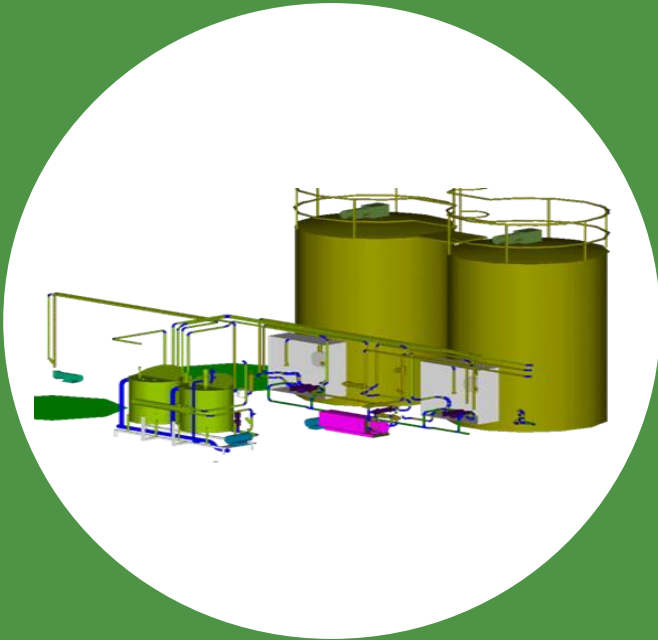




Shanghai *Mainflo* Control Engineering Co., Ltd.



Bulk Tank Inventory Management System

2019

Outlines

- Benefits
- Various designs of BTS
- Project schemes in the past
- Installation examples in China
- Main parts of the BTS
- Some design details of the BTS
- HMI screenshots of the BTS
- Data reports of the BTS
- Total solution for AT88 application
- Extended application, VMI and future plan

Different Types of Package



250 kg, Drum



1,200kg, IBC Tank



ISO Tank(23-24 tons)

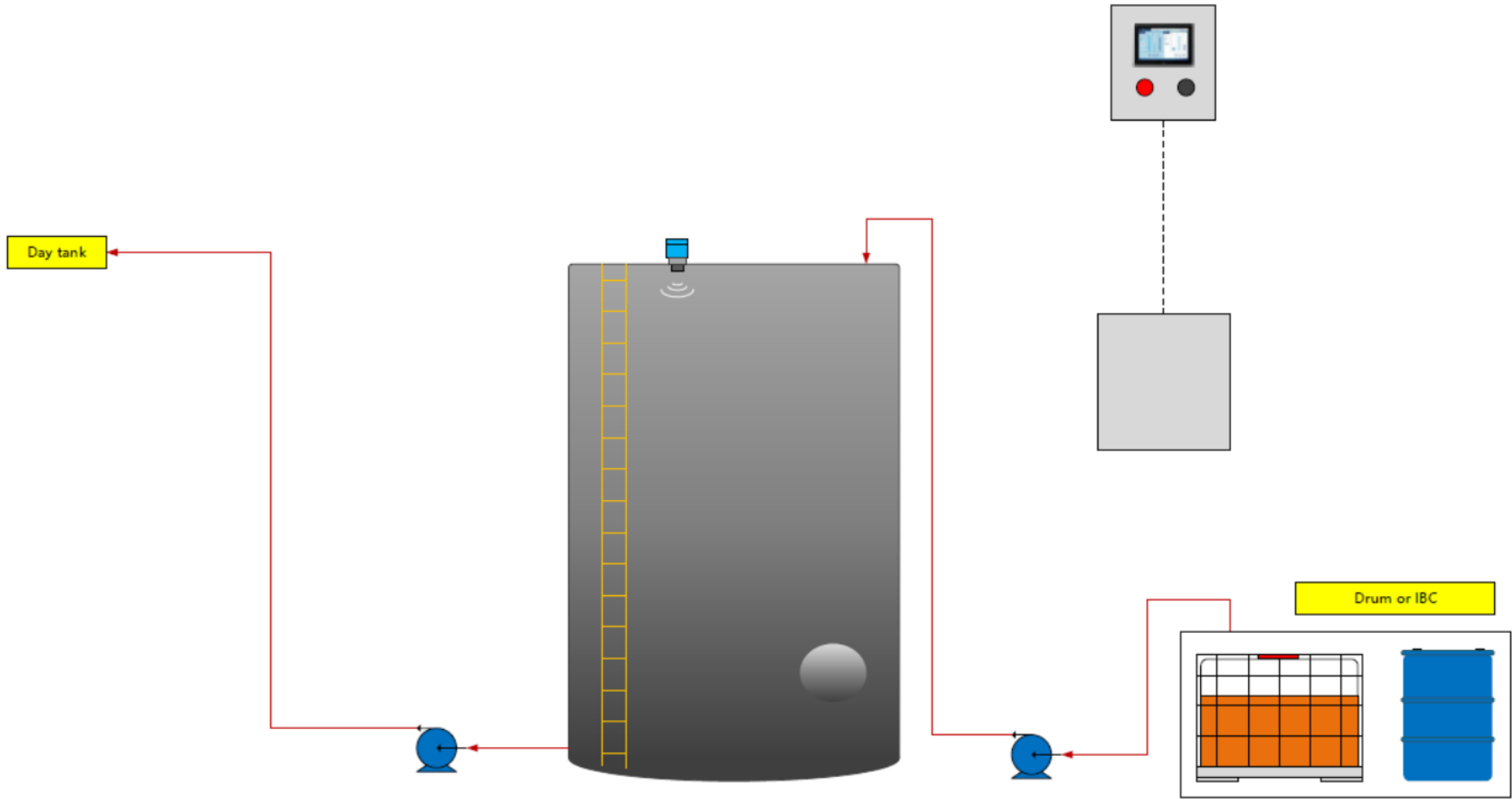
How to deal with those disposals?



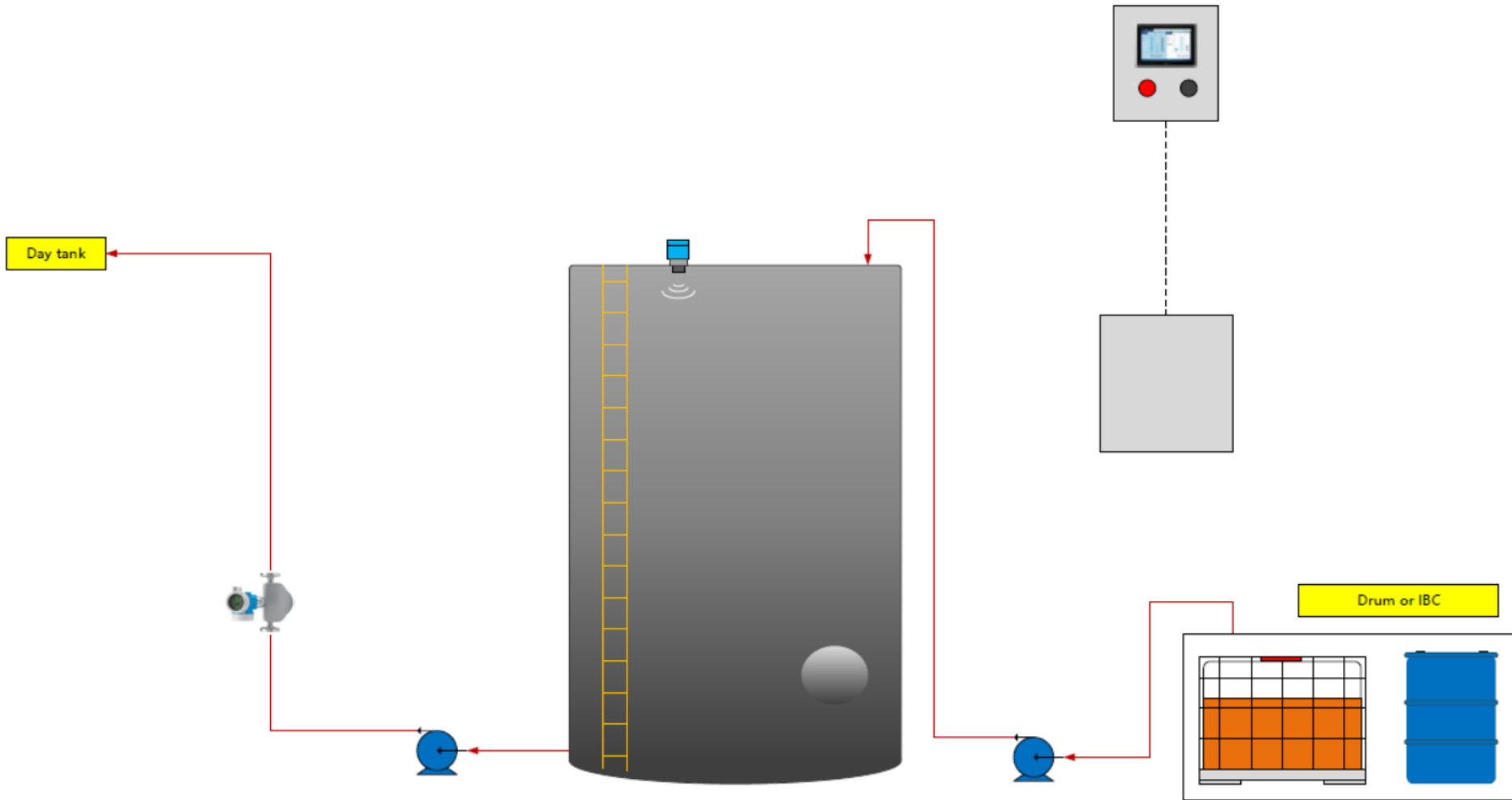
Benefits

- **Environment Friendly:** No package disposal, no pollution
- **Safety:** Less chance to touch the liquid for the workers
- **Save labor cost:** No need to move the drum or IBC tank, no need to arrange the liquid loading into the day tank
- **No residue in packages:** Average 0.5-0.7kg for a drum, 2.0-2.8kg for an IBC tank
- **Less operation error:** Automatic liquid delivery without manual operation error
- **Inventory report:** day/month/annual data report of receive and delivery, real-time available stock

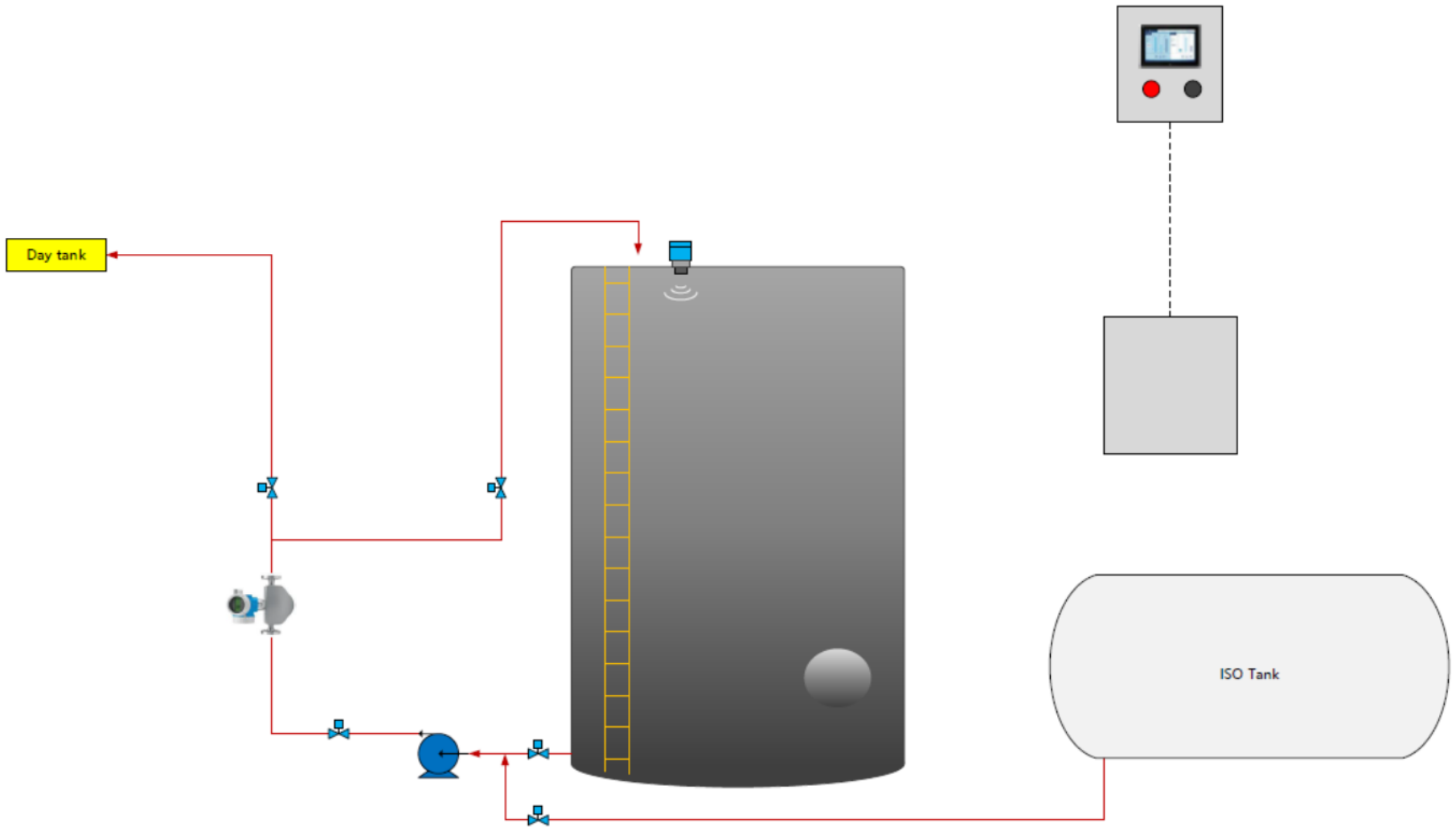
Various design of BTS: #1



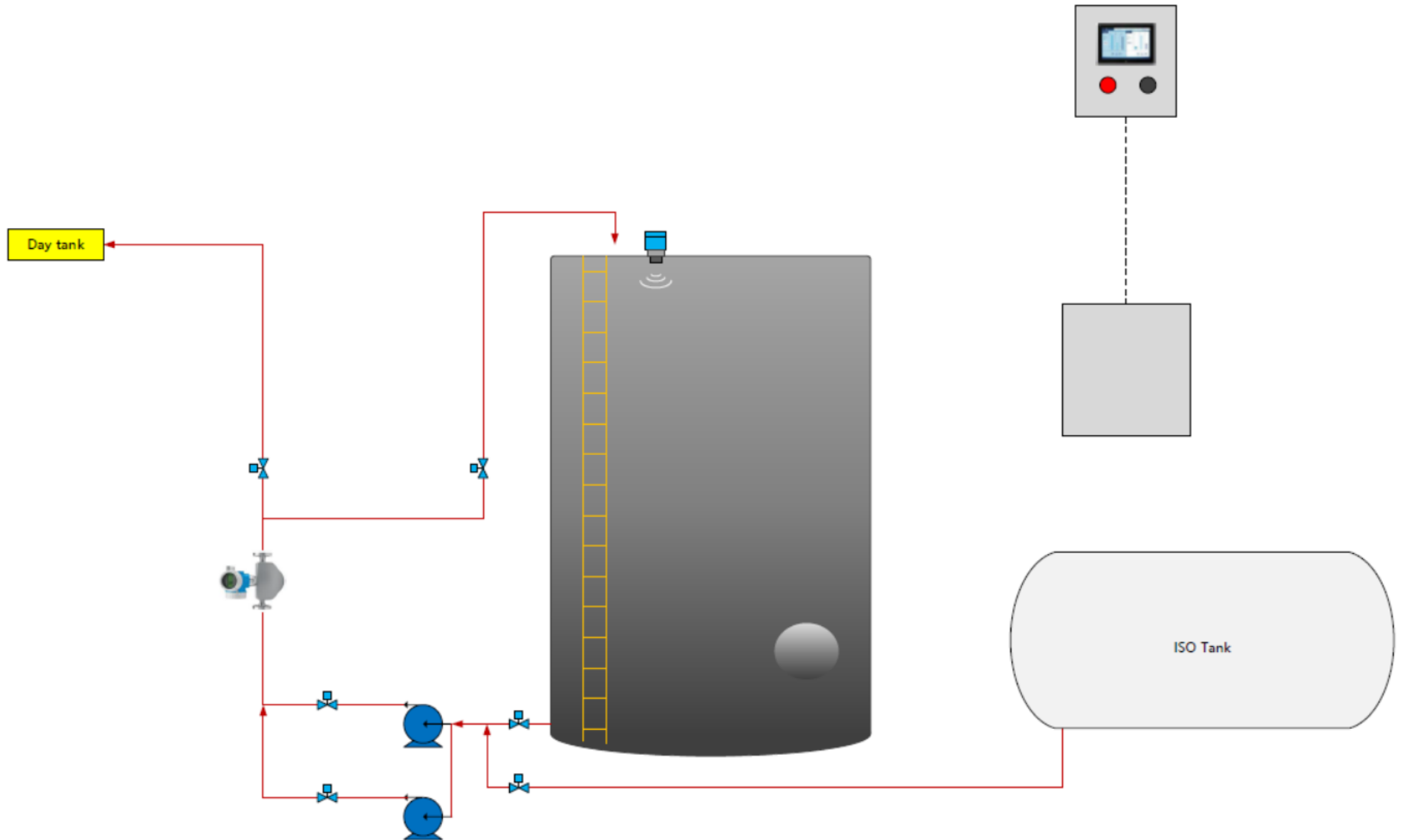
Various design of BTS: #2



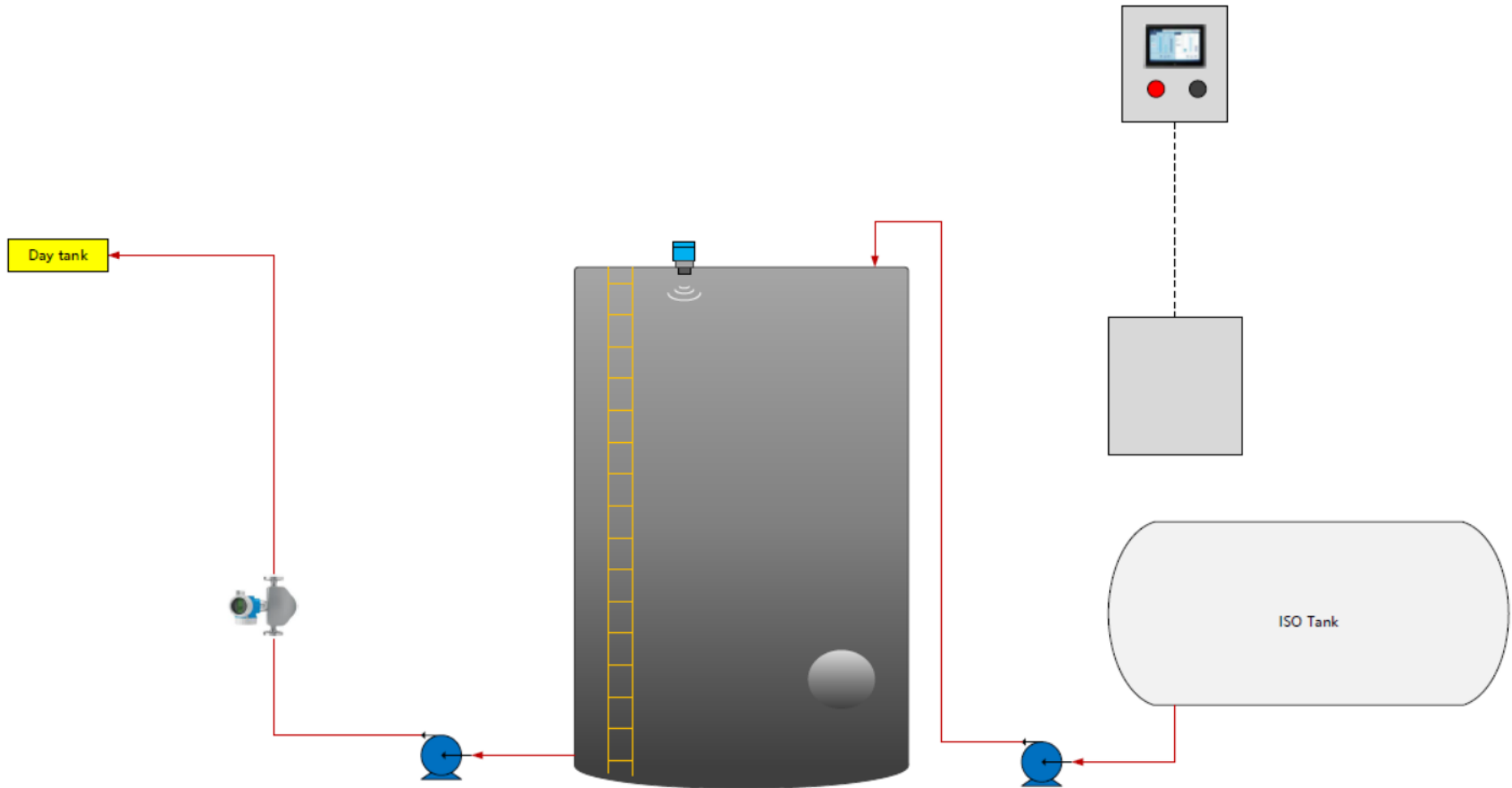
Various design of BTS: #3



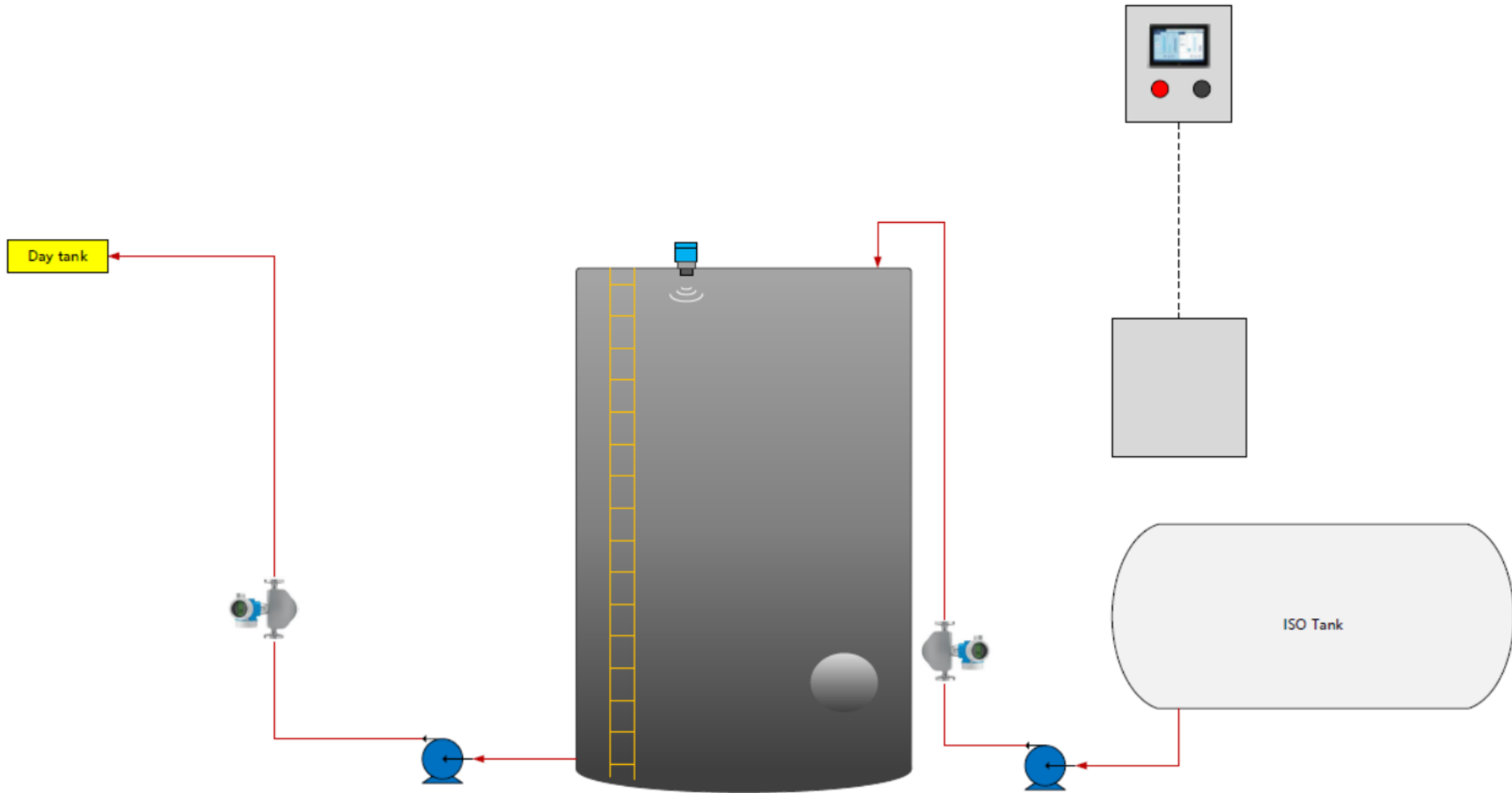
Various design of BTS: #4



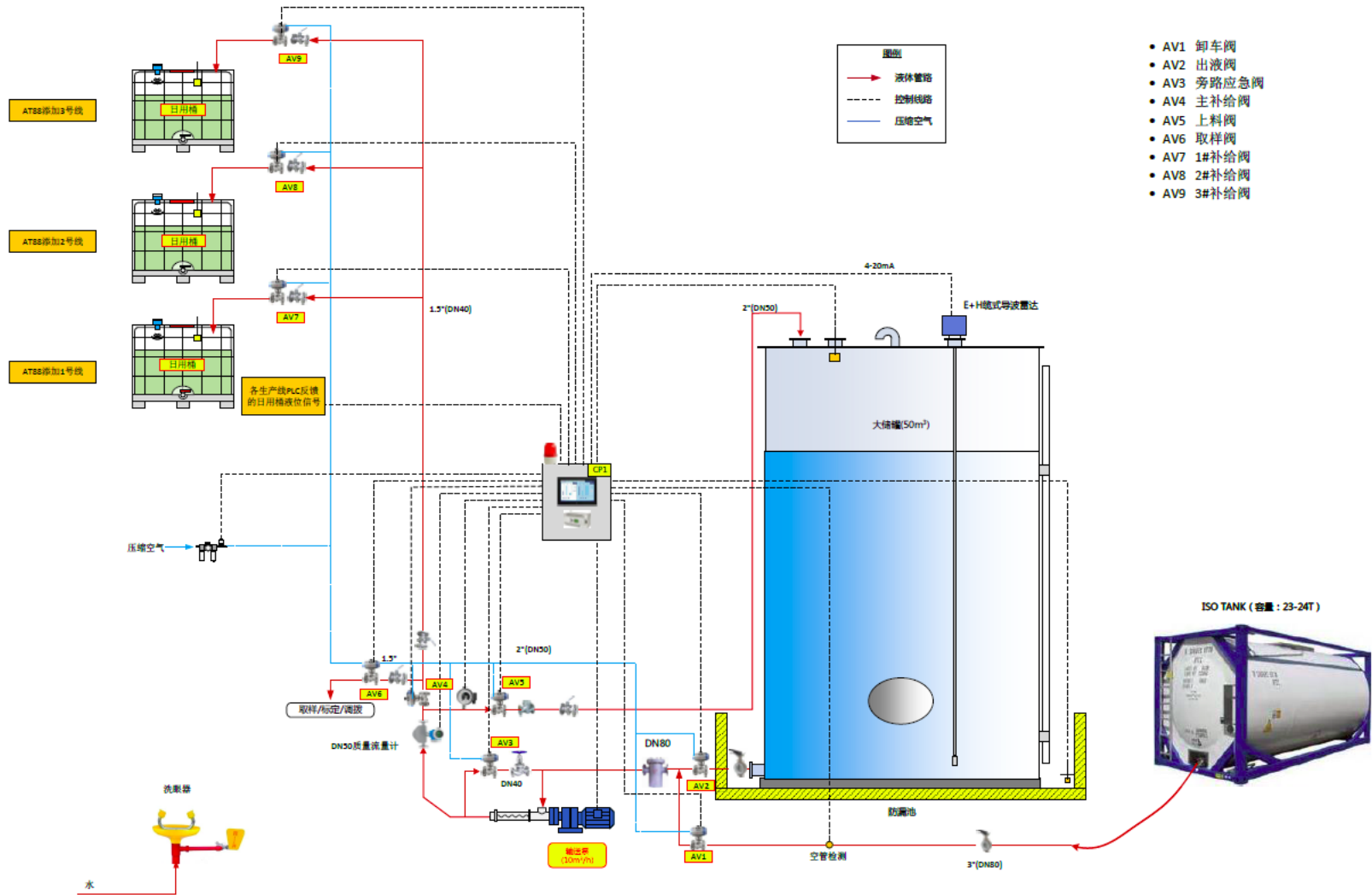
Various design of BTS: #5



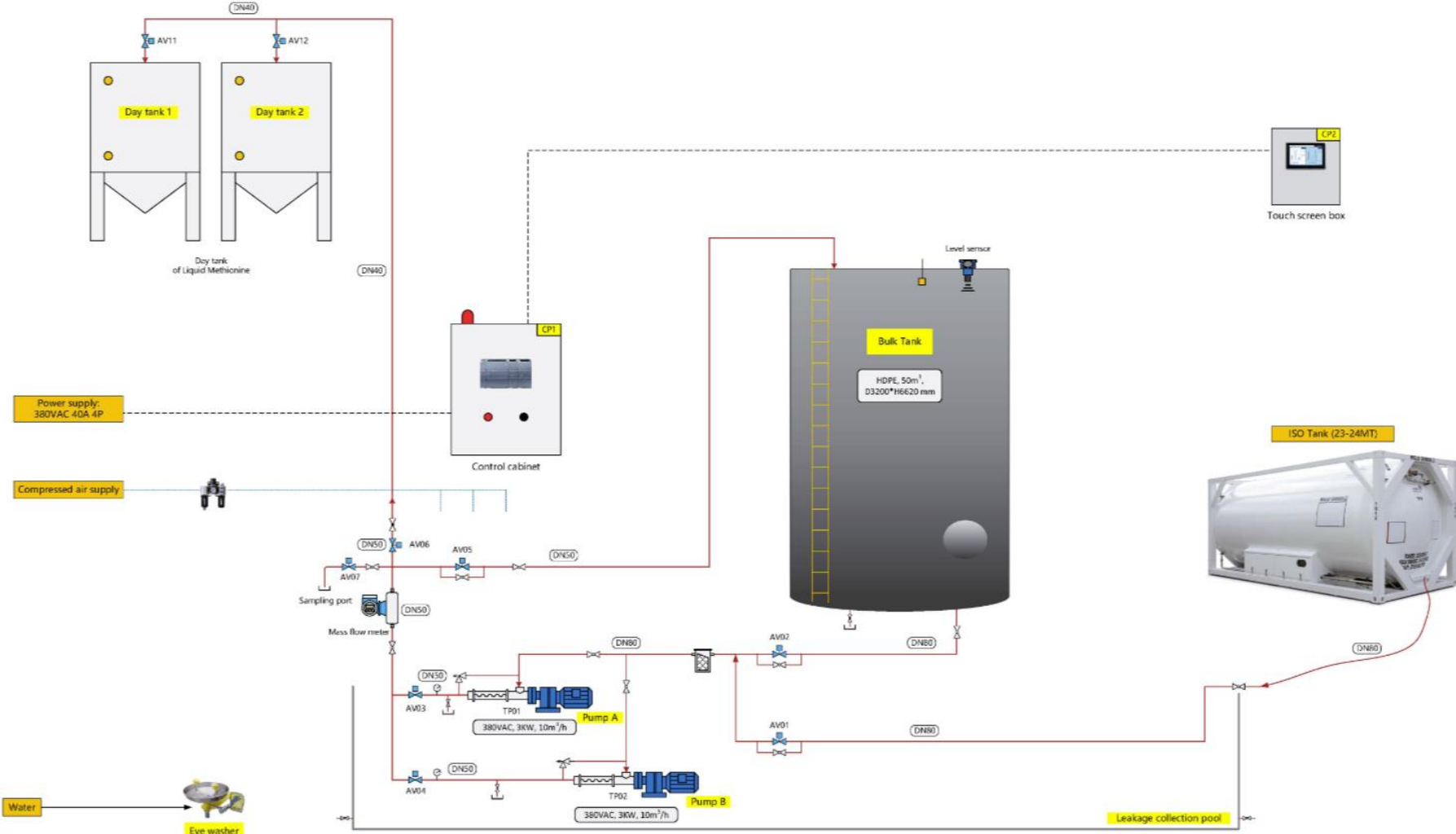
Various design of BTS: #6



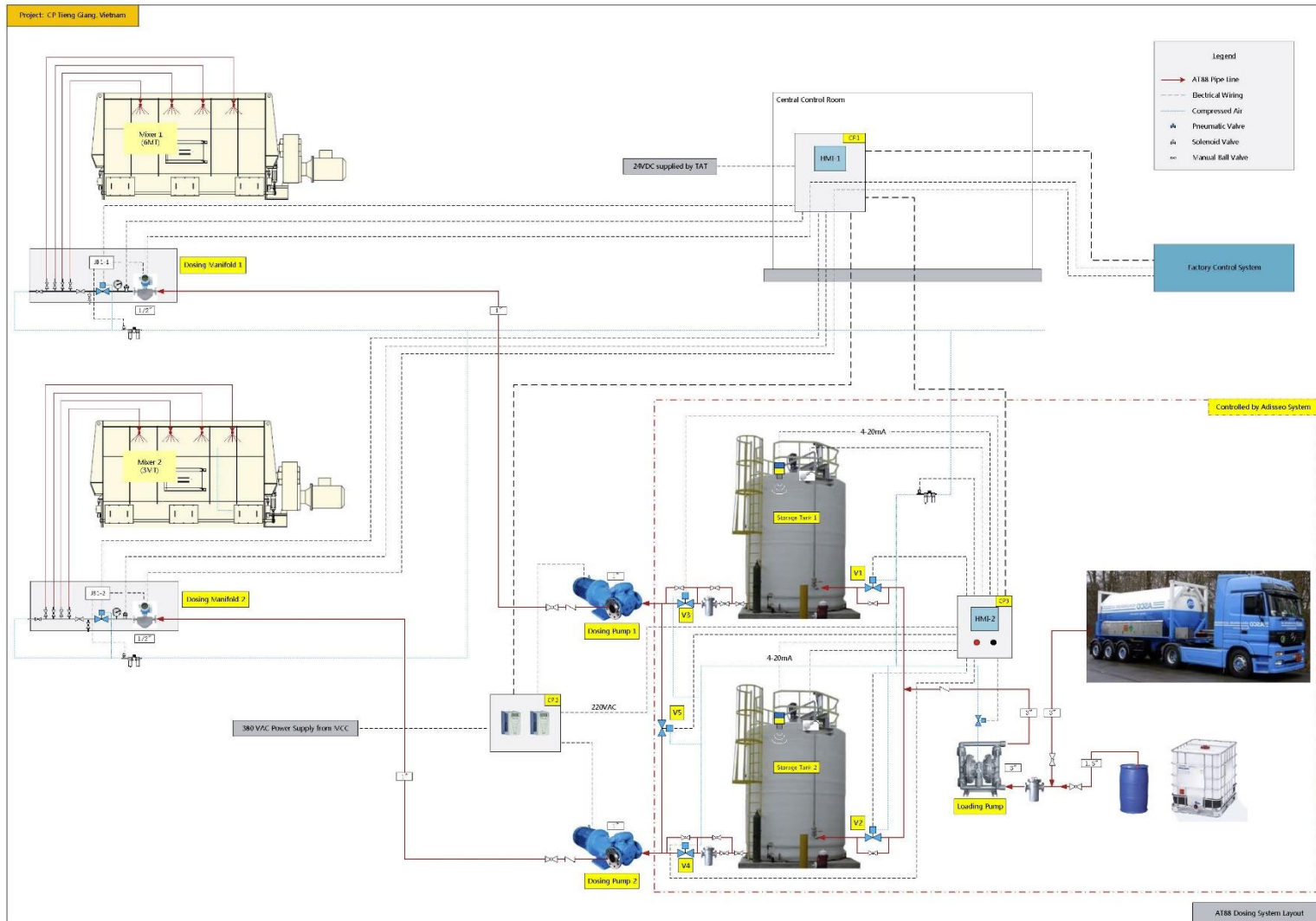
Project scheme 1 (design #3)



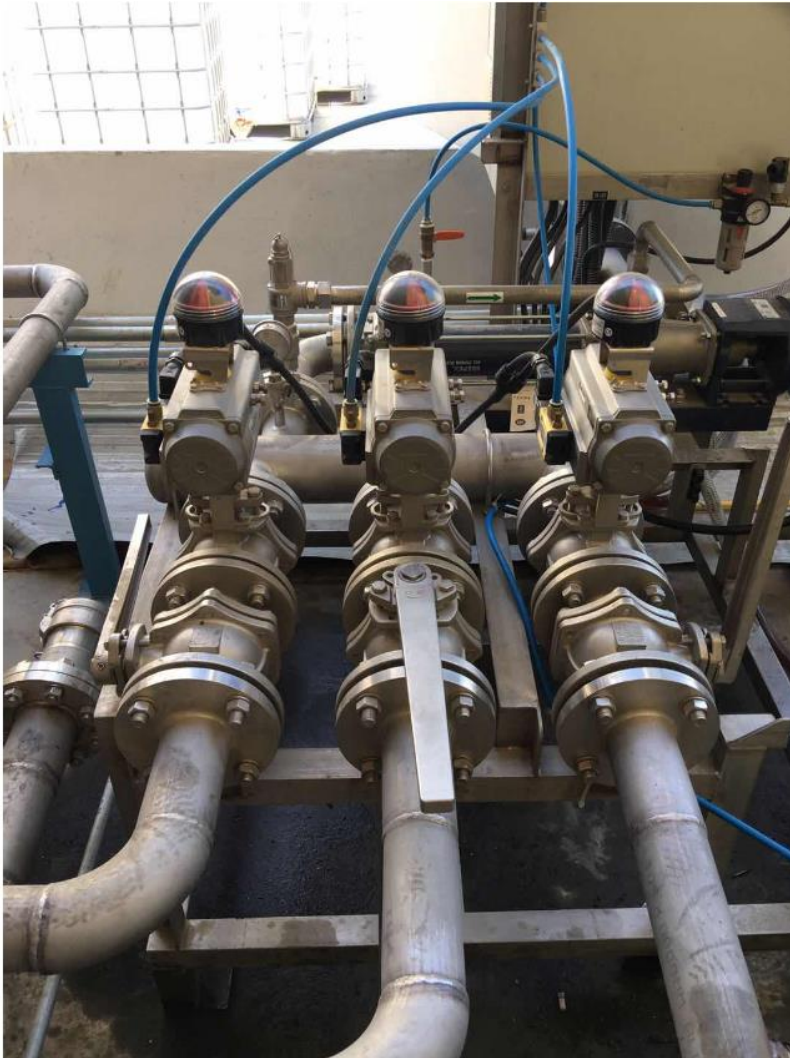
Project scheme 2 (design #4)



Project scheme 3 (Bulk tank dosing)



Project in Thailand



Project in Malaysia



Project in India



Project in China



Project in China



Project in China



Project in China

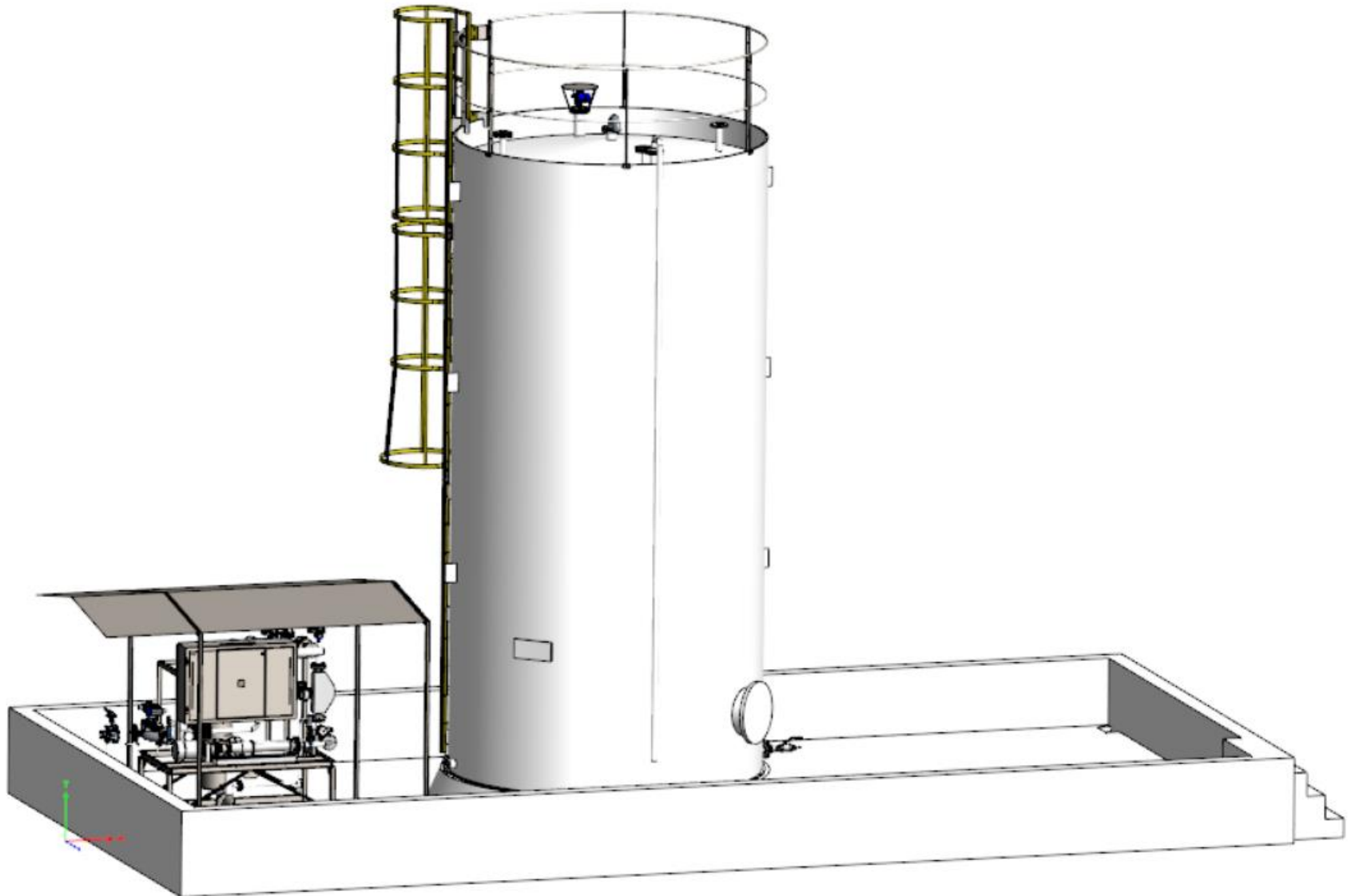


Main Components BTS



- Spill bunding and tank base
- Bulk tank with ladder and top fence
- Bulk tank High level switch
- Bulk tank Level sensor
- Pump station with pump and filter
- Flow meter(mass or volume)
- Pneumatic valves and Manual valves
- Electrical control cabinet
- HMI touch panel
- Notice board of operation and safety instruction
- Eye washer(&shower) with water supply
- Other accessories e.g. Pipes and flanges, Hose and clamps

Construction: 3D design

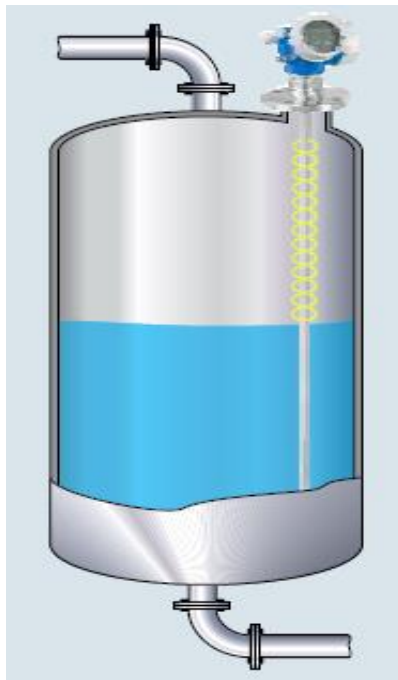


Bulk tank



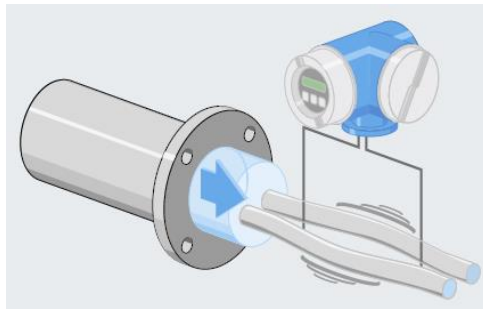
- Material: HDPE, with high mechanical strength, tough and non-corrosion ,working temperature $-30^{\circ}\text{C}\sim 50^{\circ}\text{C}$
- Capacity: $30\sim 50\text{m}^3$
- Size: Height $5\sim 6\text{m}$, diameter $2.5\sim 3.2\text{m}$
- With float level indicator
- With ladder and top fence

Level sensor for bulk tank



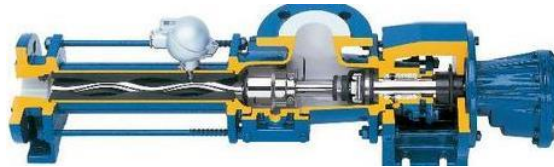
- Detect the tank level and estimate current stock volume
- Two options:
- Guided radar level meter with rope immersing into the liquid
- Radar level meter without rope
- More reliable than ultrasonic level sensor,
Less disturbance from dust or condensation

Mass flow meter



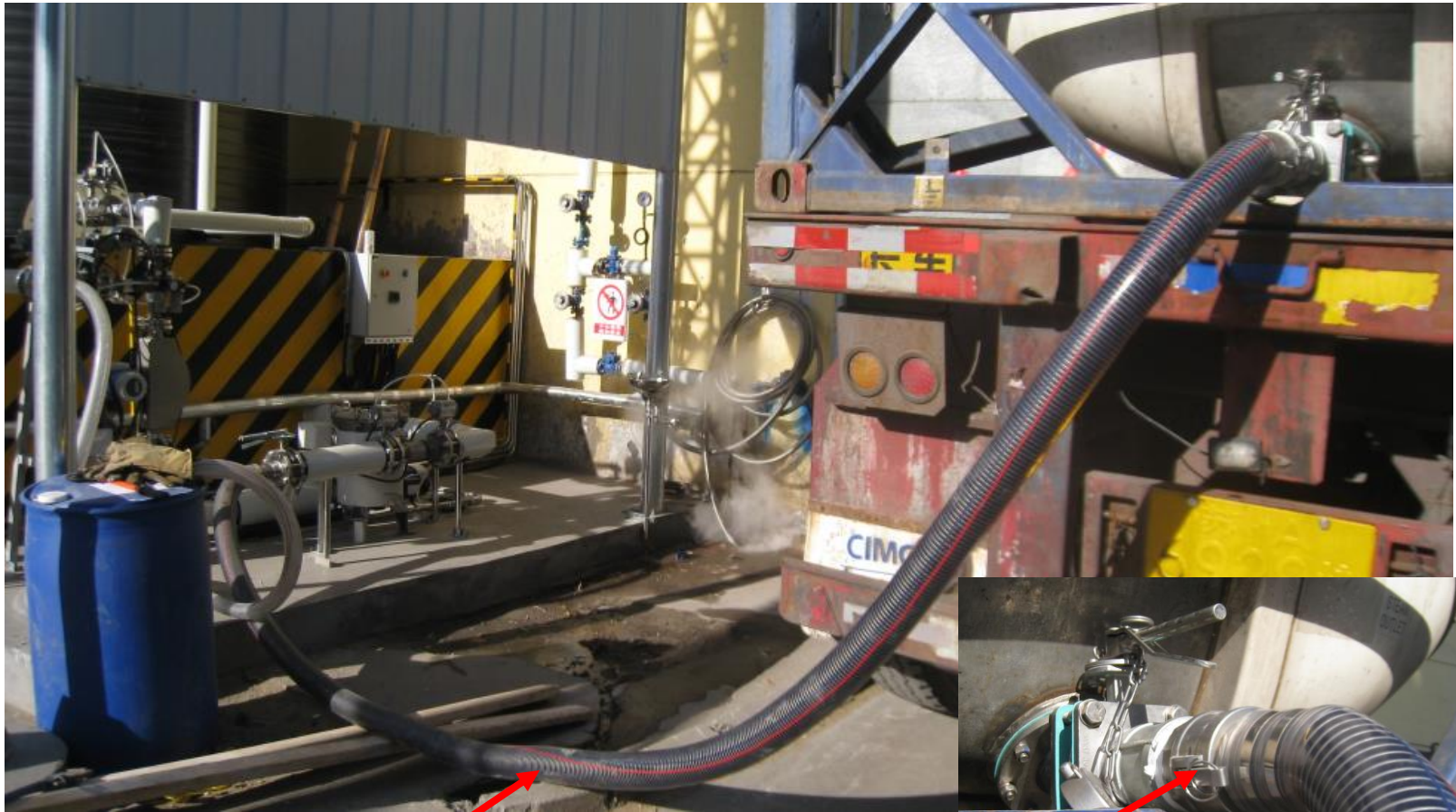
- Meter the received & delivered volume, and generate In & Out data report
- Mass flow meter can reach the accuracy of $\pm 0.2\%$
- Need correct installation, recommend vertical upwards flow direction
- Support RS-485 MODBUS communication & pulse signal

Pump selection



- Screw pump or lobe pump
- High stability , long life and low noise
- Good at High viscosity material
- Capacity >10m³/h, ensure receiving time approx. 2 hours for each ISO tank
- Motor power: approx.3kw
- Pump material: SS316

Details – connection when receiving



Receiving hose, 3"

Camlock
quick connector

Details – receiving hose protection



Hose protection pipe

Put the unloading(receiving) hose into the pipe to protect it from dust or mess.

Details – receiving hose protection



- Real-time communication between the BTS and dosing machine
- BTS start delivering liquid into the dosing tank which was found at low level, and stop at high level
- Delivery volume & time limit to avoid overflow
- Valves status feedback detection, trigger alarm when abnormal

Details – stock setting parameters

- Max stock volume(warehouse capacity)
- The maximum capacity of the liquid warehouse.
- Re-order stock volume
- Notify the operator to request a new order to ensure the supply.
- Min stock volume(safety stock)
- Trigger stock level low alarm as an urgent request.

System Control

- Integrated or distributed PLC control
- PC SCADA or touchscreen HMI
- Automatic control of loading and dosing
- Comprehensive report by batch/day/month/year
- Open to link with formula system



Data reports

- ❑ BTS is designed as an automatic liquid warehouse with inventory management , it generates various data reports as following:
 - ✓ Receiving batch report, month report and annual report;
 - ✓ Delivery day report, month report and annual report;
 - ✓ Allocation & return day report, month report and annual report;
 - ✓ General month/annual report with both IN and OUT data;
- ❑ Data report can be exported as Excel format file, convenient for further analysis.

Receiving(IN) batch report

Shanghai Mainflo Home Login 2015/9/11 13:49:01

Report Batch In Report

Main

Trend

Alarm

Calibrate

Report

Setting

About

No.	Date	Start time	Stop time	Shipment(T)	Actual (T)	Deviation(kg)	Deviation(%)
1	0 -00 -00	00 : 00 : 00	00 : 00 : 00	0.000	0.000	0.00	0.00
2	0 -00 -00	00 : 00 : 00	00 : 00 : 00	0.000	0.000	0.00	0.00
3	0 -00 -00	00 : 00 : 00	00 : 00 : 00	0.000	0.000	0.00	0.00
4	0 -00 -00	00 : 00 : 00	00 : 00 : 00	0.000	0.000	0.00	0.00
5	0 -00 -00	00 : 00 : 00	00 : 00 : 00	0.000	0.000	0.00	0.00
6	0 -00 -00	00 : 00 : 00	00 : 00 : 00	0.000	0.000	0.00	0.00
7	0 -00 -00	00 : 00 : 00	00 : 00 : 00	0.000	0.000	0.00	0.00
8	0 -00 -00	00 : 00 : 00	00 : 00 : 00	0.000	0.000	0.00	0.00
9	0 -00 -00	00 : 00 : 00	00 : 00 : 00	0.000	0.000	0.00	0.00
10	0 -00 -00	00 : 00 : 00	00 : 00 : 00	0.000	0.000	0.00	0.00
11	0 -00 -00	00 : 00 : 00	00 : 00 : 00	0.000	0.000	0.00	0.00
12	0 -00 -00	00 : 00 : 00	00 : 00 : 00	0.000	0.000	0.00	0.00

Export Monthly Annual

In Report Out Report Other Out Report General Report Maintenance

Receiving(IN) month report

Shanghai Mainflo

Home Login

2015/9/11 14:01:52

Report Monthly In Report

Month	Shipment(T)	Actual(T)	Deviation(kg)	Deviation(%)
1	0.000	0.000	0.00	0.00
2	0.000	0.000	0.00	0.00
3	0.000	0.000	0.00	0.00
4	0.000	0.000	0.00	0.00
5	0.000	0.000	0.00	0.00
6	0.000	0.000	0.00	0.00
7	0.000	0.000	0.00	0.00
8	0.000	0.000	0.00	0.00
9	0.000	0.000	0.00	0.00
10	0.000	0.000	0.00	0.00
11	0.000	0.000	0.00	0.00
12	0.000	0.000	0.00	0.00
Total	0.000	0.000	0.00	0.00

Main

Trend

Alarm

Calibrate

Report

Setting

About

Batch

Annual

Export

In Report Out Report Other Out Report General Report Maintenance

Delivery(OUT) day report

Shanghai Mainflo Home Login 2015/9/11 13:49:30

Report Daily Out Report (1-12)

Main

Trend

Alarm

Calibrate

Report

Setting

About

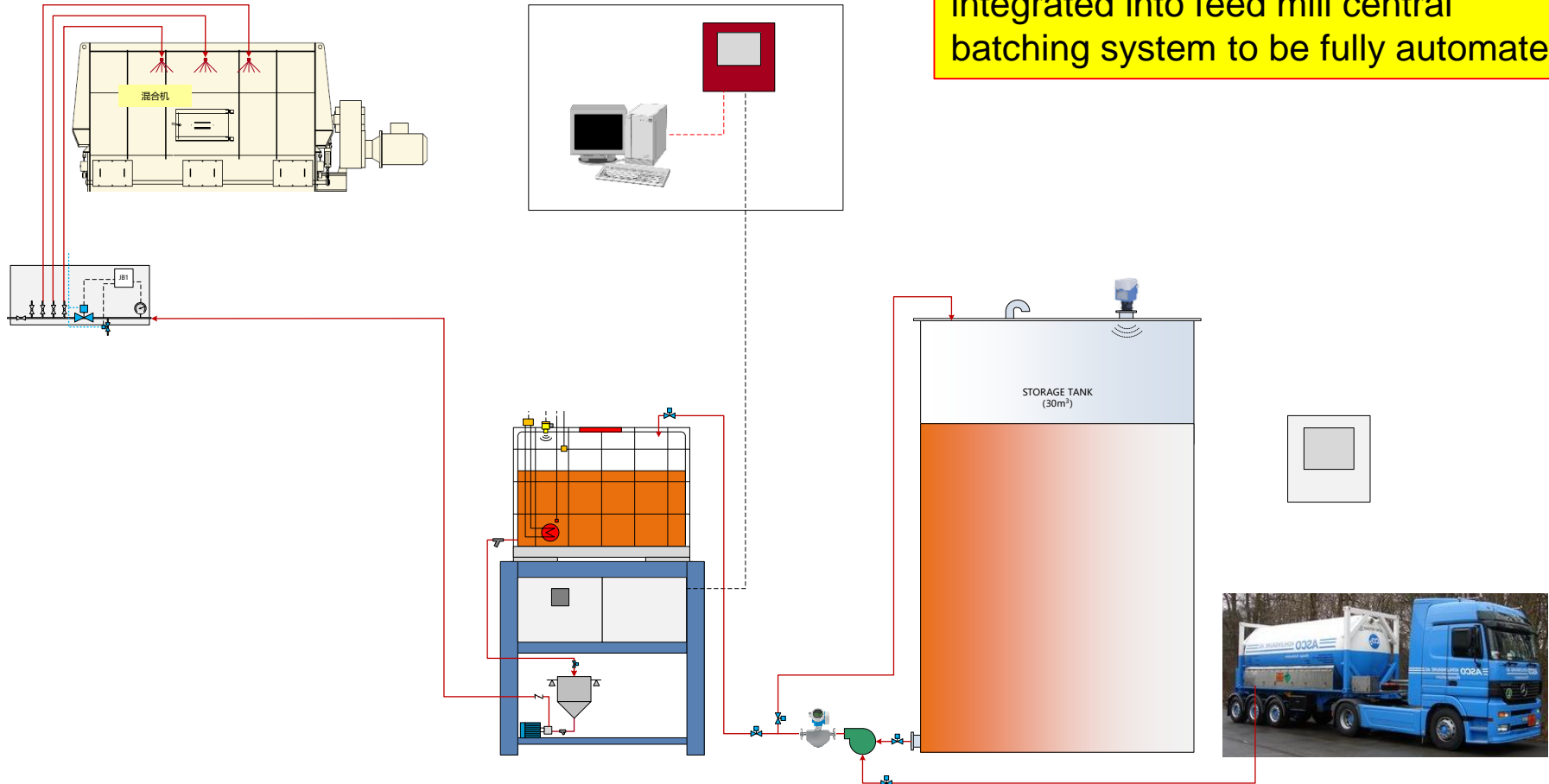
Date	To 1#(T)	To 2#(T)	To 3#(T)	To 4#(T)	To 5#(T)	Total(T)
1	0.000	0.000	0.000	0.000	0.000	0.000
2	0.000	0.000	0.000	0.000	0.000	0.000
3	0.000	0.000	0.000	0.000	0.000	0.000
4	0.000	0.000	0.000	0.000	0.000	0.000
5	0.000	0.000	0.000	0.000	0.000	0.000
6	0.000	0.000	0.000	0.000	0.000	0.000
7	0.000	0.000	0.000	0.000	0.000	0.000
8	0.000	0.000	0.000	0.000	0.000	0.000
9	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000
11	0.000	0.000	0.000	0.000	0.000	0.000
12	0.000	0.000	0.000	0.000	0.000	0.000

13-24 25-31 Export... Monthly Annual

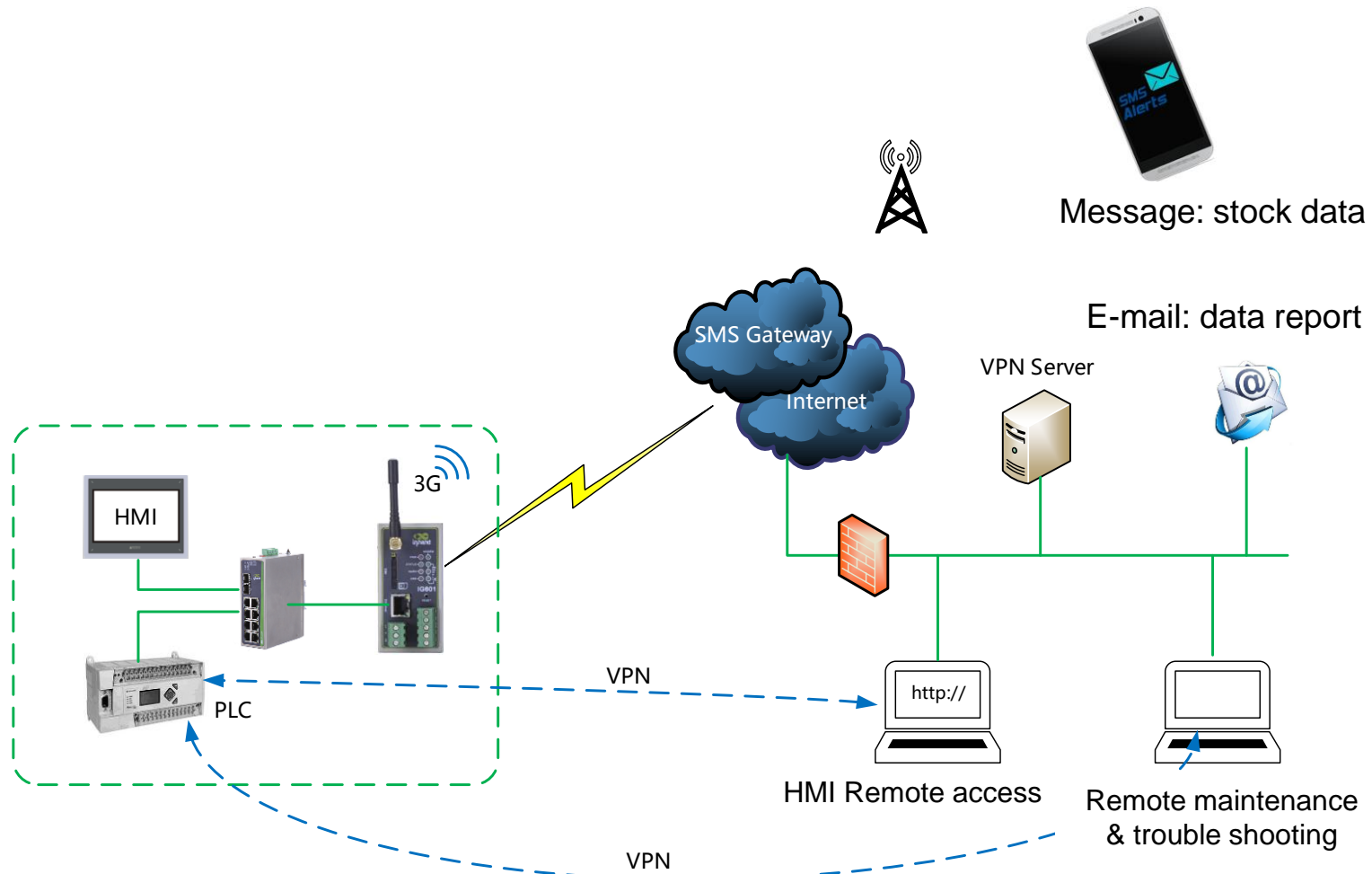
In Report Out Report Other Out Report General Report Maintenance

Total solution Batch Liquid Dosing

Batch dosing applicator can be integrated into feed mill central batching system to be fully automated



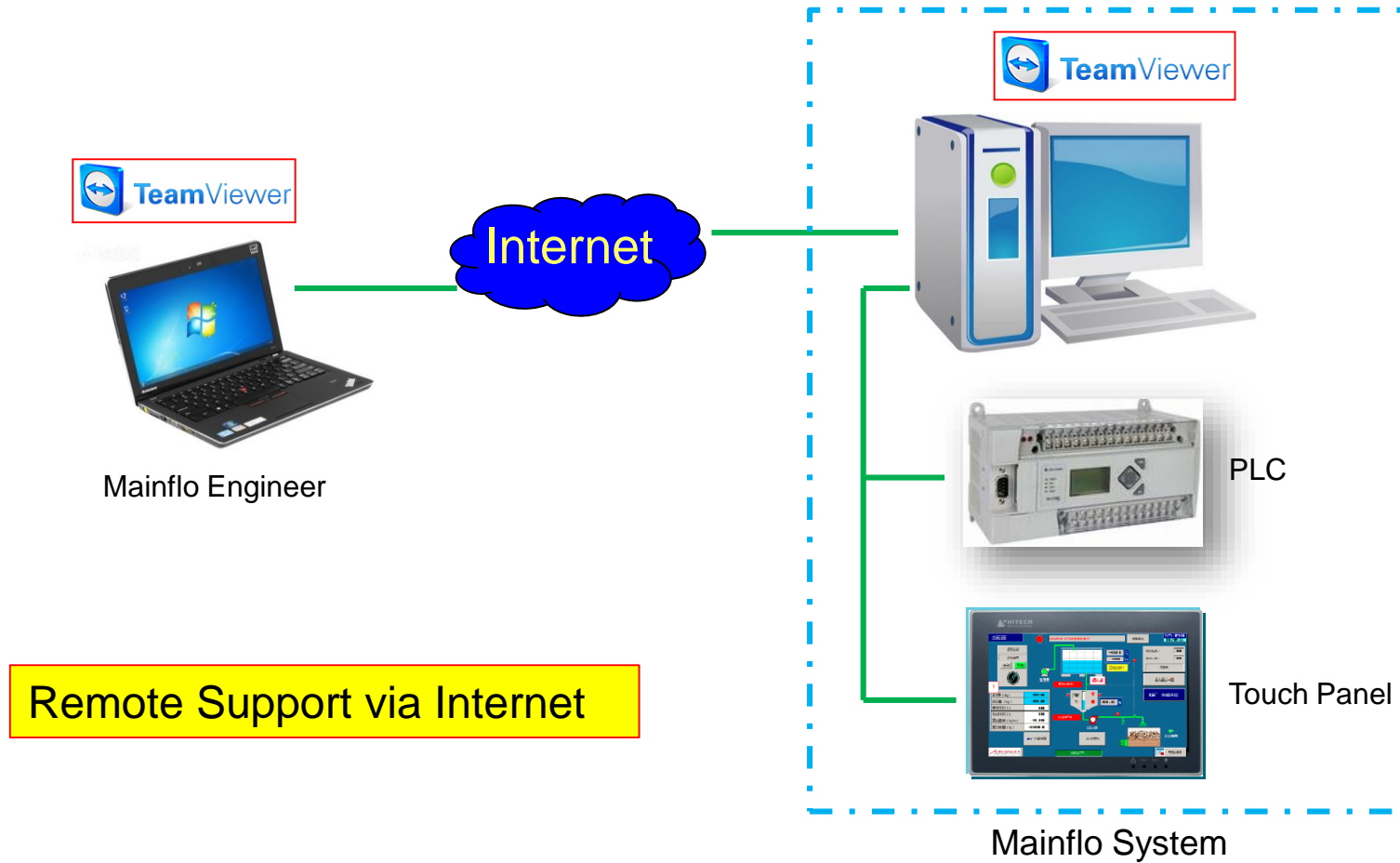
Extended application and VMI



Extended application and VMI

- Based on 3G/4G mobile network technology, via 3G/4G gateway, the data in the BTS controller can be accessible in the following way.
 - ✓ **E-mail:** BTS controller can send short text mail to report whatever data you care, which makes it easy for people faraway to know exact about the stock.
 - ✓ **SMS:** People can send message to a specific mobile phone number to request data from the BTS, also a specific condition(e.g. alarm) may trigger a message to be sent to a phone number preset into the gateway.
- Through above methods, logistics can track the customer's stock and manage it accordingly to avoid supply shortage, therefore, it can reach the initial stage of VMI.

Our Remote Support Services



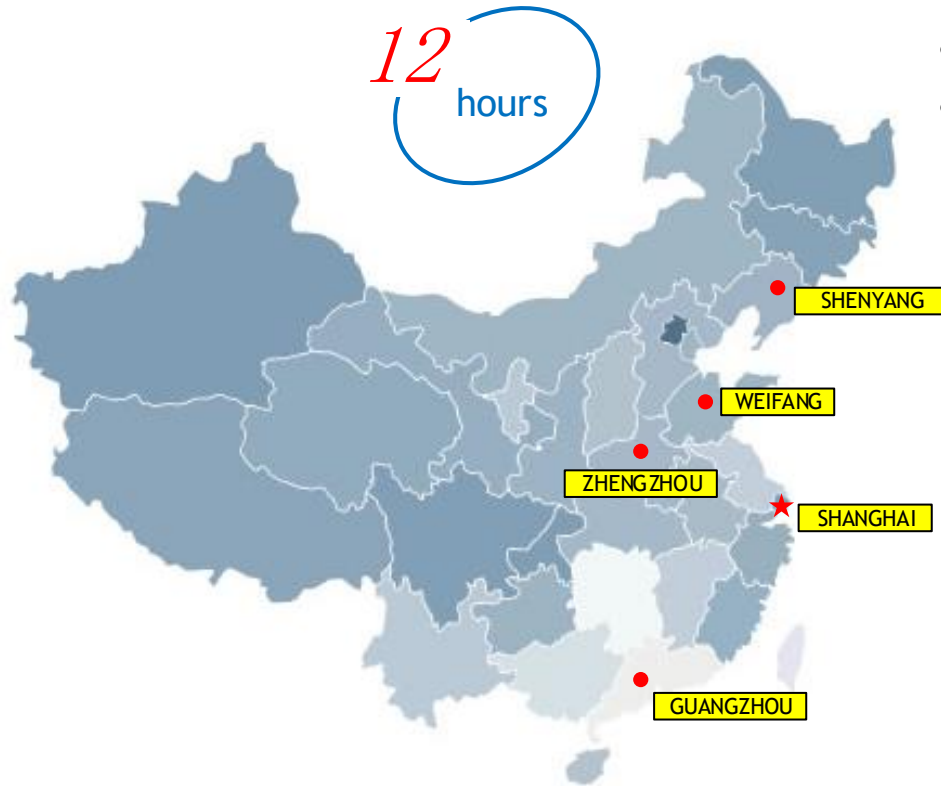
What can we do via remote support?

- Troubleshooting from PLC program
- Update the program(PC, PLC and HMI)
- Monitor the system running health status
- Optimize the running parameters
- Customize program to meet special requirement

Our Services

- Our Services
 - ❖ Consulting & Engineering
 - ❖ Equipment Supply & Erection
 - ❖ Commissioning & Start-up
 - ❖ Documentation & Training
 - ❖ Maintenance & Support
 - ❖ System customization
 - ❖ Remote support via internet
 - ❖ Linking support with plant formula system

Our Service Team in China



- 5 service team
- 1 hour fault call respond
- 12 hours troubleshooting guarantee

SHANGHAI	HQ
WEIFANG	3 persons
ZHENGZHOU	6 persons
GUANGZHOU	2 persons
SHENYANG	2 persons

Our Service Team in Asia



Service Team


-  Pakistan
-  Thailand
-  Vietnam
-  Malaysia
-  Indonesia
-  Philippines
-  India
-  Myanmar

Local engineer
Fast and Dedicated Service

Covered Area of Our System



1400+

 Mainflo Covered Area

- Most of the applicators are still in operation and have been upgraded with latest technology from time to time.

Thank You!

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