Distinctive Physical Insights Driven from Machine Learning Modelling of Nuclear Power Plant Severe Accident Scenario Propagation

K. Hossny[*1], W. Villanueva[1,2], and H. D. Wang[1]

[1] Nuclear Power Safety (NPS) Division, Department of Physics, School of Engineering Sciences, KTH Royal Institute of Technology, Stockholm, Sweden.
[2] Nuclear Futures Institute, School of Computer Science and Electronic Engineering, Bangor University, LL57 1UT Bangor, United Kingdom.

[*] Corresponding Author E-Mail: kmmhma@kth.se

Supplementary Table 1. Different ML Models Training and Test Performance Metrics

Model	Training Metrics				Test Metrics			
	Precision	**Accuracy**	**F1-Score**	**Recall**	**Precision**	**Accuracy**	**F1-Score**	**Recall**
Decision Tree	1	1	1	1	0.91	0.91	0.91	0.91
Random Forest	0.79	0.8	0.79	0.8	0.74	0.75	0.74	0.75
K Neighbours	0.79	0.78	0.77	0.78	0.61	0.60	0.59	0.60
Quadratic Discriminant Analysis	0.62	0.59	0.58	0.59	0.61	0.57	0.56	0.57
Adaptive Boosting	0.51	0.53	0.45	0.53	0.39	0.47	0.38	0.47
Gaussian Naive Bayes	0.50	0.49	0.46	0.49	0.50	0.47	0.45	0.47
Gaussian Process	1	1	1	1	0.47	0.29	0.27	0.29
Multilayer Perceptron	0.30	0.37	0.25	0.37	0.25	0.42	0.30	0.42