

HAI 20.07

HAI 20.07 includes two CSV files as training datasets and two CSV files as testing datasets. The time-

series data in each CSV file satisfies time continuity and includes 63 columns. The first column represents the observed time in the "yyyy-MM-dd hh:mm:ss" format, and the remaining 59 columns provide the recorded SCADA data points. The last four columns provide data labels for whether an attack occurred or not. Out of these columns, the attack column is applicable to all processes and the

other three columns are applicable to the corresponding control processes.

NORMAL OPERATION

The normal operations of the first training dataset (train1.csv) are given below, where all the SP change commands were delivered at the start of each day.

Setpoint

No

P1 B 2004

P1 B3004

Start Time

P1 B3005

P1_B4002

P4_ST_PS

P4_HT_PS

(Pressure SP)

(Level SP)

(Flowrate SP)

(Temperature SP)

(Scheduled Power)

(Scheduled Power)

1

0.1 (+0.002)

460 (+20)

1,100 (+22)

32 (+0)

0 (+0)

0 (+0)

7:00 (+0)

2

0.03 (+0.002)

400 (+8)

1,100 (+22)

32 (+0)

0 (+0)

0 (+0)

9:00 (+0)

3

0.1 (+0.002)

400 (+8)

1,100 (+22)

31 (+1)

0 (+0)

0 (+0)

11:00 (+0)

4

0.1 (+0.002)

400 (+8)

1,000 (+100)

32 (+0)

0 (+0)

0 (+0)

13:00 (+0)

5

0.1 (+0.002)

400 (+8)

1,100 (+22)

32 (+0)

50 (+5)

0 (+0)

15:00 (+0)

The normal operations of the second training dataset (train2.csv) are given below.

Setpoint

No

Start Time

. B2004

P1 B3004

P1 B3005

P1 B4002

P4_ST_PS

P4_HT_PS

(Pressure SP)

(Level SP)

(Flowrate SP)

(Temperature SP)

(Scheduled Power)

(Scheduled Power)

1

0.03 (+0.002)

400 (+8)

1,100 (+22)

32 (+0)

0 (+0)

0 (+0)

00:00 (+0)

2

0.1 (+0.002)

450 (+20)

1,100 (+22)

32 (+0)

0 (+0)

0 (+0)

10:00 (+0)

3

0.1 (+0.002)

400 (+8)

1,100 (+22)

32 (+1)

0 (+0)

0 (+0)

14:00 (+0)

4

0.1 (+0.002)

400 (+8)

1,000 (+100)

32 (+0)

0 (+0)

0 (+0)

16:00 (+0)

5

0.1 (+0.002)

400 (+8)

1,100 (+22)

32 (+0)

50 (+5)

0 (+0)

22:00 (+0)

ATTACK OPERATION

A total of 38 attacks were conducted, including 14 attack primitives and 14 combinations of attacks designed to simultaneously perform two attack primitives.

Attack

Duration

No

ID

Start Time

Scenario

Target Controller

Target Point(s)

(sec)

1

A101

AP12

P1-LC-SP1PV1

P1_B3004, P1_LIT01

Oct. 29,

13:40

370

2

A102

AP13

2019

P1-LC-CV1

P1_LCV01D

14:35

312

39