CLAIMS

[Claim 1] A navigational analysis device comprising:

a first acquisition means that acquires navigation data indicative of both an amount of fuel consumption in navigation of a ship and at least two elements contributing to a variation in the amount of fuel consumption in the navigation;

a second acquisition means that acquires reference data indicative of a reference amount of fuel consumption;

a calculation means that calculates, based on the navigation data and the reference data, a fluctuation caused by at least one element of the at least two elements, the fluctuation being included in a fluctuation in the amount of fuel consumption indicated by the navigation data with respect to the reference amount of fuel consumption; and

an output means that outputs a calculation made by the calculation means.

[Claim 2] The navigational analysis device according to Claim 1, wherein:

the reference data includes data indicative of a relationship between the reference amount of the fuel consumption and at least two reference elements that contribute to a variation in the reference amount of fuel consumption; and

the calculation means calculates, based on a difference between the reference amount of fuel consumption and an amount of fuel consumption that is obtained based on the reference data by using the navigation data as a value of a first element of the at least two elements, and by using the reference element as a value of a second element, a fluctuation caused by the first element.

[Claim 3] The navigational analysis device according to Claim 2, wherein:

the calculation means calculates the fluctuation by using each of values of the at least two elements as the first element.

[Claim 4] The navigational analysis device according to Claim 2 or 3, wherein:

the reference data includes a plurality of sets of data indicative of a relationship between an actual measured value of an amount of fuel consumption measured in another navigation of the navigation and the at least two reference elements; and

the calculation means determines the reference amount of fuel

consumption by using a plurality of actual measured values of amounts of fuel consumption included in the reference data.

[Claim 5] The navigational analysis device according to Claim 4, wherein:

the calculation means determines the reference amount of fuel consumption based on a result of a regression analysis, the regression analysis being performed by using data that satisfies a specific weather condition among a plurality of sets of data indicative of a relationship between an actual measured value of an amount of fuel consumption included in the reference data and the at least two reference elements.

[Claim 6] The navigational analysis device according to any one of Claims 1 to 5, wherein:

the first acquisition means acquires prediction data indicative of both a predictive value of an amount of fuel consumption in navigation of the ship and a predictive value of the element; and

the calculation means calculates, based on the prediction data and the reference data, a fluctuation caused by at least one element of the at least two elements, the fluctuation being included in a fluctuation in the amount of fuel consumption indicated by the prediction data with respect to the reference amount of fuel consumption.

[Claim 7] The navigational analysis device according to any one of Claims 1 to 5, wherein:

the second acquisition means acquires, as the reference data, prediction data indicative of both a predictive value of an amount of fuel consumption in navigation of the ship and a predictive value of the element.

[Claim 8] The navigational analysis device according to any one of Claims 1 to 7, wherein:

the element is an element relating to at least one of a distance sailed, a ship speed, weather, and an oceanographic phenomenon.

[Claim 9] A navigational analysis method comprising:

a first step of acquiring navigation data indicative of both an amount of fuel consumption in navigation of a ship and at least two elements contributing

to a variation in the amount of fuel consumption in the navigation;

a second step of acquiring reference data indicative of a reference amount of fuel consumption;

a third step of calculating, based on the navigation data and the reference data, a fluctuation caused by at least one element of the at least two elements, the fluctuation being included in a fluctuation in the amount of fuel consumption indicated by the navigation data with respect to the reference amount of fuel consumption; and

a fourth step of outputting a calculation made in the third step.

[Claim 10] A program for causing a computer to execute:

a first step of acquiring navigation data indicative of both an amount of fuel consumption in navigation of a ship and at least two elements contributing to a variation in the amount of fuel consumption in the navigation;

a second step of acquiring reference data indicative of a reference amount of fuel consumption;

a third step of calculating, based on the navigation data and the reference data, a fluctuation caused by at least one element of the at least two elements, the fluctuation being included in a fluctuation in the amount of fuel consumption indicated by the navigation data with respect to the reference amount of fuel consumption; and

a fourth step of outputting a calculation made in the third step.

[Claim 11] A computer-readable recording medium storing a program for causing a computer to execute:

a first step of acquiring navigation data indicative of both an amount of fuel consumption in navigation of a ship and at least two elements contributing to a variation in the amount of fuel consumption in the navigation;

a second step of acquiring reference data indicative of a reference amount of fuel consumption;

a third step of calculating, based on the navigation data and the reference data, a fluctuation caused by at least one element of the at least two elements, the fluctuation being included in a fluctuation in the amount of fuel consumption

indicated by the navigation data with respect to the reference amount of fuel consumption; and

a fourth step of outputting a calculation made in the third step.

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[Claim 1] A navigational analysis device comprising:

a first acquisition means that acquires navigation data indicative of both an amount of fuel consumption in navigation of a ship and at least two elements contributing to a variation in the amount of fuel consumption in the navigation;

a second acquisition means that acquires reference data indicative of a reference amount of fuel consumption;

a calculation means that calculates, based on the navigation data and the reference data, a breakdown of a fluctuation caused by at least one element of the at least two elements, the fluctuation being included in a fluctuation in the amount of fuel consumption indicated by the navigation data with respect to the reference amount of fuel consumption; and

an output means that outputs a calculation made by the calculation means.

[Claim 2] The navigational analysis device according to Claim 1, wherein:

the reference data includes data indicative of a relationship between the reference amount of the fuel consumption and at least two reference elements that contribute to a variation in the reference amount of fuel consumption; and

the calculation means calculates, based on a difference between the reference amount of fuel consumption and an amount of fuel consumption that is obtained based on the reference data by using the navigation data as a value of a first element of the at least two elements, and by using the reference element as a value of a second element, the breakdown of the fluctuation caused by the first element.

[Claim 3] The navigational analysis device according to Claim 2, wherein:

the calculation means calculates the breakdown of the fluctuation by using each of values of the at least two elements as the first element.

[Claim 4] The navigational analysis device according to Claim 2 or 3, wherein:

the reference data includes a plurality of sets of data indicative of a relationship between an actual measured value of an amount of fuel consumption measured in another navigation of the navigation and the at least

two reference elements; and

the calculation means determines the reference amount of fuel consumption by using a plurality of actual measured values of amounts of fuel consumption included in the reference data.

[Claim 5] The navigational analysis device according to Claim 4, wherein:

the calculation means determines the reference amount of fuel consumption based on a result of a regression analysis, the regression analysis being performed by using data that satisfies a specific weather condition among a plurality of sets of data indicative of a relationship between an actual measured value of an amount of fuel consumption included in the reference data and the at least two reference elements.

[Claim 6] The navigational analysis device according to any one of Claims 1 to 5, wherein:

the first acquisition means acquires prediction data indicative of both a predictive value of an amount of fuel consumption in navigation of the ship and a predictive value of the element; and

the calculation means calculates, based on the prediction data and the reference data, a breakdown of a fluctuation caused by at least one element of the at least two elements, the fluctuation being included in a fluctuation in the amount of fuel consumption indicated by the prediction data with respect to the reference amount of fuel consumption.

[Claim 7] The navigational analysis device according to any one of Claims 1 to 5, wherein:

the second acquisition means acquires, as the reference data, prediction data indicative of both a predictive value of an amount of fuel consumption in navigation of the ship and a predictive value of the element.

[Claim 8] The navigational analysis device according to any one of Claims 1 to 7, wherein:

the element is an element relating to at least one of a distance sailed, a ship speed, weather, and an oceanographic phenomenon.

[Claim 9] A navigational analysis method comprising:

a first step of acquiring navigation data indicative of both an amount of fuel consumption in navigation of a ship and at least two elements contributing to a variation in the amount of fuel consumption in the navigation;

a second step of acquiring reference data indicative of a reference amount of fuel consumption;

a third step of calculating, based on the navigation data and the reference data, a breakdown of a fluctuation caused by at least one element of the at least two elements, the fluctuation being included in a fluctuation in the amount of fuel consumption indicated by the navigation data with respect to the reference amount of fuel consumption; and

a fourth step of outputting a calculation made in the third step.

[Claim 10] A program for causing a computer to execute:

a first step of acquiring navigation data indicative of both an amount of fuel consumption in navigation of a ship and at least two elements contributing to a variation in the amount of fuel consumption in the navigation;

a second step of acquiring reference data indicative of a reference amount of fuel consumption;

a third step of calculating, based on the navigation data and the reference data, a breakdown of a fluctuation caused by at least one element of the at least two elements, the fluctuation being included in a fluctuation in the amount of fuel consumption indicated by the navigation data with respect to the reference amount of fuel consumption; and

a fourth step of outputting a calculation made in the third step.

[Claim 11] A computer-readable recording medium storing a program for causing a computer to execute:

a first step of acquiring navigation data indicative of both an amount of fuel consumption in navigation of a ship and at least two elements contributing to a variation in the amount of fuel consumption in the navigation;

a second step of acquiring reference data indicative of a reference amount of fuel consumption;

a third step of calculating, based on the navigation data and the reference

data, a breakdown of a fluctuation caused by at least one element of the at least two elements, the fluctuation being included in a fluctuation in the amount of fuel consumption indicated by the navigation data with respect to the reference amount of fuel consumption; and

a fourth step of outputting a calculation made in the third step.