Rev.0 REP(RCTL)00-00 Copyright © 2019, Hitachi, Ltd.

[Controller Board REPLACEMENT PROCESSING - RCTL]

Rev.0.1 Copyright © 2019, Hitachi, Ltd.

REP(RCTL)01-10

NOTICE: The operation time depends on the I/O load. When the I/O load is extremely high, it might take up to about four hours to complete the procedure.

NOTE: The Controller Board is blocked by this maintenance work. Check that the alternate path of the path that uses the Channel Board in the target Controller Board is set for the Channel Board in the Controller Boards other than the target Controller Board. If the alternate path is not set, it is necessary to set the alternate path or stop host I/O. Consult with the customer and then perform the work.

1. Connecting the Maintenance PC

Connect the Maintenance PC to the SSVP, and then log in to the SVP.

- "Attachment/Removal Procedure of Maintenance PC" (INST(IN)13-02-10)
- "Connection to the SVP" (SVP01-30)
- 2. Starting the SVP window

From the menu of Web Console, click [Maintenance Components] - [Maintenance Other Components].

3. Changing the operation mode Change the mode to [View Mode].

4. Starting Maintenance Utility

See Table 1-1 to check the Controller Board to which Maintenance Utility is connected. Specify an appropriate CTL number, and then start Maintenance Utility. (See "Starting Maintenance Utility by Specifying CTL" (MU01-50).)

REP(RCTL)01-20

Table 1-1 Correspondence between Controller Board to Be Replaced and Controller Board to which Maintenance Utility Is Connected.

Controller Board to be replaced	Controller Board to which Maintenance Utility is connected	
	Single SVP configuration	Dual SVP configuration
CTL01	Other than CTL01 or CTL02	Other than CTL01
CTL02	Other than CTL01 or CTL02	Other than CTL02
CTL11	Other than CTL11 or CTL12	Other than CTL11
CTL12	Other than CTL11 or CTL12	Other than CTL12
CTL21	Other than CTL21 or CTL22	Other than CTL21
CTL22	Other than CTL21 or CTL22	Other than CTL22
CTL31	Other than CTL31 or CTL32	Other than CTL31
CTL32	Other than CTL31 or CTL32	Other than CTL32
CTL41	Other than CTL41 or CTL42	Other than CTL41
CTL42	Other than CTL41 or CTL42	Other than CTL42
CTL51	Other than CTL51 or CTL52	Other than CTL51
CTL52	Other than CTL51 or CTL52	Other than CTL52

NOTE: For example, when replacing Controller Board, connect to the following CTL.

- Single SVP configuration: Other than CTL01 or CTL02
- Dual SVP configuration: Other than CTL01

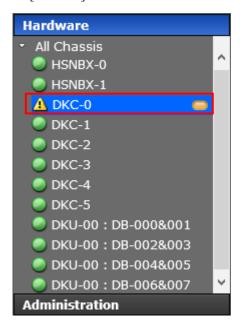
Hitachi Proprietary

DKC910I

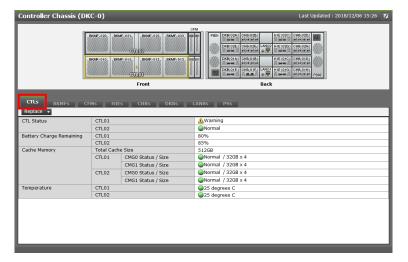
Rev.0 Copyright © 2019, Hitachi, Ltd.

REP(RCTL)01-30

- 5. Selecting replacement parts by Maintenance Utility.
 - (1) <Main window> Select [DKC-X] in the main window.



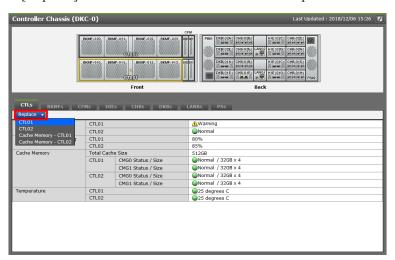
(2) <Controller Chassis window> Click the [CTLs] tab in the Controller Chassis window to display a Controller Board status. See "Alert Display Related to FRU (Field Replacement Unit)" (MU02-10) for [Status].



Rev.1 Copyright © 2019, Hitachi, Ltd.

REP(RCTL)01-40

(3) <Select Controller Board>
Click [Replace] and select a Controller Board to be replaced.



(4) <Block Controller Board>

A CAUTION

About "Forcibly run without safety checks":

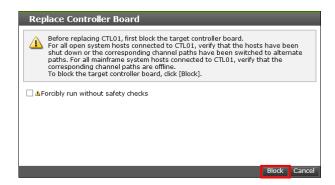
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. When the remote copy (True Copy, Universal Replicator, and global-active device) is used in the target storage system, see "Note on Deleting Remote Paths" (REP(GE)01-60). When Universal Volume Manager is used for the target storage system, see "Notes on Maintenance Work for the Storage System for which External Paths Are Configured" (REP(GE)01-61).

Rev.1.1 Copyright © 2019, Hitachi, Ltd.

REP(RCTL)01-50

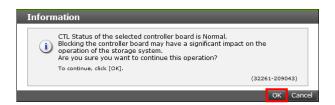
Click [Block] after checking that the Controller Board to be replaced is correct. If a message other than the described is displayed, refer to Message Section (MSG00-00).

NOTE: The error list window is displayed if multiple errors are detected by the prior check. If it is displayed, click the text of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



NOTE: When the Controller Board to be replaced is in the Normal state, the following message is displayed. Check that the Controller Board to be replaced is correctly selected, and then click [OK].

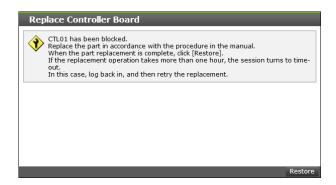
NOTE: At the time of the Controller Board blockade, fans on Drive Boxes might rotate at a high speed temporarily.



(5) <Check the beginning of Controller Board replacement> Check that the Controller Board is blocked and becomes ready for replacing.

NOTE: Do not click [Restore] at this time.

Click [Restore] after completing the replacement work.

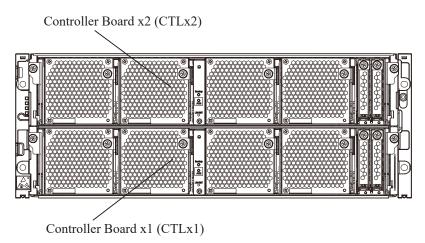


Rev.1.1 Copyright © 2019, Hitachi, Ltd.

REP(RCTL)01-60

6. Controller Board Replacement Processing

Location	Function Name of Component		Part Name
Front of DKC	1	Controller Board	Controller Board



Front view of DKC -x

NOTE: The above illustrations are for VSP 5500 and VSP 5500H. For VSP 5100 and VSP 5100H, only CTL01 and CTL12 are installed.

NOTICE: To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. See "Note on Installing and Removing Parts (REP(GE)01-30)".

Rev.1 Copyright © 2019, Hitachi, Ltd.

REP(RCTL)01-70

(1) Check that the ALM LED (red) on the Controller Board to be replaced in the DKC is lit.

NOTE: The ALM LED (red) on the Controller Board might not light up depending on the failure. In such a case, perform the following steps in order from ① to ③ to locate the Controller Board to be replaced.

Step (1):

For VSP 5100 and VSP5100H, when either of the ALARM LED ((LOC03-70), No. 5-4) on DKC-0 or that on DKC-1 is lit, perform the procedure from Step (2) on the Controller Board in the DKC on which the ALARM LED ((LOC03-70), No. 5-4) is lit. When both of the ALARM LED ((LOC03-70), No. 5-4) on DKC-0 and that on DKC-1 are lit, go to Step ②.

For VSP 5500 and VSP 5500H, go to Step ②.

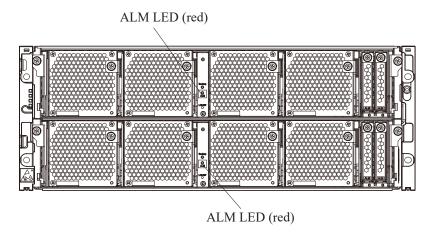
Step ②:

Turn on the Locate LED (see "Turn on/off Locate LEDs" (MU02-40)) to locate the Controller Board to be replaced, and then perform the procedure from Step (2). If the Locate LED does not light up, go to Step (3).

Step ③:

Confirm the location (LOC02-40) of the Controller Board to be replaced so as not to remove a different Controller Board, and then perform the procedure from Step (2).

Figure 1-1 ALM LED Position



Controller Board

Rev.1

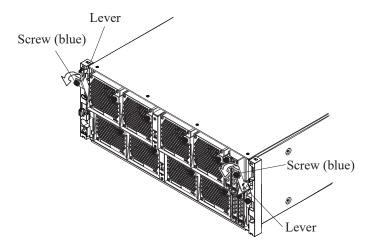
REP(RCTL)01-80



When removing a Controller Board of the DKC, be sure to remove BKMFs first because the mass of the Controller Board is about 19 kg.

- (2) Remove the Controller Board from the DKC.
 - (a) Loosen the right and left screws (blue) on the lever of the Controller Board to be replaced in the front of the DKC and open the lever.

Figure 1-2 Removing Controller Board (DKC)



NOTICE: After removing the Controller Board, the LEDs (POWER/READY/ALARM) might go out.

If the LED on the front goes out, check that anything other than the Controller Board is normal in the Maintenance Utility window and continue the replacement.

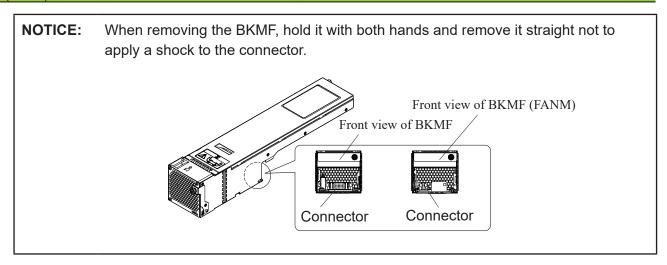
The READY LED (green) on the front of DKC lights up after performing

"7. Restoring replacement parts by Maintenance Utility".

Copyright © 2019, Hitachi, Ltd.

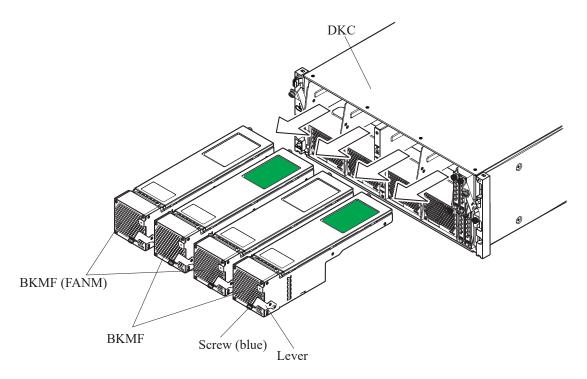
Rev.0 Copyright © 2019, Hitachi, Ltd.

REP(RCTL)01-90



- (b) Remove all BKMFs (four) installed in the Controller Board.
 - (i) Loosen the screw (blue) fixing the BKMF.
 - (ii) Open the lever and pull out the BKMF to remove.

Figure 1-3 Removing BKMF(DKC)

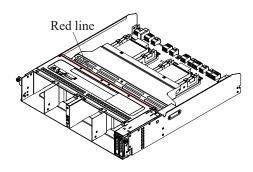


Rev.0 Copyright © 2019, Hitachi, Ltd.

REP(RCTL)01-100



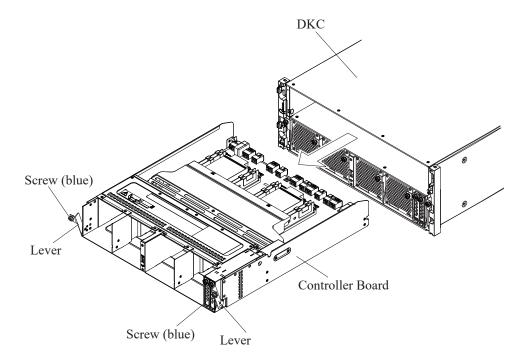
Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



NOTICE: When removing the Controller Board, hold it with both hands and remove it straight not to apply a shock to with any components.

(c) With the lever opened completely, pull out and remove the Controller Board.

Figure 1-4 Removing Controller Board (DKC)

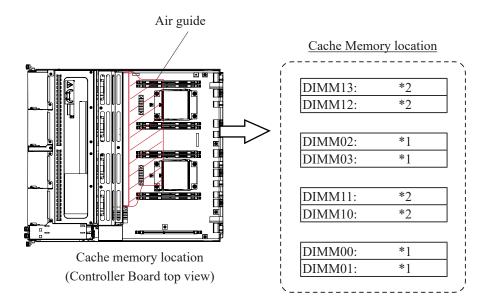


Rev.0 Copyright © 2019, Hitachi, Ltd.

REP(RCTL)01-110

(3) Move all the Cache Memories (including dust covers if any) mounted on the extracted Controller Board to the same mounting positions on a new Controller Board.

Figure 1-5 Installation Location of Cache Memory



- *1: Belonging to CMG0 (Cache Memory Group 0).
- *2: Belonging to CMG1 (Cache Memory Group 1).

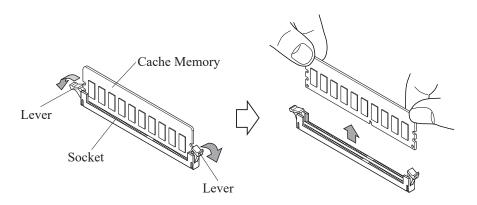
Be sure to install DIMM in CMG0.

CMG1 is an additional slot of DIMM.

Install DIMM in sets of four.

- (a) Removal procedure
 - (i) Open the air guide.
 - (ii) Pull the lever outward.
 - (iii) Hold both ends of the Cache Memory by the fingers and pull out the Cache Memory from the socket.

Figure 1-6 Removal of Cache Memory



Rev.0 Copyright © 2019, Hitachi, Ltd.

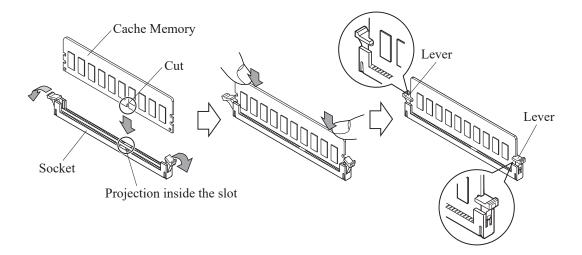
REP(RCTL)01-120

(b) Installation procedure

NOTICE: Do not put intense pressure on the Cache Memory to the extent that the PCB greatly bends after the Cache Memory is secured with the levers in installation procedure of the Cache Memory. The PCB may be damaged when intense pressure is applied.

- (i) Position the cut of the Cache Memory with the projection inside the slot and place the Cache Memory on the socket.
- (ii) Hold both ends of the Cache Memory by the fingers and fit it into the socket.
- (iii) Check that the lever is firmly fitted in the Cache Memory.
- (iv) Close the air guide.

Figure 1-7 Installation of Cache Memory



Rev.0 Copyright © 2019, Hitachi, Ltd.

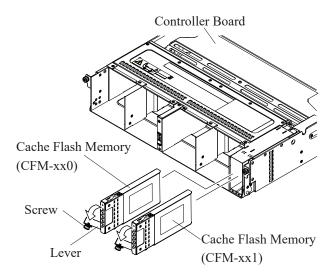
REP(RCTL)01-130

(4) Move all the Cache Flash Memories mounted on the extracted Controller Board to the same mounting positions on a new Controller Board.

NOTICE: Mounting the Cache Flash Memories to wrong mounting positions might cause the Controller Board not to recover normally.

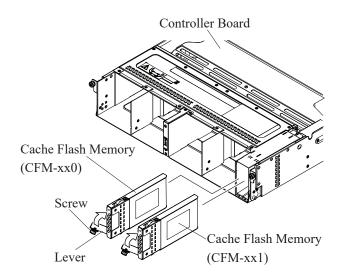
- (a) Loosen the screw (blue) which fixes the Cache Flash Memory.
- (b) Open the lever to pull out and remove the Cache Flash Memory.

Figure 1-8 Removal of Cache Flash Memory



- (c) With the lever opened completely, insert the Cache Flash Memory into the same slot of the new Controller Board.
- (d) Push the Cache Flash Memory all the way in and close the lever completely.
- (e) Tighten the screw (blue) and fix the Cache Flash Memory.

Figure 1-9 Installation of Cache Flash Memory



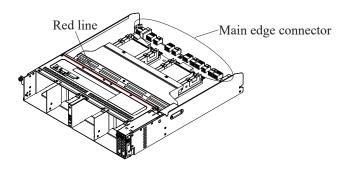
Rev.0 Copyright © 2019, Hitachi, Ltd.

REP(RCTL)01-140

(5) Install a new Controller Board.

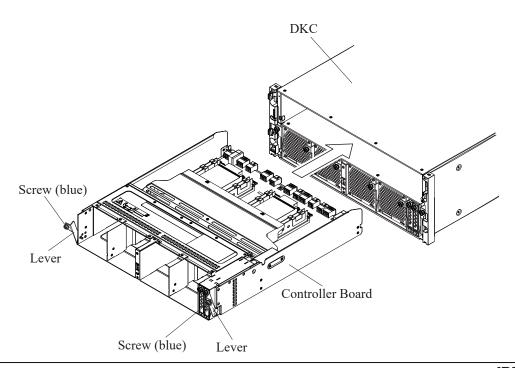


Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



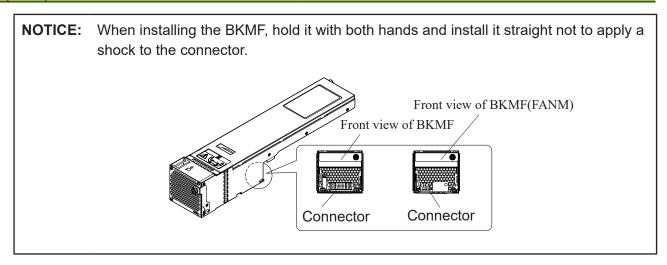
- **NOTICE:** Check that the main edge connector of the Controller Board has no deformation, damage or sticking of dust before installing the Controller Board.
 - When installing the Controller Board, hold it with both hands and install it straight not to apply a shock to with any components.
 - (a) With the right and left levers on the Controller Board opened completely, insert it into the slot of the DKC.

Figure 1-10 Installing the Controller Board (DKC)



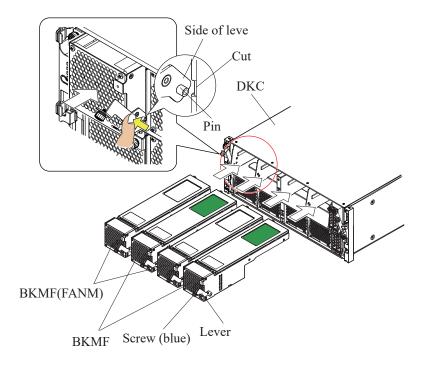
Rev.0 Copyright © 2019, Hitachi, Ltd.

REP(RCTL)01-150



- (b) Install four BKMFs in the Controller Board.
 - (i) Open the BKMF lever and insert the BKMF into the slot.
 - (ii) Insert the BKMF up to the front of the shield finger.
 - (iii) Insert the BKMF while pushing the side of its lever to the left until the pin of the lever goes through the cutout of the chassis and stops.
 - (iv) Raise the BKMF lever and tighten the screw (blue) and fix it.

Figure 1-11 Installing the BKMF

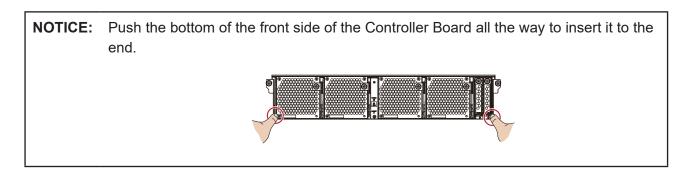


NOTE: BKMF (FANM) and BKMF contain different components. Be careful not to install them in wrong locations.

Rev.0 Copyright © 2019, Hitachi, Ltd.

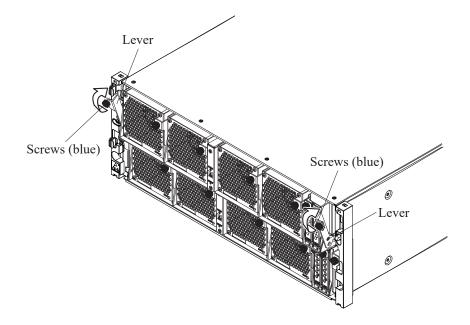
REP(RCTL)01-160

(c) Push the Controller Board all the way in and close the right and left levers completely.



(d) Tighten the screws (blue) and fix the Controller Board.

Figure 1-12 Fixing the Controller Board

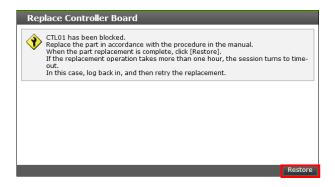


Rev.1.1 Copyright © 2019, Hitachi, Ltd.

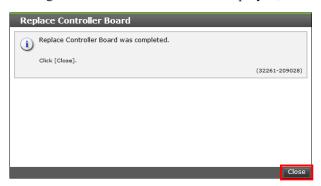
REP(RCTL)01-170

- 7. Restoring replacement parts by Maintenance Utility
 - (1) <Restore replacement parts> Click [Restore].

NOTE: At the time of the Controller Board recovery, fans on Drive Boxes might rotate at a high speed temporarily.



(2) <Check replacement parts restoration>
Check that the following message is displayed and click [Close].
If a message other than the described is displayed, refer to Message Section (MSG00-00).



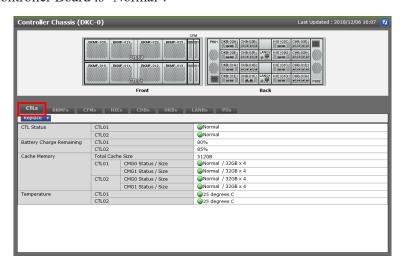
NOTE: It may take a few minutes to be able to connect to GUM of the replaced Controller Board.

When executing Auto Dump, check that the connection to GUM of the replaced Controller Board is possible, and then execute it.

Rev.0 Copyright © 2019, Hitachi, Ltd.

REP(RCTL)01-180

(3) <Check Controller Board restoration>
Click the [CTLs] tab in the Controller Chassis window and check that a Status of the replaced Controller Board is "Normal".



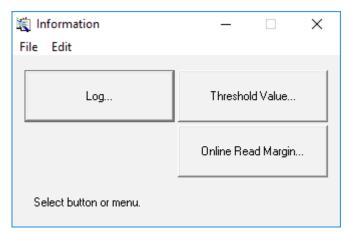
- 8. Closing Maintenance Utility
 - (1) Click [Logout] to close the window.
 - (2) <Get the error information>
 Collect small system dumps by referring to "Dump/Auto Dump" (SVP02-09-10).
 - (3) Refer to the "Use of OnlineDumpTool" (SVP02-21-10), please upload the error information.

Copyright © 2019, Hitachi, Ltd.

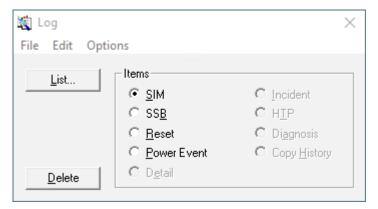
REP(RCTL)01-190

Rev.0

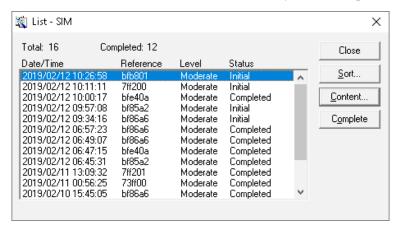
- 9. Completing the SIM log
 - (1) Change the mode to [Modify Mode], and then select [Information].
 - (2) In the Information window, click [Log...].



(3) In the Log window, select [SIM] and then [List...].



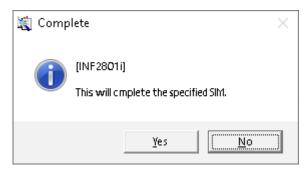
(4) In the List-SIM window, select the data for which you end the process, and then click [Complete].



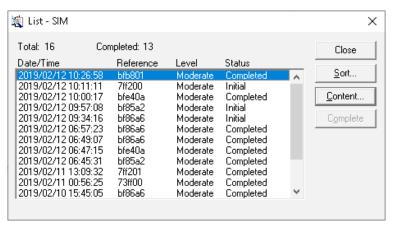
Rev.0.1 Copyright © 2019, Hitachi, Ltd.

REP(RCTL)01-200

(5) In the Complete window, click [Yes].



(6) In the List-SIM window, confirm that the "Status" of the data has become "Completed".



(7) In the List-SIM window, click [Close].Close the Log window, then the Information window.Change the mode from [Modify Mode] to [View Mode].

NOTE: If the MESSAGE LED is lit on the HSNPANEL after you complete all SIMs, display SIMs to check that SIM statuses are "Completed". If SIM statuses are not "Completed", wait for five minutes, and then perform the procedure for completing the SIM log again.

10. Checking Normality

Perform the normality check according to "Checking Normality (TRBL02-06-10)".