ISO 9123:2017-10 (E)

Hydrometry - Stage-fall-discharge relationships

Contents

Page

Foreword v

1 Scope 1

2 Normative references 1

3 Termsanddefinitions 1

4 Symbols and abbreviated terms 1
4.1 Symbols 1
4.2 Abbreviations 2

5 General considerations 3
5.1 Importance of backwater 3
5.2 Backwater conditions 3
5.3 Gauging requirements 3
5.4 Types of stage-fall-discharge relationships 4

6 Unit-fall method 4
6.1 General 4
6.2 Method of analysis 5
6.3 Computation of discharge 5
6.4 Example of unit-fall method 5

7 Constant-fall method 7
7.1 General 7
7.2 Method of analysis 7
7.3 Computation of discharge 7
7.4 Example of constant-fall method 7

8 Variable-fall method 10
8.1 General 10
8.2 Normal-fall method 11
8.3 Limiting-fall method 11
8.3.1 General 11
8.3.2 Method of analysis 11
8.3.3 Computation of discharge 11
8.3.4 Example of limiting-fall method 12

9 Rating curves and tables 16

10 Method of computation 16

11 Periodic checking of stage-fall-discharge ratings 16

12 Extrapolations 16

13 Evaluation of uncertainty in the stage-fall-discharge relation 16
13.1 General 16
13.2 Implementing the GUM procedure for evaluating uncertainty in the stage-fall- discharge relation and derived estimates 17
13.2.1 General 17

13.2.2 Propagation of uncertainty for stage-fall-discharge estimates 17
13.2.3 Uncertainty in rating curve 18
13.2.4 Uncertainty in the measured stage 21
13.2.5 Uncertainty in the measured fall 21
13.2.6 Prediction intervals of estimated discharge 21
13.2.7 Uncertainty caused by neglecting all other physical parameters 21
13.3 Example 22
13.3.1 General 22
13.3.2 Standard error of estimate 23
13.3.3 Uncertainty of mean response 23
13.3.4 Uncertainty in measured stage and fall 24
13.3.5 Uncertainty caused by neglecting all other physical parameters 24
13.3.6 Propagation of uncertainty in discharge estimation 24
13.3.7 Uncertainty in the predicted discharge 25

Annex A (informative) Multiple least squares regression -- Matrix representation 27

Bibliography 29