

Approved per signature page

SERVICE MODULE  
**THERMAL MODE CONTROL SYSTEM**  
[COTP]  
SM

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**Revision Log**

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#### APPENDIX. [COTP] Backup Modes

## INTRODUCTION

These COTP crew procedures contain information for the crew about procedures and rules for Active Thermal Control, Air Conditioning and Ventilation Systems operations

COTP (Backup Modes) book contains procedures about COTP, performed by the crew **on MCC-M**

**GO** if it is not possible to perform them by **MCC-M** during:

- maintenance support
- test performance
- change of operating modes and configuration of thermal control system pumps

These crew procedures are intended for trained crew members who have completed the full training course and simulations, and also per results of full-scale tests

These crew procedures may be updated pending ISS assembly, systems modification and procedure validation at simulators and training facilities

These crew procedures are developed per БСC software release 4.30.14 and RS Laptop software dated 07.03.00

## ACRONYMS AND ABBREVIATIONS

|                |   |
|----------------|---|
| алг            | - algorithm                               |
| б/и            | - crew procedures                         |
| БВ             | - switch panel                            |
| БВК            | - command output unit                     |
| БИТС           | - onboard measurement telemetry subsystem |
| БКС            | - onboard cable network                   |
| БРУС           | - fan speed control unit                  |
| ВАП            | - equipment fan                           |
| ВВПрК          | - transfer tunnel air duct fan            |
| ВВПрО          | - transfer compartment duct fan           |
| ВГЖТ           | - gas-liquid heat exchanger fan           |
| ВД             | - air duct                                |
| ВК             | - personal fan                            |
| ВКЮ            | - crew quarters fan                       |
| ВН             | - cabin air heater                        |
| ВОЛ            | - Lira equipment fan                      |
| ВПО            | - instrument area fan                     |
| ВПрК           | - transfer chamber fan                    |
| ВПрО           | - transfer compartment fan                |
| ВСУ            | - toilet cabin fan                        |
| ВСЭП           | - СЭП equipment fan                       |
| ВТ             | - heat exchanger fan                      |
| ВТК            | - heat exchanger-condenser fan            |
| ГЖТ            | - gas-liquid heat exchanger               |
| <b>ДнаЗ-М</b>  | - <b>report to MCC-M</b>                  |
| <b>ДпоУЗ-М</b> | - <b>√MCC-M</b>                           |
| ДТ             | - temperature sensor                      |
| загл           | - cap, plug                               |
| ЗИП            | - spares kit                              |
| ИнПУ           | - integrated control panel                |
| кбл            | - cable                                   |
| кл             | - valve                                   |
| клав           | - pushbutton                              |
| кн             | - pb                                      |
| КОБ            | - SM internal thermal loop                |

|               |  |
|---------------|--|
| КОХ           | - SM external thermal loop                       |
| КРЛ           | - command radio link                             |
| КУ            | - compressor [CKB]                               |
| МЗ            | - air conditioner fan                            |
| МОК           | - condensate line                                |
| Н/С           | - off-nominal situation                          |
| НОК           | - condensate pump                                |
| НЭП           | - Science Power Platform                         |
| Откл          | - deactivate, deactivated (if there is no label) |
| п             | - procedure                                      |
| перекл        | - switch   |
| ПДНК          | - external loop refill panel                     |
| ПК            | - valve panel                                    |
| ПКР           | - accumulator panel                              |
| <b>ПоУЗ-М</b> | - <b>on MCC-M GO</b>                             |
| ППС           | - system power panel                             |
| ПрК           | - transfer chamber                               |
| ПСС           | - caution and warning panel                      |
| ПУВН          | - cabin air heaters control panel                |
| ПФ            | - dust filter                                    |
| ПхО           | - transfer compartment                           |
| РБС           | - power outlet                                   |
| РВ            | - ventilation grill                              |
| РРЖ           | - flow control valve                             |
| рзм           | - cnctr, connector                               |
| рис           | - Figure   |
| РН            | - manual pump                                    |
| РО            | - working compartment                            |
| РП            | - flow regulator                                 |
| РПК           | - cabin flow rate indicator                      |
| РРЖ           | - flow control valve                             |
| с/с           | - ground pass, comm pass                         |
| СБК           | - condensate container                           |
| СВ            | - ventilation subsystem                          |
| СвД           | - light emitting diode, LED                      |
| СД            | - pressure alarm, pressure indicator             |
| СКВ           | - air conditioner                                |
| СМ            | - Service Module                                 |
| см            | - reference, see                                 |
| СО            | - Docking Compartment                            |
| СОГС          | - atmosphere revitalization subsystem            |
| СОТР          | - thermal mode control system                    |
| СПН           | - replaceable pump panel                         |
| СРВ-К2М       | - condensate water processor                     |
| СТР           | - active thermal control system                  |
| СУ            | - docking assembly                               |
| т/н           | - coolant  |
| ТК            | - Soyuz transport vehicle                        |
| ТКГ           | - Progress cargo vehicle                         |
| ТМИ           | - Telemetry                                      |
| ФГБ           | - Functional Cargo Block (FGB)                   |
| ФС            | - screen filter                                  |
| <b>ЦУП-М</b>  | - Mission Control Center-Moscow, <b>MCC-M</b>    |
| <b>ЦУП-Х</b>  | - Mission Control Center-Houston, <b>MCC-H</b>   |
| ЭК            | - solenoid valve                                 |
| ЭН            | - КОБ electrical heater                          |

**SYMBOLS**

- illuminated
- blinking
- not illuminated
- sw BT1 → On (i.e. up relative to label on panel)
- sw BT1 → Off (i.e. down relative to label on panel)
- i.e. right relative to label on panel
- i.e. left relative to label on panel
- mouse left click
- rotate clockwise
- rotate counterclockwise
- rotate clockwise to stop
- rotate counterclockwise to stop
- adjust by rotating
- place physical device in designated state
- control panel status
- disconnect
- connect
- press pushbutton
- press pushbutton to lock
- check (in case of discrepancy, attempt a corrective action one time only)
- verify
- continuously monitor
- verify aurally
- tactile verification
- ЗВУК** - acknowledge audio alarm
- 15:46:28 - 15 hours 46 minutes 28 seconds
- repeat steps

- BK1 is running \*\*\*\*\*  
\*\*\*\*\*  
Use the other [BK] or  
**ON MCC-M GO** Replace fan  
\*\*\*\*\* - an anticipated off-nominal situation, if the condition left of the asterisks on the same line is not met, perform action(s) enclosed by asterisk lines
- BT1 — (3 --- 5 B) \*\*\*\*\* Perform 2.5.2 - off-nominal situation, if the condition left of the asterisks on the same line is not met, perform 2.5.2
- СКВ1 работает \*\*\*\*\* **Report to MCC-M** - an anticipated off-nominal situation, if the condition left of the asterisks on the same line is not met, stop performing procedure and **√MCC-M**
- ПУВН    ↓ ПУЛЬТ ВКЛ     СвД Д1 - press pb PANEL PWR, in this case  LED Д1
- НОК1 (НОК2) — - advisory annunciation (not mandatory for monitoring)

**COMMAND ISSUE VIA RS LAPTOP**

RS Laptop CM:COTP:Commands  
 cmd T\_OFSNOK (Сброс сигн.НОК)  
 Execute

- Open the specified display
- Select the command by its unique ID
- Issue the command with execution confirmation

**PROCEDURE RUN VIA RS LAPTOP**

RS Laptop CM:COTP:CTP\_proc  
 proc FT\_11 (Задание контура КОХ)  
 param 1\_\_  
 .....  
 param n \_\_  
 Execute

- Open the specified display
- Select the command by its unique ID
- Type parameter #1 value in the parameter input field
- Type parameter #n value in the parameter input field ('n' stands for total number of procedure parameters)
- Run the procedure with execution confirmation

**COMMAND ISSUE VIA INTEGRATED CONTROL PANEL (ИНПУ)**

ИНПУ SM COTP CONTROL  
 FAN MASTER PWR OFF  FANS PWR OFF

- Open the specified display
- Place cursor on softkey (FAN MASTER PWR)
- Press key COMMAND / OFF (**OFF**)
- Verify indicator (FANS PWR OFF) becomes highlighted (in bright green)

**INDICATOR MONITORING VIA ИНПУ**

ИНПУ SM COTP CONTROL  
 FAN1 ПpK PWR ON

- Open the specified display
- Verify indicator (FAN1 ПpK PWR ON) becomes highlighted (in bright green)



## 1. GENERAL INSTRUCTIONS

### 1.1. CREW RESPONSIBILITIES

While performing operations, the crew is responsible for the following actions

1. Perform operations per these crew procedures and **MCC-M** instructions, in accordance with the crew functional responsibilities and current status of the onboard systems
2. **Report to MCC-M** completed operations
3. Monitor systems operation per these crew procedures and **MCC** instructions
4. When there is a deviation from nominal systems operation, the crew is responsible for the following actions
  - record the time when the deviation (malfunction) was detected
  - record the nature of the deviation (malfunction)
  - **report to MCC-M** at the earliest available comm pass
5. In the event of an off-nominal situation, take corrective action by executing the malfunction procedure
6. Perform indicator panel lamp test
7. Output commands via control panels by pressing pushbuttons (without lock) and holding for 1-2 sec.
8. Record actual time spent performing operations
9. When working with hardware (control panels, hoses, cables etc.) equipped with protective caps and covers:
  - remove caps and covers before operations
  - re-install caps and covers after operations

## 1.2. SAFETY PRECAUTIONS

To ensure nominal systems operation and crew safety, the crew is responsible for the following actions:

1. When working with the system, use only hardware, tools, and protective devices designated by these crew procedures or by **MCC-M**
2. Upon detection of an off-nominal situation, not documented in these crew procedures, the crew is responsible for the following actions:
  - stop working with the system
  - record time when the off-nominal situation was detected
  - record the nature of the off-nominal situation
  - **report to MCC-M** at the earliest available comm pass
3. Replace fuses only when system or instrument is unpowered.  
Replace fuse per amperage, labeled on the fuse.  
√**MCC-M** before repeating fuse replacement

## 2. AIR CONDITIONER ([CKB1,CKB2]) AND CONDENSATE LINE ([MOK])

### 2.1. [CKB] DISPLAY OPERATION

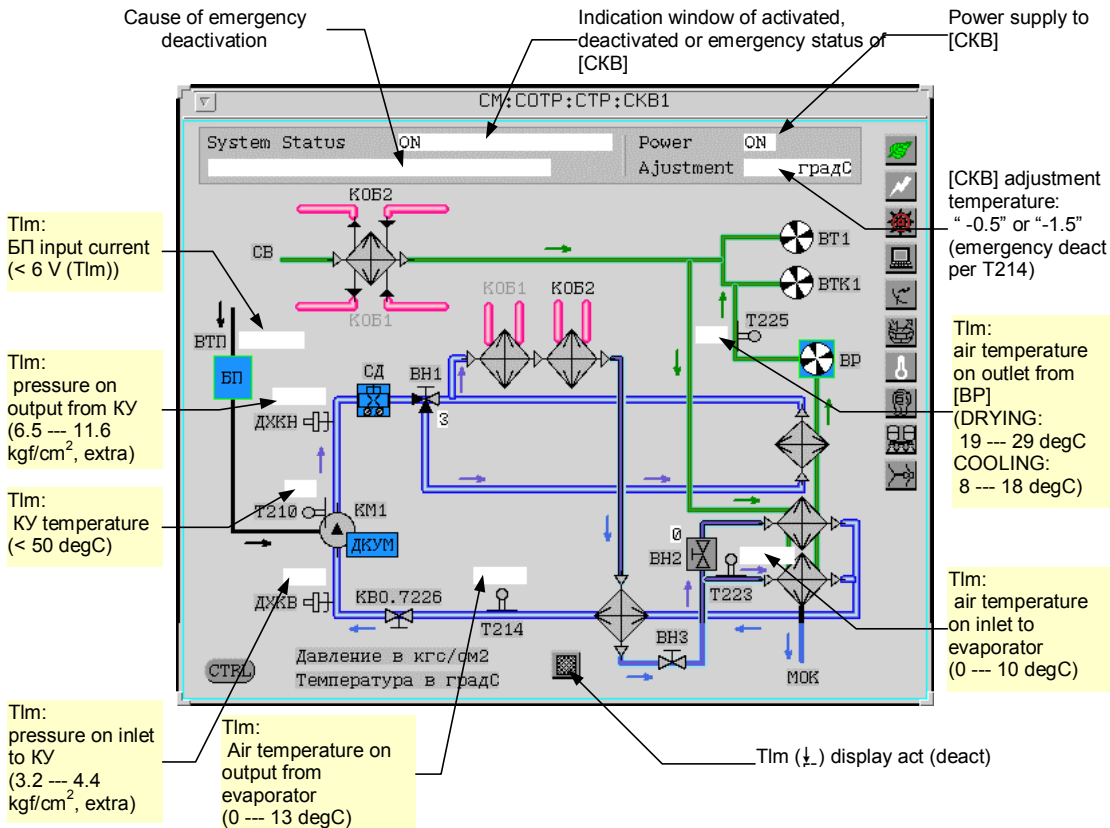


Figure 2.1-1 Display of activated [CKB1] (similar for [CKB2]) Mode "Drying" is selected. Coolant condenser operates on КОБ2. TIm values correspond to setting mode of [CKB] operation.

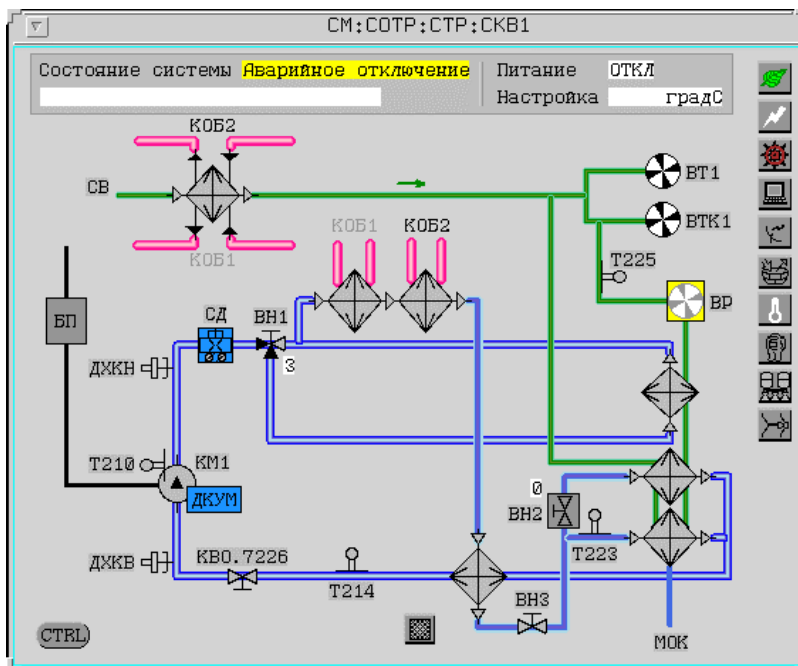








Figure 2.1-2 Display of deactivated [CKB1] (similar for [CKB2])

## 2.2. [CKB] CONTROL


### 2.2.1. [CKB1] ([CKB2]) AND [HOK1] ([HOK2]) ACTIVATION/DEACTIVATION

#### 1. [CKB1] ([CKB2]) AND [MOK] PREPARATION FOR ACTIVATION

201(401)      √ 7Кл1 (7Кл2)                      — ОТКРЫТ (Open)  
 When evacuating condensate to condensate container (СбК):  
 401            | 7Кл3                                      → ЗАКРЫТ (Closed)  
 201            | 7Кл4                                      → В СБОРНИК КОНДЕНСАТА (to СбК)  
 behind 131    | √ pb ВКЛ (On) (on 7СД)                — ↓  
                   | √ Condensate container valve-indicator — ОТКР (Open) (↙)


When pumping condensate to СРВ-К2М (condensate water processor):  
 401            | 7Кл3                                      → В СРВ-К (to [СРВ-К])  
 201            | 7Кл4                                      → ЗАКРЫТ (Closed)  
 behind 204(404) √ Mode is selected **On MCC-M GO** (COOLING or DRYING) (see 2.2.3)  
 RS Laptop     | CM:COTP:CB  
                   | √ BT1 (BT2), ВТК1 (ВТК2) —  (see 2.3)  
                   | CM:COTP:CTP:MOK  
                   | < HOK1 (HOK2)                      —  (when [CKB2] ([CKB1]) is operating  )  
                   |                    | if [HOK1]([HOK2]) —   
                   |                    | Wait                    —  (  ) (for ≤ 30 min)

#### 2. [CKB1] ([CKB2]) AND [HOK1] ([HOK2]) ACTIVATION

RS Laptop     | CM:COTP:CTP\_proc  
                   | **proc FT\_207**                              (CKB1 and HOK1 Activation)  
                   | (**proc FT\_208**)                            (CKB2 and HOK2 Activation)  
 00:00:00     | **Execute**  
 00:01:00     | CM:COTP:CTP:CKB1(CKB2)  
                   | <  
                   | < Power ON  
                   | < BP — 

When activating [CKB1] ([CKB2]) after СбК replacement or [СРВ-К2М] failure:  
 ≤ 00:05:00    | << HOK1 (HOK2)                      — 2---5 V (for 30 sec)

#### 3. [CKB1] ([CKB2]) AND [HOK1]([HOK2]) DEACTIVATION

RS Laptop     | CM:COTP:CTP\_проц  
                   | **proc FT\_209**                              (CKB1 and HOK1 Deactivation)  
                   | (**proc FT\_210**)                            (CKB2 and HOK2 Deactivation)  
                   | **Execute**  
 ПСС            |  OTHER (yellow)                    **ALARM**  
 RS Laptop     | CM:COTP:CTP:CKB1(CKB2)  
                   | < System Status                      Off-nominal halt  
                   | < Power OFF  
                   | < BP — 

#### NOTE

After [CKB1] ([CKB2]) deactivation, [HOK1] ([HOK2]) continues operating for 30 min

## 2.2.2. [CKB1] ([CKB2]) SETTING TEMPERATURE SELECTION

RS Laptop      Activate [CKB1]([CKB2]) (see 2.2.1 step 2)

| # | CKB1 (CKB2)<br>T <sub>setting</sub> selection | Cmd               |                        | ↵                      |
|---|---|-------------------|------------------------|------------------------|
|   |   | CM:COTP: Commands |                        | CM:COTP:CTP:CKB1(CKB2) |
| 1 | CKB1: minus 0.5 °C                            | T_PRSKV1M05D      | (CKB1 Setpoint –0.5 C) | Ajustment -0.5 градC   |
| 2 | CKB1: minus 1.5 °C                            | T_PRSKV1M15D      | (CKB1 Setpoint –1.5 C) | Ajustment -1.5 градC   |
| 3 | CKB2: minus 0.5 °C                            | T_PRSKV2M05D      | (CKB2 Setpoint –0.5 C) | Ajustment -0.5 градC   |
| 4 | CKB2: minus 1.5 °C                            | T_PRSKV2M15D      | (CKB2 Setpoint –1.5 C) | Ajustment -1.5 градC   |

## 2.2.3. [CKB1] ([CKB2]) OPERATING MODE SELECTION

(On MCC-M GO)

### CAUTION

When operating, observe integrity of hydraulic manifolds and check for leaks

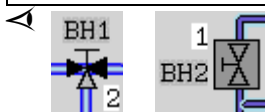
### 1. COOLING MODE SELECTION

behind 204 (404) Valve BH1 → 2 (upward)

Valve BH2 → 1 (upward)

RS Laptop

CM:COTP:CTP:CKB1(CKB2)



**Report to MCC-M**

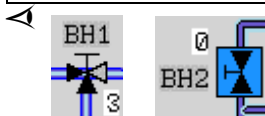
### 2. DRYING MODE SELECTION

behind 204 (404) Valve BH1 → 3 (downward)

Valve BH2 → 0 (downward)

RS Laptop

CM:COTP:CTP:CKB1(CKB2)



**Report to MCC-M**

## 2.2.4. [CKB1] ([CKB2]) ACTIVATION/DEACTIVATION USING DIRECT COMMAND (ON MCC-M GO)


### CAUTION

Perform only during comm pass when operating per **Ошибка! Источник ссылки не найден.**,  
**Ошибка! Источник ссылки не найден.**  
(OFF-NOMINAL DEACTIVATION) when the [CKB1] ([CKB2]) parameters  $T_{coolant} < N$  or  $T_{OK\ converter} > N$

#### 1. [CKB1] ([CKB2]) ACTIVATION

RS Laptop

```

CM:TBM:Procedures
proc F18_3
param: 11
Execute
CM:COTP:Commands
cmd T_ONPSKV1
(cmd T_ONPSKV2)
Execute
CM:COTP:CTP:CKB1(CKB2)
< System Status
< Power ON
< BP — 

```

(Cntl cmd (KY) output for БС 1, Enable)


(CKB-1 power ON)  
(CKB-2 power ON)

Without indication

#### 2. [CKB1] ([CKB2]) DEACTIVATION

RS Laptop

```

CM:COTP:Commands
cmd T_OFPSKV1
(cmd T_OFPSKV2)
Execute
CM:TBM:Procedures
proc F18_4
param: 11
Execute
CM:COTP:CTP:CKB1 (CKB2)
< System Status
< Power OFF
< BP — 

```

(CKB-1 power OFF)  
(CKB-2 power OFF)

(Cntl cmd (KY) output for БС 1 (Initial), Inhibit)

Without indication

## 2.2.5. [CKB1]([CKB2]) TEMPERATURE SENSOR FUNCTIONAL CHECK (ON MCC-M GO)

on [CKB1(2)] housing

behind 204(404) cnctr X027/52   ↔ [CKB] cbl

00:00:00       Activate [CKB1] ([CKB2]) by command in comm pass (see 2.2.4 step 1)

00:01:00       <<< [CKB1] ([CKB2]) activation \*\*\*\*\*

\*\*\*\*\*  
Deactivate [CKB1] ([CKB2]) by command in comm pass  
(see. 2.2.4 step 2)

Operate [CKB2] ([CKB1]) (see 2.2.1.)

**On MCC-M GO** Replace БУ (see RODF: IFM IVA SM)

\*\*\*\*\*

Deactivate [CKB1] ([CKB2]) by command in comm pass (see 2.2.4 step 2)

cnctr X027/52   →|← onboard cable network

**Report to MCC-M**

## 2.2.6. POWER SUPPLY FUNCTIONAL CHECK (ON MCC-M GO)

To the left of compressor

behind 204(404) cnctr X005/52   ↔ БКС

00:00:00       Activate [CKB1] ([CKB2]) by command in comm pass (see 2.2.4 step1)

00:01:00       <<< [CKB1] ([CKB2]) activation \*\*\*\*\*

\*\*\*\*\*  
Deactivate [CKB1] ([CKB2]) by command in comm pass  
(see 2.2.4 step 2)

Operate [CKB2] ([CKB1]) (see 2.2.1.)

**On MCC-M GO** Replace БП (see RODF: IFM IVA SM)

\*\*\*\*\*

Deactivate [CKB1] ([CKB2]) by command in comm pass (see 2.2.4 step 2)

behind 204(404) cnctr X005/52   →|← БКС

**Report to MCC-M**



### 2.3. [BT1], [BTK1] ([BT2], [BTK2]) OPERATION

#### NOTE



[BT1], [BTK1] ([BT2], [BTK2]) are operating continuously  
Deactivate only when perform assembly operations or maintenance activities

| Fan    | Part-No.   | Fan-location | Control panel and its location |
|--------|------------|--------------|--------------------------------|
| [BT1]  | MO-2-5008p | behind 205   | 306 ППС-21, 204 БРУС А15       |
| [BT2]  | MO-2-5008p | behind 405   | 308 ППС-22, 404 БРУС А18       |
| [BTK1] | MO-1-5006  | behind 205   | 306 ППС-21, 204 БРУС А16       |
| [BTK2] | MO-1-5006  | behind 405   | 308 ППС-22, 404 БРУС А19       |

#### 1. [BT1] ([BTK1], [BT2], [BTK2]) ACTIVATION WHEN OPERATING WITHOUT FAN SPEED CONTROL UNIT (БРУС)


ППС-21(22)       BT1 (BTK1, BT2, BTK2)  
RS Laptop      CM:COTP:CB or CM:COTP:CTP:CKB1 (CKB2)  
                    <img alt="fan icon" data-bbox="454 371 479 391"/> BT1 (BTK1, BT2, BTK2) —  (3 ---5 V)





#### 2. [BT1] ([BTK1], [BT2], [BTK2]) DEACTIVATION WHEN OPERATING WITHOUT БРУС

ППС-21(22)       BT1 (BTK1, BT2, BTK2)  
RS Laptop      CM:COTP:CB or CM:COTP:CTP:CKB1 (CKB2)  
                    <img alt="fan icon" data-bbox="454 481 479 501"/> BT1 (BTK1, BT2, BTK2) — 

#### 3. [BT1] ([BTK1], [BT2], [BTK2]) ACTIVATION WITH БРУС MODE SELECTION (To reduce noise level)

#### NOTE

- [BT1] ([BTK1], [BT2], [BTK2]) rpm control is possible only after installation of [CKB1] ([CKB2]) with БРУС delivered instruments
- With  LED 8 (mode 8) (one) – fan nominal revolutions  
From mode 1 to mode 7 – decrease of rpm
- After each press of pb MODE, fan noise should decrease
- Mode switchover time is 5 sec

БРУС А15(16,18,19)   POWER (opposite of arrow direction)  
ППС-21(22)       BT1 (BTK1, BT2, BTK2)  
RS Laptop      CM:COTP:CB or CM:COTP:CTP:CKB1 (CKB2)  
                    <img alt="fan icon" data-bbox="226 724 243 739"/> BT1 (BTK1, BT2, BTK2) —  (3 ---5 V) \*\*\*\*\* Perform 2.5.2 (2.5.3)

БРУС А15(16,18,19)  POWER (in arrow direction)      



**On MCC-M GO:**

| # | Mode selection | БРУС A15(16,18,19)<br>(mode switchover time is 5 sec) | ◀                                 |
|---|----------------|---|-----------------------------------|
| 1 | 1              | ↓ MODE (once after БРУС powerup)                      | <input type="checkbox"/> LED 1, 8 |
| 2 | 2              | ↓ MODE (twice after БРУС powerup)                     | <input type="checkbox"/> LED 2, 8 |
| 3 | 3              | ↓ MODE (three times after БРУС powerup)               | <input type="checkbox"/> LED 3, 8 |
| 4 | 4              | ↓ MODE (four times after БРУС powerup)                | <input type="checkbox"/> LED 4, 8 |
| 5 | 5              | ↓ MODE (five times after БРУС powerup)                | <input type="checkbox"/> LED 5, 8 |
| 6 | 6              | ↓ MODE (six times after БРУС powerup)                 | <input type="checkbox"/> LED 6, 8 |
| 7 | 7              | ↓ MODE (seven times after БРУС powerup)               | <input type="checkbox"/> LED 7, 8 |

RS Laptop

 or ◀ BT1 (BTK1, BT2, BTK2) —  (3 --- 5 V)


\*\*\*\*\* Perform 2.5.2 (2.5.3)

**Report to MCC-M****4. [BT1] ([BTK1], [BT2], [BTK2]) DEACTIVATION WHEN OPERATING WITH БРУС**

БРУС A15(16,18,19) ⇄ POWER (opposite of arrow direction) ■ LEDs (all)

ППС-21(22) Ⓢ BT1 (BTK1, BT2, BTK2)

RS Laptop

 or ◀ BT1 (BTK1, BT2, BTK2) — 

2.4. [MOK] DISPLAY OPERATION

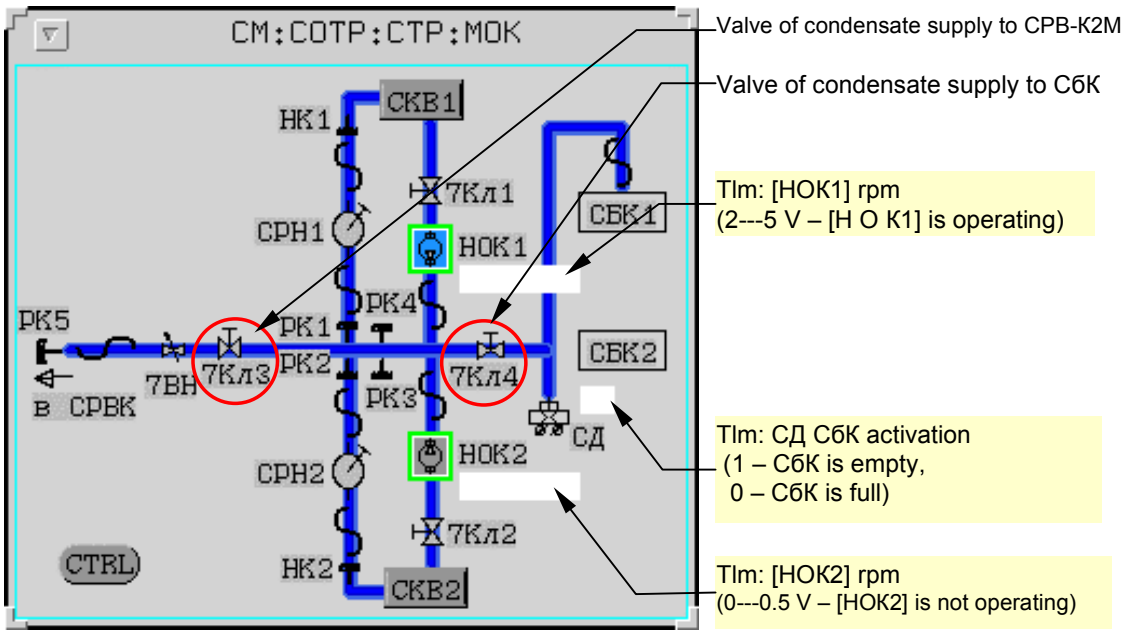
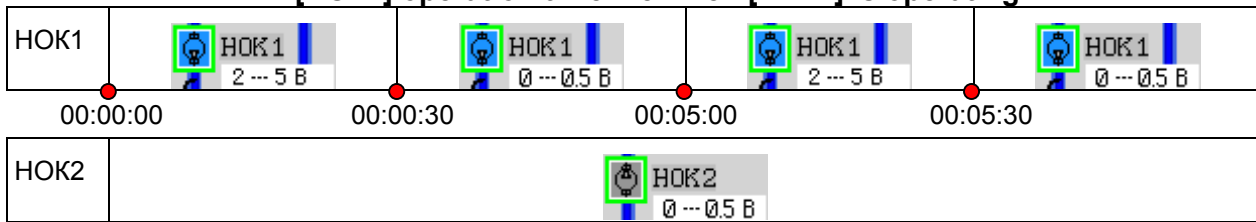
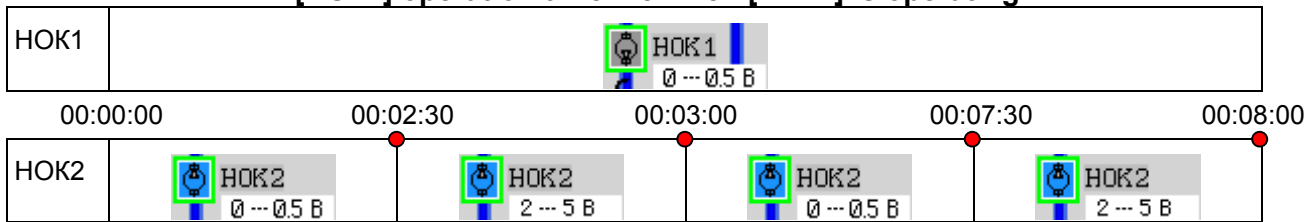


Figure 2.4. [MOK] display  
(Configuration: [HOK1] is operating, [HOK2] is not operating)

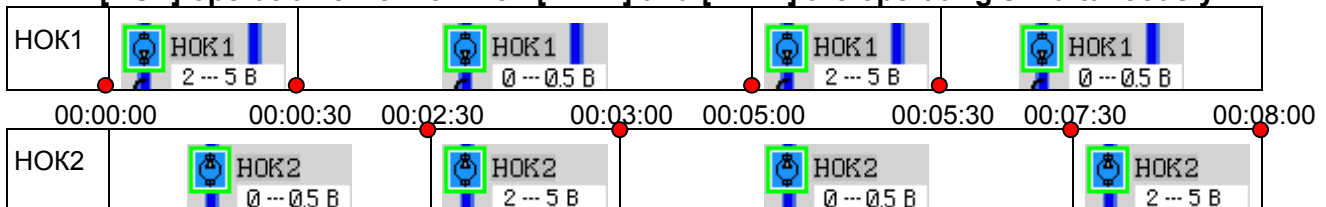
[HOK1] operation timeline when [СБК1] is operating



[HOK2] operation timeline when [СБК2] is operating



[HOK] operation timeline when [СБК1] and [СБК2] are operating simultaneously



When СБК1 and СБК2 are deactivated (in 30 min after deactivation):

HOK1, HOK2 —

**2.5. [CKB1] ([CKB2]) AND [MOK] MALFUNCTIONS**

| CAUTION  |
|--|
| 1. In case of freon leak (hissing noise and/or white cloud in the area of compressor) deactivate [CKB], instruments and units with heating cells — <b>report to MCC-M</b><br><b>On MCC-M GO</b> perform atmosphere scrubbing |
| 2. Do not tighten connectors or do other work on active [CKB] system   |
| 3. In the event of any knocking sounds coming from compressor or fans, immediately deactivate [CKB] — <b>report to MCC-M</b>   |

**2.5.1. 'SM SKV1 (2) AIR CONDITIONER OFF-NOMINAL SHUTDOWN-RS'**

NOTE

In mode of condensate pump operation when condensate container is full or when there is a signal from [CPB-K2M], [CKB1], [CKB2] are not deactivated automatically

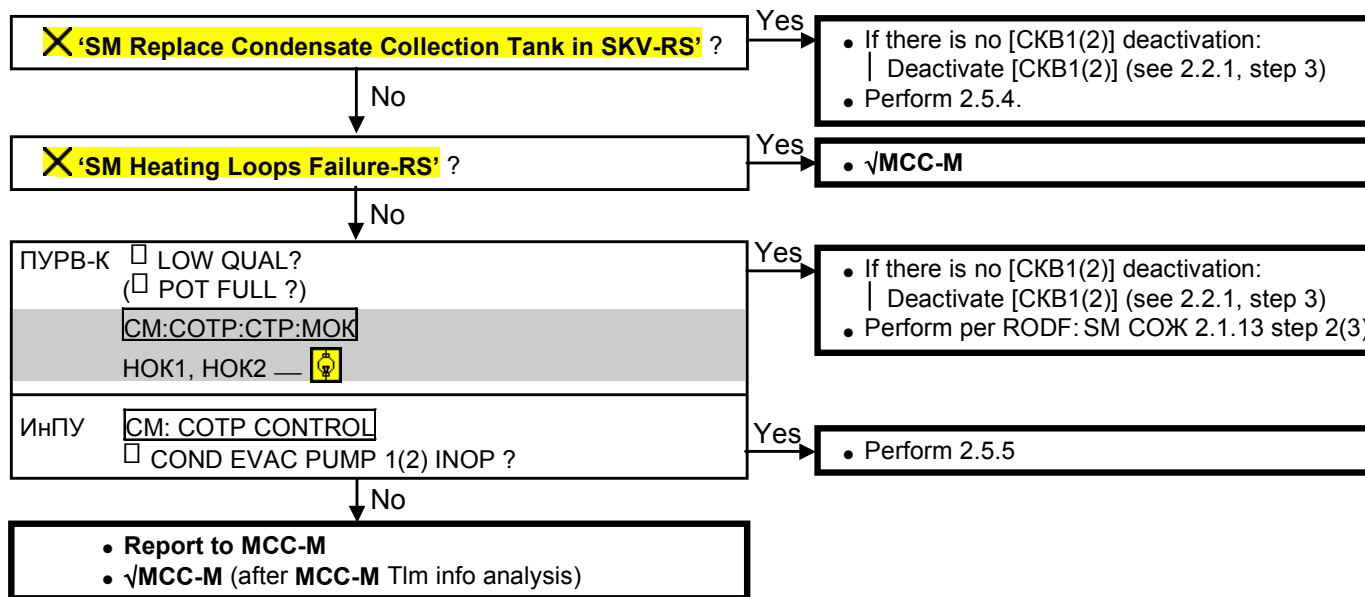
ПСС  
RS Laptop

OTHER (yellow)     **ALARM**

Caution events

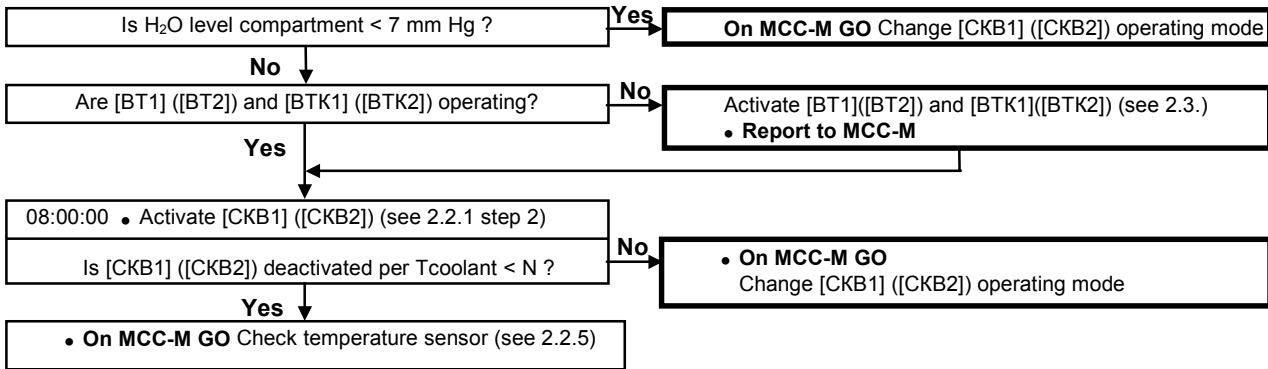
**X 'SM SKV1 (2) Air Conditioner Off-Nominal Shutdown-RS'**

(with act. [CKB1] [(CKB2)])

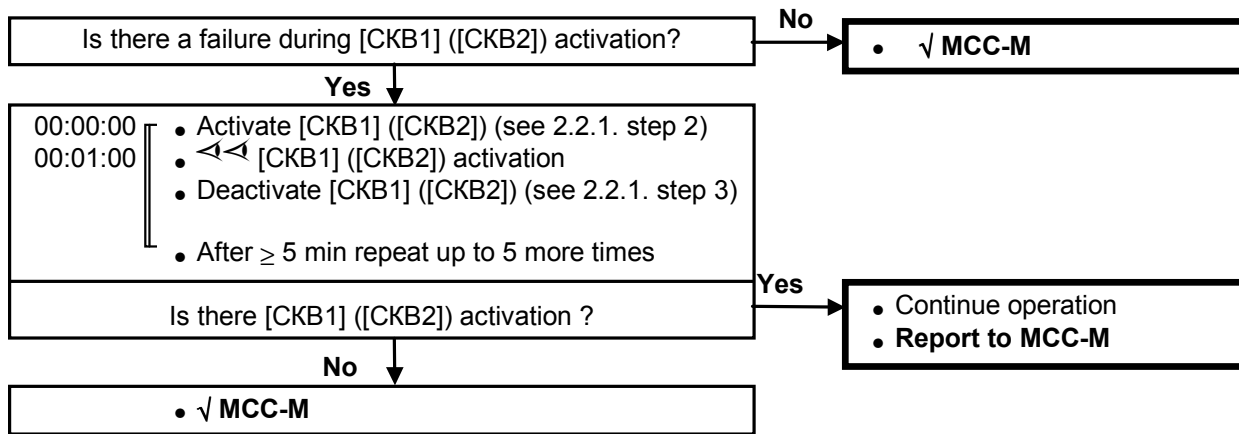


**2.5.1.1. COOLANT TEMPERATURE IS ABNORMALLY LOW (ON MCC-M GO)**

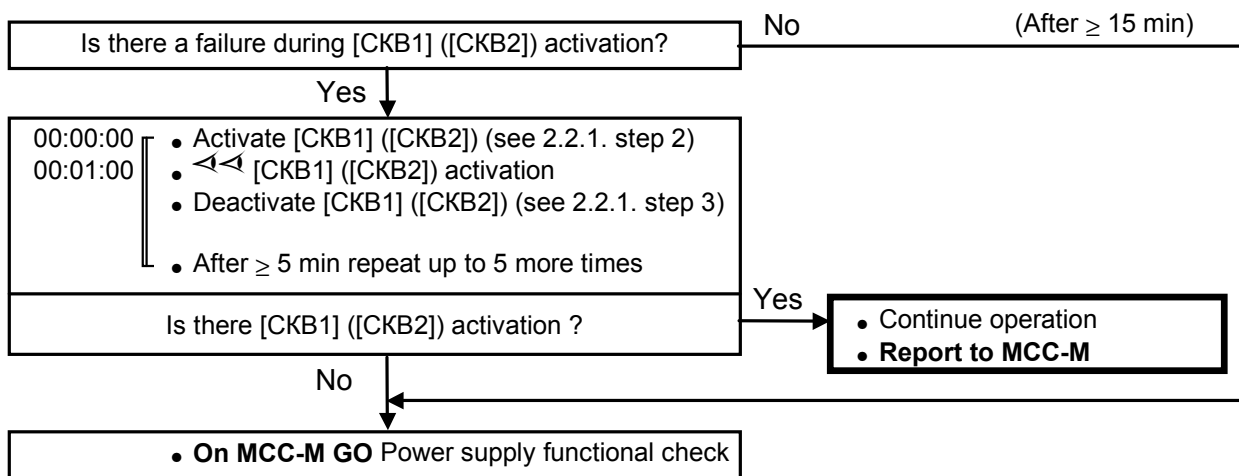
Deactivate КОБ parallel operation (per Table of 2.2.1, step 3)

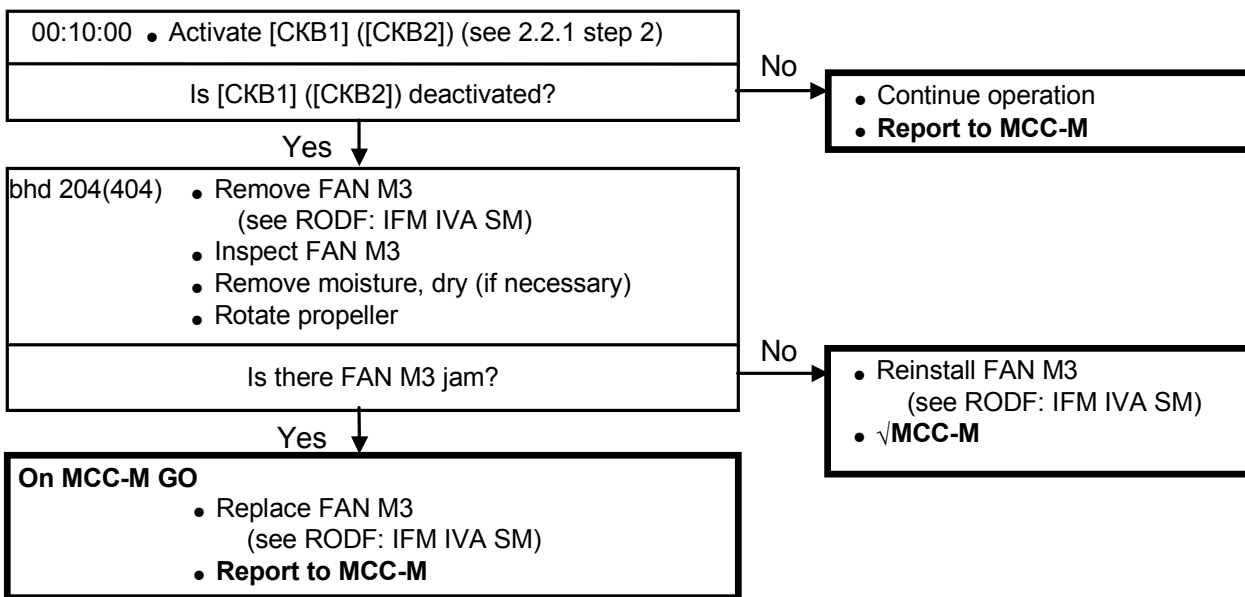


**2.5.1.2. COOLANT PRESSURE IS ABNORMALLY HIGH (ON MCC-M GO)**

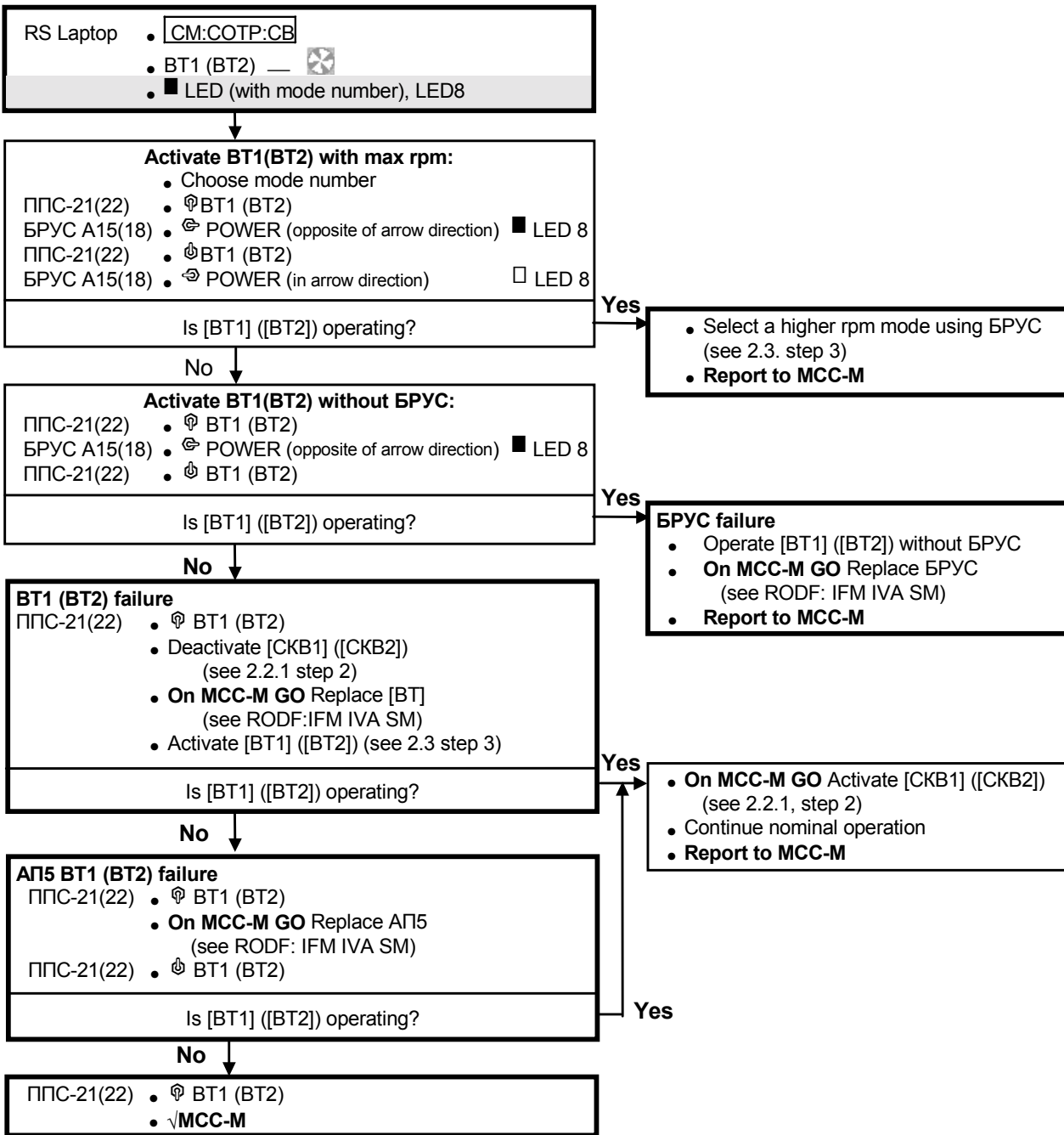


**2.5.1.3. POWER SUPPLY INLET CURRENT IS ABNORMALLY HIGH (ON MCC-M GO)**

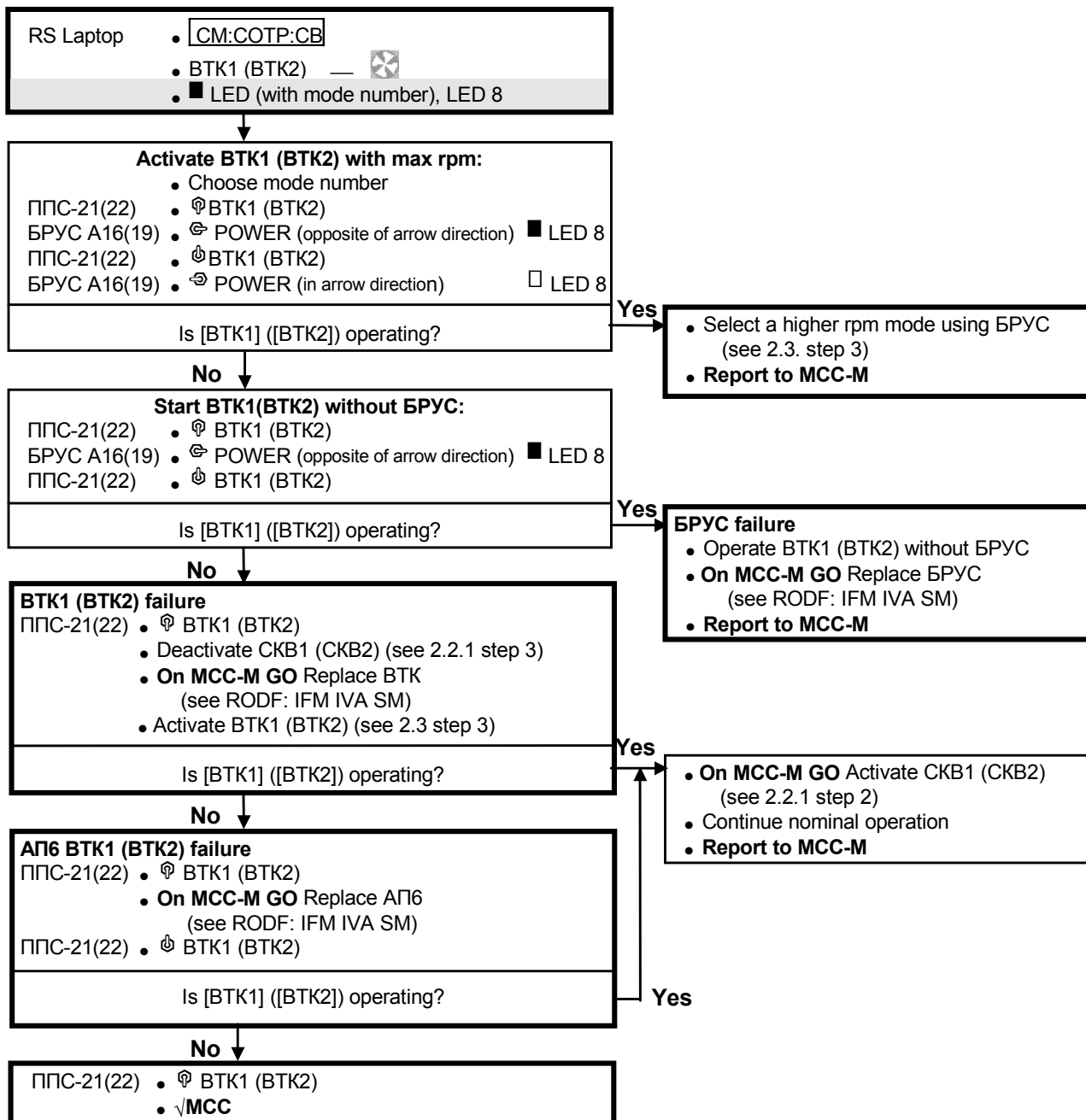


**2.5.1.4. FAN REVOLUTIONS ARE ABNORMALLY LOW (ON MCC-M GO)**

**2.5.2. [BT1] ([BT2]) FAILURE**



## 2.5.3. [BTK1] ([BTK2])



## 2.5.4. 'SM REPLACE CONDENSATE COLLECTION TANK IN SKV-RS'

ПСС  
RS Laptop

OTHER (yellow) **ALARM**

Caution events

✗ 'SM Replace Condensate Collection Tank in SKV-RS'  
✗ 'SM SKV1 (2) Air Conditioner Off-Nominal Shutdown-RS'

(with act. [CKB1] ([CKB2]))

CM:COTP:CTP:МОК

 (condensate container is full)

 (HOK1 0...0.5 В ( HOK2 0...0.5 В )

behind 131

◀ Presence of drops on condensate container indicator valve

CM:COTP:Commands

cmd T\_OFSNOK (HOK alarm Cancel)

**Execute**

Prior to condensate container replacement [CKB1] ([CKB2]) and [МОК] are operating on **MCC-M GO**

behind 201  
behind 131

1. FILLED CONDENSATE CONTAINER REMOVAL

7Кл4 → ЗАКРЫТ (Closed)

СБК indicator valve → ЗАКР (Closed) (↻)

Flexible hose ↔ ОК-32 (СБК inlet fitting) (24 mm wrench)

Cap →↵ ОК-32 (cap is tethered within СБК area)

Disengage securing clamps (two) and remove condensate container

Record number and discard

131

2. NEW CONDENSATE CONTAINER INSTALLATION

Unstow new СБК from ЗИП, record number, install

Engage securing clamps (two)

cap ↔ ОК-32 (СБК inlet fitting) (24 mm wrench),  
tether cap within СБК area

Flexible hose →↵ ОК-32

Tighten coupling nut (24 mm wrench)

131

3. NEW СБК CONFIGURATION FOR CONDENSATE COLLECTION

New СБК indicator valve → ОТКР (Open) (↻)

⊥ ВКЛ (On) (on 7СД) into bracket

CM:COTP:CTP:МОК

 (СБК is not filled)

 (HOK1 0...0.5 В ( HOK2 0...0.5 В )



201

7Кл4

→ В СБОРНИК КОНДЕНСАТА (to condensate container)



**On MCC-M GO:**


00:00:00 RS Laptop Activate [CKB1] ([CKB2]) (see 2.2.1, step 2)  
 ≤ 00:05:00  HOK1 2...5 B  HOK2 ( 2...5 B ) (for 30 sec)

Caution events

- ✓ 'SM Replace Condensate Collection Tank in SKV-RS'
- ✓ 'SM SKV1 (2) Air Conditioner Off-Nominal Shutdown-RS'

**Report to MCC-M** Serial numbers of removed and installed C6K

**2.5.5. [HOK1] ([HOK2]) FAILURE**

ПСС  OTHER (yellow) **ALARM**  
 ИИПУ  SM, STATUS:COTP  
 'COTP-SIG'  
 COND EVAC PUMP 1 (COND EVAC PUMP 2) INOP  
**On MCC-M GO** Replace [HOK] (see RODF: IFM IVA SM)  
 Activate [CKB1] ([CKB2]) (see 2.2.1, step 2)  
 RS Laptop  CM:COTP: Commands  
 cmd T\_OFSNOK (HOK alarm Cancel)  
**Execute**  
 ИИПУ  SM, STATUS:COTP  
 'COTP-SIG'  
 COND EVAC PUMP 1 (COND EVAC PUMP 2) INOP  
 RS Laptop  CM:COTP:CTP:MOK  
 ◀ HOK1 (HOK2) —  (is operating per timeline)  
 If no spare [HOK], evacuate condensate using manual pump (PH)  
 per RODF: SM COTP (Backup Modes), 2.1.

**2.5.6. MOISTURE APPEARANCE IN [CKB1]([CKB2]) AREA**

behind 202(402) ◀ Appearance of moisture drops  
 When [HOK1] ([HOK2]) is operating:  
 ◀◀ No condensate motion in translucent hose on [HOK1] ([HOK2]) outlet  
 ◀ HOK1 (HOK2) is operating ([HOK] are locked)  
 00:00:00 Deactivate [CKB1] ([CKB2]) (see 2.2.1 step 3)  
 00:30:00 **On MCC-M GO** Replace HOK valves 6485.130 Кл.ВХОД and  
 6485.140 Кл.ВЫХОД (see RODF: IFM IVA SM)  
**On MCC-M GO** prior to replacement, evacuate condensate from [CKB1]([CKB2])  
 using manual pump [PH] per RODF: SM COTP (Backup Modes), 2.1  
 00:00:00 Activate [CKB1]([CKB2]) (see 2.2.1 step 2)  
 00:30:00 ◀◀ Condensate motion in translucent hose on [HOK1]([HOK2]) outlet \*\*\*\*\*  
 \*\*\*\*\*  
**On MCC-M GO** Replace inlet fitting 6485.200 with new one from spares  
 00:00:00 Activate [CKB1]([CKB2]) (see 2.2.1 step 2)  
 00:30:00 ◀◀ Condensate motion  
**Report to MCC-M**  
 \*\*\*\*\*  
**Report to MCC-M**

### 3. ACTIVE THERMAL CONTROL SYSTEM [CTP]

#### 3.1. ACTIVE THERMAL CONTROL SYSTEM MALFUNCTION

##### 3.1.1. LOOP OUTSIDE LEAK

###### 1. KOX1 LEAK

RS Laptop

CM:COTP:CTP:ПКР1

1ДД1, 1ДД2 ≤ 400 mm Hg

CM:COTP:CTP

All KOX1 pumps



2Н1 pump



CM:COTP:CTP:Statuses

Normal Pressure in KOX1

Normal Pressure in KOX2

During KOX1pri operation (prior to leak):

CM:COTP:CTP:KOX1\_proc

FT\_27

(Loop 1PPЖ Deactivation)

CM:COTP:CTP:KOX1

← 1PPЖ

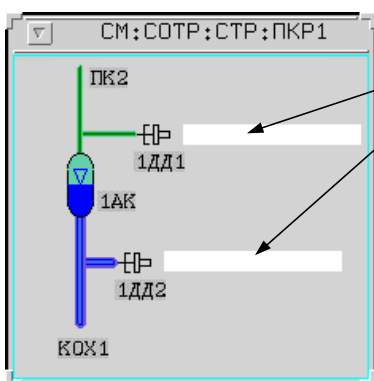
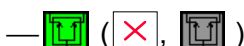


Figure 3.1.1-1. Pressure in KOX1 in the event of leak into vacuum

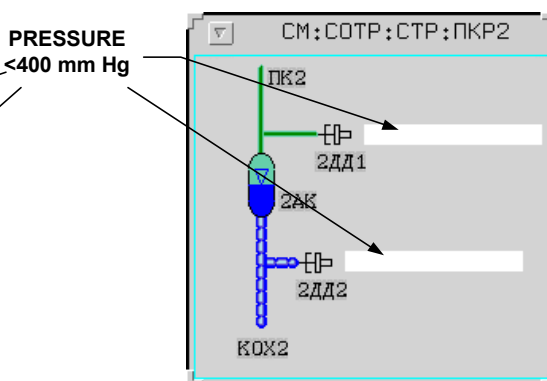


Figure 3.1.1-2. Pressure in KOX2 in the event of leak into vacuum

###### 2. KOX2 LEAK

RS Laptop

CM:COTP:CTP:ПКР2

2ДД1, 2ДД2 ≤ 400 mm Hg

CM:COTP:CTP

All KOX2 pumps



1Н5, 1Н6 pumps



CM:COTP:CTP:Statuses

Normal Pressure in KOX1

Normal Pressure in KOX2


### 3. КОБ1 LEAK


RS Laptop

CM:COTP:CTP:ПКР3


3ДД1, 3ДД2 ≤ 400 mm Hg

CM:COTP:CTP

All pumps КОБ1 — 

H1,H2 4СПН1 pumps — 

CM:COTP:CTP:ЭН

3ЭН1---3ЭН6 — 

CM:COTP:CTP:Statuses

Normal Pressure in КОБ1

Normal Pressure in КОБ2

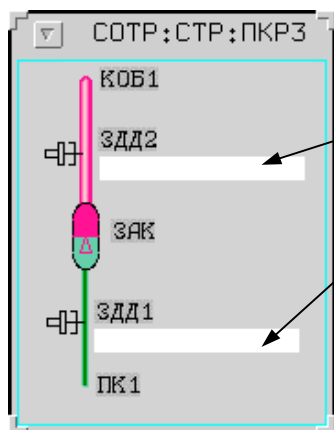


Figure 3.1.1-3. Pressure in КОБ1 in the event of leak into vacuum

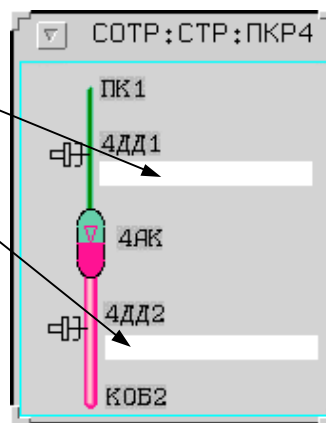


Figure 3.1.1-4. Pressure in КОБ2 in the event of leak into vacuum


### 4. КОБ2 LEAK


RS Laptop

CM:COTP:CTP:ПКР4


4ДД1, 4ДД2 ≤ 400 mm Hg

CM:COTP:CTP

All pumps КОБ2 — 

H1,H2 3СПН1 pumps — 

CM:COTP:CTP:ЭН

4ЭН1---4ЭН6 — 

CM:COTP:CTP:Statuses

Normal Pressure in КОБ2









Normal Pressure in КОБ1

### 3.1.2. КОБ1 INTERNAL LEAK

(Determined per MCC-M TIm)

On MCC-M GO:

#### 1. TRANSFER TO 4СПН1(4СПН2) КОБ2

| Transfer                    | Procedure<br>CM:COTP:CTP_проц                | param |   | CM:COTP:CTP   |
|-----------------------------|--|-------|---|---|
|                             |  | 1     | 2 |   |
| КОБ1 → 4СПН1 КОБ2           | FT_106<br>(Transition during КОБ1 operation) | 1     | 0 | Pre. act. КОБ1 pump — <br>H1,H2 4СПН1 — <br>3ЭН1---3ЭН6 —  |
| КОБ1 → 4СПН2 КОБ2           |  | 1     | 1 | Pre. act. КОБ1 pump — <br>H1,H2 4СПН2 — <br>3ЭН1---3ЭН6 —  |
| (КОБ1 + КОБ2) → deact. КОБ1 | FT_108<br>(Halt КОБ units simo operation)    | 0     |   | All КОБ1 pumps — <br>3ЭН1---3ЭН6 —    |

#### 2. КОБ1 AND COMPARTMENT PRESSURE EQUALIZATION

behind 249 ПК1 cap ↔ filling device (ПЗ)

Secure caps within ПЗ area

Кл В9 → ОТКРЫТ (Open)

00:00:00 Кл В6 → ОТКРЫТ (Open)

RS Laptop CM:COTP:CTP:ПКР3 and CM:COTP:CTP:ПК1

00:01:00 < 3ДД1=3ДД2=8ДД3= P(MB) ±10 mm Hg

#### 3. LEAK SOURCE PINPOINTING AND ISOLATION



















**Report to MC-M** area location with PH = 8  
Collect and remove traces of coolant, using paper towels  
Discard used paper towels  
Cover source of leak with waterproof material

√ **MCC-M**

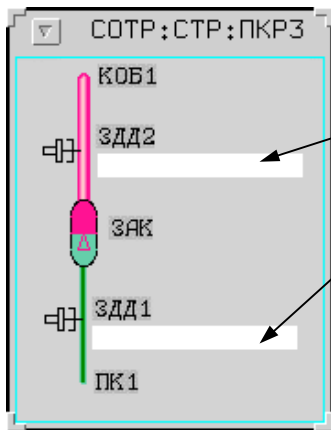


Figure 3.1.2-1 Pressure in КОБ1 in the event of internal leak

**PRESSURE**  
~ P (МВ)

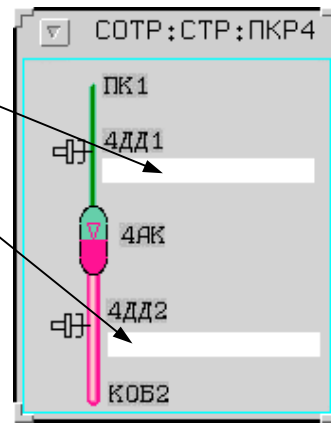


Figure 3.1.2-2 Pressure in КОБ2 in the event of internal leak

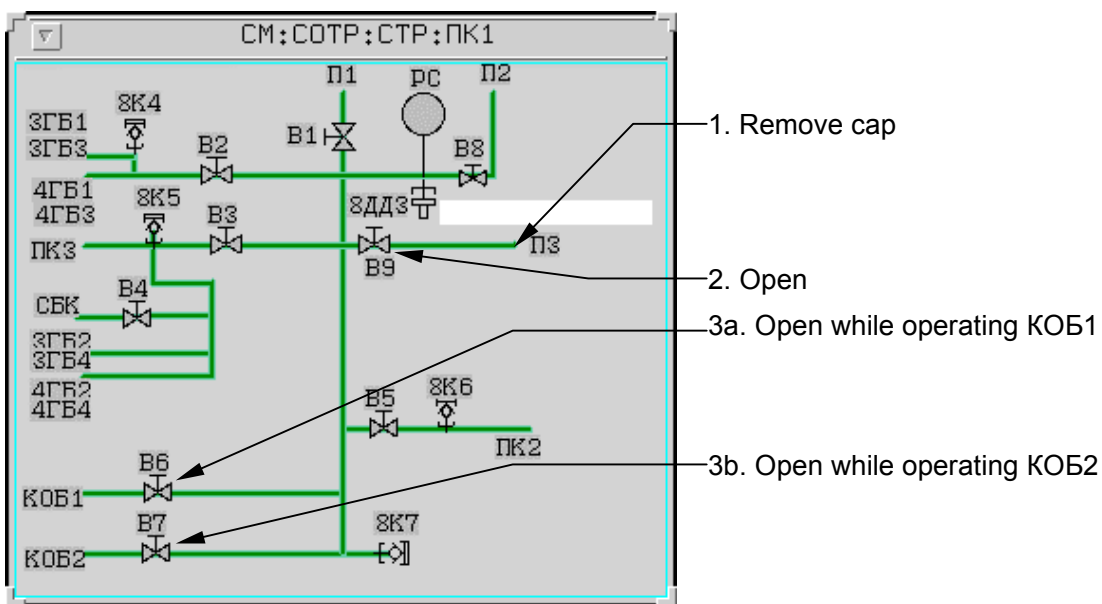










Figure 3.1.2-3 Valve panel (ПК1) operation in the event of КОБ1 (КОБ2) internal leak

### 3.1.3. КОБ2 INTERNAL LEAK

(Determined per MCC-M TIm)

On MCC-M GO:

#### 1. TRANSFER TO ЗСПН1(ЗСПН2) КОБ1

| Transfer                    | Procedure<br>CM:COTP:CTP_проц                | param |   | CM:COTP:CTP  |
|-----------------------------|--|-------|---|--|
|                             |  | 1     | 2 |  |
| КОБ2 → ЗСПН1 КОБ1           | FT_107<br>(Transition during КОБ2 operation) | 1     | 0 | Pre. act. КОБ2 pump— <br>H1,H2 ЗСПН1 — <br>4ЭН1---4ЭН6 —  |
| КОБ2 → ЗСПН2 КОБ1           |  | 1     | 1 | Pre. act. КОБ2 pump— <br>H1,H2 ЗСПН2 — <br>4ЭН1---4ЭН6 —  |
| (КОБ1 + КОБ2) → deact. КОБ2 | FT_108<br>(Halt КОБ units simo operation)    | 1     |   | All КОБ2 pumps — <br>4ЭН1---4ЭН6 —   |

#### 2. КОБ2 AND COMPARTMENT PRESSURE EQUALIZATION

behind 249 ПК1 cap ↔ filling device (ПЗ)

Secure caps within ПЗ area

Кл В9 → ОТКРЫТ (Open)

00:00:00 Кл В7 → ОТКРЫТ (Open)

RS Laptop CM:COTP:CTP:ПКР4 and CM:COTP:CTP:ПК1

00:01:00 < 4ДД1=4ДД2=8ДД3= P(MB) ±10 mm Hg


Pinpoint leak (see 3.1.2 step 3)

### 3.1.4. 'ОТКАЗ КОХУРОВ КОХ' (KOH LOOPS FAILURE)

ПСС  OTHER (yellow) **ALARM**

RS Laptop  Caution events

**X 'SM Cooling Loops Failure-RS'** (All KOX1 and KOX2 pumps failure)

 Station transfers to survival mode


√ MCC-M

### 3.1.5. 'ОТКАЗ КОХУРОВ КОБ' (КОБ LOOPS FAILURE)

ПСС  OTHER (yellow) **ALARM**

RS Laptop  Caution events

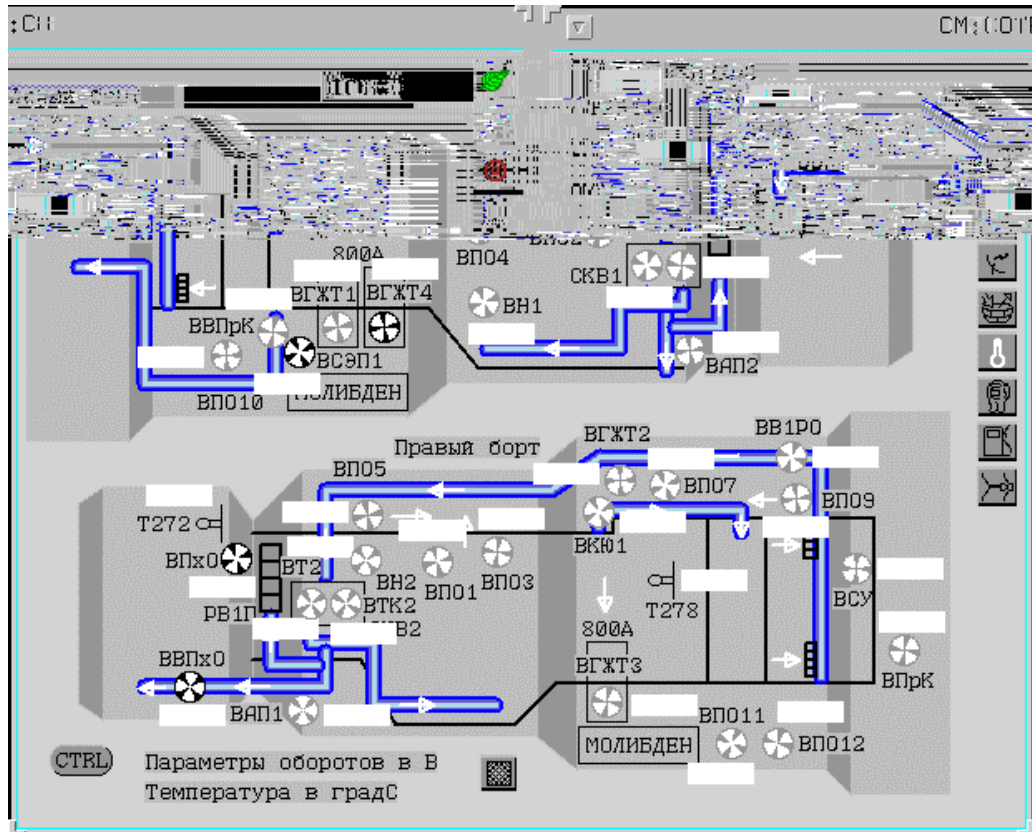
**X 'SM Heating Loops Failure-RS'** (All КОБ1 and КОБ2 pumps failure)

 Station transfers to survival mode

√ MCC-M

## 4. VENTILATION SUBSYSTEM ([CB])

### 4.1. [CB] DISPLAY OPERATION



ВПФ1, ВПФ2 are not indicated in the display

## 4.2. FAN CONTROL

### 4.2.1. FAN ACTIVATION/DEACTIVATION VIA SYSTEM POWER PANEL (ППС)

#### NOTE

1. ВАП1, ВАП2, ВВ1Р0, ВВ2Р0, ВВПрК, ВПрК, ВВПрХ0, ВПрХ0, ВГЖТ1-ВГЖТ4, ВПО1-ВПО11, ВСЭП-1, ВПФ1, ВПФ2 are running continuously. Deactivation only **on MCC-M GO**
2. ВПО12 is activated only when the treadmill is running



Activation (deactivation):  
 ППС      Ⓢ (Ⓢ) corresponding sw (see Table 4.2.1.)  
 RS Laptop    **CM:COTP:CB**  
 <img alt="fan icon" data-bbox="455 855 478 875"/> All activated fans      —   
 <img alt="fan icon" data-bbox="455 895 478 915"/> All deactivated fans      — 



Table 4.2.1.

| Fan    | Item            | Onboard location  | Panel        | sw     |
|--------|-----------------|---|--------------|--------|
| BAП1   | 17KC.53Ю 5005-0 | behind 104  | ППС-22 (308) | BAП1   |
| BAП2   | 17KC.53Ю 5005-0 | behind 102  | ППС-21 (306) | BAП2   |
| BB1PO  | MO-1-5006       | behind 336, behind cover 17KCM-7661-360 on rigid air duct | ППС-23 (338) | BB1PO  |
| BB2PO  | MO-1-5006       | behind 333, behind cover 17KCM-7661-360 on rigid air duct | ППС-24 (338) | BB2PO  |
| BBПpK  | MO-2-5008       | behind 129  | ППС-24 (338) | BBПpK  |
| BBПxO  | MO-2-5008       | ПxO, cone, plane 1  | ППС-22 (308) | BBПxO  |
| BГЖT1  | MO-2-5006       | behind 126  | ППС-24 (338) | BГЖT1  |
| BГЖT2  | MO-2-5008       | behind 328  | ППС-24 (338) | BГЖT2  |
| BГЖT3  | MO-2-5008       | behind 128  | ППС-23 (338) | BГЖT3  |
| BГЖT4  | MO-1-5006       | behind 126  | ППС-24 (338) | BГЖT4  |
| BПO1   | 17KC.53Ю 5011-0 | behind 408  | ППС-22 (308) | BПO1   |
| BПO10  | MO-2-5008       | behind 129  | ППС-24 (338) | BПO10  |
| BПO11  | MO-2-5008       | behind 131  | ППС-23 (338) | BПO11  |
| BПO12  | MO-2-5008       | behind 130  | ППС-24 (338) | BПO12  |
| BПO2   | 17KC.53Ю 5011-0 | behind 208  | ППС-21 (306) | BПO2   |
| BПO3   | 17KC.53Ю 5011-0 | behind 416  | ППС-22 (308) | BПO3   |
| BПO4   | 17KC.53Ю 5011-0 | behind 216  | ППС-21 (306) | BПO4   |
| BПO5   | MO-2-5008       | behind 307  | ППС-22 (308) | BПO5   |
| BПO6   | MO-2-5008       | behind 307  | ППС-21 (306) | BПO6   |
| BПO7   | MO-2-5008       | behind 328  | ППС-23 (338) | BПO7   |
| BПO8   | MO-2-5008       | behind 338  | ППС-24 (338) | BПO8   |
| BПO9   | MO-2-5008       | behind 338  | ППС-23 (338) | BПO9   |
| BПpK   | MO-2-5008       | ПpK, plane 1  | ППС-23 (338) | BПpK   |
| BПxO   | MO-2-5008       | ПxO, cone, plane 4  | ППС-21 (306) | BПxO   |
| BПФ1   | 17KC.53Ю 5011-0 | behind 449 (behind ПФ1)                                   | ППС-24 (338) | BПФ1,2 |
| BПФ2   | 17KC.53Ю 5011-0 | behind 246 (behind ПФ2)                                   |              |        |
| BCЭП-1 | MO-2-5008       | behind 126  | ППС-24 (338) | BCЭП1  |

## 4.2.2. [BH1] ([BH2]) CONTROL

### CAUTION

1. Activate [BH1] ([BH2]) only if:

RS Laptop   
 ◀ TP\_CFVN1 BH1 control & monitoring  
 ( TP\_CFVN2 BH2 control & monitoring )

2. For a time of БИТС maintenance, [BH1] ([BH2]) heater section activation is forbidden  
 Operation is allowed only in fan mode

### NOTE

1. Cabin air heater has three sections, each section power is 200 W
2. Amount and numbers of activated sections – arbitrary (per crew discretion)

| Fan | Item            | Onboard location | Panel                               | Controller      |
|-----|-----------------|------------------|-------------------------------------|-----------------|
| BH1 | 17KC.53Ю 5007-0 | on 219           | ПУВН, 237, crew quarters, Port      | pb FAN          |
| BH2 | 17KC.53Ю 5007-0 | on 305           | ПУВН, 440, crew quarters, Starboard | pb ZONE HEATERS |

### 1. PANEL ACTIVATION (only during [BH1] ([BH2]) first activation)

237(440) ПУВН ↓ PANEL PWR ON  LED Д1  
 ↓ LAMP TEST (hold)  (all) (when monitoring)

### NOTE

When the crew is onboard ПУВН may remain on

### 2. FAN ACTIVATION

237(440) ПУВН ◀  LED Д1  
 If  LED Д1  
 | Perform step 1  
 ↓ FAN ON  
 BH1(BH2) 🖐️ BH1(BH2) is running  
 ↻ air flow direction (if necessary)

### 3. SECTION ACTIVATION (per crew discretion)

BH1(BH2) 🖐️ BH1(BH2) is running  
 00:00:00  
 237(440) ПУВН ↓ STATUS CHECK  
 In any combination:  
 ↓ ZONE HEATERS 1  ZONE 1  
 ↓ ZONE HEATERS 2  ZONE 2  
 ↓ ZONE HEATERS 3  ZONE 3  
 00:01:00  ZONE 1,2,3  
 BH1(BH2) 🖐️ Air is being heated  
**Report to MCC-M**

#### 4. SECTION AND [BH1]([BH2]) DEACTIVATION

### CAUTION

When ↓ ZONE HEATERS OFF  
[BH1] ([BH2]) and [BH1] monitoring algorithm are deactivated

237(440) ПУВН ↓ FAN OFF  
↓ STATUS CHECK ■ ZONE 1,2,3  
BH1 (BH2) 🗣️ 🖐️ BH1(BH2) is not operating  
If necessary, perform step 2 to activate [BH1] ([BH2])

#### 5. PANEL DEACTIVATION (in the event of partial deactivation)

237(440) ПУВН ↓ PANEL PWR OFF ■ LED Д1

#### 4.2.3. CONTROL OF CREW QUARTERS FANS (БКЮ1 (БКЮ2))

### CAUTION

- When the crew is in the crew quarters, БКЮ1 (БКЮ2) should be activated
- Activate БКЮ1 (БКЮ2) only if:  
RS Laptop `CM:COTP:CTP: Algorithms`  
  - TP\_CVKQ1 БКЮ1 monitoring
  - ( TP\_CVKQ2 БКЮ2 monitoring )
- For a period of БИТС maintenance, БКЮ1 (БКЮ2) operation without algorithm is allowed

| Fan  | Item      | Onboard location | Panel                                | Controller |
|------|-----------|------------------|--------------------------------------|------------|
| БКЮ1 | MO-2-5008 | behind 322       | БКВ-2, 440, crew quarters, Starboard | pb ON/OFF  |
| БКЮ2 | MO-2-5008 | behind 320       | БКВ-2, 237, crew quarters, Port      | pb ON/OFF  |

#### 1. БКЮ1 (БКЮ2) ACTIVATION

440 (237) БВК-2 ↓ ON □ LED  
337(332) 🗣️ 🖐️ БКЮ1(БКЮ2) is running (through crew quarters overhead)  
ИНПУ `SM COTP CONTROL`  
'COTP-SIG'  
□ FAN 1 (FAN 2) ПрК PWR ON

#### 2. БКЮ1 (БКЮ2) DEACTIVATION

440 (237) БВК-2 ↓ OFF ■ LED  
337(332) 🗣️ 🖐️ БКЮ1(БКЮ2) is not running (through crew quarters overhead)  
ИНПУ `SM COTP CONTROL`  
'COTP-SIG'  
■ FAN 1 (FAN 2) ПрК PWR ON

#### 4.2.4. TOILET CABIN FAN (BCY) CONTROL

| Fan | Item            | Onboard location     | Panel                   | Controller |
|-----|-----------------|----------------------|-------------------------|------------|
| BCY | 17KC.53Ю 5005-0 | on 455, toilet cabin | ББ-1, 455, toilet cabin | sw         |

NOTE.

Operates if necessary for toilet cabin ventilation

Activation (deactivation):

ББ-1                    ⚙ (⌘)  
 455                    🖱 🖱 BCY is running (is not running)

#### 4.2.5. LIRA EQUIPMENT FAN (БОЛ) OPERATION MONITORING (ON MCC-M GO)

| Fan | Item      | Onboard location | Panel | Controller | Note               |
|-----|-----------|------------------|-------|------------|--------------------|
| БОЛ | МО-3-5010 | behind 338       | -     | -          | Operates with LIRA |

In case of LIRA activation (deactivation):

RS Laptop            CM:COTP:CB  
                           ⏪ БОЛ                    — 🌀 (🌀)

#### 4.2.6. [BK1] ([BK2], [BK3], [BK4]) OPERATION

| Fan        | Item            | Onboard location | Panel | Controller             | Note      |
|------------|-----------------|------------------|-------|------------------------|-----------|
| BK1--- BK4 | 17KC.53Ю 5004-0 | Portable         | -     | sw on housing, PBC10/3 | Delivered |

NOTE

1. BK1 --- BK4 are used to provide additional ventilation
2. Connect in SM to any PBC 10/3 (in case of fire or leak outlet is powered down automatically)

##### 1. HARDWARE SETUP

Unstow:

BK1 (BK2, BK3, BK4) 17KC.53Ю 5004-0,  
 adapter 17KC.290Ю 2001-30,  
 cbl 17KC.59Ю 8259A-390 (17KC.59Ю 8259A-400, 17KC.59Ю 8259A-410,  
 17KC.59Ю 8259A-420)  
 bracket LIV/20

##### 2. [BK1] ([BK2], [BK3], [BK4]) INSTALLATION (see Figure 4.2.6)

BK1 (BK2,  
 BK3, BK4)

Depress latch-rods flush (two)  
 Into bracket grooves of BK1 (BK2, BK3, BK4)  
 Align bracket pulley of BK1 (BK2, BK3, BK4)  
 with adapter opening

- BK1 (BK2, BK3, BK4) bracket →|← adapter (to stop)
- BK1 (BK2, BK3, BK4) with adapter →|← LIV/20 bracket
- Screw on adapter ↺ (manually)
- LIV/20 basket with BK1 (BK2, BK3, BK4) →|← working area
- cbl BK1 (BK2, BK3, BK4) →|← cnctr on BK1 (BK2, BK3, BK4) housing
- cbl BK1 (BK2, BK3, BK4) →|← cnctr 2 PBC 10/3

3. [BK1] ([BK2], [BK3], [BK4]) ACTIVATION

- PBC 10/3 ⚙
- BK1 (BK2, BK3, BK4) ⚙
- 👂 🖐 BK1(BK2, BK3, BK4) is running
- Report to MCC-M**

4. [BK1] ([BK2], [BK3], [BK4]) DEACTIVATION

- BK1 (BK2, BK3, BK4) ⚙
- PBC 10/3 ⚙
- 👂 🖐 BK1(BK2, BK3, BK4) is not running

5. [BK1] ([BK2], [BK3], [BK4]) REMOVAL (see Figure 4.2.6)

- cbl BK1(BK2, BK3, BK4) ↔ cnctr 2 PBC 10/3
- LIV/20 bracket with BK1 (BK2, BK3, BK4) ↔ working area
- Screw on adapter ↺ (manually)
- BK1 (BK2, BK3, BK4) with adapter ↔ LIV/20 bracket
- Stow:
- BK1 (BK2, BK3, BK4) with cable, adapter, (УПК) LIV/20 bracket
- Report to MCC-M**

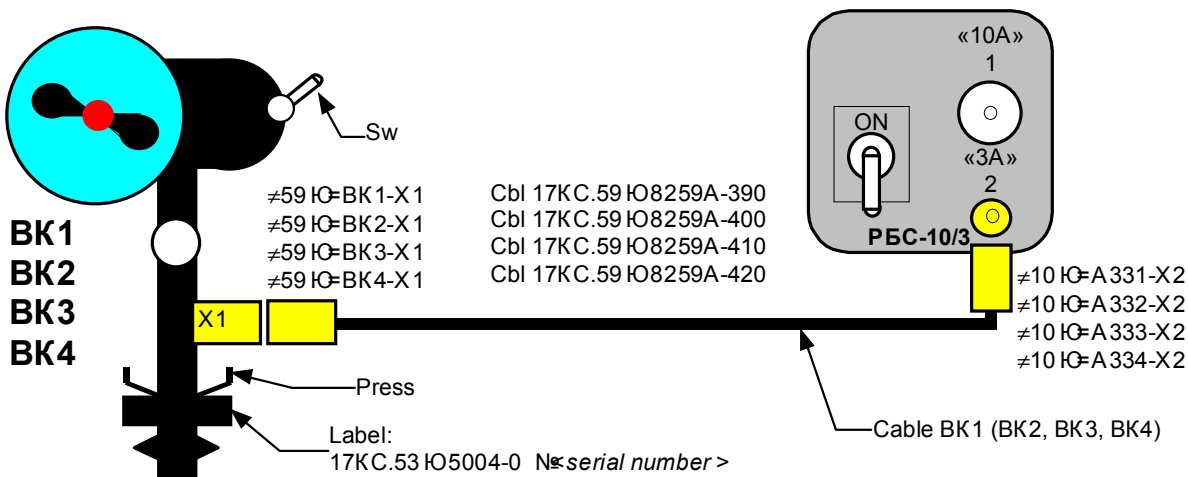


Figure 4.2.6 [BK1], [BK2], [BK3], [BK4] Connection Diagram

**4.3. AIR FLOW CONTROL IN CREW QUARTERS (STARBOARD (PORT))**

(per crew discretion)

1. AIR FLOW DIRECTION CHANGE

337(332) Turn rod to move louvers in desired direction

2. AIR FLOW VOLUME CHANGE

337(332) Pull handle (in the center of the crew quarters overhead)  
Increase volume ↻  
Decrease volume ↻  
**Report to MCC-M**

**4.4. DUST FILTER (ПФ1 (ПФ2, ПФ3, ПФ4)) INSPECTION**

(Once or twice a day)

449(246,448,245) Visually inspect ПФ1 (ПФ2, ПФ3, ПФ4)  
Remove foreign objects (if necessary)  
**Report to MCC-M**

## 4.5. VENTILATION SUBSYSTEM [CB] PREVENTIVE MAINTENANCE

### CAUTION

1. During preventive maintenance not more than two panels may be open at the same time for not more than 2 hrs. following After 2 hours, panels must be closed to 30 minutes
2. Clean panels using vacuum cleaner and/or wet wipes
3. Manually remove any large pieces of debris from [CB] hardware

### 4.5.1. ПФ1 (ПФ2, ПФ3, ПФ4) CARTRIDGE REPLACEMENT

(00:15:00 x four, every 20 days)

#### NOTE

During replacement of all dust filters, perform the operation to completion on one side prior to deactivation and filter replacement on the other side

|        |   |
|--------|---|
| ППС-24 | ⊕ ВПФ1,2                                |
| ППС-23 | ⊕ BB1PO (prior to ПФ1, ПФ3 replacement) |
| ППС-24 | ⊕ BB2PO (prior to ПФ2, ПФ4 replacement) |

#### 1. ПФ USED CARTRIDGE REMOVAL

- 449(246,448,245) Loosen bolts (four) on frame (7 mm wrench or screwdriver M5)  
 Remove frame  
 Slide out drum with cartridge into [PO]  
 Remove cartridge from drum flange and fold cartridge corrugations carefully  
 Discard

#### 2. ПФ NEW CARTRIDGE INSTALLATION

- Unstow new cartridge from spares  
 449(246,448,245) Install it on drum flange  
 Unfold corrugation of filter gasket  
 Reinstall drum with cartridge  
 Reinstall frame  
 Tighten bolts (four) on frame (7 mm wrench or screwdriver M5)

|        |                                      |
|--------|--------------------------------------|
| ППС-23 | ⊕ BB1PO (after ПФ1, ПФ3 replacement) |
| ППС-24 | ⊕ BB2PO (after ПФ2, ПФ4 replacement) |
|        | ⊕ ВПФ1,2                             |

**Report to MCC-M**

**4.5.2. CLEANING OF [CKB1] ([CKB2]) GAS-LIQUID HEAT EXCHANGER (ГЖТ) GRILL**

(01:00:00 x two, every 6 months)

Deactivate CKB1(CKB2) (see 2.2.1 step 3)

Deactivate BT1, BTK1 (BT2, BTK2) (see 2.3)

Loosen bolts (twenty) on rigid air duct removable panel at ГЖТ inlet  
(8 mm wrench)

Removable panel ←→ rigid air duct

behind 204(404) Clean ГЖТ with vacuum cleaner

Removable panel →← rigid air duct

Tighten fastening bolts (twenty) on rigid air duct removable panel  
at ГЖТ inlet (8 mm wrench)

Activate BT1, BTK1 (BT2, BTK2) (see 2.3)

Activate CKB1 (CKB2)(see 2.2.1 step 2) (if necessary)

**Report to MCC-M****4.5.3. GAS ANALYZER (ГА) VENTILATION CLEANING**

(00:15:00)

ППС-24

⊕ ВПФ1,2

ППС-23

⊕ ВВ1РО

450

Clean screen on panel

behind 449

Clean grill on air duct housing between ПФ1 and ПФ3

ППС-23

⊕ ВВ1РО

ППС-24

⊕ ВПФ1,2

**Report to MCC-M****4.5.4. SCREEN FILTER CLEANING****1. ΦC9 ВДПрК SCREEN FILTER CLEANING**

(00:10:00, every 2 months)

129

Clean screen filter (at ВДПрК inlet)

**Report to MCC-M****2. ΦC14 SCREEN FILTER CLEANING ON ГЖТ2**

(00:20:00, every 6 months)

**NOTE**

1. СЭП equipment ('Molibden' hardware and units 800) may continue to operate
2. ΦC14 is allowed not to be retrieved from guides if access is good

ППС-23

⊕ ВПО7

ППС-24

⊕ ВГЖТ2

behind 327

Loosen fastening bolt ΦC14 (8 mm wrench)  
Pull ΦC14 out of guides (using loop) into [PO]  
Clean with vacuum cleaner

Reinstall ΦC14

Tighten fastening bolt

ППС-23

⊕ ВПО7

ППС-24

⊕ ВГЖТ2

**Report to MCC-M**



### 3. ΦC16 SCREEN FILTER CLEANING ON ΓЖТЗ

(00:30:00, every 6 months)

#### NOTE

СЭП equipment ('Molibden' hardware and units 800) may continue to operate

- ППС-23      ⚙ ВГЖТЗ  
behind 124,128    Lift flexible air duct (using strip)  
Loosen fastening bolt ΦC16 (8 mm wrench, during the first cleaning)  
Pull ΦC16 out of guides (using loop) into [PO]  
Clean with vacuum cleaner  
Reinstall ΦC16  
Cover with flexible air duct (using strip)
- ППС-23      ⚙ ВГЖТЗ  
**Report to MCC-M**

#### 4.5.5. FLEXIBLE AIR DUCT CLEANING

(00:20:00, every 2 months)

- ПхО      Clean flexible air duct (outside surface) with vacuum cleaner

#### 4.5.6. FAN SCREEN CLEANING

(every 2 months)

Perform operations, see Table 4.5.6.

## CLEANING OF FAN SCREENS

Table 4.5.6.

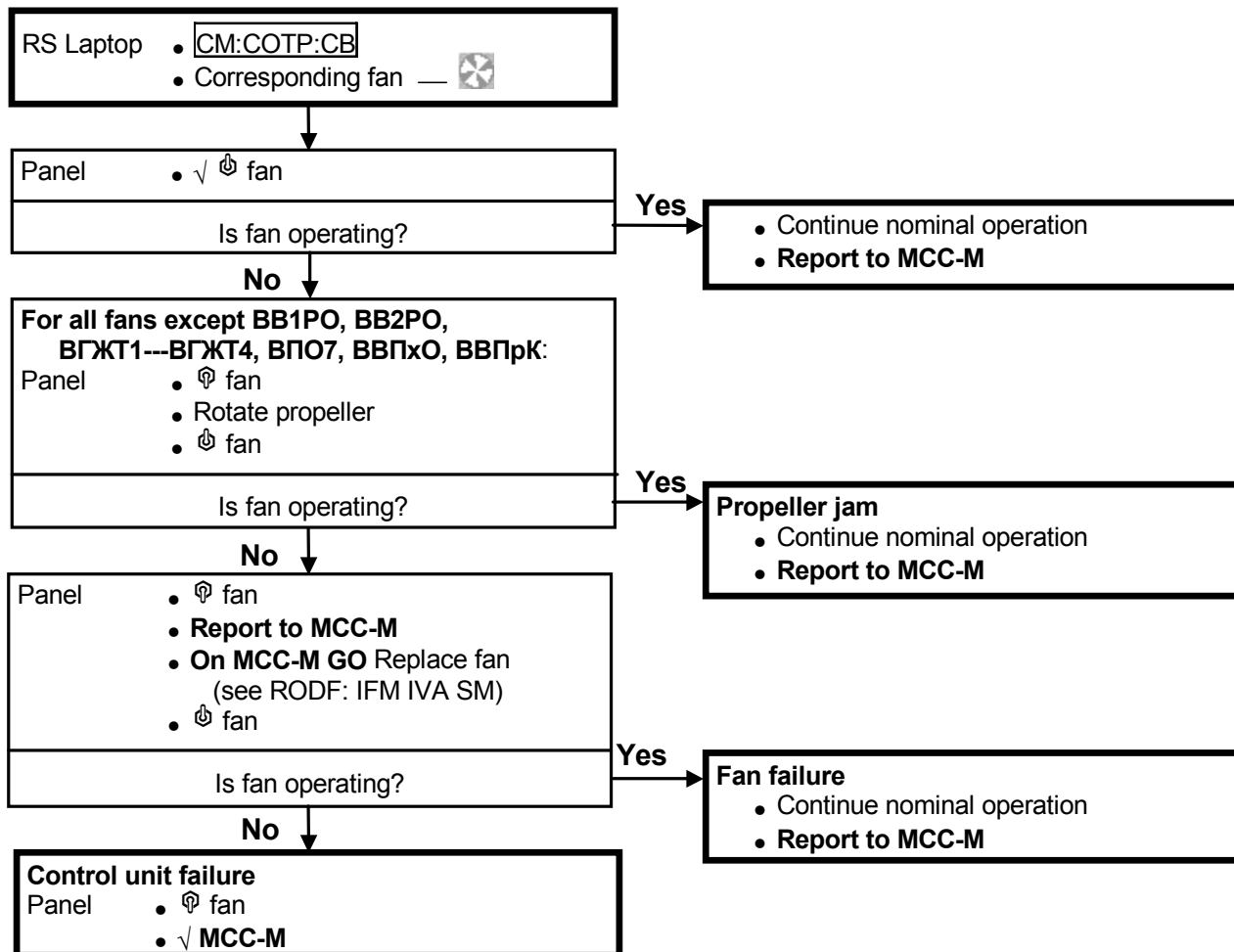
| #  | Screen                  | Fan location                           | Fan control    | Operation                             | Note  | Duration |
|----|-------------------------|--|----------------|---------------------------------------|---|----------|
| 1  | ВГХО<br>ВГРК            | ГХО, pl 4<br>ГРК, pl 1-4               | ППС-21         | Deactivate fan                        |   | 00:10:00 |
|    |                         |  | ППС-23         | Clean screen                          |   | 00:10:00 |
|    |                         |  | БВ-1           | Activate fan                          |   | 00:10:00 |
| 3  | ВПО1<br>ВПО3<br>ВПО5    | behind 408<br>behind 416<br>behind 307 | ППС-22         | Deactivate treadmill                  | Do not open more than two panels at a time                                | 00:20:00 |
|    |                         |  | ППС-23         | (during ВПО10, ВПО11, ВПО12 cleaning) |   |          |
|    |                         |  | ППС-21         | Deactivate fan                        |   |          |
| 4  | ВПО2<br>ВПО4<br>ВПО6    | behind 208<br>behind 216<br>behind 307 | ППС-21         | Clean screen                          |   | 00:20:00 |
|    |                         |  | ППС-24         | Activate fan                          |   |          |
|    |                         |  | ППС-23         |                                       |   |          |
| 5  | ВПО8<br>ВПО9            | behind 338<br>behind 338               | ППС-24         |                                       |   | 00:20:00 |
|    |                         |  | ППС-23         |                                       |   |          |
|    |                         |  | ППС-24         |                                       |   |          |
| 6  | ВСЭП1                   | behind 126                             | ППС-24         |                                       | PT-50-1 (two) may continue to operate                                     | 00:20:00 |
|    |                         |  | ППС-22         |                                       |   |          |
|    |                         |  | ППС-21         |                                       |   |          |
| 7  | ВАП1<br>ВАП2            | behind 104<br>behind 102               | ППС-22         |                                       | Instruments in ВАП1 (ВАП2) area may continue to operate                   | 00:20:00 |
|    |                         |  | ППС-21         |                                       |   |          |
|    |                         |  | ППС-24         |                                       |   |          |
| 8  | ВПО10<br>ВПО11<br>ВПО12 | behind 129<br>behind 131<br>behind 130 | ППС-24         |                                       | Do not open more than two panels at a time. ВПО12 operates with treadmill | 00:20:00 |
|    |                         |  | ППС-23         |                                       |   |          |
|    |                         |  | ППС-24         |                                       |   |          |
| 9  | ВН1<br>ВН2              | 219<br>305                             | ПУВН           | Deactivate fan and sections via ПУВН  |   | 00:10:00 |
|    |                         |  | ↓ FAN OFF (ON) | Clean screen                          |   |          |
| 10 | ВОЛ                     | behind 339                             | -              | Activate fan (if necessary) via ПУВН  |   | 00:20:00 |
|    |                         |  |                | Deactivate LIRA                       |   |          |
| 11 | ВКЮ1<br>ВКЮ2            | 322<br>320                             | ББК-2          | Clean screen                          |   | 00:10:00 |
|    |                         |  | ↓ OFF (ON)     | Deactivate fan via ББК-2              |   |          |
| 12 | ВГЖТ1<br>ВГЖТ4          | behind 126<br>behind 126               | ППС-24         | Activate fan (if necessary) via ББК-2 |   | 00:20:00 |
|    |                         |  | ППС-24         | Deactivate fan                        |   |          |

## 4.6. VENTILATION SUBSYSTEM [CB] MALFUNCTION

### 4.6.1. FAILURE OF FANS CONTROLLED VIA ППС AND OF TOILET CABIN FAN

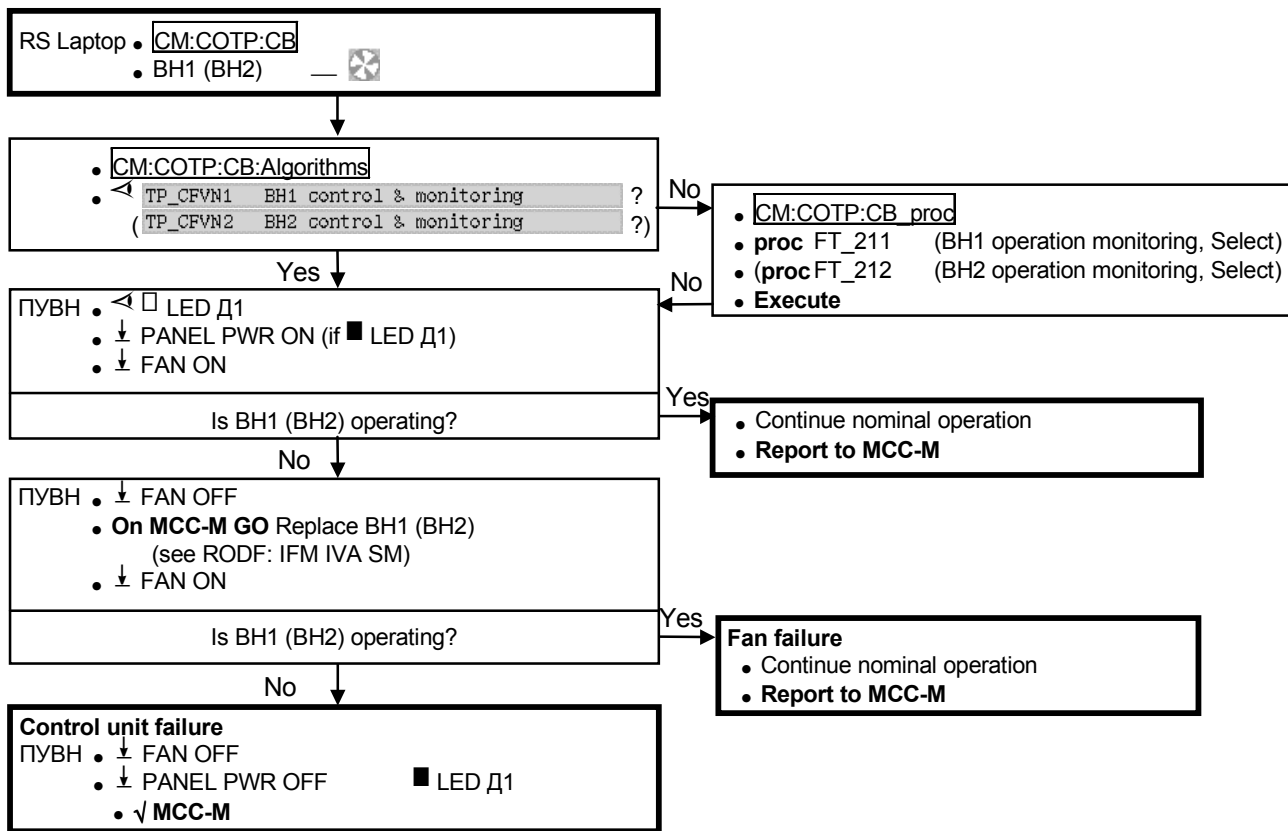
#### CAUTION

In case of ВВПхО failure, ventilation between SM and NODE1 may be disrupted



## 4.6.2. CABIN AIR HEATER ([BH1] ([BH2])) FAILURE

### 1. [BH1] ([BH2]) FAN STOP

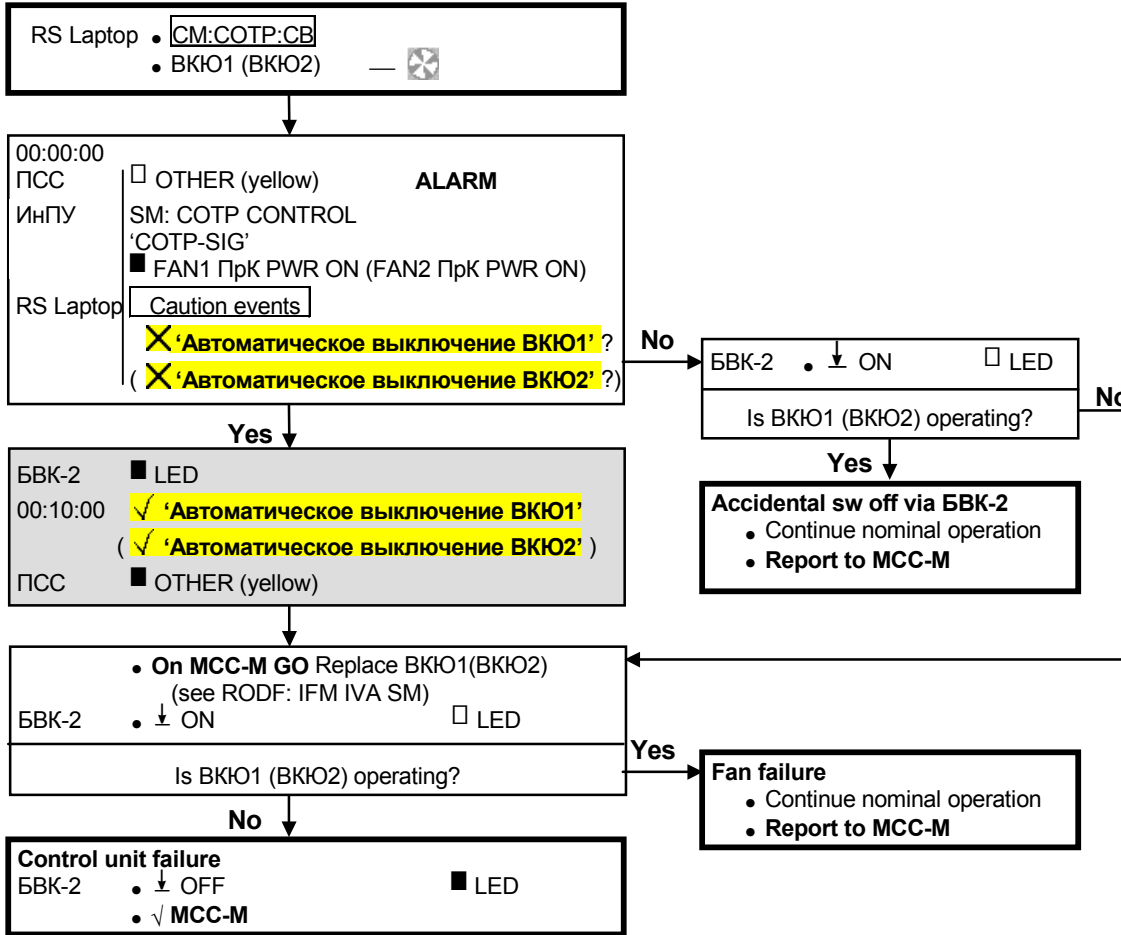


### 2. BURNING SMELL FROM [BH1] ([BH2])

237(440) ПУВН ↓ FAN OFF  
 ↓ STATUS CHECK (hold)  
 < ▣ ZONE 1, 2, 3  
**Report to MCC-M**  
**On MCC-M GO** Replace fan (see RODF: IFM IVA SM)

**4.6.3. CREW QUARTERS FAN (BKЮ1 (BKЮ2)) FAILURE**

**CAUTION**  
Crew stay in Starboard (Port) crew quarters is forbidden



After malfunction is eliminated (with automatic shutdown):

ИнПУ Switch off indicator light FAN1 ПрК PWR ON (FAN2 ПрК PWR ON)  
(see RODF: MANUAL CONTROLS 2.5.2.)

**Report to MCC-M**

**4.6.4. PERSONAL FAN ([BK1] ([BK2], [BK3], [BK4])) FAILURE**

- BK1(BK2,BK3,BK4) ☞
- РБС 10/3 ☞
- √ All connectors mating
- ☞
- BK1(BK2,BK3,BK4) ☞
- ☞ BK1(BK2, BK3, BK4) is running

\*\*\*\*\*  
\*\*\*\*\*  
Use the other [BK] or  
**ON MCC-M GO** Replace fan  
(see RODF: IFM IVA SM)  
\*\*\*\*\*

**Report to MCC-M**