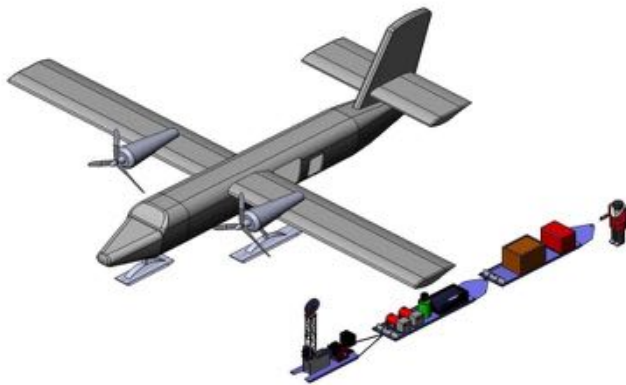
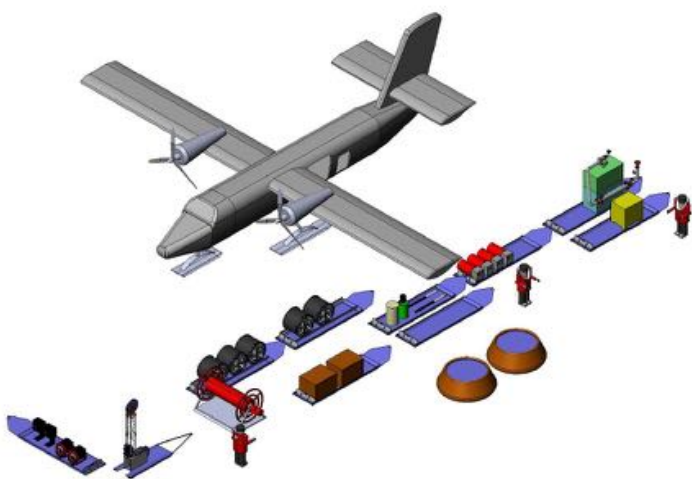


# Scalable Hot Water Drill (ScHWD) (Upcoming development)

**LAYOUT: 50-100M**



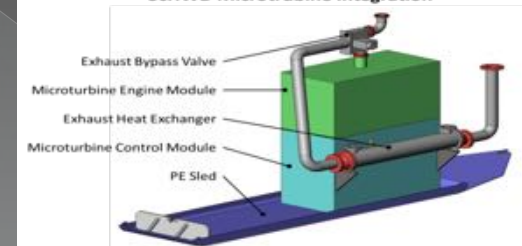
**LAYOUT: 800-1000M**



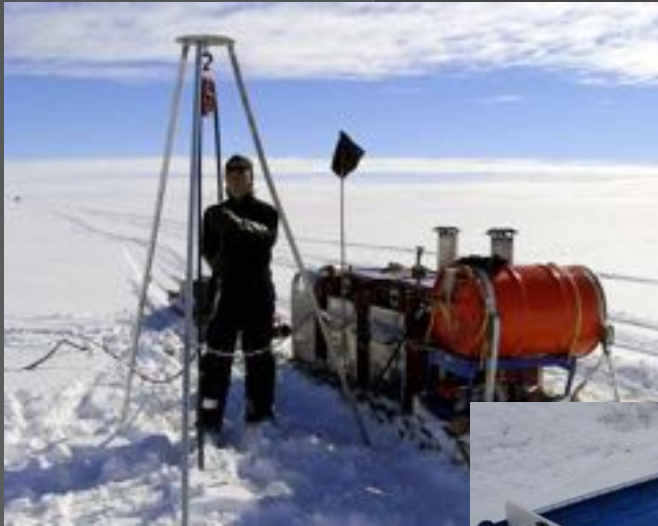
## ScHWD Development planned for 2016

- Augments the IDDO equipment inventory per the Long Range Plans
- Significantly broadens the range of science that can be supported
- Meets the science requirements identified by the research community
- Provides flexibility for a minimum logistical burden for field projects of a wide range of sizes
- Leverages the latest developments in hot water drilling and advances the technology with the numerous advantages of a microturbine generator that have potential applications across the polar programs.

**ScHWD Microturbine Integration**



# IDDO Small Hot Water Drills (Upgrades in progress)



Nominal hole type: Dry  
Nominal Diameter: 6 cm (2.5 in)  
Depth: 30 m (dry), 60 m max (wet)  
Rate in firn: 2 m/min



## Heater Replacement (lightweight)

- SS tubing rather than pipe
- Environmental burner cover

The SmHWD systems are being upgraded over the next two years

- Focus of upgrades will be safety, reliability, and mobility
- Implementing user-identified improvements
- 1 upgraded system (30 m depth capability) will be ready to deploy for 15-16 season
- 60 m system will complement Scalable Hot Water Drill (60-1000 m)



# Sediment Laden Lake Ice Drill (Upcoming development)

**IDDO is currently reviewing Science Requirements for the a new Sediment Laden Lake Ice Drill**

## Scientific Requirements (summarized/abbreviated):

- Produce access holes through clean or dirty ice less than 6m thick
- The drill should be field portable, with the ability to be carried by one...
- Diameter of holes needed between 5-25 cm
- Should require very little water to start the drilling, and would preferably recirculate the ice melt and seed water to avoid loss or contamination to the environment.
- Setup time for the drill should be within a half hour after initial unpacking on site, with drilling speeds of at least 25 cm diameter holes through a 6 m ice cover per hour for example.
- Helicopter transportable, packed in cases that can be lifted by a maximum of two people
- One person should be able to do the drilling operations in the field
- Permanent indicators on the hose indicating depth and the distance to the tip
- Drill should be able to be used to free up cables frozen in the ice, including riding them down through the ice
- Materials used should be as non-corrosive as possible from fresh to sea water salinities
- The design should be easily cleanable with standard solvents/sterilants

**One approach is to modify or add on to a Hotsy-type unit recently shipped to IDDO from McMurdo (previously used by Peter Doran)**

- Addition of submersible pump
- Addition of heat exchanger
- Swappable nozzles
- Verify material compatibility (for sea water, etc.)

