Claims

[Claim 1]

An information processing system for a combustion facility, the system comprising:

an acquisition unit configured to acquire state quantity information that is information relating to a state quantity of the combustion facility; and

an operation content derivation unit configured to input the state quantity information acquired by the acquisition unit and derive an operation content, which corresponds to the input state quantity information, of a supply apparatus configured to supply an object to be incinerated to the combustion facility by using a learning model trained based on a correspondence relationship between the state quantity information, the operation content of the supply apparatus, and a reward corresponding to a state of the combustion facility.

[Claim 2]

The information processing system according to Claim 1,

wherein the state quantity information is a representative value obtained by statistically processing a value relating to the state quantity of the combustion facility for a predetermined time length.

[Claim 3]

The information processing system according to Claim 2,

wherein the predetermined time length is a time length including a time difference between a point of time when the supply of the object to be incinerated is performed by the supply apparatus and a point of time when a fluctuation in the state quantity occurs in response to the supply.

[Claim 4]

The information processing system according to any one of Claims 1 to 3,

wherein the operation content of the supply apparatus is defined by a combination of two or more of an operation amount of a first operation element of the supply apparatus, an operation amount of a second operation element of the supply apparatus different from the first operation element, and a stop time of the supply apparatus.

[Claim 5]

The information processing system according to any one of Claims 1 to 4,

wherein the supply apparatus is a reciprocating or rotary feeder, and

the operation content of the supply apparatus is defined by a combination of two or more of a stroke of the feeder, a speed of the feeder, and a stop time of the feeder.

[Claim 6]

The information processing system according to any one of Claims 1 to 5,

wherein the reward is derived based on a magnitude of a difference between a detection value of at least one index included in the state quantity information and a target value of the index.

[Claim 7]

The information processing system according to any one of Claims 1 to 6,

wherein the state quantity is two or more of a lower heating value, a concentration of a discharged substance, a supply amount of the object to be incinerated, or a steam amount.

[Claim 8]

The information processing system according to any one of Claims 1 to 7,

further comprising:

a learning unit configured to perform reinforcement learning of the learning model based on the correspondence relationship between the state quantity information acquired by the acquisition unit, the operation content of the supply apparatus, and the reward.

[Claim 9]

The information processing system according to any one of Claims 1 to 8,

wherein the learning model is obtained by performing reinforcement learning based on the correspondence relationship between the state quantity information acquired by the acquisition unit, the operation content of the supply apparatus, and the reward, based on an initial model generated by pre-learning based on at least a correspondence relationship between the state quantity information and the operation content of the supply apparatus obtained from an operation history of an operator.

[Claim 10]

The information processing system according to any one of Claims 1 to 9,

wherein the learning model is obtained by performing reinforcement learning based on the correspondence relationship between the state quantity information acquired by the acquisition unit, the operation content of the supply apparatus, and the reward, based on an initial model generated by pre-learning based on at least a correspondence relationship between the state quantity information in another facility and the operation content of the supply apparatus provided in the other facility.

[Claim 11]

An information processing method relating to a combustion facility, the method comprising:

acquiring state quantity information that is information relating to a state

quantity of the combustion facility; and

inputting the state quantity information and deriving an operation content, which corresponds to the input state quantity information, of a supply apparatus configured to supply an object to be incinerated to the combustion facility by using a learning model trained based on a correspondence relationship between the state quantity information, the operation content of the supply apparatus, and a reward corresponding to a state of the combustion facility.

[Claim 12]

A learning system for a combustion facility, the learning system comprising:

a learning unit configured to perform reinforcement learning of a learning model based on a correspondence relationship between state quantity information that is information relating to a state quantity of the combustion facility, an operation content of a supply apparatus configured to supply an object to be incinerated to the combustion facility, and a reward corresponding to a state of the combustion facility.

[Claim 13]

A learning method for a combustion facility, the learning method comprising:

performing reinforcement learning of a learning model based on a correspondence relationship between state quantity information that is information relating to a state quantity of the combustion facility, an operation content of a supply apparatus configured to supply an object to be incinerated to the combustion facility, and a reward corresponding to a state of the combustion facility.