Response to the reviewers for paper OE-D20-01516: *Evolution of Lift in a Pure Cruciform for Energy Harvesting*

We would like to express our gratitude to the anonymous reviewers for their time and insight. Below, we document the comments from the reviewers and our response to the comments. We indicate the changes in the original manuscript using the colour blue.

Answers to Reviewer 1

Comment R1.1 *Why OpenFOAM is employed? If other software can be employed to solve the calculation?*

Answer to R1.1 OpenFOAM is an open source software capable of doing a lot of CFD related tasks. The obvious merit is the

Comment R1.2 *Mesh independence test is carried out using GCI method, but I think the reference can be updated. For example:[Applied Thermal Engineering. 2020;171:115090], [https://doi.org/10.1016/j.ene*

Answer to R1.2 In Koide et al. (2017),

Comment R1.3 *Some figures' resolution need to be adjusted.*

Answer to R1.3 In Koide et al. (2017),

Comment R1.4 *Boundary conditions need to be shown.*

Answer to R1.4 In Koide et al. (2017),

Answers to Reviewer 2

Comment R2.1 *It's suggested to define FIM in line 37 of page 3 (sub-section 2.1), even though it's easy to know that FIM means flow-induced motion.*

Answer to R2.1 Answer

Comment R2.2 *Why chose the distance of* $7.5D$ *from front/back boundary to centre of cylinder (Fig 2)? And how did the boundary condition set in this study?*

Answer to R2.2 Answer

Comment R2.3 *It's suggested to presented or validated the time step (or nondimensionalised time step) of the simulation in this work.*

Answer to R2.3 what is gi

Comment R2.4 *In line 30 of page 15, why the sudden jump followed by a gradual drop and a gradual rise in* y^*_{RMS} *can be observed in this study but not in woks ofNguyen et al. (2012) nor Koide* *et al. (2013)? Any difference of parameters leads to the different results?*

Answer to R2.4 Answer

Comment R2.5 *The CFD over predict the frequency response and the value of St in low reduced velocity range (Fig 10), is this caused by the boundary condition or the size of computational domain?*

Answer to R2.5 Answer

Comment R2.6 *It's interested that the fluctuation exists in Fig 11(a) when* $U^* = 22.7$*, how this exist and how the value of* y^*_{RMS} *and* f^* *calculated for this case (The values can be found in Fig 10)?*

Answer to R2.6 Answer

Comment R2.7 *Looks like that the values still going to decline in Fig 12(a). It means that the vibration here still doesn't stable?*

Answer to R2.7 Answer

Comment R2.8 *How it's possible that* $P_{Fluid,RMS} < P_{Mech.,RMS}$ *for a given reduced velocity (Fig 20)?*

Answer to R2.8 Answer

Comment R2.9 *The fluid power is possible to improve by redirect the energy from the Karman to the streamwise vortex, and how it realizes? It's suggested to clarify a possible measure for it, or try to put forward an example.*

Answer to R2.9 Answer

References

Koide, M., Sekizaki, T., Yamada, S., Takahashi, T., Shirakashi, M., 2013. Prospect of Micro Power Generation Utilizing VIV in Small Stream Based on Verification Experiments of Power Generation in Water Tunnel. Journal of Fluid Science and Technology 8, 294–308. doi:10.1299/jfst.8.294.

Koide, M., Takahashi, T., Shirakashi, M., Salim, S.A.Z.B.S., 2017. Three-dimensional structure of longitudinal vortices shedding from cruciform two-cylinder systems with different geometries. Journal of Visualization , 1–11.

Nguyen, T., Koide, M., Yamada, S., Takahashi, T., Shirakashi, M., 2012. Influence of mass and damping ratios on VIVs of a cylinder with a downstream counterpart in cruciform arrangement. Journal of Fluids and Structures 28, 40–55. doi:10.1016/j.jfluidstructs.2011.10.006.