Reservoir operating rules across a range of system complexities and degree of operator competencies

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Abstract South Africa, as with most developing countries, has historically focused its efforts on developing operating rules for reservoirs and systems of interlinked reservoirs on large schemes which support major economic zones. In order to achieve a more equitable approach to water resources management, South Africa embarked on a process to develop operating rules for the smaller reservoirs and systems supplying water to towns and rural areas. This process entailed developing operating rules for over 100 dams across the country. This paper presents some of the lessons learnt from this process. One of the main conclusions is that the operating rules need to be adapted to the level of sophistication that can be accommodated by the reservoir operators. In its simplest form the operating rule is a description of actions to be undertaken under various situations. At the other extreme operating rules consist of complex decision support systems which include stochastic simulation models which carry out simulations every month and advise users of the risk of entering a restriction zone in future so that informed decisions can be made. This could include advice on transfer of water from other sources, the conjunctive use of surface and groundwater, or using desalination plants during serious droughts. A range of example operating rules are presented which cover the scope of this project. The conclusion reached in this paper is that a systematic approach is required to identify the type of operating rules that are applicable in any given situation, and a possible systematic approach is presented.

Key words Reservoir Operation; water restrictions; decision support systems