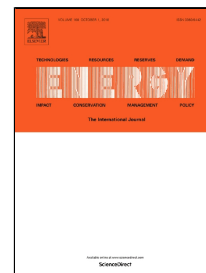


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Safety assessment of hydro-generating units using experiments and grey-entropy correlation analysis

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1 **Safety assessment of hydro-generating units using experiments** 2 **and grey-entropy correlation analysis**

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21 **Abstract:** This paper focuses on the safety analysis of a nonlinear hydro-generating unit
22 (HGU) running under different loads. For this purpose, a dynamic balance experiment
23 implemented on an existing hydropower station in China is considered, to qualitatively
24 investigate the stability of the system and to obtain the necessary indices for safety
25 assessment. The experimental data are collected from four on-load units operating at
26 different working heads including 431m, 434m, 437m, and 440m. A quantitative analysis
27 on the safety performance of the four units was carried out by employing an integration
28 of entropy weights method with grey correlation analysis. This assisted in obtaining the
29 safety degree of each unit, providing the risk prompt to the operation of nonlinear hydro-

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