

# Technical issues connected with the installation and maintenance of the SOOP system

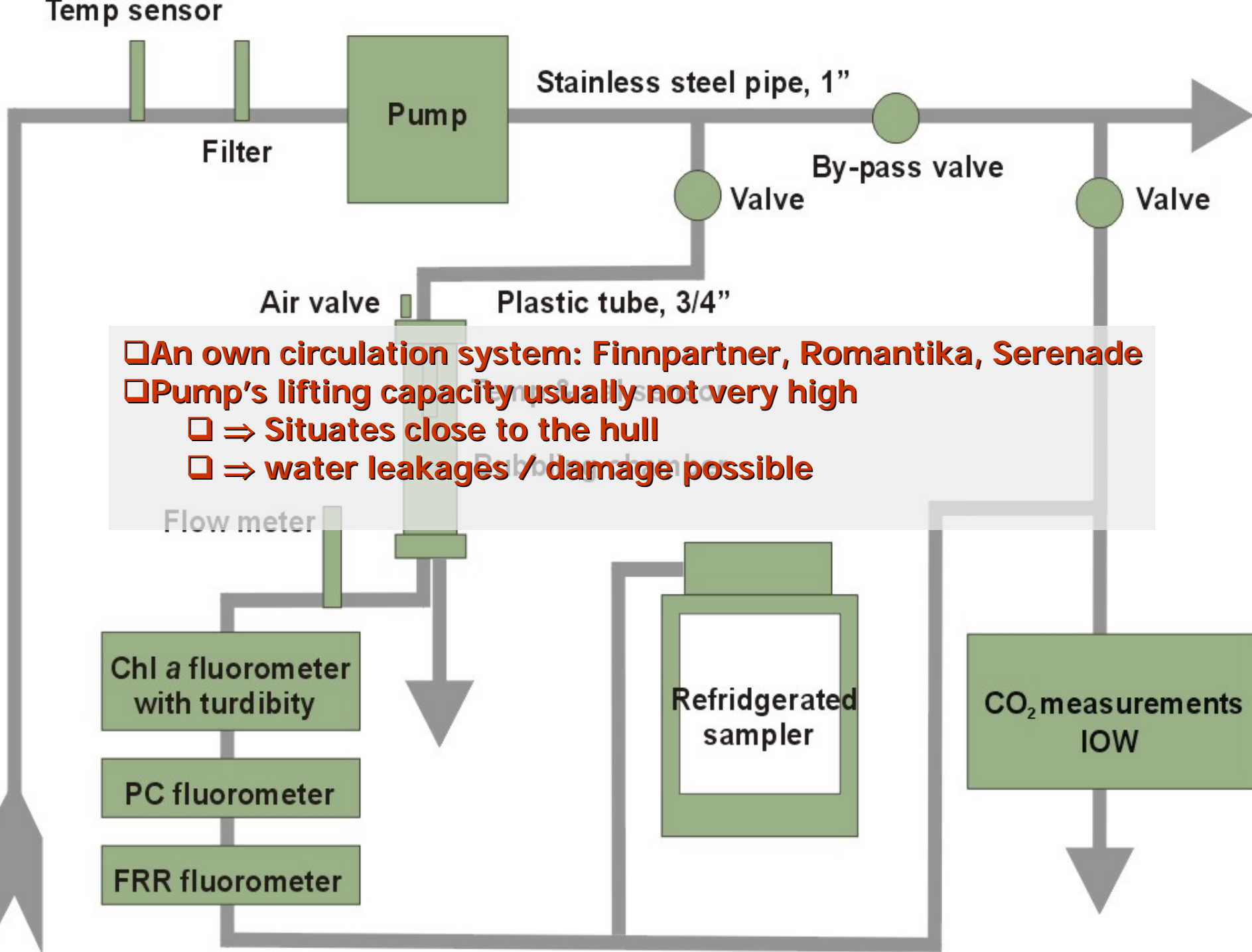
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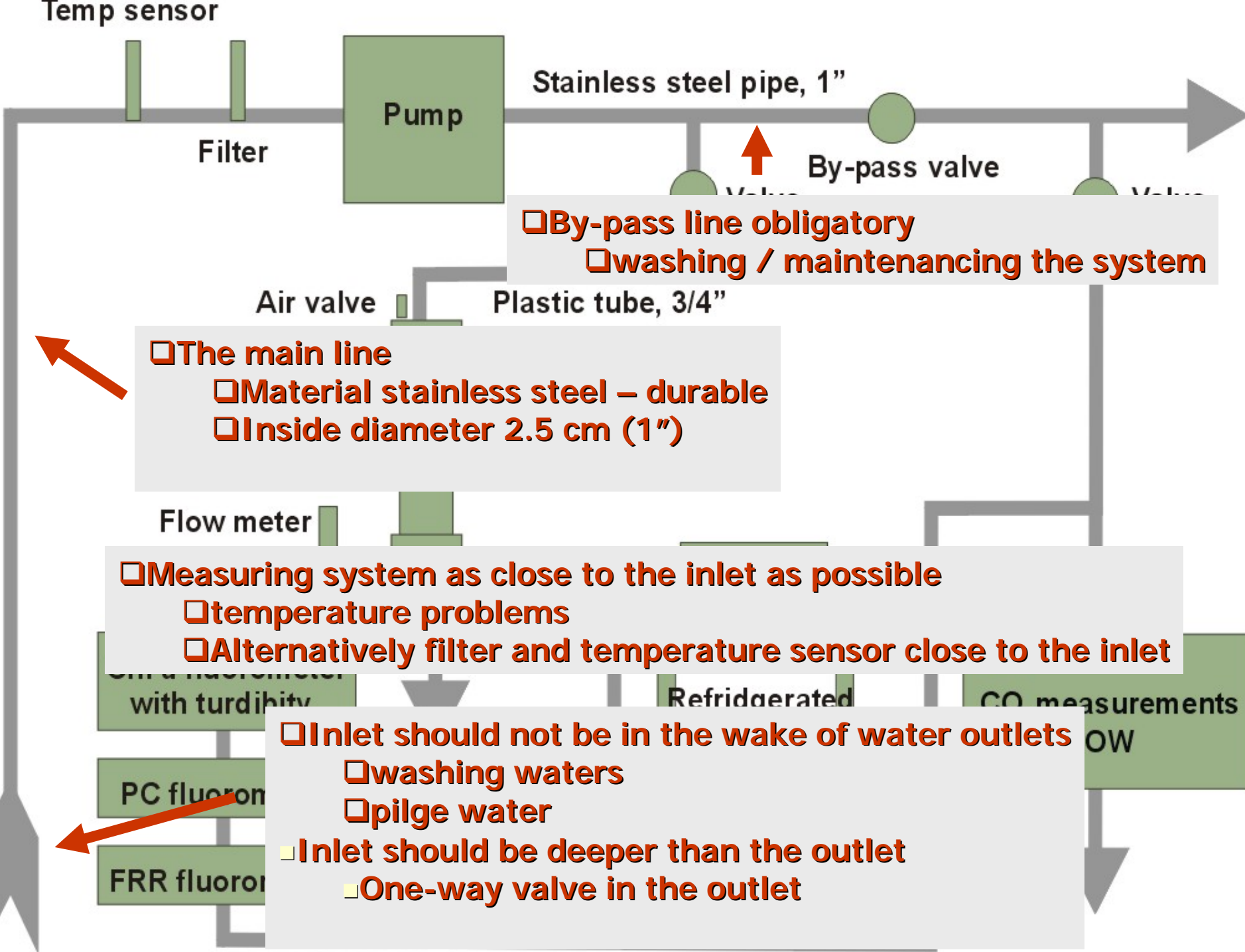
# GPS

- Antenna on the deck of ship (smokestack, bridge)
  - open place, as little shade, few dead angles as possible
- GPS indoors and rather close to the antenna (10-15 m)
- A cable from the GPS to the PC
  - sheltered, twisted, data transfer cable
  - PC down in the machine room  $\Rightarrow$  long cable (100 m)  $\Rightarrow$  optimising the route from GPS to PC
  - requirement of cable of non-flammable material
- Onboard Coast Guard Ships we use ship's GPS, but not onboard merchant ships
  - no permit

# PC

- Lab View based logging / sampling software
  - time/position + 8 parameters
  - digital, analog, or "pulse-mode" data
- Sampling is triggered by a 12 V pulse from the PC to the sampler
  - Time / position criterium
- Put the PC to a dry place
  - can be hard to find down in the machine room
- Remember to clean the PC every now and then
  - greasy dirt very sticky
  - ports / interfaces with cleaning fluids
- **THE USE OF UPS IS STRONGLY RECOMMENDED**
  - the ship's electric system is far from stable



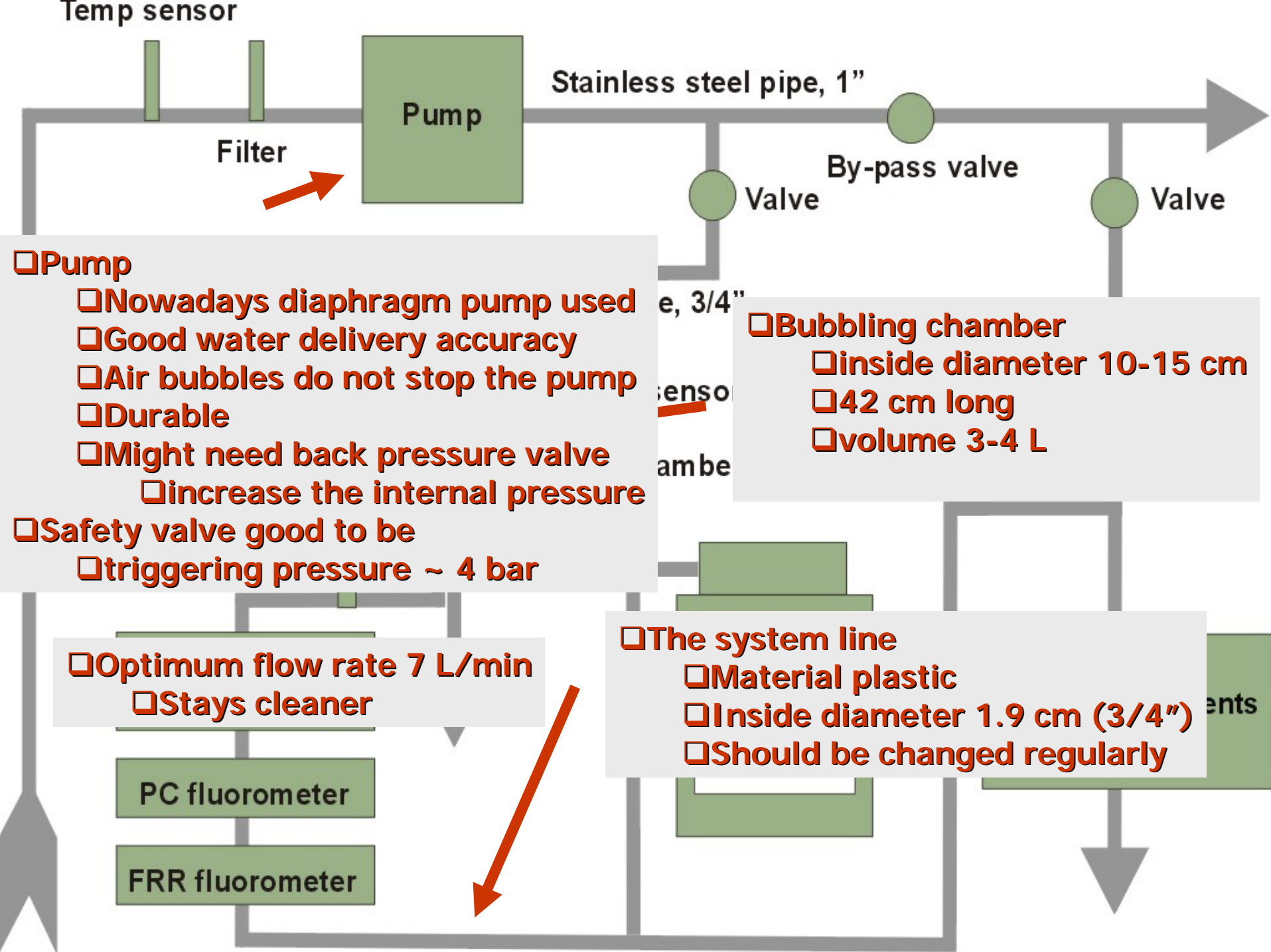


- ❑ By-pass line obligatory
- ❑ washing / maintenancing the system

- ❑ The main line
  - ❑ Material stainless steel – durable
  - ❑ Inside diameter 2.5 cm (1")

- ❑ Measuring system as close to the inlet as possible
  - ❑ temperature problems
  - ❑ Alternatively filter and temperature sensor close to the inlet

- ❑ Inlet should not be in the wake of water outlets
  - ❑ washing waters
  - ❑ pilge water
- Inlet should be deeper than the outlet
  - One-way valve in the outlet



Stainless steel pipe, 1"

Filter

Pump

Valve

By-pass valve

Valve

**□ Pump**

- Nowadays diaphragm pump used
- Good water delivery accuracy
- Air bubbles do not stop the pump
- Durable
- Might need back pressure valve
  - increase the internal pressure

**□ Safety valve good to be**

- triggering pressure ~ 4 bar

**□ Bubbling chamber**

- inside diameter 10-15 cm
- 42 cm long
- volume 3-4 L

**□ The system line**

- Material plastic
- Inside diameter 1.9 cm (3/4")
- Should be changed regularly

**□ Optimum flow rate 7 L/min**

- Stays cleaner

PC fluorometer

FRR fluorometer

vents

# Things to notice

- Working permit onboard only for qualified people
  - A separate permit for work with fire (welding etc.)
  - Usually all the installation work is done by the staff or their representative
- Who:
  - Installs the pump, the pipings?
  - makes the inlet and outlet holes (where?)
  - installs the antenna and the antenna cables?
  - and
  - Can these be done in the sea?
- Ship should stay in port at least 1.5 h, preferably more
- Instrument calibration and checking
  - temperature, salinity sensors
  - fluorometers