Clean in place and Tank Cleaning Solutions

- **Equipment**
  - Process equipment outline
- **Guide**
  - Guide lead times
- **Costs**
  - Budget costs can be put together relatively quickly

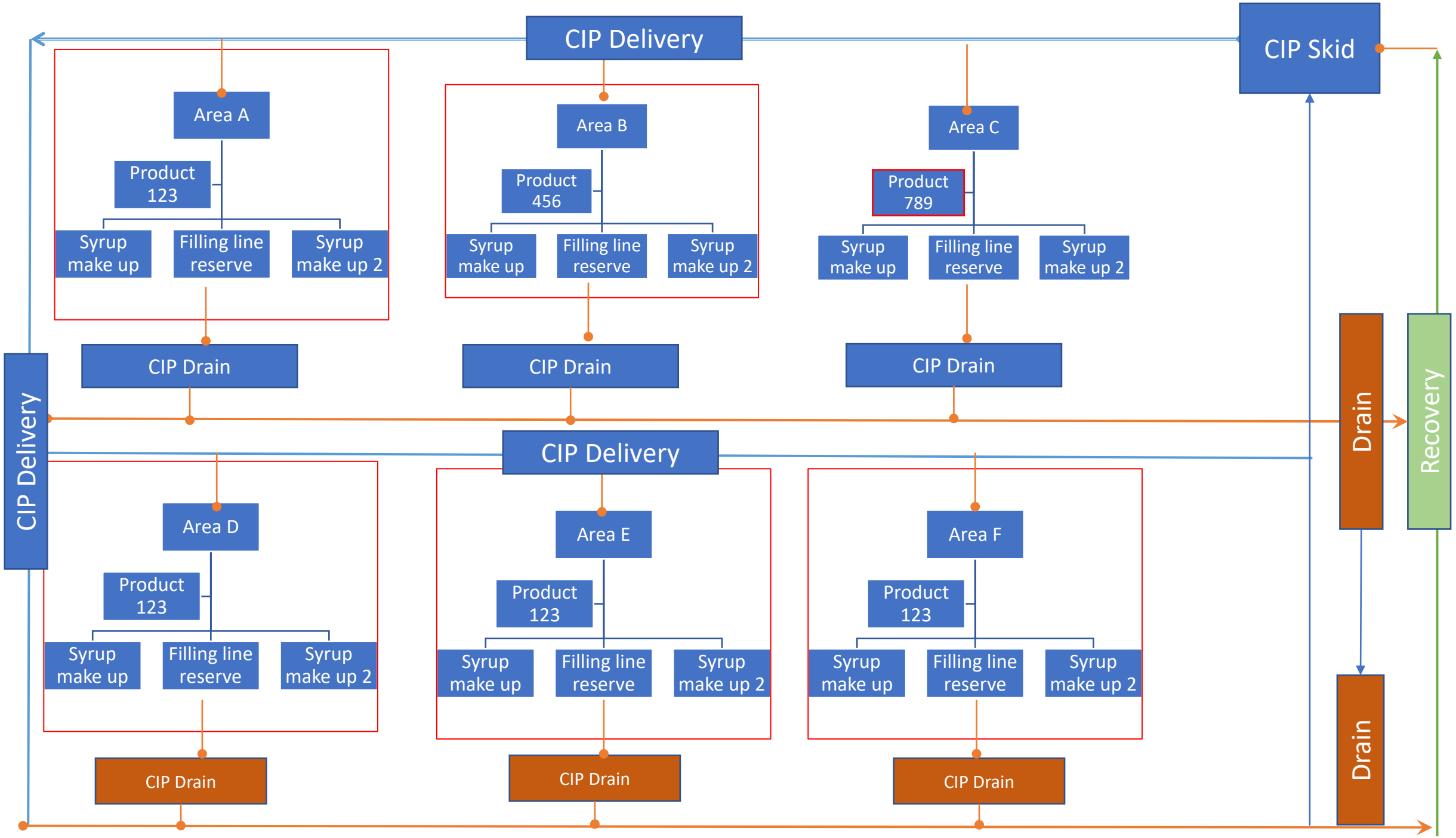
Flexachem.com
PUMPS - SEALS - VALVES - PROCESS EQUIPMENT

Functional description & equipment listing

- Total number of production tanks to be cleaned and the total pipelines
- Each tank dimension / volume
- Worst case duty per tank in terms of cleaning the production tanks
- Total number of tanks to be cleaned at anyone time
  - If you have a production area – list it as AREA 1 (3 tanks), AREA 2 (4 Tanks) etc..
  - In which case you can organise a clean on demand of a production AREA
- Existing “spare tanks” for CIP system if applicable
- Existing “spare pumps” for CIP system if applicable

CIP Area to be mapped out

- Total tanks in production
- Space for skid to be installed
- Services available
- Total pipeline
- Total equipment to be cleaned
- Water recovery
- Example shown

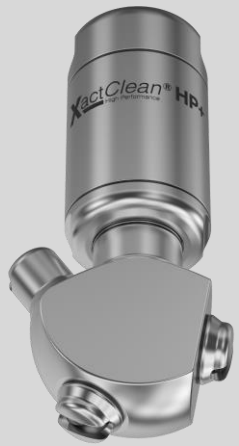

CIP Delivery
CIP Skid
Area A
Product 123
Syrup make up
Filling line reserve
Syrup make up 2
CIP Drain
Area B
Product 456
Syrup make up
Filling line reserve
Syrup make up 2
CIP Drain
Area C
Product 789
Syrup make up
Filling line reserve
Syrup make up 2
CIP Drain
CIP Delivery
Drain
Recovery
CIP Delivery
Area D
Product 123
Syrup make up
Filling line reserve
Syrup make up 2
CIP Drain
Area E
Product 123
Syrup make up
Filling line reserve
Syrup make up 2
CIP Drain
Area F
Product 123
Syrup make up
Filling line reserve
Syrup make up 2
CIP Drain
Drain

CIP Loop comment

- The main aim is to provide a CIP loop that can be tapped into per AREA and apply the cleaning steps in each tank as necessary
- A recovery loop is an option to save water, this is used on the first rinse of the next cycle and rinses to drain there after

Series 569

Series 5S2



Series 5M!

<u>Tank Cleaning Option</u> 1, 2& 3 – if the product is easily removed / washed down

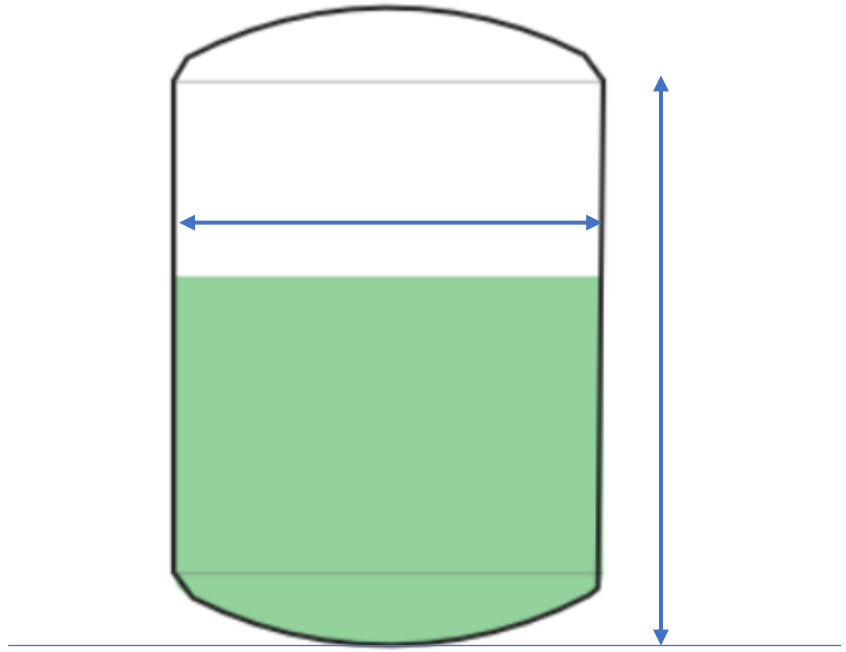
- Lechler Series 5S2 – Rotating head
  - Class 4 cleaning
  - Consumption 40 lpm
  - Medium to larger tanks or stubborn product
- Lechler Series 569 – Rotating head
  - Class 3 cleaning
  - Small to medium tanks
- Lechler Series 5MI – Rotating head
  - Class **2** cleaning
  - Smaller droplet sizes but more cost effective
  - Smaller tanks or easily removed soiling

General Tank dimensions ASME80/20 design – example of 5000 litre tank

Key dimension is the tank diameter to calculate best throw of the liquid for cleaning purposes

Filled Volume	3.3292	m^3
Total Volume	5.6788	m^3
Inside Dish Depth (a)	296.34	mm
Dish Radius (fD)	1750.00	mm
Knuckle Radius (kD)	105.00	mm

Sketch



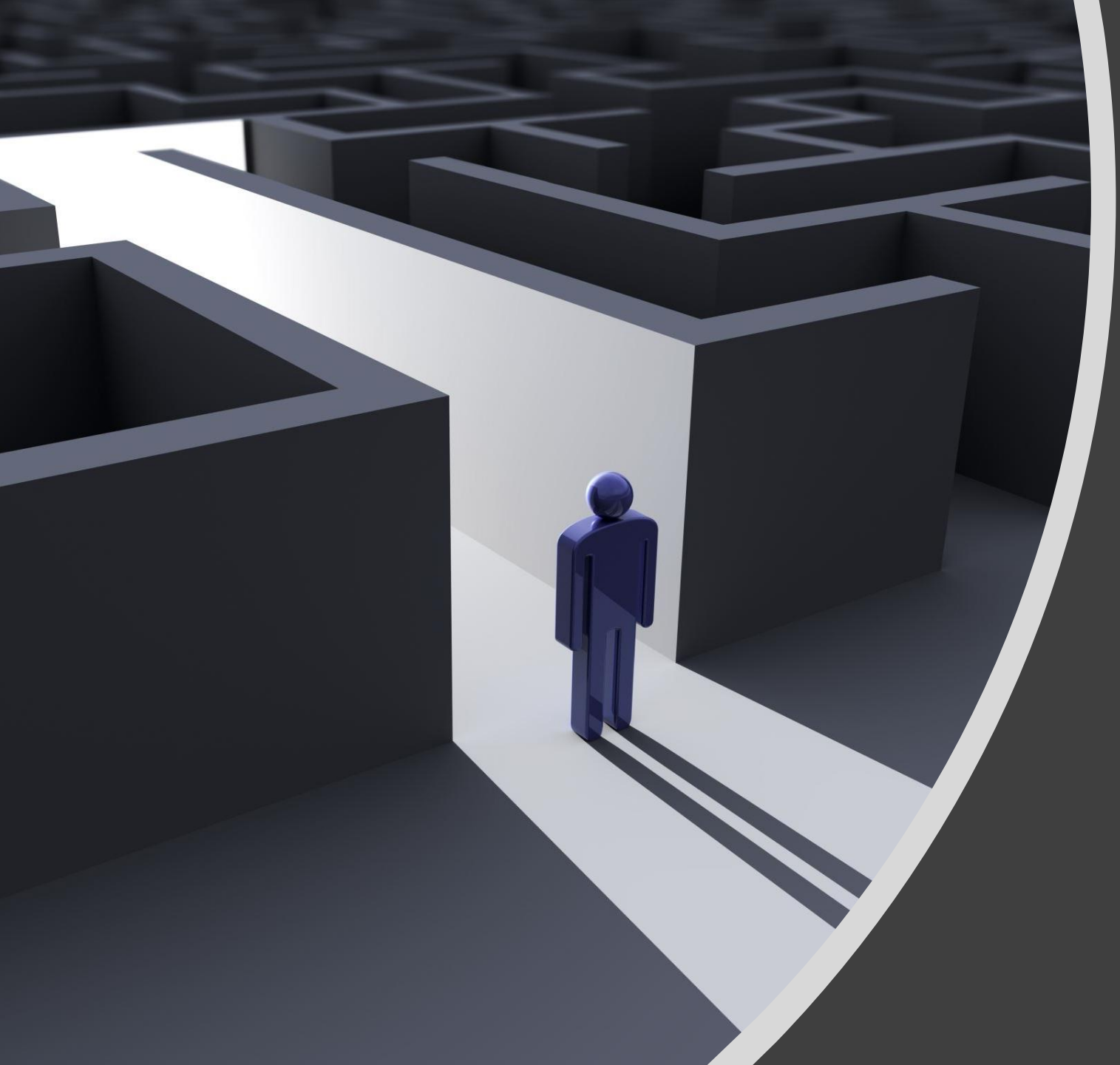
Clean in Place Skid – Options + calculations

- The number of tanks to be cleaned and pipeline allows the total consumption calculation & therefore capacity of the skid required
- Multi-tank available, water recovery and full automation – including for ATEX areas
- Mobile skid available but note limited capacity

Inoxpa fixed CIP Skid – Sized up based on single or multi line cleaning requirements

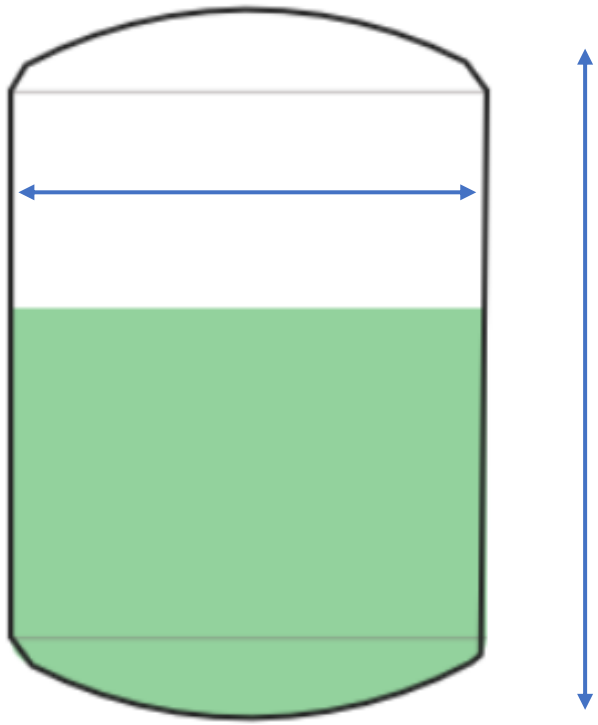
Valve manifold – Flexibility in distribution

- This depends on the number of tanks feeding production, the number of return lines and if you include a CIP line



Guide questions to enable selection

Sketch



Tanks

- What is the total quantity tanks ?
- What are the tank volumes per tank ?
- What are the tank diameters per tank
- What tanks have agitators ?
- What is the most difficult product for cleaning in each tank?
- Are there existing spray balls on these tanks?
- What are the distances between the tanks and proposed CIP Station?
- How many tanks do you wish to clean at a time
  - Example- in sequence or on demand

Cleaning Cycle

- What cleaning cycles are involved?
  - Rinsing
  - Hot wash
  - detergent wash
  - disinfectant wash
  - hot rinse
  - cold rinse
- what is the typical time for each of these cycles that are used in minutes ?
- do you plan on water recovery?
- Do you want this process automatic or semi automatic?
- Is this a safe area or ATEX ?
- will the pipeline also be cleaned?
  - What is the nominal bore of the pipeline loop?
  - Estimated meterage and estimated number of fittings involved
  - will the pipeline also have the same cleaning cycle as the tanks

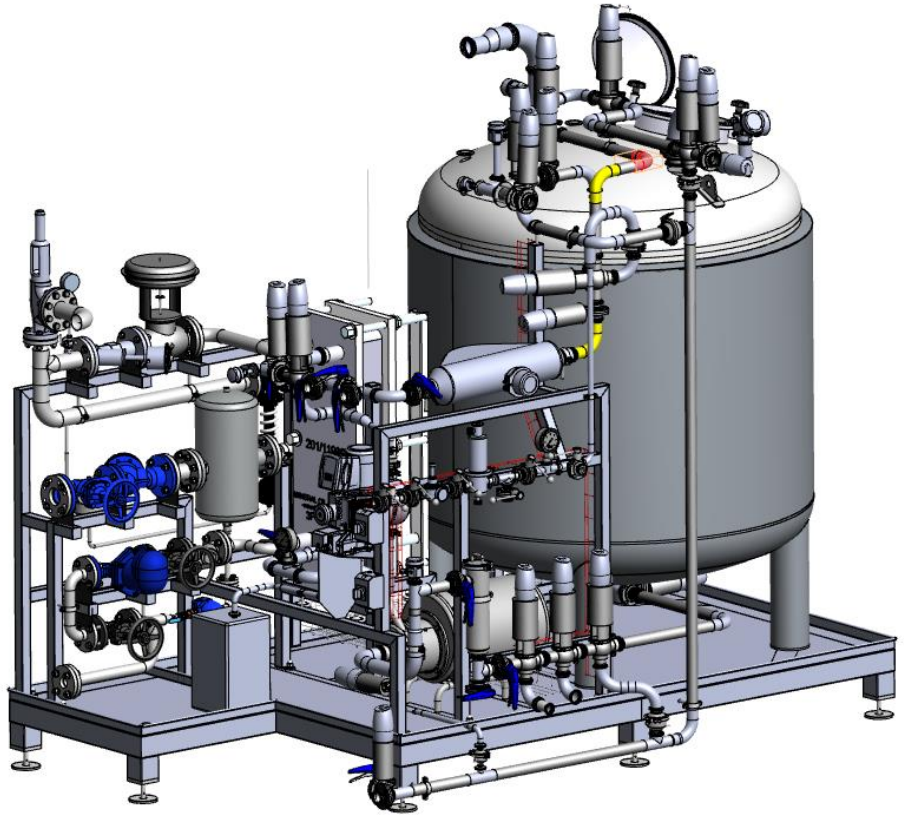
Specifications - General

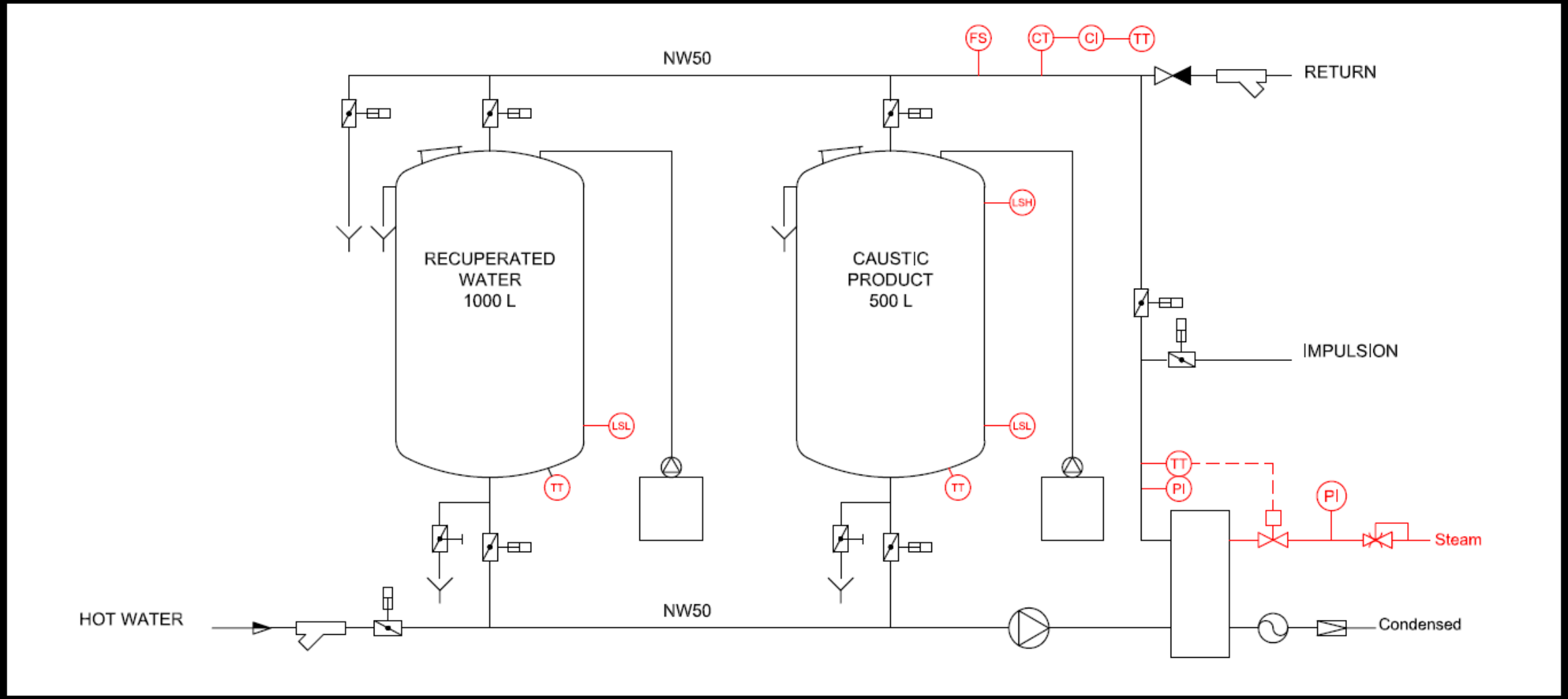
- Automatic or semi automatic
- HMI display - yes or no
- Elastomers - options generally are EPDM or Viton
- Operating temperature for the Hot rinse - 80°C
- Number of cycles in total and time per cycle
- Physical space available for this skid - width, height, length in meters
- Electrical, steam & Water services available for the skid

Sample calculation

- 5 tanks
- 3 minute cycle x 40 litre per minute
- Cleaned in sequence = single line CIP
- 4 cycles – Rinse, Hot Wash, Detergent, Rinse = 2400 litres ±
  - Allow also for pipeline requirements
- Suggests timeline = 1 hour for total cleaning between products for all 5 tanks or 12-15 mins per tank in sequence
- Queries
  - How quickly can you refill the cold tank
  - How quickly can you refill the hot tank or heat from cold to 80°C

Single or Multi tank are no problem





A P&ID will be provided – We just agree on the conditions