

## Aquarius Reef Base: Life Support Buoy Specifications

### Dimensions

- 10-meter diameter discus buoy
- Tower extends approximately 8 meters above top deck
- LSB deck approximately 1.5 meters above water line

### Equipment on the Life Support Buoy (LSB)

- (2) 40 KW diesel generators
- (2) High Pressure 5000 psi MAKO Compressors
- (2) Air conditioners
- (1) Small SS volume tank
- Eight 8D batteries (48 volt battery bank)
- (2) Internal fuel diesel tanks
- Environmental monitoring equipment (O<sub>2</sub>, CO et cetera sensors)
- Air panels and electronic equipment for telemetry
- DC and AC power panels, wiring, breakers and electronic racks with distribution panels
- VHF and telemetry antennas on tower
- (3) Solar panels

### Telecommunications

- 1 GB Ethernet from Aquarius to the LSB via umbilical.
- From LSB to Shore - Motorola PTP 600 series wireless bridge (maximum: 300 Mbps; average 250 Mbps; minimum 100 Mbps).

### Sensor deployment capability

- Oceanographic sensors can be deployed on the LSB, in the water column and on the bottom near the LSB. Sensors can be hardwired to the LSB for power and data telemetry using through-hull and through-tower penetrators installed on the buoy specifically for this purpose.
- Sensor power: During Aquarius missions, sensors can utilize existing generator power provided by LSB. When Aquarius is offline, sensors may be powered, depending upon demand, by the existing solar panels. The LSB can accommodate an alternate power supply (e.g., small diesel generator, additional solar panels or other) provided by the PI.
  - 48-volt bank provides power to LSB onboard DC systems and seafloor instruments requiring DC power.
  - 48-volt bank also provides power for 24 and 12-volt DC systems, including seafloor instrumentation and sensors.
  - A 'box' containing a 48-volt, 24-volt and a 12-volt bus was added in preparation for seafloor instrumentation deployment. The box has a 3-PIN 'cannon plug' connector.

- Existing generators and solar panels can charge 48-volt bank. Depending on instrumentation amp draw, the 48-volt bank may need to be charged by the generator more often if solar panels cannot keep up with power usage.
- LSB has 200-amp total service provided by onboard 100-amp service and a separate 100-amp service for habitat onboard systems.
- No modifications were made to LSB AC systems to independently power seafloor instrumentation and sensors.
- If any instrument or sensors require AC power from the LSB they will be powered from a standard outlet unless an electrician modifies existing system. However, traditionally most if not all monitoring instruments and sensors have been powered by DC power.
- The habitat can supply 24-volt DC power and standard 110 AC power when running.
- A converter such as a 'Sorenson' unit can be used to dial in 12-volt DC power if needed.

