Dive Planner Use Cases

The following use cases have been read from the ProPlannerVGM (VB app) by Chris Bradshaw in June 2022. They are not reviewed/approved and probably not complete however use as a starting point.

As a dive planner I want to

* Select the breathing gases available
* Adjust the Oxygen and Helium content of any breathing gas (the rest is Nitrogen)
* For the available gases, select the breathing gases available for use in Decompression
* For the available gases, select if the gas is used in closed circuit or open circuit mode
* On startup, see the application defaults of the breathing gas configuration (available, O2, He, used in Deco, closed-circuit/open-circuit)
* Set the Safety Factors
* Set the descent rate
* Set the ascent rate
* Set atmospheric pressure
* For each gas;
  + See the name of the gas
  + See the number of the gas
  + See the percentage of oxygen
  + See the percentage of helium
  + See the percentage of nitrogen
  + See the maximum operating depth
  + See the Equivalent Air Depth (see Wikipedia)
  + See if it is a Decompression gas
  + See if the breathing mode for the gas is closed-circuit or open-circuit.
* Define a single dive to one depth or multiple depths with parameters;
  + A unique ID or name of the dive
  + Select decompression gases
  + Select descent/bottom time gas
  + Descent rate
  + Ascent rate
  + Bottom Depth(s)
  + Bottom set point(s) if gas is closed circuit
  + Bottom Time(s)
* See for a single dive a table of
  + Depth
  + Time at that depth
  + Run time into the dive (cumulative time)
  + Gas used for that part of the dive
  + CNS
  + OTU
  + Descent rate
  + Ascent rate
  + The decompression stops that I must make which is
    - A depth
    - A duration
    - The PPO2 at that stop
* See a graph for a single dive showing
  + Depth vs Time
  + An indication of gas used for each part of the dive
* Define a series of dives
  + Which is as per a single dive plus
  + A surface interval between each dive
  + The PPO2 whilst in that surface interval (defaulted to 21% = air)
* See for a series of dives
  + The overall run time
  + The overall CNS
  + The overall OTU
  + The overall gas usage
* Select units in Metres Sea Water (MSW) or Feet Sea Water (FSW)
* Set the last stop depth to 3m, 4.5m or 6m (units depending on selected units)
* Set the decompression algorithm to use (see developer use cases)
* Set the breathing gas setup as the application default
* Restore the breathing gas setup to application default
* Restore the breathing gas setup to factory default
* Save the single dive to human readable file including the following (see dive.csv);
  + Dive name/ID
  + Atmospheric pressure (mbar)
  + Safety factors
  + Name of decompression algorithm
  + Sequence of dive plan, i.e. a list of
    - depths of a dive
    - durations of dive
    - duration of surface interval between this and next dive
    - O2 percentage of breathing gas
    - He percentage of breathing gas
    - PPO2 achieved in that dive
    - Open Circuit or Closed Circuit dive
    - Gas Index (number of the breathing gas used from list of gases)
  + List of all gases including
    - Gas Index
    - Enabled/disabled
    - O2 percentage
    - He percentage
    - Depth (maximum)
    - PPO2 (at maximum)
    - Gas is for Open Circuit or Closed Circuit use
    - Deco or not deco gas
    - WC (?)
    - Bar use
  + List of all decompression stops including
    - Depth
    - Duration
    - Run time (time from dive start)
    - Mix (name of the gas, e.g. Air)
    - SPO2 (if any)
    - CNS percentage
    - OTU (count, integer)
    - “No.” (??)
    - Rate – i.e. direction, as “Descent”, “Bottom” or “Ascent”
* Save the list of all defined dives to human readable file including (see list.csv)
  + Date of the export of the list
  + Then for each dive in the list
    - plan name
    - date of planning
    - max depth
    - Bottom time
    - Equivalent gradient factor if any, in format (XX/YY) e.g. 20/95
    - PPO2 in bar (e.g. 1.36)
    - Open/closed circuit
    - O2 percentage
    - Helium percentage
* Print the single dive including the following;
  + ? cannot get printer driver working to see output
* Print the list of dives
  + ? cannot get printer driver working to see output

As a developer I want to

* Encapsulate the decompression algorithm in a plug-in style format
* Supply one or more plug-in decompression algorithms with the user interface