TOOLS AND EQUIPMENT REQUIRED

FGB 226   CO2 Removal Kit (CRK) Portable Fan Assy
NOD1S3   CRK Conical Adaptor Assy, LiOH Adaptor
NOD1P4   LiOH Canisters (2)
 L2 or
 NOD1D4
 D4
NOD1S3   Charcoal/HEPA Filters
FGB 426/   CSA-CP
 427
NOD1P4   Carbon Dioxide Monitoring Kit (CDMK)
 A2
SM 411   __-1M Russian Air Sampling Kit (2 pipes), including ACCURO Manual Pump,
            and Grab Sample Containers (GSC)
FGB 103/   US Portable Breathing Apparatus and/or Russian Isolating Gas Mask (3)
 106
FGB 112/   Wet Wipes, Towels
 113/226

            Flashlights (2)

MCC-M activate the Harmful Contaminants Filter (___) in the FGB.

1. VERIFYING BREATHABLE ATMOSPHERE IN SAFE HAVEN

SM   If the CSA-CP readings taken in Node 1, PMA1, FGB or SM after SC2,
            SC3 egressed Lab (as called out in FIRE IN LAB or LAB FIRE SOURCE
            LOCATION SAMPLING procedures) are below the Masking Levels in
            Table 1, doff PBAs or Russian gas masks.

Table 1. Masking Levels

GMT	
Location	
Contaminant concentration	_SA-CP readings
CO	200 ppm	
HCl	10 ppm	
HCN	5 ppm	

2. SM VENTILATION ACTIVATION
    Verify SM Ventilation by aural cue (automatically in 30 min after FIRE
     signal)

    2.1 Activate the Micropurification Unit (___) in the Service Module 7.2.
         SYSTEM PURIFICATION MODE ACTIVATION (RODF: ____: 7.
         MICROPURIFICATION UNIT (C___)).

    2.2 Activate VOZDUKH system.
         Perform 6.21. VOZDUKH DEACTIVATION FOR BREAK IN
          OPERATION and 6.6. VOZDUKH ACTIVATION AFTER BREAK IN
          OPERATION (RODF: ____: 6. VOZDUKH (CO2 REMOVAL
          SYSTEM)), then:

     3. <u>CONFIGURING LAB SYSTEMS</u>
      3.1 TRANSITIONING TO SINGLE LOOP MODE
       LAB: TCS: LTL TWMV Icon
       | LTL TWMV Commands |
       'LTL TWMV'

       cmd CLC – Inh **Execute**

       CLC – Inh

       cmd Posn – Byp **Execute**

       Posn – Byp

       LAB: TCS: Software
       | Software Commands |
       'IATCS'
       'Mode'

       cmd Sngl LT – Arm

       Arm Status – Sngl LT Armed

       cmd Sngl LT – Sngl LT

       Expect Caution: **'Lab LTL SFCA Uncontrolled DP-LAB'**
       Expect Caution: **'Lab MTL SFCA Uncontrolled DP-LAB'**

       Wait up to 3 minutes.

       Verify Mode – Sngl LT

PCS   LAB: TCS: MTL TWMV Icon
       | MTL TWMV Commands |
       'MTL TWMV'

       cmd CLC – Ena **Execute**

       CLC – Ena

       Expect Caution: **'Lab LTL PPA Pump Outlet Temp High – LAB'**.
       Expect Caution: **'Lab LTL TWMV Overtemp – LAB'**.
       Expect Caution: **'Lab Rack LAB1D6 Overtemp – LAB'**.
       Expect Caution: **'Lab Rack LAB1P6 Overtemp – LAB'**.
       Expect Caution: **'Lab Rack LAB1S6 Overtemp – LAB'**.

      3.2 If any equipment was manually powered off or if Load Shed was
       initiated
        MCC-H for electrical power reactivation steps

4. LAB INGRESS AND DAMAGE ASSESSMENT
 4.1 Obtain flashlights, __-1M Russian Air Sampling Kit, ACCURO Manual Pump, CSA-CP, and CDMK.

Lab Aft 4.2 Don US PBA.
 Open Lab Aft Hatch per decal.
 Enter Lab with equipment gathered in step 4.1.

Lab 4.3 Perform damage assessment, noting extent of damage and equipment capabilities lost.

 If Charcoal filters are installed in return air registers
 4.4 To install HEPA filters in return duct air registers, perform {3.1.302 LAB BACTERIA/CHARCOAL FILTER R&R} skip steps 1 --- 4, 13 --- 16 and replace filters only in standoffs Lab1PD3, Lab1PD5, Lab1SD3, Lab1SD1, (SODF: ISS IFM: LAB: PREVENTIVE/ECLSS), then:

 4.5 Perform Lab air sample collection using __-1M, ACCURO Manual Pump and GSC.

 4.6 Obtain contaminant level readings in Lab using CSA-CP and record readings in Table 2.

 4.7 To obtain CO2 level in Lab, perform {CARBON DIOXIDE MONITOR: CDM - PERSONAL AND AREA} (SODF: MED OPS: NOMINAL: EHS), then:
 Record levels in Table 2.

 4.8 Egress Lab and close Hatch per decal.
 Doff PBAs if save haven CSA-CP readings from Table 1 allow.

 4.9 Relay damage assessment, readings to **MCC-H** at next communication opportunity.

Table 2.- Lab Contaminant Level Readings/GMT

Contaminant	Masking Levels	step 4.6, 4.7/GMT	step 6.3, 6.4/GMT	step 8.3, 8.5/GMT	step 8.3, 8.5/GMT	step 8.3, 8.5/GMT
CO	200 ppm					
HCl	10 ppm					
HCN	5 ppm					
CO2	N/a					

5. LAB CCAA ACTIVATION FOR PARTICULATE SCRUBBING
 For each Lab smoke detector
PCS 5.1 Lab: ECLSS: Smoke Detector PD1 (SD5)
 Lab1PD1 (SD5) Lab Smoke Detector

 RPC Position – Closed

 'Monitoring'

cmd Inhibit

Status – Inhibited

'Fire Status'

cmd Reset

Verify Status – No Fire

5.2 To activate CCAA, perform {1.502 LAB CCAA ACTIVATION FOR LAB AIR SCRUB} (SODF: ECLSS: ACTIVATION AND CHECKOUT: THC), then:

5.3 Lab: ECLSS: Smoke Detector PD1 (SD5)

> Lab1PD1 (SD5) Lab Smoke

Note Smoke Detector PD1 and SD5 initial Scatter readings.

GMT _____   PD1 Scatter _____

GMT _____   SD5 Scatter _____

CAUTION
If Scatter readings increase markedly after CCAA activation plus 5 minutes, fire has restarted. Perform step 5.5 of this procedure immediately.

5.4 Verify PD1 and SD5 Scatter readings decrease as CCAA runs.

5.5 To deactivate CCAA if the fire restarts, or when Scatter readings stabilize, indicating that particulate removal is complete, or **ON MCC-H GO**, LAB: ECLSS: LAB1P6 (LAB1S6) CCAA: CCAA Commands

> LAB1P6 (LAB1S6) CCAA Commands

cmd – Stop

State – EIB Off

6. LAB INGRESS AND ATMOSPHERIC SCRUBBING SET UP
    6.1 Obtain flashlights, CSA-CP, CDMK, CRK, LiOH Canister, and two Charcoal filters.
    Don PBA or Russian Isolating Gas Masks

    6.2 Open Lab Aft Hatch per decal and ingress Lab.

    6.3 Obtain contaminant level readings in Lab, using CSA-CP and record readings in Table 2.

6.4　To obtain CO2 level in Lab, perform {CARBON DIOXIDE MONITOR: CDM - PERSONAL AND AREA} (SODF: MED OPS: NOMINAL: EHS), then:
Record levels in Table 2.

6.5　Relay CSA-CP and CDMK readings to **MCC-H** at next communications opportunity.

6.6　If CO2 concentration in Lab from step 6.4 is greater than 1.3 % or 13,000 ppm (10 mmHg at 760 mmHg total pressure), then:

Lab　　　　To set up and activate Carbon Dioxide Removal Kit in Lab, perform {4.302 ECLSS FRP-3: CARBON DIOXIDE REMOVAL KIT ACTIVATION/DEACTIVATION} (SODF: ECLSS: CORRECTIVE: ARS), then:

6.7　To replace starboard side HEPA filters with Charcoal filters, perform {3.1.302 LAB BACTERIA/CHARCOAL FILTER R&R} skip steps 1 --- 4, 13 --- 16 and replace filters only in standoffs Lab1PD3, Lab1PD5, Lab1SD3, Lab1SD1, (SODF: ISS IFM: LAB: PREVENTIVE / ECLSS), then:

6.8　Egress Lab and close Hatch per decal.
Doff PBAs if safe haven readings in step 2.1 allow.

7.　LAB CCAA REACTIVATION
7.1　To activate CCAA, perform {1.502 LAB CCAA ACTIVATION FOR LAB AIR SCRUB} (SODF: ECLSS: ACTIVATION AND CHECKOUT: THC), then:

7.2　To deactivate fan, after a minimum of 5 hours of Cabin Fan run time, or **On MCC-H GO**
LAB: ECLSS: LAB1P6 (LAB1S6) CCAA: CCAA Commands

LAB1P6 (LAB1S6) CCAA Commands

cmd − Stop

State − EIB Off

8.　LAB INGRESS AND CONTAMINANT LEVEL ASSESSMENT
8.1　Obtain GSC, CSA-CP, CDMK, replacement LiOH cannister, and two Charcoal filters, Russian kit __-1M, ACCURO Manual Pump and Russian Draeger tube air samplers.
Don PBA or Russian Isolating Gas Masks.

8.2　Open Lab Aft Hatch per decal and enter Lab.

Lab　　8.3　Obtain contaminant level readings in Lab using CSA-CP, then:
Record readings in Table 2.

8.4 Perform air sample collection using __-1M, Acuro Manual Pump and GSC.
Perform atmosphere test using Draeger tube air samplers.
Record readings into Table 3.

Table 3.- Draeger Tube Assessment

GMT				
Location				
Contaminant concentration		Draeger tube air samplers		
		1	2	3
CO	200 ppm			
HCl	10 ppm			
HCN	5 ppm			
_F	Check **MCC**			
NO$_2$	Check **MCC**			
NH$_3$	Check **MCC**			
Formaldehyde	Check **MCC**			

1. Pump counter indication, showing that color is changing.
2. Maximum indication of Draeger tube scale.
3. Pump counter indication with maximum scale indication.

8.5 To obtain CO2 level in Lab, perform {CARBON DIOXIDE MONITOR: CDM - PERSONAL AND AREA} (SODF: MED OPS: NOMINAL: EHS), then:
Record levels in Table 2.

8.6 Relay CSA-CP and CDMK readings to **MCC-H** at next communications opportunity.

8.7 If CO, HCN, or HCl levels are above the Masking Levels, then:
To replace Charcoal filters, perform {3.1.302 LAB BACTERIA/ CHARCOAL FILTER R&R} skip steps 1 --- 4, 13 --- 16 and replace filters only in standoffs Lab1PD3, Lab1PD5, Lab1SD3, Lab1SD1 (SODF: ISS IFM: LAB: PREVENTIVE/ECLSS), then:

8.8 If CO2 level is about 1.3 % (13,000 ppm) (10 mmHg at 760 mmHg total pressure), then:
To deactivate CRK and replace LiOH cannister, perform {4.302 ECLSS FRP-3: CARBON DIOXIDE REMOVAL KIT ACTIVATION/DEACTIVATION}, step 5 (SODF: ECLSS: CORRECTIVE: ARS), then:

Egress Lab and close Aft Hatch per decal.

Repeat steps 7 and 8 (all) until atmospheric contaminant readings are below the stated levels.

8.9 If CO, HCN, and HCl are below 1 hour Emergency Guidance
Concentration High Levels and if CO2 level is 1.3 % (13,000 ppm)
or less
   Egress Lab leaving Aft Hatch open.
   Doff Breathing masks.

9. <u>RELEASE IMV ISOLATION</u>

PCS   Fire Summ: Manual Fire Alarm Display: Manual Fire Alarm Response:
   ISS IMV Isolation
   | ISS IMV Isolation |

9.1 'RS IMV Isolation'
   'Isolate'

   cmd Release

   RS IMV Isolation Status – Released

9.2 'Node 1 IMV Isolation'
   'Isolate'

   cmd Release

   Node 1 IMV Isolation Status – Released

> NOTE
> Per SPN 863, NCS Node IMV Isolation Release must be sent to
> the Node MDM as well a the INT to release Node IMV Isolation.

   'NCS Isolation'

   cmd Release

   Node 1-1 Isolation Status – Not Isolated
   Node 1-2 Isolation Status – Not Isolated

9.3 'LAB IMV Isolation'
   'Isolate'

   cmd Release

   Lab IMV Isolation Status – Released

9.4 'MPLM IMV Isolation'
   'Isolate'

   cmd Release

   MPLM IMV Isolation Status – Released

> NOTE
> **MCC-H** will provide Lab CCAA and IMV
> equipment configuration for steps 10 --- 12.

10. ECLSS HARDWARE RECONFIGURATION
    On MCC-H GO

    10.1 To replace Charcoal filters with HEPA filters, perform {3.1.302 LAB
          BACTERIA/CHARCOAL FILTER R&R} skip steps 1 --- 4, 13 --- 16
          and replace filters only in standoffs Lab1PD3, Lab1PD5,
          Lab1SD3, Lab1SD1 (SODF: ISS IFM: LAB: PREVENTIVE/
          ECLSS), then:

    10.2 To reactivate the LTL PPA, perform {2.203 LAB IATCS
          TRANSITION TO DUAL (AUTO)}, all (SODF: TCS: NOMINAL:
          IATCS), then:

    10.3 To activate the CCAA, perform {1.501 CCAA ACTIVATION},
          (SODF: ECLSS: ACTIVATION AND CHECKOUT: THC), then:

    10.4 To activate the AR Rack, perform {1.301 ATMOSPHERE
          REVITALIZATION RACK ACTIVATION} (SODF: ECLSS:
          ACTIVATION AND CHECKOUT: ARS), then:

11. REESTABLISHING USOS – RS INTERMODULE VENTILATION
    On MCC-H GO

    11.1 To open the Node Fwd Port, Node Fwd Stbd, Node Aft Port, Node
          Aft Stbd, Lab Aft Port and Lab Aft Stbd IMV Valves, perform
          {2.506 IMV VALVE RECONFIGURATION POST CCS}, step 2
          (SODF: ECLSS: NOMINAL: THC), then:

    11.2 To turn on the Node Aft Port Fan and the Lab Aft Port Fan, perform
          {1.504 IMV FAN ACTIVATION/DEACTIVATION POST CCS},
          steps 1 and 2 (SODF: ECLSS: NOMINAL: THC), then:

PMA1   11.3 Grille Cover – Closed

12. MANUAL CLEAN-UP OF LAB
LAB   12.1 Clean fluids, particulates, and soot from interior of Lab using
               materials such as Wet Wipes, towels, etc. and discard into
               Progress.