

## ***Interactive comment on “CLIPS based decision support system for Water Distribution Networks” by S. Kulshrestha and R. Khosa***

**Anonymous Referee #1**

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Overall quality:

The paper describes the use of expert systems and its applications in water distribution management well. It is made clear where current expert systems are lacking (the inability to update the ES with new data and a limited scope of applications). The design of the ES that includes CLIPS is understandable. However, the results and conclusions of this paper are lacking. The paper describes the modules that were built for the system, but in these descriptions a relatively minor part is spent on describing the use of CLIPS for these modules.

What is missing is a results chapter which summarises the application of the CLIPS system in the new ES, and the results of this application. Question such as: "How did the use of the CLIPS system negate the disadvantages of current ES?" or "How does

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the CLIPS system address issues posed by ES systems in an equal/better way than current ES?" are not clearly answered. In addition, the conclusion mainly summarises the design of the system but is lacking in mentioning the (scientific) improvement this system brings.

Summarising: The introduction, description of current ES and the design of the new system is good. But, this paper needs to address the scientific significance of the designed system in a clear way and establish a better link between the designed system and its perceived advantages over current ES. At the moment this is not done enough to be accepted. If these issues are solved, a revised paper has a good chance at being accepted.

Scientific comments:

Abstract: The abstract summarises the use of AI and CLIPS in an ES, but not the results and the conclusions.

Figure 2: The figure does not make clear if the modules (calibration, simulation, etc.) are made of the part shown in the middle, or if they exchange data.

Chapter 2: "The first line of expert systems was developed just 35 yr ago and their basic design has not changed since." A source or more explanation is needed.

Chapter 11: Daily run module: The sub modules II and III use CLIPS to derive results. These are - for this paper - one of the most important functionalities of the ES. These descriptions must be expanded to include more description about use of CLIPS and its results.

12 Conclusions: The conclusions is lacking in describing the improvements of using the CLIPS system has brought. A good summary is needed here, in addition to a separate results chapter giving a longer overview.

Technical corrections:

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Page 2, line 9: "and they have applied 'an' Artificial Intelligence (AI) tool"

Page 2, line 10: "The application of 'an' AI tool"

Page 4, line 6: spell out yr to years.

Page 6, line 21: "extensive,composed" add a space after the comma.

Page 6, line 25: "In addition to this system is also affected with" Fix syntax.

Page 11, line 7: "For instance, consider the following partial rule that is used by the system." Where is this rule shown?

Figure 4: "Data-base" and "Frame-work" are written as database and framework.

Page 12, line 11: "WAMAN" is not explained.

Figure 17: Following the rest of the figure, "Valve status" should be "Valve Status" and "Q & H values", "Q & H Values"

Page 19, line 12: "It has been observed that CLIPS is the suitability of the forward reasoning" Fix syntax.

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