03.109 Electrolysis System Biological Filter Swapout
(03. HSS Procedures)

> NOTE
> Starting MD16, when this procedure calls for you to contact MCC for an action, you may proceed on your own go.

OBJECTIVE:

To perform a biological filter change out of the Solid Polymer Electrolysis (SPE) System.

EQUIPMENT:

Spare biological filter (will be gathered during the procedure)
Paper towels
Water Recovery System (WRS) Kit
Nut driver with 5/16” nut
PPE safety glasses
PPE static wrist tether
Portable anemometer

REFERENCES:

03.108 Electrolysis System Activation
03.111 Electrolysis System Deactivation
Airflow Tracking Spreadsheet

> NOTE
> Powering off of the system must be performed in the correct sequence to ensure H2O does not enter the coolant water pump from the Auxiliary Electrolysis Module.

L2C 1. DEACTIVATE ELECTROLYSIS SYSTEM

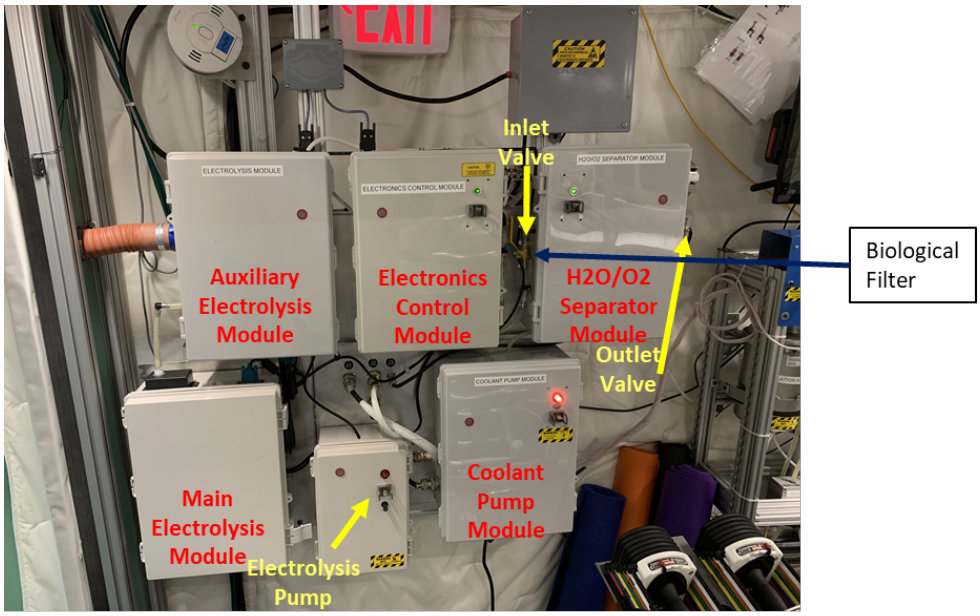

Figure 1: Solid Polymer Electrolysis System

L2C

1.1 Don static wrist tether and attach to any unpainted metallic surface.

1.2 Don PPE safety glasses.

1.3 Gather portable anemometer and take reading of exhaust flow to the right of the H2O/O2 Separator Module (see Figure 1). Turn on and set anemometer to m/s. Hold anemometer within an inch of the outlet valve, left of center, for 10 seconds to gather an accurate reading.

1.4 Confirm that O2 exhaust flow on the right side of the outlet valve of the H2O/O2 Separator Module is within 0.6 – 0.8 m/s. Record in Airflow Tracking Spreadsheet.

1.5 Turn off portable anemometer.

1.6 Switch inlet valve located to the left of the H2O/O2 Separator Module to “CLOSED”. (see Figure 1).

-Confirm inlet water valve is perpendicular to hose.

1.7 Switch outlet valve located to the right of the H2O/O2 Separator Module to “CLOSED”. (see Figure 1).

-Confirm outlet water valve is perpendicular to hose.

1.8 Flip power switch of Electrolysis Pump Module to “OFF”. (see Figure 1).

-Confirm Electrolysis Pump Module light is off.

1.9 Flip power switch of Electronics Control Module to “OFF”.

-Confirm Electronics Control Module light is off.

1.10 Flip power switch of H2O/O2 Separator Module to “OFF”.

-Confirm H2O/O2 Separator Module light is off.

1.11 Unlock both latches on Auxiliary Electrolysis Module and open door.

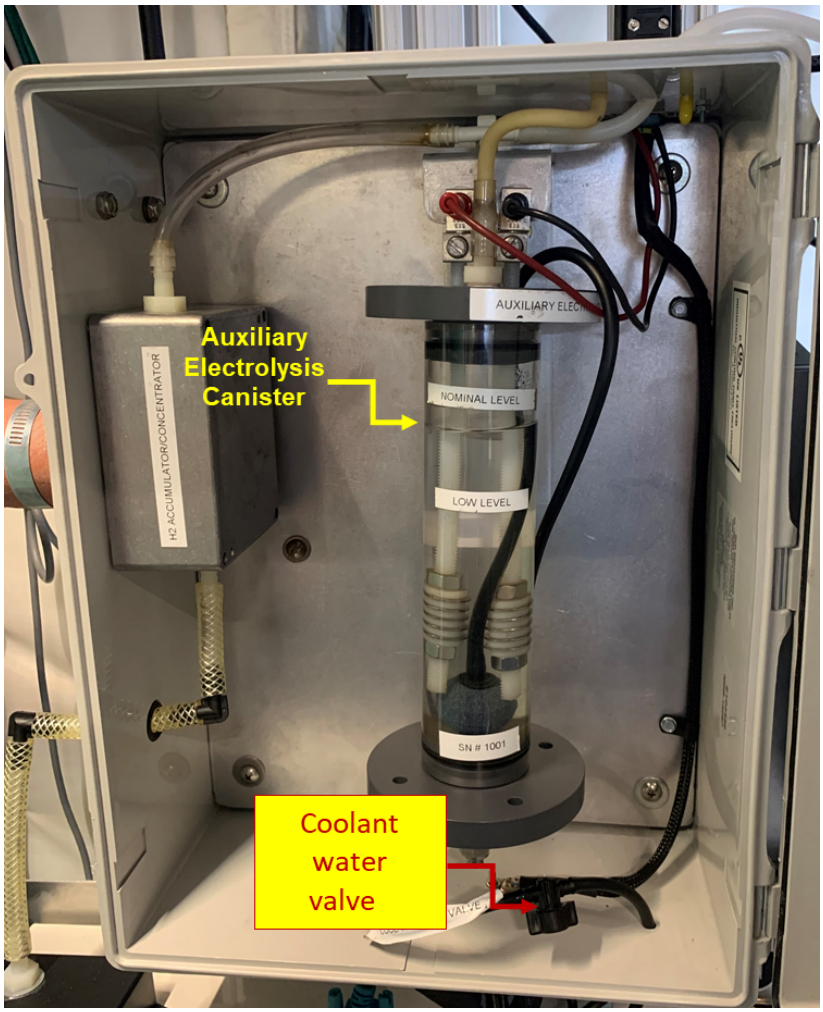

Figure 2: Coolant Water Valve

1.12 Turn coolant water valve (located on black tube behind the Auxiliary Electrolysis Canister) 90 degrees clockwise to “CLOSED”. (see Figure 2).

-Confirm coolant water valve tabs are perpendicular to hose.

-Confirm no more bubble formation.

1.13 Close Auxiliary Electrolysis Module door and lock both latches.

1.14 Flip power switch of Coolant Pump to “OFF”.

-Confirm Coolant Pump light is off and motor stops humming.

1.15 Flip Main Pump Power switch on Water Recovery System (WRS) to “OFF”. (WRS is located next to the SPE System.) (see Figure 3).

-Confirm WRS Main Pump Power light is off.

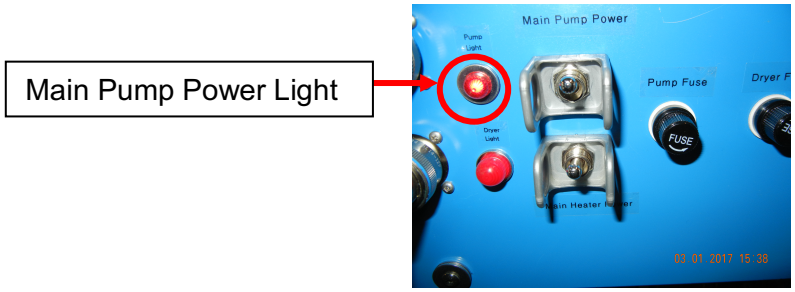

Figure 3: Main Pump Power Switch

1.16 Flip power switch of power strip behind Electronics Control Module to “OFF” (see Figure 1).

-Confirm power strip light is off.

2. BIOLOGICAL FILTER SWAPOUT

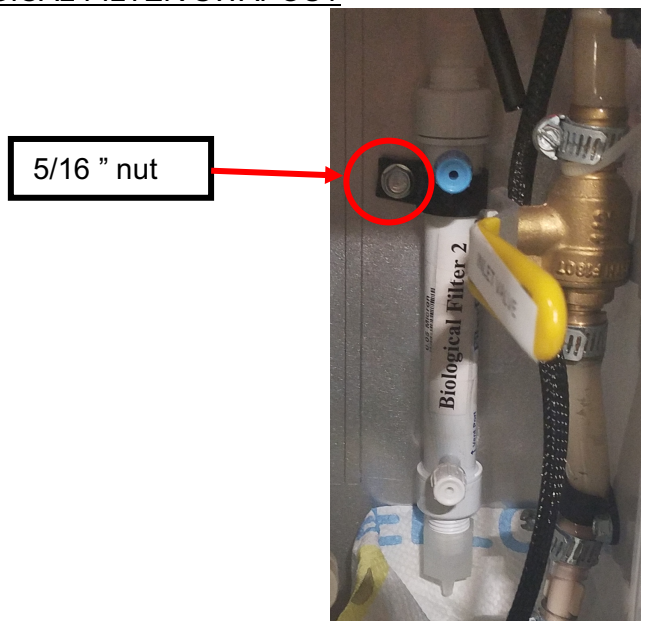

Figure 4: Installed Biological Filter

2.1 Hold paper towel under prime biological filter (located between Electronics Control Module and H2O/O2 Separator Module).

2.2 Pull black tube from top of prime biological filter and use paper towel to catch any water drops.

2.3 Pull black tube from bottom of prime biological filter and use paper towel to catch any water drops.

2.4 Use nut driver with 5/16” nut to release prime biological filter from Electrolysis System (see Figure 4).

2.5 Take prime biological filter and drain into galley sink wastewater.

2.6 Remove clamp from biological filter and temp stow at galley sink.

2.7 Remove spare biological filter from Water Recovery System Kit.

2.8 Stow prime biological filter in the spare biological filter stowage location in the Water Recovery System Kit.

2.9 Attach clamp to the spare filter before bolting it back in. Make sure blue cap is on top. Verify nut on left side (see Figure 4).

2.10 Use nut driver to secure clamp with biological filter to Electrolysis System.

2.11 Connect spare biological filter to the bottom and top tubes.

Confirm the black tubes are flush with clear caps on biological filter.

2.12 Remove and discard used paper towel.

3. <u>REACTIVATE SPE SYSTEM</u>

L2C

3.1 Switch coolant water valve (located on black tube behind the Auxiliary Electrolysis Canister) to “OPEN” (see Figure 1).

3.2 Move power switch of power strip behind Electronics Control Module to “ON” (see Figure 1).

Confirm power strip light is on.

3.3 Flip Main Pump Power switch on Water Recovery System (WRS) (located to right of SPE System) to “ON” (see Figure 3).

Confirm WRS Main Pump Power light is on.

3.4 Flip power switch on Electrolysis Pump to “ON” (see Figure 1).

Confirm Electrolysis Pump light is on and pump motor is humming.

3.5 Unlock both latches on Auxiliary Electrolysis Module and open door (see Figure 1).

Confirm coolant water valve tabs are parallel to hose.

3.6 Flip power switch of H2O/O2 Separator Module to “ON”.

Confirm H2O/O2 Separator Module light is on.

3.7 Flip power switch of Electronics Control Module to “ON”.

Confirm Electronics Control Module light is on.

3.8 Flip power switch of Coolant Pump Module to “ON”.

Confirm Coolant Pump Module light is on.

3.9 Switch outlet valve of H2O/O2 Separator Module to “OPEN”.

Confirm outlet water valve is parallel to hose.

3.10 Switch inlet valve of H2O/O2 Separator Module to “OPEN”.

Confirm inlet water valve is parallel to hose.

3.11 Visually inspect Auxiliary Electrolysis Canister to confirm electrolysis reaction is occurring by verifying gas bubble formation.

If no bubble formation, check valve position after L curve at bottom of black tubing and confirm valve is in open position. Inform MCC and proceed.

3.12 Close Auxiliary Electrolysis Module door and lock both latches.

3.13 Unlock both latches to Main Electrolysis Module and open door.

3.14 Visually inspect each of the (4) Main Electrolysis Canisters to confirm electrolysis reaction is occurring by verifying gas bubble formation.

If no bubble formation, inform MCC.

3.15 Close Main Electrolysis Module door and lock both latches.

3.16 Gather portable anemometer and take reading of exhaust flow to the right of the H2O/O2 Separator Module (see Figure 1). Turn on and set anemometer to m/s. Hold anemometer within an inch of the outlet valve, left of center, for 10 seconds to gather an accurate reading. Confirm that O2 exhaust flow on the right side of the outlet valve of the H2O/O2 Separator Module is within 0.6 – 0.8 m/s.

3.17 Inform MCC if off nominal and record in Airflow Tracking Spreadsheet.

3.18 Inspect biological filter assembly for leaks.

{If leaks are present contact MCC}

3.19 Turn off portable anemometer.

3.20 Doff PPE safety glasses.

3.21 Detach and doff static wrist tether.

3.22 Stow all tools.