the further work was presented by Jack yesterday. It will need to be reviewed and accepted by P4 before inclusion in our FDIS.
  - H_o and M_o capacity for sand underlying clay by Templeton has also been funded; aiming to present ar SNAME symposium Feb 2022 – so may be accepted by P4 in time for inclusion on our FDIS.
  - Review adequacy of additional load cases near resonance. Stock/Perry have proposal in with IADC Jack-Up Committee (IJUC) that was updated at Nov 2014 P3 meeting. Now IADC's second priority (after editing of 19905-4), so little chance progress in the near future.
  - Testing of improved approach to spudcan-soil dynamics for earthquakes. This is dependent on the initiation of a JIP. Attempt at DeepStar funding failed. May try SNAME managed JIP with potential of some funding from the wind-farm sector.

ISO 19905-1 – Third edition timeline – what next?

- DIS submitted to IOGP 2021-10-18 – not long after the completion of the formal 5-year review in which the standard was confirmed by 7 nations with 4 more recommending revision/update. 5 nations offered experts.
- DIS has to be processed by IOGP and then by ISO. Former is in a queue behind other standards. The latter should take no more than 2 months.
- Once DIS published, the ballot period is 12 weeks. After that we have to address the comments from the ballot and prepare the FDIS – likely to take around 6 months. The FDIS ballot period is 8 weeks and publication should follow within 6 weeks. This is therefore around 1 year after the DIS reaches ISO.
- The ongoing activity has enabled us to keep the core Panels together; in some instances we need to identify succession plans.
- There is an issue regarding the numbering of Figures and Tables. Current format is C.SC-N as permitted for our standards at the outset. Now ISO want C-N format. If this is insisted upon it will have to be done by ISO or BSI, and will cause delay as well as an unnecessary challenge for both us and our users.

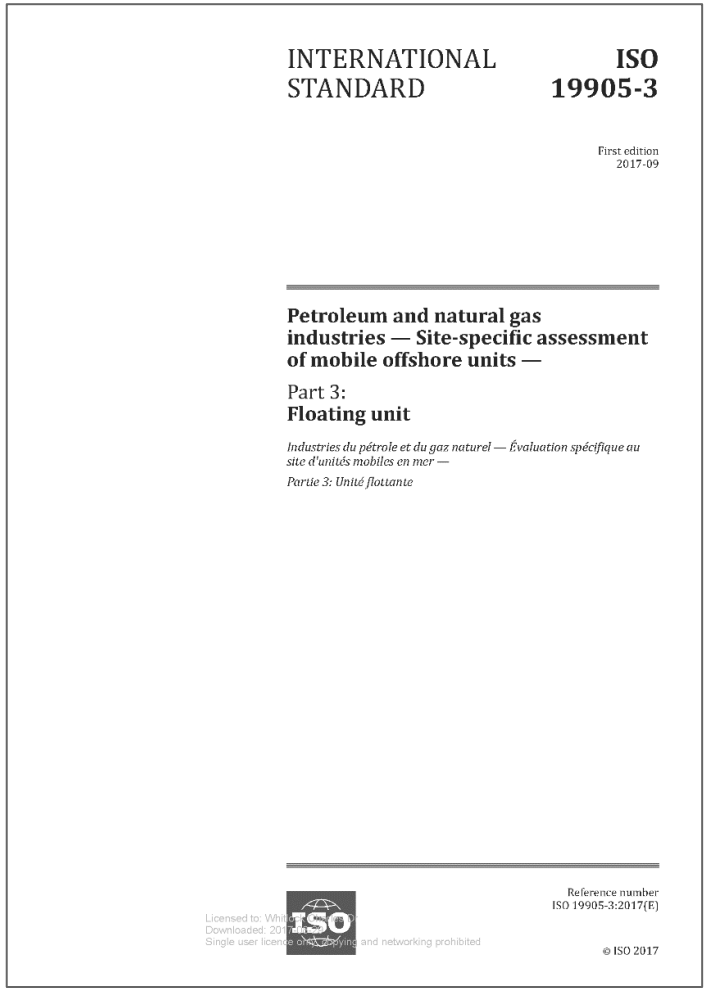
Status of ISO/TR 19905-2 Jack-Ups, Commentary and Example Calculation

- Published December 2013, but dated 2012, to match references in 19905-1, CEN & BSI dated their wrappers 2013.
- Limited feedback so far – mostly minor.
- 2nd Edition of 19905-2 will address feedback and include additional text supporting the main updates in 19905-1 on:
  - Chord shear areas.
  - Go-By example to support new Annex E.4 on "Calculated foundation capacity" (awaited).
  - Possibly background on cyclic mobility / liquefaction
  - Potentially an update of the "go-by" to capture the changes in 3rd edition of 19905-1; hoping this will be done as a Noble Denton training exercise.
- Aiming to publish with 3rd Ed of 19905-1, but will lag by a few months if the full "go-by" update is included..
- Will progress the draft early in 2022, now that ISO/DIS 19905-1 is completed.



Status of ISO 19905-3
Site specific assessment of mobile floating units

- First Edition of ISO 19905-3 was published in October 2017, thanks to the good work by John Stiff and Panel 53.
- A number of Technical comments from the ballot on the FDIS of the First Edition were carried forward to the Second Edition.
- In 2018 the UK HSE and others requested that text regarding airgap be strengthened.
- We thought an update addressing this was ready to submit towards the end of 2018 … but … there were delays.
- ISO proposed a number of changes in their close-out of FDIS ballot comments. We were uncomfortable with some and responded accordingly to the 2-week review. Very pleased to report that our preferences were adopted.
- The second edition was eventually published in March 2021 – however the parallel CEN ballot was not held (and is still pending – now likely to start in Jan 2022) so not yet available as e.g. BS-EN-ISO.


INTERNATIONAL STANDARD

ISO 19905-3

First edition
2017-09

Petroleum and natural gas industries — Site-specific assessment of mobile offshore units —

Part 3:
Floating unit

Industries du pétrole et du gaz naturel — Évaluation spécifique au site d'unités mobiles en mer —

Partie 3: Unité flottante

Reference number
ISO 19905-3:2017(E)

Status of ISO 19905-4
Installation and removal of jack-ups [Going on and off location]

- Panel 54 has worked on guidance for site specific installation and removal operations to address:
  - The procedures and communication methods to keep the operational risks within tolerable limits.
  - The situations to be addressed and provide guidance as to how to assess these with the goal of allowing the operability of rigs to be assessed using an appropriate and consistent methodology, to check or extend the limits documented in the Marine Ops Manual.
- Participant list includes almost 90 names and 39 organisations.
  - Good spread; 9 Consultants, 9 Owners, 4 Designers, 5 MWS, 3 Operators, 4 Movers, 5 Others
  - Around 75% of the organizations are US-based; others include Australia, Denmark, Netherlands, Singapore, UAE, UK

The 14th Panel 54 meeting will be held later this month.

Status of ISO 19905-4
Installation and removal of jack-ups [Going on and off location]

- Intend to publish the Normative and Informative Annex A first, together with:
  - Annex B – Checklists
  - Annex C – Example rig-move procedure
  - Annex D – Competence
  - Annex E – Responsible Parties.

- Further Annexes detailing calculation methodologies will be included in a subsequent edition.

Status of ISO 19905-4
Installation and removal of jack-ups (cont.)

- Technical input (near-)complete after the Spring 2020 P54 meetings. Further minor updates made in November 2020 and May 2021.
- We need editorial (ERP) meetings, and funding to support this, however:
- IOGP's JIP30 that has been used to fund editing of ISOs was not supportive in 2019 and 2020.
- Funding also requested from IADC Jack-Up Committee – those present at a 2019 meeting generally favourable.
- In 2020 we suggested that both parties seek 19905-4 specific funding from their wider membership. We drafted a letter and proposal soliciting funding, finalised in December 2020 that was been circulated in IOGP early in the year – with, we understand no uptake. Jim Rocco at IADC circulated IADC jack-up owners recently with a request for funding split over 2 years – not aware of any uptake so far.
- Slim chance of some funding from SNAME OC-10 / J-Reg Offshore Renewable Energy JIP on windfarm jack-ups.

- To date, representatives of all the major sectors of industry that use jack-ups have contributed at least 3300 hours of un-paid effort to the development of this document in Panel and Task Group meetings alone; further time and expense has been spent on preparation for meetings, travel, etc.

Until such time as some funding is available it is unlikely that we will be able to progress the editing.

Looking Forward

- Maintain Technical Panel momentum.
- Progress 19905-1 3rd Edition to FDIS and publication.

  Some 19905-1 technical issues will be parked until 4th Edition; two that missed the DIS could make it to the FDIS.
- Progress 19905-2 2nd Edition for publication with/shortly after 19905-1.
- Continue to progress 19905-4 for publication in 2023
  - but this will only happen if we can find funding for the editing
- We still need new blood in the WG & TP's, and a succession plan.

And last, but not least ….

Many thanks to all who contributed to the publication of:

- ISO 19905-1:2012 and ISO 19905-1:2016
- ISO/TR 19905-2:2012
- ISO 19905-3:2017 and ISO 19905-3:2021

And to those who have been active in the development of

- 19905-1,
- TR 19905-2 and
- 19905-4.


Maersk Inspirer – MSC CJ70


KFELS “B-Class”

The End
(… but, hopefully not of 19905 development)

Mike.hoyle@dnv.com
+44 20 3816 4928
+44 77 4779 5443

www.dnv.com