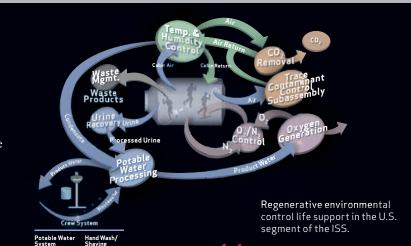


Environmental Control and Life Support System (ECLSS)

Earth's natural life-support system provides the air we breathe, the water we drink, and other conditions that support life. For people to live in space, however, these functions must be performed by artificial means. The ECLSS includes compact and powerful systems that provide the crew with a comfortable environment in which to live and work.

The on-orbit ECLSS is supplemented by an assortment of resupply vehicles provided by the international partnership. The U.S. Space Shuttle delivers water (scavenged from the water produced by the Shuttle fuel cells and transferred across to ISS in CWCs), high pressure O, and N,, and atmospheric gas. The Russian Progress, Japanese H-II Transfer Vehicle (HTV), and European Automated Transfer Vehicle (ATV) deliver water and atmospheric gas.

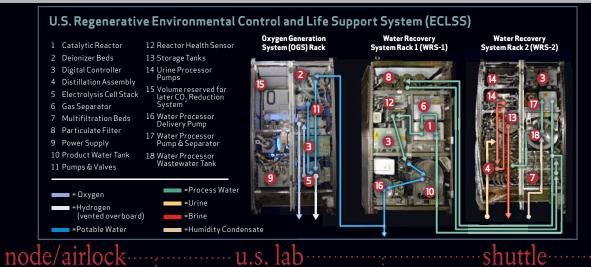
The ISS Program is currently reviewing a high pressure gas delivery system for post Shuttle retirement. The Nitrogen/ Oxygen Resupply System (NORS) would provide capability to deliver high pressure O, and N, on any vehicle with pressurized delivery capability, including U.S. Commercial Resupply System (CRS) vehicles.



Airflow ventilation fan.

Fans and filters circulate air

and filter out contaminants.

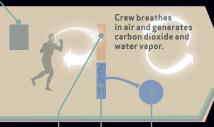


Lithium Hydroxide (LiOH) cartridge used for eliminating CO_2 from air, backup system.

Contingency Water Container (CWC) Bag.



Fuel Cells (make electricity and water from oxygen and hydrogen).



Condensate is stored in the Wastewater
Storage Tank
Assembly (WSTA)
for processing in the

Common Cabin Air Assembly (CCAA, condenses water vapor from air).

Carbon Dioxide Removal Assembly (CDRA, adsorbs from crew).

Sabatier uses carbon dioxide from CDRA scrubbing (currently vented) and hydrogen from OGA electrolysis (currently vented) to produce water; vents methane out of the Station.

Freshwater Storage Tanks.

Elektron (produces oxygen from water through elec-trolysis; vents hydrogen out of the Station).

The Russian Condensate Water Processor is known as the "SRV-K" (equivalent to the US WPA) and it processes the condensate that is reclaimed

Vozdukh (absorbs carbon

Crew breathes in

air and generates carbon dioxide

and water vapor

H₂O/PERSPIRATION

OXYGEN

Russian EDVs used to store and



service module

Solid Fuel Oxygen Generator (SFOG) backup system which burns candles to produce oxygen.

ECLSS on the ISS provides the following functions:

- Recycles wastewater (including urine) to produce drinking (potable) water and technical water (for flush and oxygen generation)
- Stores and distributes potable water
- Uses recycled water to produce oxygen for the crew
- Removes carbon dioxide from the cabin air
- Filters the cabin air for particulates and microorganisms • Removes volatile organic trace

gases from the cabin air

• Monitors and controls cabin air partial pressures of nitrogen, oxygen, carbon dioxide, methane, hydrogen, and water vapor

- Maintains total cabin pressure
- Detects and suppresses fire
- Maintains cabin temperature and humidity levels
- Distributes cabin air between ISS modules (ventilation)

The U.S. Regenerative Environmental Control and Life Support System takes steps toward closing the water cycle; it takes humidity condensate from the cabin air and urine from the crew and converts these into drinking water, oxygen for breathing, and hydrogen.

Oxygen and Nitrogen (Shuttle replenishes the gases stored in the airlock tanks).

FUEL CELL

02

02

CWC Bags (used by

astronauts to carry water from the Shuttle to the ISS).