

SALVIA-OCT.

Smart Analysis of a Vessel In Actual seas

DATA VALIDATION

- (A) using mean value and standard deviation
- (B) using mean value

CALCULATION ITEMS

- (1) Preliminary data filtering
 - (1A) using mean value and standard deviation
 - (1B) using mean value
- (2) Data correction on sea state
- (3) Ship performance Assessment
 - (3A) based on Resistance Criteria Method
 - (3B) based on Estimated Performance Curve
- (4) Assessment of fouling and aging

Data Input

Calculation

Save

Load

Data Import

Data Export

Manual

Converter



SALVIA-OCT.-web V2.1

Startup Guide

ver. 1

National Maritime Research Institute, National Institute of
Maritime, Port and Aviation Technology, Japan

Introduction

Before using this service

To use the application, you need to access the NMRI Cloud, and

- **register as a member of NMRI Cloud**
- **apply to use SALVIA-OCT.-web.**

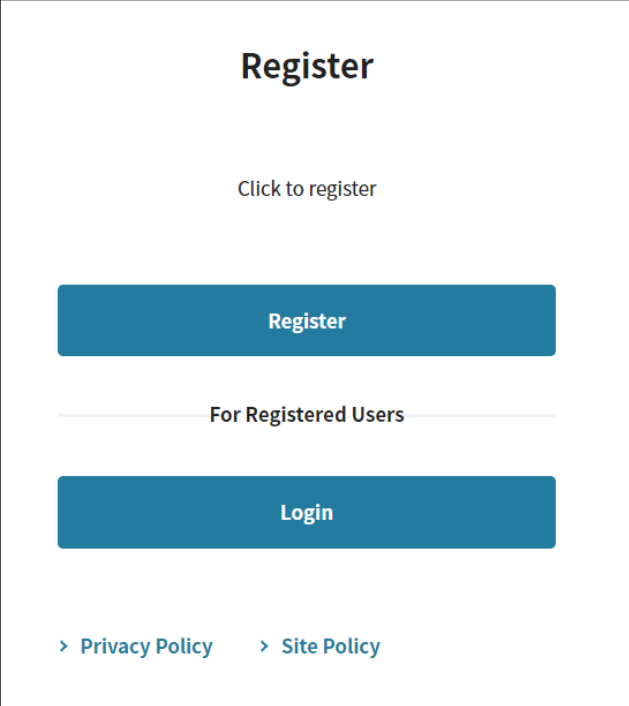
NMRI Cloud registration :

<https://cloud.nmri.go.jp/portal/auth/signup>

Available 2 weeks after application for use.

First page of SALVIA-OCT.-web :

<https://cloud.nmri.go.jp/apps/salvia>



Register

Click to register

Register

For Registered Users

Login

> Privacy Policy > Site Policy

NMRI Cloud Member Registration Screen

After the registration, you will be transferred to the application screen.

Recommended environment: Google Chrome, Microsoft Edge

Before using this service

Using this application, you can obtain data from services provided by ShipDC and the Japan Weather Association.

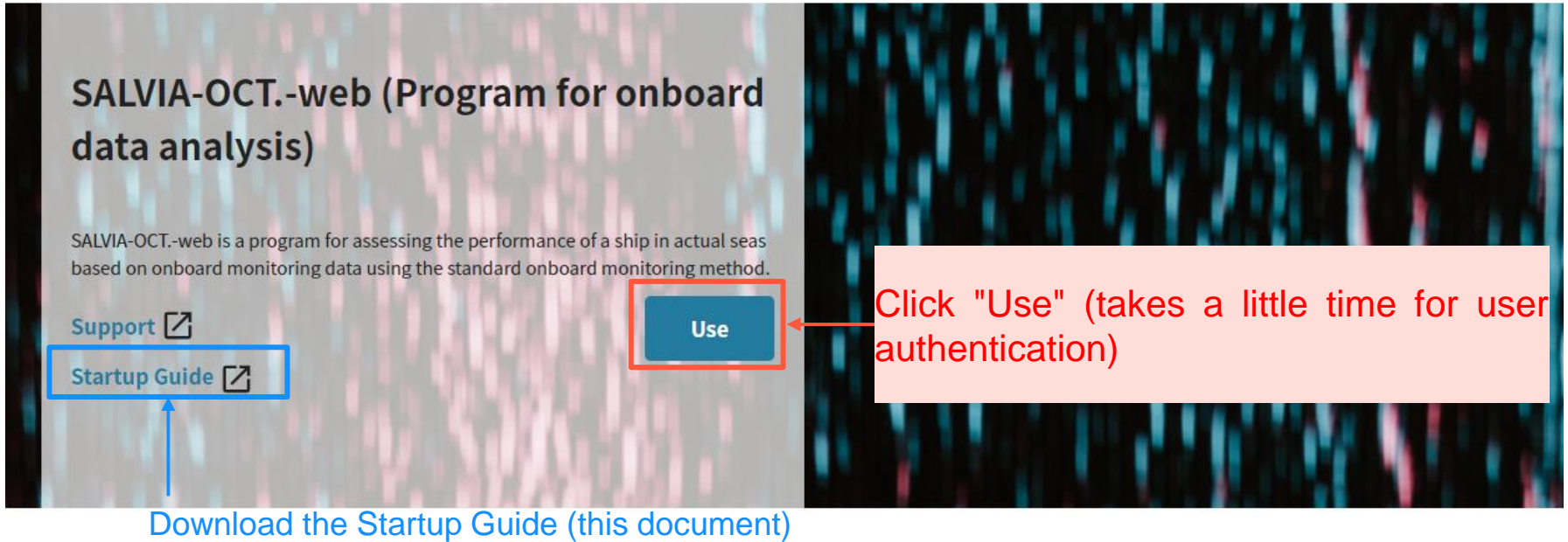
ShipDC website <https://www.shipdatacenter.com/>

Japan Weather Association website <https://www.jwa.or.jp/>

To obtain ship monitoring data from ShipDC's service, it is necessary to **obtain a key file from ShipDC** in advance. Before acquiring the key file, you can confirm the operation with sample data.

To obtain weather data from the Japan Weather Association, you need to **apply for an account at NMRI Cloud**. Before obtaining an account, you can confirm the operation with sample data.


SALVIA-OCT.-web




The screenshot shows the SALVIA-OCT.-web interface. The title is "SALVIA-OCT.-web (Program for onboard data analysis)". Below the title is a description: "SALVIA-OCT.-web is a program for assessing the performance of a ship in actual seas based on onboard monitoring data using the standard onboard monitoring method." There are two links: "Support" and "Startup Guide", both with external link icons. A blue box highlights the "Startup Guide" link, with a blue arrow pointing to it from the text "Download the Startup Guide (this document)". To the right, there is a "Use" button highlighted with a red box, and a red arrow points to it from a red text box that says "Click 'Use' (takes a little time for user authentication)".

SALVIA-OCT.-web (Program for onboard data analysis)

SALVIA-OCT.-web is a program for assessing the performance of a ship in actual seas based on onboard monitoring data using the standard onboard monitoring method.

Support 

Startup Guide 

Use

Click "Use" (takes a little time for user authentication)

Download the Startup Guide (this document)

Outline

SALVIA-OCT.-web is a program for assessing the performance of a ship in actual seas based on onboard monitoring data using the standard onboard monitoring method.

About SALVIA-OCT.-web

SALVIA-OCT.
Smart Analysis of a Vessel In Actual seas

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- (4) Assessment of fouling and aging

Data Input Calculation Save **Load** Data Import Data Export **Manual** **Converter**

- ✓ **SALVIA-OCT.-web** is an application that extracts ship performance from monitoring data to enable performance comparison and evaluation.
- ✓ The analysis and evaluation of the monitoring data follow the standard methodology developed by the OCTARVIA project.
- ✓ This application enables analysis of the monitoring data without arbitrariness.

About SALVIA-OCT.-web

SALVIA-OCT.
Smart AnaLysis of a Vessel In Actual seas

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[Download the manual](#)

Data Input

Calculation

Save

Load

Data Import

Data Export

Manual

Converter

Check (1B), (2), and (3A), then click "Data Input" button to go to data Input page.

Click the SALVIA-OCT. logo at the top of each tab to return to this first page ("top" tab).

■ Calculation items

- ✓ Preliminary data filtering
- ✓ Data correction on sea state
- ✓ Ship performance Assessment
- ✓ Assessment of fouling and aging
- ✓ Data validation

■ What to do for the calculation

- ✓ Select a calculation item
- ✓ Input the data
- ✓ Click "Calculation" button

Data that needs to be prepared

1. Principal particulars and main engine specifications
 2. Monitoring data
 3. Self-propulsion factors and propeller performance data
 4. Environmental force (waves, winds)
- ◆ By clicking "**Import**" button on the first page, you can use the results of EAGLE-OCT.-web for the self-propulsion factors and propeller performance data and that of OCTARVIA-web for the environmental force (waves and winds).
 - ◆ **It is recommended to run EAGLE-OCT.-web and OCTARVIA-web in advance.**
 - ◆ Monitoring data can be obtained from ShipDC, and weather data from Japan Weather Association via their respective APIs.

Data Input

SALVIA-OCT.-web : Data Import



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1. Check the calculation items (1B), (2) and (3A)

2. Click "Data Import" button



SALVIA-OCT.-web : Data Import



Data Import from EAGLE-OCT

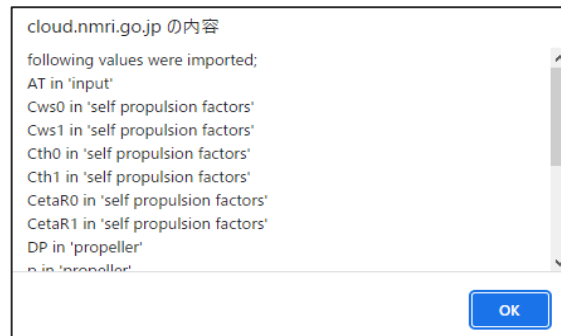
Import Items

- propeller open characteristics
- self-propulsion factors(1-t, η_R)
- projected transverse area above water line

Data Import from EAGLE-OCT

1. Select a export file of EAGLE-OCT.-web

If the import is successful, a pop-up will appear. Then click "OK" button.



Data Import from OCTARVIA-prediction

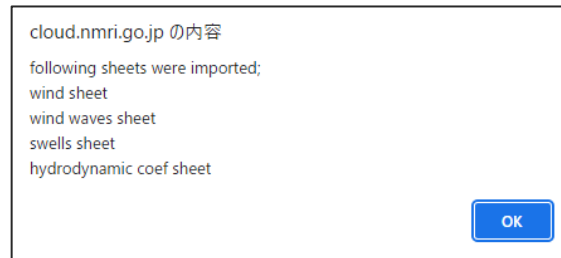
Import Items

- added resistance in short crested irregular waves [wind waves]
- added resistance in short crested irregular waves [swells]
- wind force coefficients
- hydrodynamic coefficients

Data Import from OCTARVIA-prediction(1)

2. Select a export file of OCTARVIA-web

If the import is successful, a pop-up will appear. Then click "OK" button.



SALVIA-OCT.-web : Input (Principal particulars and main engine specifications)

2. After input, go to the "Parameter" tab

1. Manual input (Not automatically input by import.)

Planned Improvements (Automatically input by import of EAGLE-OCT.-web.)

ship data

Item	Value	Unit	Remark
Builder	NMRI	-	builder
ID	4894	-	ship ID number
L_{ps}	300	m	length between fore position of water line and A.P./aft position of water line; L_{ps}
B_{max}	40	m	maximum breadth; B_{max}
d_{mid}	14	m	mean draft; d_{mid}
d_{aft}	14	m	aft draft; d_a
d_{fore}	14	m	fore draft; d_f
A_T	1546.667	m ²	projected transverse area above water line; A_T
V_S	25	knot	designated ship speed; V_S
Δ_{rep}	109200	ton	representative displacement; Δ_{rep}

engine

Item	Value	Unit	Remark
gear	1	-	gear ratio; gear ($N_P = gear N_E$)
η_s	0.98	-	transmission efficiency; η_s
MCR	59540	kW	maximum continuous rating of engine for setting the limit; MCR
N_{Elim}	98.5	rpm	engine revolution at MCR for setting the limit; N_{Elim}

Principal particulars

- Length, maximum breadth
 - Draft
 - Projected transverse area above water line*¹
 - Designated ship speed
 - Representative displacement*²
- *1 Estimable by EAGLE-OCT.-web
 *2 For example, designed full displacement. This is the user-specified value for filtering and correcting monitoring data

Main engine specifications

- Gear ratio*³
 - Transmission efficiency*⁴
 - MCR of main engine
 - Engine revolution at MCR
- *3 If there is no reducer, input the default value of 1.
 *4 If unknown, input the default value of 0.98

SALVIA-OCT.-web : Input (Parameter)

port input **parameter** voyage data_B voyage data_B_fig propelle

selector of calculation

Item	Value	Unit	Remark
I_{sw}	1	-	definition of wind [0: relative wind, 1: absolute wind]
I_{sv}	1	-	definition of wave direction [0: based on the north direction (0 deg. means waves from north.), 1: based on the heading direction (0 deg. means head waves.)]
I_{pow}	1	-	calculation method [0: Direct Power Method (DPM), 1: Extended Power Method (EPM)]
I_{cal}	0	-	identification of weather [0: calm sea condition, 1: specific weather condition]
I_{sp}	0	-	load variation effect on self propulsion factors by ISO15016:2015 [0: not considered, 1: considered]

selector of external forces for correction [0: not corrected, 1: corrected]

Item	Value	Unit	Remark
I_{wind}	1	-	correction on winds
I_{wave}	1	-	correction on wind waves
I_{swell}	1	-	correction on swells
I_{drift}	0	-	correction on drift motion
I_{rudder}	0	-	correction on rudder

setting for filtering based on normalized apparent slip ratio

Item	Value	Unit	Remark
$I_{d_{slip}}$	1	-	filtering by normalized apparent slip ratio [0: not use, 1: use]
$slip_{pm}$	1	-	criteria for normalized apparent slip ratio ; $slip_m$

setting for Resistance Criteria Method (RCM)

Item	Value	Unit	Remark
ID_{VP}	1	-	selector for iteration in RCM [0: off, 1: on]
C_{DPC}	2	%	criteria for evaluation in ship speed V_S - engine output BHP plane
δR_{eval}	10	%	rate of resistance increase for extracting the data for evaluation
δR_{fit}	50	%	initial rate of resistance increase for extracting the data for fitting

1. Defaults are acceptable except for wave and wind settings. (No need to change)

2. Select wave and wind direction definitions according to the monitoring data to be used.

- ✓ Definition of wind (relative/ absolute)
- ✓ Definition of wave (0deg. is waves from north/ 0deg. is head waves)

3. After the selection, go to the "voyage data_B" tab

SALVIA-OCT.-web : Input (voyage data)

< meter **voyage data_B** voyage data_B_fig propeller self propulsion factors >

Load Data

set criteria for steady condition [mode-B]

Item	Value	Unit	Remark
Builder	NMRI	-	builder
ID	4894	-	ship ID number

Item	Unit	Remark
time		time(UTC)
longitude	deg.	longitude
latitude	deg.	latitude
V_g	knot	ship speed over the ground
V_w	knot	ship speed through the water
ψ_N	deg.	ship direction
ξ_N	deg.	heading angle
β	deg.	drift angle
δ	deg.	rudder angle
N_{Ec}	rps	orderd main engine revolution
BHP	kW	engine output
FOC	ton	fuel consumption
U_{wind}	m/s	mean wind speed
γ	deg.	wind direction (0deg means head winds.)
H_w	m	significant wave height of wind waves; H_w
T_w	s	mean wave period of wind waves; T_w
θ_w	deg.	primary wave direction of wind waves (0deg means heading waves.) (0 <= θ_w); θ_w^*
H_s	m	significant wave height of swells; H_s
T_s	s	mean wave period of swells; T_s
θ_s	deg.	primary wave direction of swells (0deg means heading waves.) (0 <= θ_s); θ_s^*
Δ	ton	displacement
ΔV	knot	difference between ship speed over the ground and ship speed through the water
SFC	g/(kWh)	specific fuel consumption

* subscript 'one side' means [0, 360], 'both side' means [0, 180]

1. Load the monitoring data file (csv format) recorded in the specified format.

2. If the loading is successful, a pop-up will appear. Then click "OK" button.

cloud.nmri.go.jp の内容

The uploaded file has been loaded.

OK

- If the number of rows of data is large, it will take time for the data to be reflected on the web. (After clicking "OK" button, the system will enter a waiting state.)
- We have confirmed that the system works with a maximum of 20,000 rows of data.

3. Scroll to the middle of the tab after the data is reflected on the web.

SALVIA-OCT.-web : Input (voyage data)

File format of monitoring data (when calculation item **1B is selected**):
CSV format

Date	Lon.	Lat.	Ship speed over ground (knot)	Ship speed through water (knot)	Course direction (deg.)	Heading direction (deg.)	Rudder angle (deg.)	Main engine revolution (rpm)	Main engine output (rpm)	Fuel consumption (t/day)	Wind speed (m/s)	Wind direction (deg.)	Wind wave			Swell			Displacement (ton)
													Significant wave height (m)	Mean wave period (s)	Primary wave direction (deg.)	Significant wave height (m)	Mean wave period (s)	Primary wave direction (deg.)	
2016/9/4 2:00	123.0667	29.75	18.9914	19.27	108.7	108.7	0	82.2	18,942.59	3.5153	5.6989	293.0344	1.6	6.1	348.5	0	0	0	64225
2016/9/4 2:30	123.2333	29.7	19.0395	19.39	108.2	108.2	0	82.2	18,720.30	3.476	7.0953	300.4079	1.61	6.1	348.4	0	0	0	64225
2016/9/4 3:00	123.4167	29.7	19.4103	19.79	72.8	72.8	0	82.3	18,695.58	3.4717	3.4112	327.8691	1.61	6	23.2	0	0	0	64225
2016/9/4 3:30	123.6	29.75	19.7586	18.94	68.2	68.2	0	82	18,647.87	3.4632	6.304	311.9966	1.62	5.9	27.4	0	0	0	64225
2016/9/4 4:00	123.7833	29.8	19.7054	19.47	79.1	79.1	0	82.4	18,691.39	3.4709	9.2742	293.6941	1.64	5.8	16.1	0	0	0	64225
2016/9/4 4:30	123.9667	29.81667	19.6787	19.73	84.2	84.2	0	82.1	18,987.73	3.5233	7.1368	283.8593	1.65	5.8	10.4	0	0	0	64225
2016/9/4 5:00	124.1667	29.8	20.2104	20.16	89	89	0	82.3	18,793.97	3.4891	3.8151	254.3887	1.66	5.7	4.9	0	0	0	64225
2016/9/4 5:30	124.35	29.83333	20.6413	19.51	75.7	75.7	0	82	18,588.09	3.4527	6.5229	305.7721	1.65	5.8	18.1	0	0	0	64225
2016/9/4 6:00	124.55	29.86667	20.6589	19.36	76.7	76.7	0	81.9	18,715.82	3.4753	3.7489	292.117	1.65	5.9	17.1	0	0	0	64225
2016/9/4 6:30	124.75	29.91667	20.6491	19.47	77	77	0	82.2	18,857.23	3.5002	4.8848	325.9721	1.64	5.9	17.1	0	0	0	64225
2016/9/4 7:00	124.9333	29.93333	20.7725	19.26	76.1	76.1	0	82	18,951.24	3.5169	2.6555	270.5501	1.63	6	18.2	0	0	0	64225
2016/9/4 7:30	125.1333	29.96667	20.7188	19.5	86.3	86.3	0	82.2	18,733.35	3.4784	6.6736	280.9597	1.61	5.9	8.3	0	0	0	64225
2016/9/4 8:00	125.3333	29.98333	20.5155	19.51	81.9	81.9	0	82.1	18,748.56	3.481	6.0088	278.0204	1.59	5.9	13.1	0	0	0	64225

Notes on file creation

- ✓ Enter the date in the format YYYY/MM/DD HH:MM(:SS).
- ✓ The rudder angle should be set to 0 degrees at neutral.
- ✓ If wind wave and swell are not separated, set all swell values to 0.
- ✓ Do not enter anything other than numbers (letters, etc.).
- ✓ If there are items that are not measured, please enter 0 (do not leave blank or do not delete blank data and shift data up.).

SALVIA-OCT.-web : Input (voyage data)

File format of monitoring data (when calculation item **1A is selected**):
CSV format

Store and create data in the following order

1. Date (UTC)
2. Longitude
3. Latitude
4. Ship speed over ground (mean/instantaneous)
5. Ship speed over ground (standard deviation)
6. Ship speed through water (mean/instantaneous)
7. Ship speed through water (standard deviation)
8. Course direction (mean/instantaneous)
9. Course direction (standard deviation)
10. Heading direction (mean/instantaneous)
11. Heading direction (standard deviation)
12. Rudder angle (mean/instantaneous)
13. Rudder angle (standard deviation)
14. Main engine revolutions (mean/instantaneous)
15. Main engine revolutions (standard deviation)
16. Main engine output (mean/instantaneous)
17. Main engine output (standard deviation)
18. Fuel consumption
Wind speed
(mean/instantaneous)
18. Wind direction (mean/instantaneous)
19. Wind speed (standard deviation)
20. Wind direction (standard deviation)
21. Significant wave height (wind wave)
22. Mean wave period (wind wave)
23. Primary wave direction (wind wave)
24. Significant wave height (swell)
25. Mean wave period (swell)
26. Primary wave direction (swell)
27. Displacement

SALVIA-OCT.-web : Input (voyage data)

Number of rows (The number of rows is automatically updated after the "Load Data" button is executed.)

set true wind

Item	Value	Unit	Remark
fsd	30	min	period of measurement

No.	time	longitude	latitude	V_w	ψ_N	ζ_N	β	δ	N_{Ec}	BHP	FOC	U_w	
		deg.	deg.	knot	deg.	deg.	deg.	deg.	rpm	kW	ton	m/s	
1	2016 / 09 / 04 02 : 00	123.067	29.75	18.991	19.27	110	108.7	1.3	0	82.2	18942.59	2.6	5.6
2	2016 / 09 / 04 02 : 30	123.233	29.7	19.039	19.39	109.83	108.2	1.6309	0	82.2	18720.3	2.6	7.05
3	2016 / 09 / 04 03 : 00	123.417	29.7	19.410	19.79	89.952	72.8	17.152	0	82.3	18695.58	2.6	3.4
4	2016 / 09 / 04 03 : 30	123.6	29.75	19.758	18.94	72.306	68.2	4.1068	0	82	18647.87	2.6	6.3
5	2016 / 09 / 04 04 : 00	123.783	29.8	19.705	19.47	72.298	79.1	-6.801	0	82.4	18691.39	2.6	9.2
6	2016 / 09 / 04 04 : 30	123.967	29.82	19.678	19.73	83.130	84.2	-1.0691	0	82.1	18987.73	2.6	7.11
7	2016 / 09 / 04 05 : 00	124.167	29.8	20.210	20.16	96.624	89	7.6240	0	82.3	18793.97	2.6	3.8
8	2016 / 09 / 04 05 : 30	124.35	29.83	20.641	19.51	79.171	75.7	3.4710	0	82	18588.09	2.6	6.5
9	2016 / 09 / 04 06 : 00	124.55	29.87	20.658	19.36	77.064	76.7	0.3647	0	81.9	18715.82	2.6	3.7
10	2016 / 09 / 04 06 : 30	124.75	29.92	20.649	19.47	73.963	77	-3.036	0	82.2	18857.23	2.6	4.8
11	2016 / 09 / 04 07 : 00	124.933	29.93	20.772	19.26	86.377	76.1	10.277	0	82	18951.24	2.6	2.6
12	2016 / 09 / 04 07 : 30	125.133	29.97	20.718	19.5	77.052	86.3	-9.2471	0	82.2	18733.35	2.6	6.6
13	2016 / 09 / 04 08 : 00	125.333	29.98	20.515	19.51	86.746	81.9	4.8464	0	82.1	18748.56	2.6	6.0
14	2016 / 09 / 04 08 : 30	125.517	30	19.929	19.25	83.118	82.4	0.7180	0	82.1	18504.12	2.6	6.8
15	2016 / 09 / 04 09 : 00	125.7	30.03	19.556	19.2	79.150	81.7	-2.5491	0	81.8	18510.83	2.6	8.2

1. After loading the monitoring data, click "set true wind" button to convert wind speed and direction.

If the original wind data definition is relative wind, it is converted to absolute wind; if it is absolute wind, it is transcribed as is.

Be sure to click this button (otherwise you will not be able to click "Calculation" button at the first page).

2. Setting of data filtering conditions

- For the main engine revolution, enter a value of 40% of the MCR revolution in the lower limit (min.).
- For the displacement, enter as follows using the representative displacement Δ_{rep} entered in the "input" tab.

min. : 0.95 Δ_{rep} max. : 1.05 Δ_{rep}

3. Go to the "top" tab

SALVIA-OCT.-web : Calculation

The screenshot displays the SALVIA-OCT. web interface. At the top, the logo "SALVIA-OCT." is shown with the tagline "Smart AnaLysis of a Vessel In Actual seas". Below the logo is a navigation bar with tabs: "top", "import", "input", "parameter", and "voyage data_B". The "top" tab is highlighted with a red box. The main content area is divided into two sections: "DATA VALIDATION" and "CALCULATION ITEMS".

DATA VALIDATION

- (A) using mean value and standard deviation
- (B) using mean value

CALCULATION ITEMS

- (1) Preliminary data filtering
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At the bottom of the interface, there is a row of buttons: "Data Input", "Calculation", "Save", "Load", "Data Import", and "Data Export". The "Calculation" button is highlighted with a red box, indicating it is the active step.

If data input is completed, the “Calculation” button becomes active.

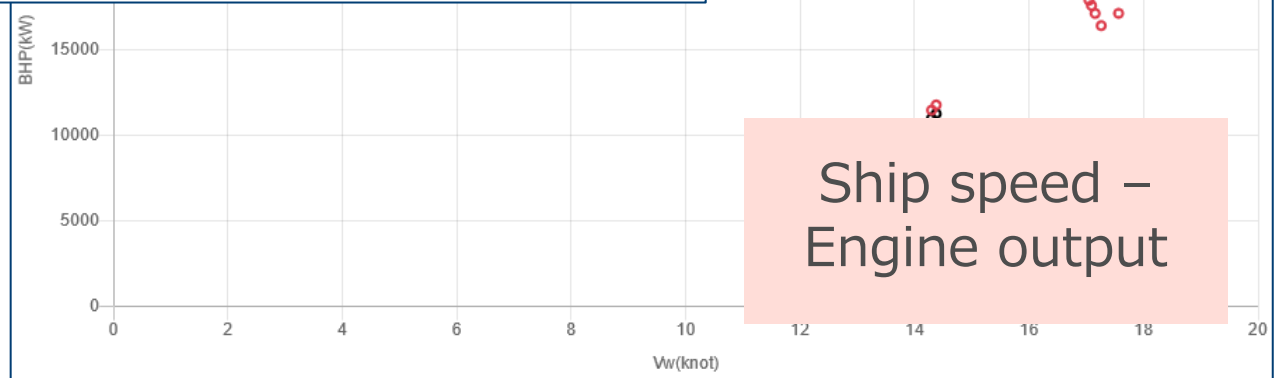
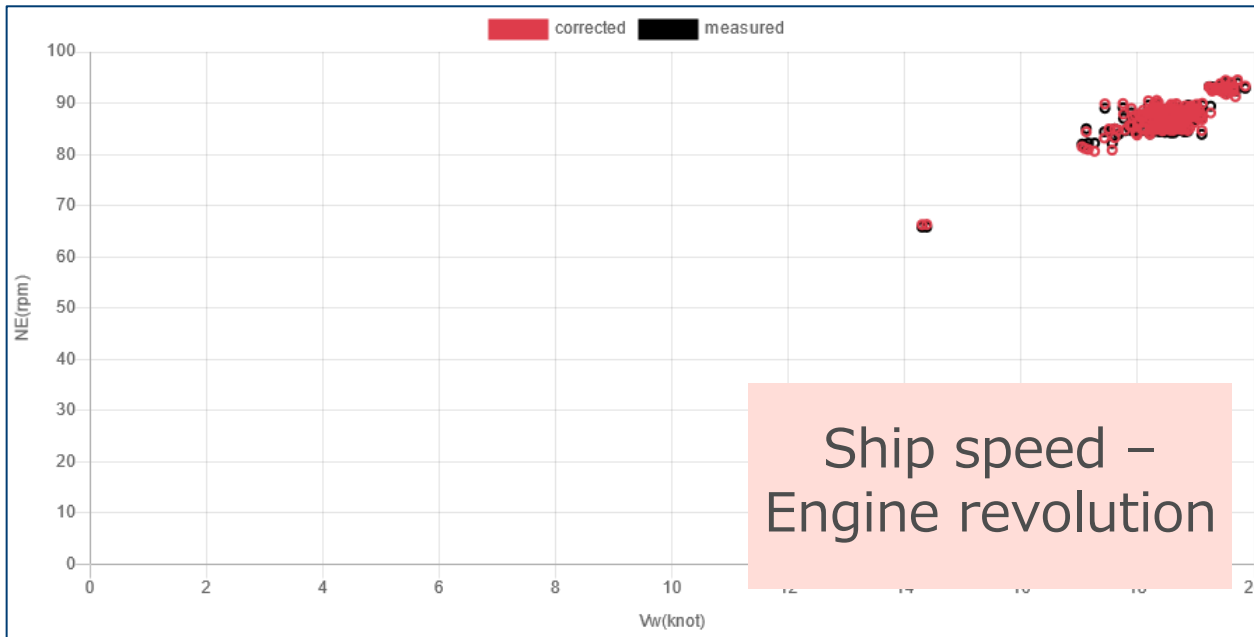
➡ Click the “Calculation” button to execute the calculation.

Results

SALVIA-OCT.-web : Output

Result of data correction

The graphs are displayed on “corrected data ALL” tab and “corrected data for RCM” tab.



SALVIA-OCT.-web : Output

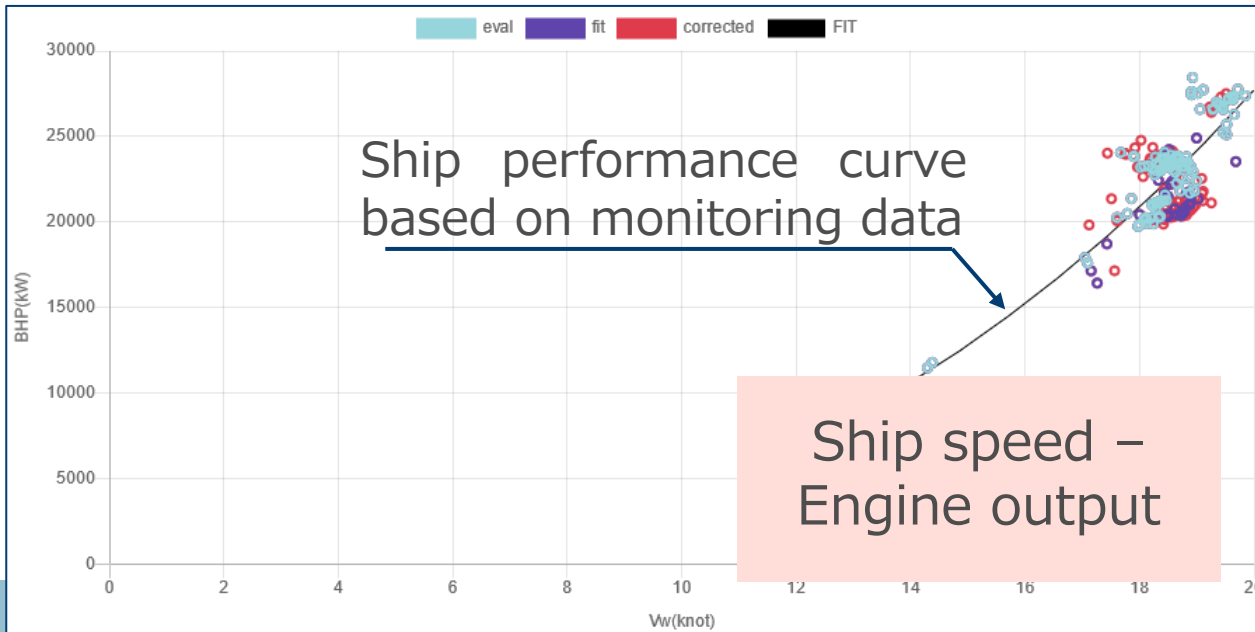
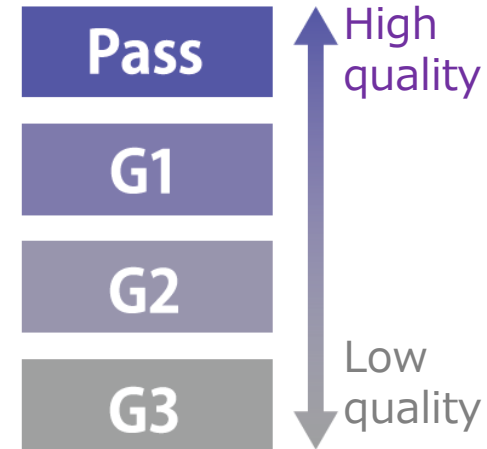
Ship performance evaluation (RCM : Resistance Criteira Method)

summary of RCM

results of RCM

Item	Value	Remark
Pass Grade	Pass	Pass : power curve obtained by the straight procedure G1 : power curve by the initial criterion of δR for the fitting data G2 : power curve by the initial criterion of δR for the fitting data G3 : power curve by no filtering of δR for the fitting data with $b_n=$
δR_{resfit}	50	resultant δR for extracting the data for fitting (unit : %)
N_{d_eval}	107	number of the data for evaluation
N_{d_fit}	136	number of the data for fitting

Quality information for the evaluation



The relationships of "ship speed - main engine revolution" and "main engine revolution - main engine output" are also displayed.

Data acquisition via API

Data acquisition via API: ShipDC



< top input parameter **ShipDC** polaris >

Confirm available data

key

Get the list of accessible data

Available data

shipid	dataClass	datatype/shipField	availableFrom	availableTo
--------	-----------	--------------------	---------------	-------------

Input target range

ship ID DataType/ShipField

from to range target

Output to SALVIA-OCT

Select average value (recommended)
 Select instantaneous value

Specify the key file issued to user

Get the list of accessible data

Data acquisition via API: ShipDC



< top input parameter ShipDC polaris >

Confirm available data

key .key

Available data

	shipid	dataClass	datatype/shipField	availableFrom	availableTo
<input checked="" type="checkbox"/>	<input type="text" value="..."/>	losData	ShipData	2021-10-01	2022-12-31

Checking

Ship ID and the data period are input automatically.

Accessible vessels are displayed.

Input target range

ship ID DataType/ShipField

from to range target

Output to SALVIA-OCT

Select average value (recommended)

Select instantaneous value

Data acquisition via API: ShipDC



< top input parameter **ShipDC** polaris >

Confirm available data

key

Available data

	shipid	dataClass	datatype/shipField	availableFrom	availableTo
<input checked="" type="checkbox"/>	<input type="text" value="key"/>	losData	ShipData	2021-10-01	2022-12-31

Input target range

ship ID DataType/ShipField

from to range target

Output to SALVIA-OCT

Select average value (recommended)

Select instantaneous value

} Select average or instantaneous value.
(For some ships, only instantaneous value is available.)
Download the acquired data

Posting the acquired data to the browser.

Data acquisition via API: ShipDC

'voyage data_B tab' after posting the acquired ShipDC data

parameter ShipDC polaris **voyage data_B** voyage data_B_fig

nweather 24

frequency of sampling data

Item	Value	Unit	Remark
fsd	30	min	period of measurement

set true wind

No.	time	longitude	latitude	V _g	V _w	Ψ _N	ξ _N	β	δ	N _{Ec}	BHP	FOC	U _{wind0}	V
		deg.	deg.	knot	knot	deg.	deg.	deg.	deg.	rpm	kW	ton	m/s	d
1	2023/08/10 00:00	153.9560	-7.749	10.778	10.339	0	0	0	-0.13	61.308	4043.393	0	6.93	
2	2023/08/10 01:00	153.9581	-7.649	10.517	10.632	0	0	0	-0.07	61.875	4230.867	0	7.07	
3	2023/08/10 02:00	153.9602	-7.550	9.8302	9.8605	0	0	0	0.05	60.369	4281.662	0	7.38	
4	2023/08/10 03:00	153.9623	-7.451	11.080	10.765	0	0	0	0.14	59.632	4233.452	0	7.73	
5	2023/08/10 04:00	153.9644	-7.352	10.501	10.119	0	359.99	-0.009	0.22	60.621	4223.117	0	8.1	
6	2023/08/10 05:00	153.9665	-7.253	11.469	10.312	0	359.99	-0.009	0.25	59.905	4172.423	0	8.48	
7	2023/08/10 06:00	153.9686	-7.154	10.482	9.9635	0	359.98	-0.019	0.25	60.078	4279.309	0	8.86	
8	2023/08/10 07:00	153.9707	-7.054	9.3676	9.8003	0	359.98	-0.019	0.28	61.706	4164.124	0	8.23	
9	2023/08/10 08:00	153.9728	-6.955	10.091	9.8685	0	359.98	-0.019	0.27	60.470	4279.806	0	7.67	
10	2023/08/10 09:00	153.9748	-6.856	10.558	10.374	0	359.99	-0.009	0.25	60.122	4032.515	0	7.18	
11	2023/08/10 10:00	153.9769	-6.757	11.029	10.735	0	359.99	-0.009	0.2	61.287	4126.011	0	6.76	
12	2023/08/10 11:00	153.9790	-5.991	11.033	10.708	0	359.99	-0.009	0.11	59.667	4094.755	0	6.43	
13	2023/08/10 12:00	153.98117	-6.559	10.917	10.269	0	359.99	-0.009	0.04	60.133	4260.513	0	6.03	
14	2023/08/10 13:00	153.9832	-6.459	11.084	10.720	0	359.98	-0.019	0.2	59.925	4276.359	0	5.43	
15	2023/08/10 14:00	153.9853	-6.360	11.099	10.817	0	359.97	-0.029	0.35	60.077	4081.962	0	4.81	

1. Immediately after data posting, the tab will be red because there is no displacement data and no wave data on the tab.

2. Click [set true wind] button.

3. Displacement data can be uploaded by clicking [Set Profile] button.

4. Wave data can be acquired from JWA-POLARIS.

Data acquisition via API: ShipDC

Displacement data format: CSV file

```
3
2023/07/10 07:30:00      182838      16.5      16.5
2023/08/01 10:30:00      182700      16.5      16.5
2023/08/08 00:00:00      175000      15.8      15.8
```

<Notes>

- On the first line, enter the number of lines after the second line.
- Enter date, time, displacement, fore draft, and aft draft, in that order.
- Keep the number of digits for date, time and date/time. If the date is a single digit, always precede it with a zero (0).

Data acquisition via API: JWA-POLARIS



The dedicated account is automatically set up when you log in to NMRI Cloud.

< parameter ShipDC polaris voyage data_B voyage data_B_fig >

set date and position

use the data on voyage data_A/B tab

upload CSV file

Setting the data of date and position

Preprocessing
(Getting the request number)

If you have already acquired ShipDC data, you can run Route Hindcast.

status message

request number count

divide size Type

status message

specification of waves

wind waves and swells resulting waves

add wind data to voyage data_A/B tab

Data acquisition via API: JWA-POLARIS

The screenshot displays the SALVIA-OCT web interface. At the top, the logo reads "SALVIA-OCT. Smart Analysis of a Vessel In Actual seas". Below the logo is a navigation bar with tabs: "parameter", "ShipDC", "polaris" (selected), "voyage data_B", and "voyage data_B_fig".

The main content area is titled "set date and position" and includes a "package" dropdown menu set to "2:T1st". There are two radio buttons: "use the data on voyage data_A/B tab" (selected) and "upload CSV file" (with a "select CSV file" button). A "Route Hindcast" button is located below these options.

A section titled "Result of preprocessing" contains several input fields and buttons. The "status" field shows "Succeeded". The "message" field is empty. The "request number" is "14-21". The "count" field is "1440", with a blue annotation "Number of data points to be acquired" pointing to it. The "divide size" is "8". The "Type" dropdown is set to "1:CSV". There are two buttons: "Route Hindcast Result" (highlighted with a blue box and an arrow pointing to it from the text "Start the data acquisition (Charges occur)") and "Check API LOG".

Below this section, there are empty "status" and "message" fields. A "specification of waves" section has two radio buttons: "wind waves and swells" (selected) and "resulting waves". There is also a checkbox for "add wind data to voyage data_A/B tab". At the bottom, there are two buttons: "Write to SALVIA-OCT" and "Download CSV file".

Data acquisition via API: JWA-POLARIS

SALVIA-OCT.
Smart Analysis of a Vessel In Actual seas

< parameter ShipDC **polaris** voyage data_B voyage data_B_fig >

set date and position _____ package 2:T1st

use the data on voyage data_A/B tab
 upload CSV file

status Succeeded message _____

request number 14-21 count 1440

divide size 8 Type 1:CSV

status Succeeded message _____

specification of waves
 wind waves and swells resulting waves

add wind data to voyage data_A/B tab

Select "wind waves and swells or "resulting waves" .

Checking if you want to post the wind data acquired from POLARIS to voyage data_A/B tab.

Download the acquired data

Posting the acquired data to the browser.

Others

SALVIA-OCT.-web : Save/Load, export function



< top import input parameter voyage data_B >

DATA VALIDATION

(A) using mean value and standard deviation

Output for OCTARVIA (JSON format)

Saving calculation results (JSON format)

CALCULATION ITEMS

- (1) Preliminary data filtering
 - (1A) using mean value and standard deviation
 - (1B) using mean value
- (2) Data correction on sea state
- (3) Ship performance Assessment
 - (3A) based on Resistance Criteria Method
 - (3B) based on Estimated Performance Curve
- (4) Assessment of fouling and aging

Loading calculation results (JSON format)

This is a file to be read when calculating the performance in actual seas by OCTARVIA-web.

Download operating instructions and converter to Excel file.


Data Input Calculation **Save** **Load** Data Import **Data Export** Manual Converter

Click them and it will be automatically downloaded to your local PC. 31

Converting Save data to Excel file

- ✓ Save data can be converted to an Excel file using a dedicated converter. **(Can be read in Excel version)**
- ✓ It is also possible to convert the save data in Excel version to JSON format and load it with SALVIA-OCT.-web.

Using with EAGLE-OCT.-web

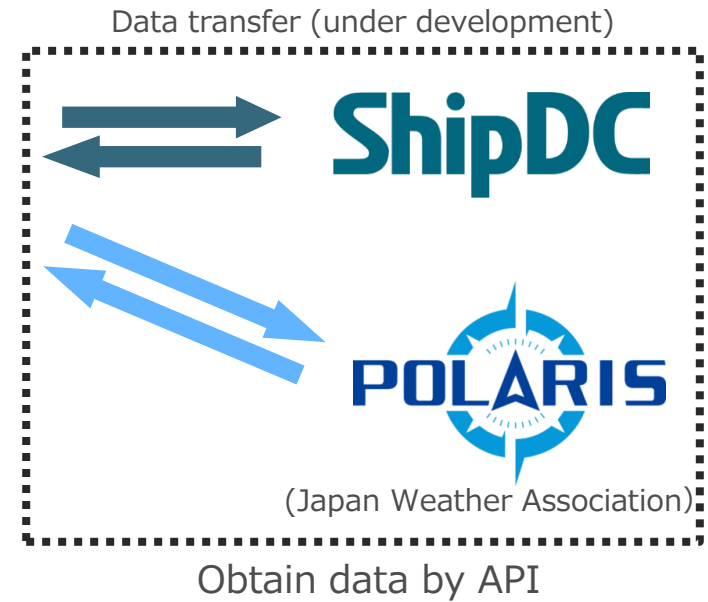
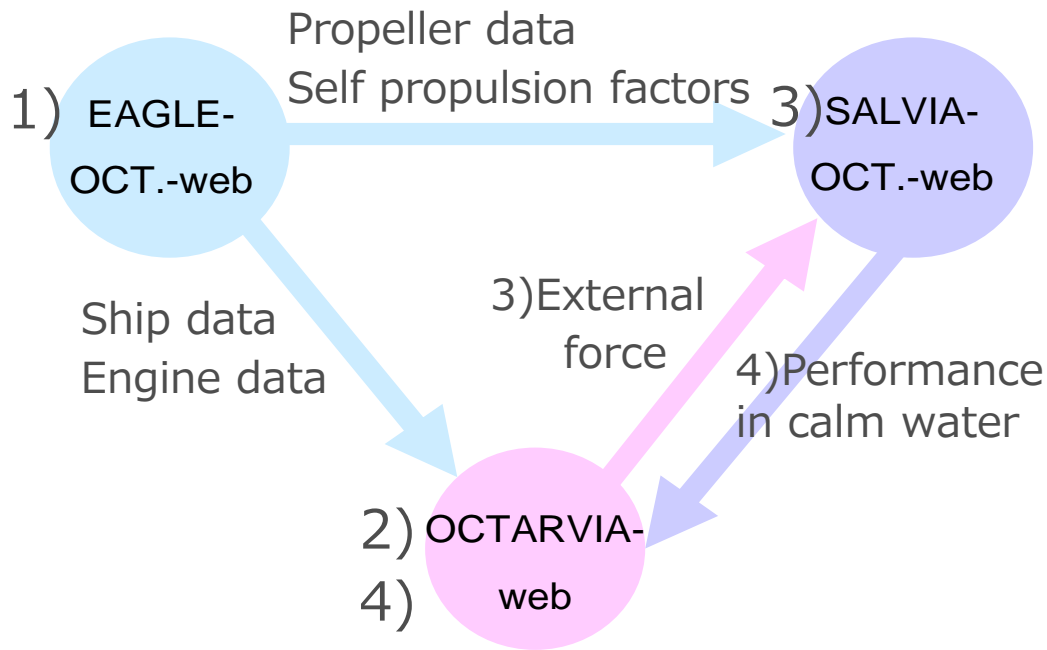
Converter for web application	
EAGLE-OCT.	SALVIA-OCT.
JSON to Excel	JSON to Excel
Excel to JSON	Excel to JSON
	
Ver. 1.0	

Convert save data of web application to Excel

Convert Excel version Save data to JSON

Dedicated converter (works with Excel)

Cooperation with other apps



By transferring between applications, you can do the following:

- 1) Estimation of hull shape, hull and propeller performance with **EAGLE-OCT.-web**
- 2) Using the results of 1), **OCTARVA-web** calculates the increase in resistance due to waves and winds.
- 3) Using the results of 1) and 2), evaluate the performance in calm water by analyzing monitoring data in **SALVIA-OCT.-web**.
- 4) Using the results of 1)~3), simulate performance (ship speed, fuel consumption) under arbitrary sea conditions in **OCTARVIA-web**.

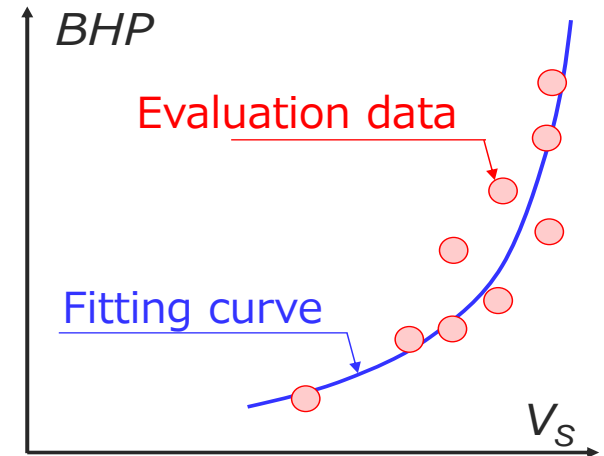
SALVIA-OCT.-web : Resistance Criteria Method

Resistance Criteria Method (RCM) : Evaluation method using the **rate of increase in resistance (δR)** from calm water at the same ship speed

Output quality information of **Pass Grade** (next page)

Conduct two types of data extraction on the corrected data

- Data close to calm water \Rightarrow "Evaluation data" with δR less than 10%.
- Data in waves and winds \Rightarrow "Fitting data" with δR less than 50%.



Equations of ship speed V_S – Main engine revolution N_E – Main engine output BHP

$$BHP = a_n \cdot N_E^{b_n}$$
$$N_E = d_{nv} \cdot V_S$$

Apply to fitting data
 \Rightarrow "Fitting Curve"

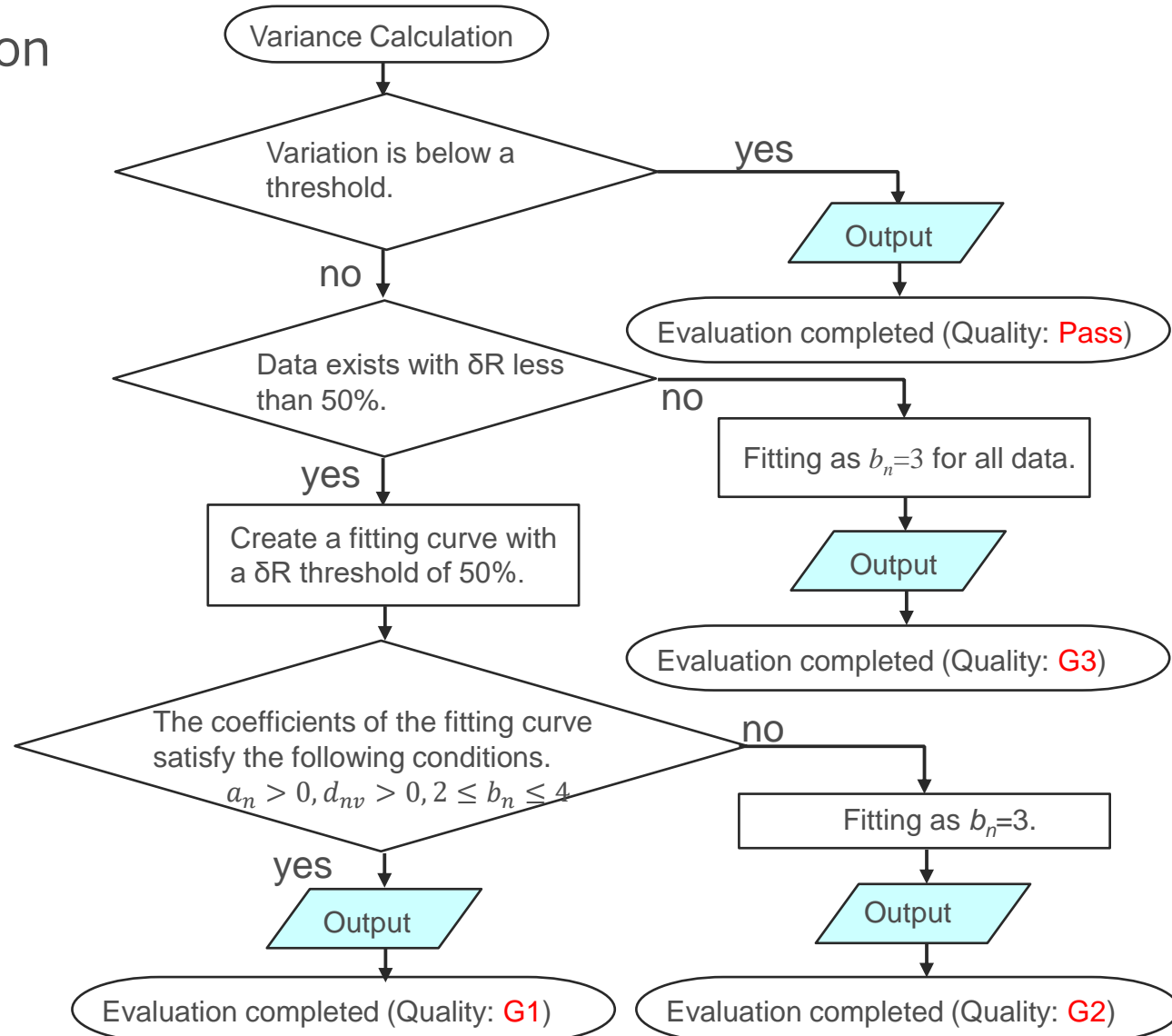
Variation in **evaluation data** around the **fitting curve**

- If the variation is below the threshold value,
- If the variation exceeds the threshold value, lower the δR , recreate the fitting curve, re-calculate the variation, and if it is below the threshold value,

Fitting curve is the evaluation result
(Quality: **Pass**)

SALVIA-OCT.-web : Pass Grade of RCM

Pass Grade Description



SALVIA-OCT.-web : Output

<Quality of the evaluation>

✓ The quality of the evaluation depends on the quality of the data input.

Pass – Grade	Data existence	Variability in evaluation data	Curve coefficient $a_n > 0, d_{nv} > 0,$ $2 \leq b_n \leq 4$	Obtained curve
Pass	Both evaluation data and fitting data exist (data with $\delta R \leq 10\%$ exists).	• When δR_{fit} is 50% or less, the variation in evaluation data (DPC) becomes 2 or less.	satisfy the conditions	Curve obtained from fitting data with δR_{fit} at 50% or below
G1	Both evaluation data and fitting data exist (data with $\delta R \leq 10\%$ exists).	δR_{fit} is 50% or less and the variation in evaluation data (DPC) is greater than 2.	satisfy the conditions	The curve obtained from fitting data with a 50% of δR_{fit}
	No evaluation data exists, but fitting data is available (no data with $\delta R \leq 10\%$, but data with $\delta R \leq 50\%$ is available).	Not available for evaluation		
G2	Both evaluation data and fitting data exist (data with $\delta R \leq 10\%$ exists).	• When δR_{fit} is 50% or less and the variation in evaluation data (DPC) is greater than 2	does not satisfy the conditions	The curve obtained from fitting data with δR_{fit} at 50% (where $b_n=3$)
	No evaluation data exists, but fitting data is available (no data with $\delta R \leq 10\%$, but data with $\delta R \leq 50\%$ is available).	Not available for evaluation		
G3	No evaluation data or fitting data available (no data where δR is 50% or less)	Not available for evaluation	Satisfies/does not satisfy the conditions	The curve obtained from the unfiltered data of δR (where $b_n=3$)

δR : increase in resistance from calm water,

b_n : Exponent of the engine revolution-Main Engine Output Relationship Curve

Details of RCM

For details on Pass Grade and other RCM-related information, please refer to the following paper.

Naoto Sogihara, Akiko Sakurada, Masaru Tsujimoto: "Validation of Filtering Method for Evaluating Ship Performance in Calm Sea Using Onboard Monitoring Data", Journal of the Japan Society of Naval Architects and Ocean Engineers, 2021 Volume 33 Pages 25-33
DOI: <https://doi.org/10.2534/jjasnaoe.33.25>