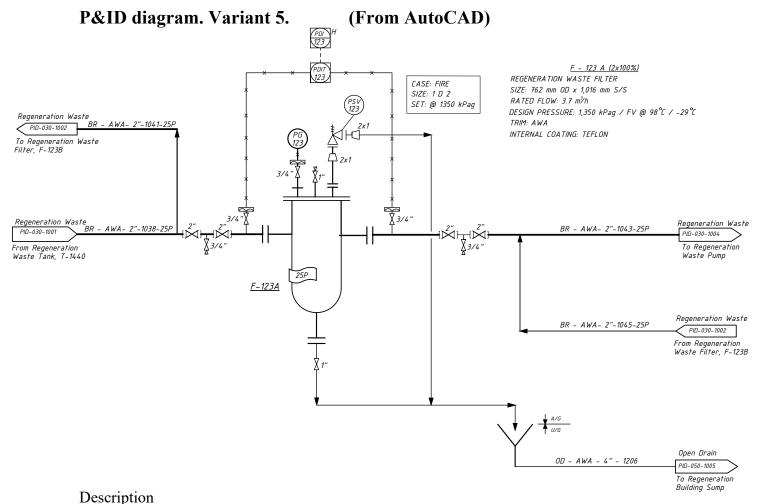


## Kazakh-British Technical University School of Information Technology and Engineering

Practice 8
P&ID diagram

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Screen Description This is - Regeneration Waste line labeled "PID-030-1002." Regeneration Waste This pipeline carries regeneration waste toward the next stage (F-BR -PID-030-1002 123B). Ties in with the outlet side of the Regeneration Waste Filter (F-To Regeneration Waste 123A). Referenced by line, which defines its piping characteristics. Filter, F-123B (BR-AWA-2"-1041-25P) This is - Regeneration Waste line labeled "PID-030-1001." Regeneration Waste Conveys regeneration waste feed from an upstream source (Tank PID-030-1001 T-1440) into the filter vessel (F-123A). Connects from Tank T-1440 to From Regeneration the inlet of the filter vessel. Referenced by line for size, rating, and Waste Tank, T-1440 material details. (BR-AWA-2"-1038-25P) This is - Drainage or drain unit of the pipeline system. Serves as a low-point drain or bleed point, allowing maintenance personnel to drain liquid from the line between the vessel inlet and the filter. It consists of: 2 x two-way on-off solenoid valves (2") for closing system from direct way and 1 x one-way on-off solenoid valve for drain liquid from the system. Installed on the 2" line segment feeding F-123A. May lead to a closed drain system or open drain, depending on the plant design. This is - Diaphragm pressure seal (welded). Protects the connected pressure instruments from direct contact with potentially corrosive or dirty process fluid. The diaphragm transfers pressure hydraulically to the instrument side. Tapped off the vessel (F-123A) or an associated nozzle. Connects via a capillary line to the differential pressure instruments or a local gauge. Tapped off the

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	vessel (F-123A) or an associated nozzle. Connects via a capillary line
Ψ	to the differential pressure instruments or a local gauge.
1	This is - Filled thermal element capillary tube (sensing line).
	Transmits the process pressure from the diaphragm seal to the
<b>1</b>	instruments without exposing those instruments directly to the process
1	fluid. The fluid inside the capillary is typically oil or another stable fill
	fluid. Runs between the pressure seal and the pressure instruments.
:	This is - PDIT (Pressure Differential Indicating Transmitter), field-
	mounted.
L. VPDIT\	Measures the differential pressure across the filter (F-123A) to
123	monitor filter loading or clogging. Outputs a signal to the control
(23)	system. Receives the high- and low-pressure signals via capillary lines
	from taps on F-123A. Sends an electronic signal to the control system.
	This is - PDI (Pressure Differential Indicator), typically panel/console-
	mounted with HIGH pressure difference level
V <sub>PDI</sub> ∖\H	•
1 122	Displays the differential pressure reading for the operator at the main
\\\\\\\\\\\	control panel or local control station. Shares the same or parallel
	pressure taps (via capillary tubes). Receives the differential pressure
<u> </u>	signal for indication.
	This is - PG (Pressure Gauge).
( PG <b>\</b>	Provides a local (field) reading of the absolute or gauge pressure
123)	inside F-123A. Operators can quickly verify vessel pressure without
<u> </u>	needing the control room. Typically mounted on a top or side nozzle
<u> </u>	of F-123A. May include a small isolation valve for maintenance.
	This is - Two-way on–off solenoid valve with a generic instrument
$\blacksquare$	connection to the process line.
77 -	
3/4" 🚶 戊	Acts as an automated valve (solenoid-driven) to open or close a small
<sup>- ン/ キ</sup>	side stream or instrument line. Could be used for purging, sampling, or
I 1	interlocking. Mounted on a small branch from F-123A or a connected
<b>+</b> 1	line. Electrically actuated, receiving a signal from the control system
<u>_</u>	to switch on/off.
<b>7</b>	This is - Drain valve.
<b>Т</b>	A manual or block valve for draining/venting fluid from the vessel or
X 1"	its connected piping. Often used during maintenance or shutdown to
<b>4</b> .	remove remaining liquid. Installed on the vessel top/side nozzle or
	pipeline spool. May discharge to a closed or open drain.
	This is Comparis in attraction to the access line and
	This is - Generic instrument connection to the process line or
	equipment.
	Provides a tapping point for instrumentation (e.g., temperature sensor,
	pressure indicator, level transmitter) or sample extraction.
•	
+ / 2x1	This is - Generic pressure safety valve or pressure relief valve (with
\$\sqrt{1}\sqrt{2}\sqrt{1}	possible reducers/concentrics 2x1).
	Protects the line or vessel from overpressure by opening at a set
	pressure, venting fluid/gas to a safe location. May be connected at or
T	near the top of F-123A or on the inlet/outlet line. Outlets typically
$\triangle 2x1$	route to a flare header, vent stack, or safe disposal system.
-	

PSV 123 +   T F-123A	This is - PSV 123 (Pressure Safety Valve). he primary safety valve dedicated to F-123A, set at a specific relief pressure (e.g., 1350 kPag). Automatically relieves excess pressure. Mounted on a vessel nozzle or dedicated piping spool. Discharges to a flare system, vent, or other safe containment line.  This is - F-123 A, the Regeneration Waste Filter vessel (internally coated with Teflon). Filters regeneration waste fluid, removing particulates or impurities before discharge or further processing. Rated for the specified design pressure (e.g., 1350 kPag).
\textstyle 1"	This is - Two-way on-off solenoid valve. (1") Automated valve controlling flow in or out of the vessel's lower region. Could be part of a drain or feed line used during regeneration cycles or maintenance. Mounted on a line branching off the vessel's bottom or side nozzle. Receives electrical signal from the control system to open/close.
→ A/G → U/G OD - A	This is - Drain connection.  A dedicated drain line from the bottom or low point of F-123A, collecting any residual liquid. Merges with or leads to the open drain or possibly a sump.
Regeneration Waste  PID-030-1004  To Regeneration Waste Pump	This is - "Regeneration Waste PID-030-1004" line to the Regeneration Waste Pump.  Carries filtered waste from F-123A to a pump (F-123B's feed or a separate regeneration waste pump). The discharge side of F-123A that leads to further processing or disposal. Connected with pipe line (BR-AWA-2"-1043-25P)
Regeneration Waste  ———————————————————————————————————	This is - "Regeneration Waste PID-030-1002" line from Regeneration Waste Filter F-123B.  Another waste line segment, possibly interconnecting two filters (F-123A and F-123B) or tying back into a common manifold. May be part of a parallel or series filtration arrangement. Connected with pipe line (BR-AWA-2"-1045-25P)
Open Drain  PID-050-1005  To Regeneration Building Sump	This is - Open Drain "PID-050-1005" to the Regeneration Building Sump. Collects drainage from various low-point drains and directs it to a building sump or wastewater treatment area. Downstream of drain valves and drain lines. Referenced by line or other site drain standards. (OD-AWA-4"-1206)
ste <u>BR - AWA- 2"-1041-25P</u> Waste	This is - Line spec "BR – AWA – 2"–1041–25P."  Specifies the piping material, diameter, schedule, and other mechanical/chemical design parameters for the pipeline. Governs the pipeline leading from F-123A to the next stage. Ensures consistent design with process requirements (pressure/temperature/chemical compatibility).
Vaste BR - AWA- 2"-1038-25P	This is Line spec "BR – AWA – 2"–1038–25P."

	Defines the piping characteristics (size, rating, material) for the pipeline labeled. Covers the inlet line from Tank T-1440 to F-123A. Ensures correct pressure/temperature ratings and corrosion allowance.
BR - AWA- 2"-1043-25P	This is - Line spec "BR – AWA – 2"–1043–25P." Governs the pipeline, leading from F-123A's outlet to the Regeneration Waste Pump. Ensures consistent design and safe operation under specified conditions.
BR - AWA- 2"-1045-25P	This is - Line spec "BR – AWA – 2"–1045–25P."  Defines piping requirements for the line (from Filter F-123B).  Manages the design and material specs for the interconnection or discharge line associated with F-123B.
OD - AWA - 4" - 1206	This is - Line spec "OD – AWA – 4"–1206." Specifies design for the Open Drain line that leads to the Regeneration Building Sump. Ensures adequate sizing (4") and proper material selection for drain service. Final route for draining or flushing fluids from F-123A.

## **Overall System Context**

Flow: Regeneration waste from upstream sources (Tank T-1440) enters F-123A through line. After filtration, the waste exits via line to subsequent treatment or disposal. Safety/Instrumentation: The vessel is protected by a PSV and a generic relief valve. Instrumentation taps feed pressure, level, or flow signals to instruments or provide drain/vent functions. Drain points and open drain lines allow maintenance and emergency drainage.