

Interactive comment on “Flood Impacts on a Water Distribution Network” by Chiara Arrighi et al.

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On behalf of my co-authors I would like to thank the referee #2 for his comments and suggestions. I am now giving a short reply to the specific comments, which will be addressed in detail in the revised manuscript.

- 1) The worst failure scenario is the 500 years recurrence interval and will be specified in the revised version of the abstract.
- 2) The interdependency is not only between the hazard and the network but also inside the network. In this sense, we strongly focused on interconnection. In fact the cascade effect on the pressure at nodes (i.e. the following possible need of decontamination) does not only depend on flood depth but also on the user demand, terrain morphology and network topology. Multiple interactions between WDN and flood are first in the triggering mechanisms and then in the spatial distribution of flood parameters.

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- 3) Fig.1 will be checked.
- 4) The referee is right, this is a typo.
- 5) The name of Arno river will be specified.
- 6) L247 the sentence will be rephrased.
- 7) Societal costs have not been previously estimated, since out of the scope of the previous work.
- 8) The 0.5 m threshold has been identified based on the judgement of experts (network managers) who undertaken a 'what-if' analysis to evaluate the vulnerability of active components. This threshold has been considered as conservative with respect to the mean position of electric devices (e.g. control panels, sensors) observed in the plants. This clarification will be added.
- 9) Fig. 3 the flooded area represents the portion of territory where flood depth exceeds 0.01 m during the events. The caption will be modified.
- 10) The description of the flood scenarios will be improved to better characterize the events. Maximum flood depths in the historic and suburban districts reach 3.5 m and 4.5 m respectively for the 500 years recurrence interval (see fig. 4).
- 11) Table 3 will be modified.
- 12) The paragraph L334-346 will be moved to the introduction.
- 13) The work by Arrighi et al (2016) considered the 200 years flood scenario. Here the length of the contaminate pipeworks (e.g. the costs) for the 200 years and 500 years scenarios do not differ significantly. The sentence will be clarified.
- 14) A more detailed discussion will be added to the conclusion about the adopted threshold. A planned future work will consider a dynamic coupling of the flood and network model and in this case a function of the water depth will be adopted.

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