

Case 11/2022

Issue: Foundation (Suction Can) and Steel Jacket for Wind Turbine No. 1  
(Amendment to SEC Case 14/2012)

Recommendation: Design

- (1) To accept the amendment of the diameter of suction cans to 17m as foundation for an offshore wind turbine.
- (2) To accept the following amendment on the design soil parameters with a factor of safety (FOS) of 3 adopted for calculating the allowable design capacities under working load:
  - (a) Under Static Load Conditions
    - (i) The ultimate bearing resistance on suction can wall tip in the sand layer shall not exceed 10MPa.
    - (ii) The ultimate shaft friction in sand layer shall be as follows:
      - (a) The ultimate shaft friction in sand layer shall not exceed  $0.4 \times \tan \phi' \times$  effective stress (the  $\beta$  method) with a limit of 33.2 kPa.
  - (b) Under Transient Load Conditions
    - (i) The limiting value of the ultimate bearing resistance on whole base in sand layer is limited to 841kPa.
- (3) To accept the amendment of the thickness of cold-formed steel tubular sections up to 90mm to form the suction cans. The cold-formed steel tubular sections are also extended to the use of jacket substructure.
- (4) To accept the amendment of pile spacing to 34m between the centres of the suction cans which is less than the minimum requirement in the Code of Practice for Foundations 2017.
- (5) To accept the use of DNVGL-OS-C401 as a guideline for fabrication of the cold-formed tubular sections thicker than 22mm.

Qualified Supervision

- (6) To accept the fabrication of the cold-formed tubular sections at factory outside Hong Kong SAR shall be under the qualified

site supervision provided by the representatives from RSE and RSC streams, in order to ensure the fabrication with adequate quality control and the compliance with the required quality standards.

Decision:

After deliberation and taking into consideration of the offshore conditions, members endorsed the recommendations (1) to (6) subject to the following conditions:-

- (a) The compression load test as proposed in this paper should be carried out to verify the performance of the foundation; and
- (b) The conditions and requirements contained in paragraphs (a) to (g) in Decision Section of the SEC Paper 14/2012.