**RESPONSE TO REVIEWERS**

Manuscript title: " **Pipe size sensitivity in pressure relief networks using Genetic Algorithms**".

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We would like to sincerely thank the reviewers for their time spent reviewing the manuscript, and for providing their very insightful and generous comments, which helped improve our manuscript.

Our point-by-point response to the reviews is given below. The comments made by the reviewers are in italics. We have also prepared a marked version of the manuscript with all changes indicated, using the track changes option in MS word.

**Response to Reviewer A:**

***Comment:*** *“In opinion of reviewer the topic developed in the manuscript is a contribution to the modeling and optimization of industrial processes, however, I recommend emphasizing the novelty of the application proposed in the CONCLUSIONS section, together with the projection according to the summary of the results. The reviewer recommends linking the developed theme with new challenge, and the potential of machine learning applications in this study case.”*

***Response:*** We would like to thank the reviewer for his thorough review of the manuscript, as well as for his generous comments. As it has been suggested by the reviewer, the novelty of the proposed application has been emphasized in the conclusions section, as well as the potential for machine learning applications.

**Response to Reviewer B:**

***Comment#1:****“*In the paper pipe size sensitivity assessment of pressure relief networks using genetic algorithm is presented.”

***Response#1:*** We would like to thank the reviewer for his thorough review of the manuscript, as well as for his generous comments.

***Comment#1*** The introduction section is actually (already well-known) genetic algorithm presentation (e.g. basic concept, history, authors…)… I believe that actual researches about “pressure relief networks optimization” should be emphasized…

***Response#1:*** We would like to thank the reviewer for his comment. A thorough analysis of all the works that have investigated pressure relief network design have been provided in Section 2 of this manuscript. Moreover, a new figure has been added to demonstrate a simple relief network illustration.

***Comment#2: “***Only one case (Figure 2), which was already elaborated by other authors,

is presented… while results of the approach are promising…”

***Response#2:*** We would like to thank the reviewer for his comment. A new figure has been added to demonstrate a simple relief network illustration.

***Comment#3: “***In the conclusion section future work should be addressed, for instance multi-objective optimization…”

***Response#3:*** We would like to thank the reviewer for his comment. Potential future work that recommends the use of multi-objective optimization have been added onto the conclusions section.

***Comment#4:*** Minor concern: Average “civilization” computational time using PC with a 64-bit 233

Operating System (2.7 GHz, 8.00 GB RAM), and an Intel® Core ™ i7-2620M could be stated…

***Response#4:*** We would like to thank the reviewer for his comment. The CPU time has been added to the results and discussion section.