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ECOLOGY AREA IPT COMPANION MANUAL

PURPOSE: To aid you with the IPT modules and try to give a process description of the Ecology Area so that you may be better able to operate this area safely and efficiently.

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ECOLOGY AREA---GENERAL PROCESS

The Ecology Area comprises all the equipment and systems that collect and treat all the emissions and wastes from the Plant, either for recycle or safe and clean discharge. It can be divided into three major sub areas: Air Ecology, Water Ecology, and Waste Storage and Handling.

Air Ecology can be broken down as follows:

An Emergency Dump Scrubber: is a combination Venturi and packed tower scrubber. It neutralizes the chlorine gas from the chlorine cells on loss of vacuum in the wet chlorine header. The spent cell effluent discharges directly into WP-800 (treatment tank).

The High Pressure Scrubber: is a combination Venturi and packed tower scrubber. It neutralizes the chlorine from the chlorine compressor discharge on high discharge pressure, the chlorine from the PSV header in case of safety valve relief, and the chlorine from the Liquefaction Area vents and sniffs. The spent cell effluent discharges into WP-800.

The Startup Scrubber: is a combination Venturi and packed tower scrubber. It neutralizes the chlorine from the chlorine cells on start up. The packed tower (T-250) is common to the emergency Venturi (J-250) and the start up Venturi (J-251).

Cell effluent supply is provided by two 2300 volt pumps forwarding cell effluent from D-301 to the emergency and start up scrubbers.

Water Ecology can be broken down as follows:

Sump 12 and the Trench System: is a system of trenches that constitute the drainage system for the Plant. It collects all surface water, except the power and effluents, and routes them to Sump 12. From Sump 12, the collected effluents are normally pumped to the holding tank WP-800. In case of emergencies, Sump 12 can also be

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pumped to the emergency holding tanks, D-803 A/B, or directly to the Outfall Trench.

The North Area and Outfall: are the only discharge points of liquid effluents out of the Chlor-alkali II Plant. It terminates in a permitted outfall point which is equipped with continuous flow and pH monitoring and a compositor sample.

Two HCl addition stations in this trench control the pH as close to ~~neutral~~^{3.60} as possible. An oil skimmer at the outfall point separates and retains the small quantities of oil that might be present in the effluent.

T. S. S. (Total Suspended Solids): consists of a diked area containing a recirculating tank (D-810) and a mixer. Bottom solids from the brine clarifier are forwarded here and dissolved into a clear liquid by HCl addition. After neutralization, the effluent is then pumped directly into the north ditch for disposal at the Outfall.

D-803 A & B: emergency holding tanks, normally kept at a minimum level. They hold the plant effluents during upsets when the tracing and neutralization system capabilities are exceeded or during startups.

WP-800: a recirculating tank of 300,000 gallons capacity. Normally, all plant effluents, both from Sump 12 and the Scrubber System, are routed to this tank where they are recirculated and treated before discharging to the Outfall Trench.

The Transfer line: is the heart of the liquid effluents system. It connects WP-800, D-803's, Sump 12 and the Outfall. A Mod5 based control system sets and controls the flow configurations through this transfer line between the different parts of the system.

Chemical Storage: is a diked area with sodium thiosulfate and hydrochloric acid tanks and pumps to receive, store and supply both HCl and thiosulfate for chemical treatment of the Plant effluents.

Waste Storage: consists of a segregated area with discrete quantities of chemical waste and contaminated material stored for disposal by incineration or thermal oxidation by Central Waste Treatment.

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pumped to the emergency holding tanks, D-803 A/B, or directly to the Outfall Trench.

The North Area and Outfall: are the only discharge points of liquid effluents out of the Chlor-alkali II Plant. It terminates in a permitted outfall point which is equipped with continuous flow and pH monitoring and a compositor sample.

Two HCl addition stations in this trench control the pH as close to neutral as possible. An oil skimmer at the outfall point separates and retains the small quantities of oil that might be present in the effluent.

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The North Area and Outfall: are the only discharge points of liquid effluents out of the Chlor-alkali II Plant. It terminates in a permitted outfall point which is equipped with continuous flow and pH monitoring and a compositor sample.

Two HCl addition stations in this trench control the pH as close to ~~neutral~~^{3.6} as possible. An oil skimmer at the outfall point separates and retains the small quantities of oil that might be present in the effluent.

T. S. S. (Total Suspended Solids): consists of a diked area containing a recirculating tank (D-810) and a mixer. Bottom solids from the brine clarifier are forwarded here and dissolved into a clear liquid by HCl addition. After neutralization, the effluent is then pumped directly into the north ditch for disposal at the Outfall.

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The Transfer line: is the heart of the liquid effluents system. It connects WP-800, D-803's, Sump 12 and the Outfall. A Mod5 based control system sets and controls the flow configurations through this transfer line between the different parts of the system.

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ECOLOGY AREA TRENCH COLLECTION AND DISTRIBUTION

TANKS AND VESSELS

Sump 12

Sump 12 is an in-ground, concrete designed sump used to collect rain water and any waste water in the plant through the trenches. The pumps, P-812 A/B, pump the contents of Sump 12 to WP-800, D-803 A/B, or the outfall, depending on the need for treatment. These pumps prevent the plant from flooding. The primary inlet trench to Sump 12 is equipped with a strainer which requires cleaning on a routine basis. The strainer catches debris carried along in the trench system and prevents plugging and possible damage to the P-812's and downstream piping. Plugging of the strainer can prevent the trenches in the plant to drain to the sump, back up, and flood the plant.

MX-801: MX-801 is an FRP designed mixer used to static control the pH of the contents being sent to the trench. HCl is added at the mixer to control the pH, and sodium thiosulfate is added to treat for hypochlorites.

VALVES

Sump 12 Level Control Valve: This valve is used to control the level in Sump 12, as well as the level of the trenches throughout the plant to prevent plant flooding. This valve is labeled AO-306 and is located at Sump 12 on the discharge of the P-812's.

Sodium Thiosulfate to MX-801: This valve is used to add sodium thiosulfate to MX-801 to kill the hypochlorites of the contents going to the outfall trench. Without this, a Cl₂ spill could occur. This valve is labeled AO-317 and is located at MX-801.

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ECOLOGY AREA TRENCH COLLECTION AND DISTRIBUTION

TANKS AND VESSELS

Sump 12

Sump 12 is an in-ground, concrete designed sump used to collect rain water and any waste water in the plant through the trenches. The pumps, P-812 A/B, pump the contents of Sump 12 to WP-800, D-803 A/B, or the outfall, depending on the need for treatment. These pumps prevent the plant from flooding. The primary inlet trench to Sump 12 is equipped with a strainer which requires cleaning on a routine basis. The strainer catches debris carried along in the trench system and prevents plugging and possible damage to the P-812's and downstream piping. Plugging of the strainer can prevent the trenches in the plant to drain to the sump, back up, and flood the plant.

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ECOLOGY AREA TRENCH COLLECTION AND DISTRIBUTION

TANKS AND VESSELS

Sump 12

Sump 12 is an in-ground, concrete designed sump used to collect rain water and any waste water in the plant through the trenches. The pumps, P-812 A/B, pump the contents of Sump 12 to WP-800, D-803 A/B, or the outfall, depending on the need for treatment. These pumps prevent the plant from flooding. The primary inlet trench to Sump 12 is equipped with a strainer which requires cleaning on a routine basis. The strainer catches debris carried along in the trench system and prevents plugging and possible damage to the P-812's and downstream piping. Plugging of the strainer can prevent the trenches in the plant to drain to the sump, back up, and flood the plant.

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Sodium Thiosulfate to MX-801: This valve is used to add sodium thiosulfate to MX-801 to kill the hypochlorites of the contents going to the outfall trench. Without this, a Cl_2 spill could occur. This valve is labeled AO-317 and is located at MX-801.

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Spent HCl from Methanes: This is HCl that we get from the Methanes Plant to treat the waste water to the Division outfall. There are also plans to add this acid to D-810 (T. S. S. Unit). This is a real savings because we do not have to use good 34% HCl. It also helps Methanes because they need to get rid of it. This valve is labeled AO-331 and is located west of MX-801.

Spent HCl from Vinyl II to MX-801: This is HCl that we hope to get from Vinyl II in the near future. This could be a real savings because we don't have to use good 34% HCl. It also helps Vinyl II since they have to get rid of it. This valve is labeled AO-318 and is located west of MX-801.

ABV'S on P-812'S to WP-800: These are DO valves used to line up the Sump 12 pumps to WP-800. These valves are digital output valves. They run wide open or closed. These valves are labeled DO-327, 328, and 329 and are located on the southeast side of WP-800.

ABV'S on P-812'S to D-803'S: These are DO valves used to line up the Sump 12 pumps to D-803 A/B. These valves are digital output valves. They run wide open or closed. These valves are labeled DO-326, 327, 328, and 329 and are located on the southeast side of WP-800.

Sump 12 to Trench: This valve controls the flow of Sump 12 to the outfall trench. This valve is labeled AO-319 and is located south of T-206.

Point 8: This is a manual valve that sends Sump 12 and the trenches straight to the outfall. This valve is rarely used. It would be used if both P-812's failed to run. Lack of control could cause noncompliance. This valve is located at Sump 12.

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Spent HCl from Methanes: This is HCl that we get from the Methanes Plant to treat the waste water to the Division outfall. There are also plans to add this acid to D-810 (T. S. S. Unit). This is a real savings because we do not have to use good 34% HCl. It also helps Methanes because they need to get rid of it. This valve is labeled AO-331 and is located west of MX-801.

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ABV'S on P-812'S to WP-800: These are DO valves used to line up the Sump 12 pumps to WP-800. These valves are digital output valves. They run wide open or closed. These valves are labeled DO-327, 328, and 329 and are located on the southeast side of WP-800.

ABV'S on P-812'S to D-803'S: These are DO valves used to line up the Sump 12 pumps to D-803 A/B. These valves are digital output valves. They run wide open or closed. These valves are labeled DO-326, 327, 328, and 329 and are located on the southeast side of WP-800.

Sump 12 to Trench: This valve controls the flow of Sump 12 to the outfall trench. This valve is labeled AO-319 and is located south of T-206.

Point 8: This is a manual valve that sends Sump 12 and the trenches straight to the outfall. This valve is rarely used. It would be used if both P-812's failed to run. Lack of control could cause noncompliance. This valve is located at Sump 12.

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Spent HCl from Methanes: This is HCl that we get from the Methanes Plant to treat the waste water to the Division outfall. There are also plans to add this acid to D-810 (T. S. S. Unit). This is a real savings because we do not have to use good 34% HCl. It also helps Methanes because they need to get rid of it. This valve is labeled AO-331 and is located west of MX-801.

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ABV'S on P-812'S to D-803'S: These are DO valves used to line up the Sump 12 pumps to D-803 A/B. These valves are digital output valves. They run wide open or closed. These valves are labeled DO-326, 327, 328, and 329 and are located on the southeast side of WP-800.

Sump 12 to Trench: This valve controls the flow of Sump 12 to the outfall trench. This valve is labeled AO-319 and is located south of T-206.

Point 8: This is a manual valve that sends Sump 12 and the trenches straight to the outfall. This valve is rarely used. It would be used if both P-812's failed to run. Lack of control could cause noncompliance. This valve is located at Sump 12.

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MECHANICAL EQUIPMENT

P-812 A/B

These pumps pump the water that has collected from the trenches in the plant into Sump 12 and pumps to WP-800, D-803 A/B, or the outfall trench. These pumps are auto start/stop pumps.

INSTRUMENTATION

AI-304 P-812'S Flow Transmitter To D-803 A/B

Indicates the amount of flow from Sump 12 to D-803 A or B. This flow is controlled with valves AO-301 and AO-302.

AI-359 Sodium Thiosulfate Flow Transmitter to MX-801

Indicates the amount of sodium thiosulfate flow to MX-801. This flow is controlled with valve AO-317.

AI-387 Spent HCl Flow Transmitter to MX-801

Indicates the amount of HCl we receive from the Methanes plant going to MX-801. This flow is controlled with valve AO-331.

AI-327 Sump 12 Level Transmitter

Indicates the amount of level in Sump 12. This flow is controlled with valve AO-306.

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MECHANICAL EQUIPMENT

P-812 A/B

These pumps pump the water that has collected from the trenches in the plant into Sump 12 and pumps to WP-800, D-803 A/B, or the outfall trench. These pumps are auto start/stop pumps.

INSTRUMENTATION

AI-304 P-812'S Flow Transmitter To D-803 A/B

Indicates the amount of flow from Sump 12 to D-803 A or B. This flow is controlled with valves AO-301 and AO-302.

AI-359 Sodium Thiosulfate Flow Transmitter to MX-801

Indicates the amount of sodium thiosulfate flow to MX-801. This flow is controlled with valve AO-317.

AI-387 Spent HCl Flow Transmitter to MX-801

Indicates the amount of HCl we receive from the Methanes plant going to MX-801. This flow is controlled with valve AO-331.

AI-327 Sump 12 Level Transmitter

Indicates the amount of level in Sump 12. This flow is controlled with valve AO-306.

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MECHANICAL EQUIPMENT

P-812 A/B

These pumps pump the water that has collected from the trenches in the plant into Sump 12 and pumps to WP-800, D-803 A/B, or the outfall trench. These pumps are auto start/stop pumps.

INSTRUMENTATION

AI-304 P-812'S Flow Transmitter To D-803 A/B

Indicates the amount of flow from Sump 12 to D-803 A or B. This flow is controlled with valves AO-301 and AO-302.

AI-359 Sodium Thiosulfate Flow Transmitter to MX-801

Indicates the amount of sodium thiosulfate flow to MX-801. This flow is controlled with valve AO-317.

AI-387 Spent HCl Flow Transmitter to MX-801

Indicates the amount of HCl we receive from the Methanes plant going to MX-801. This flow is controlled with valve AO-331.

AI-327 Sump 12 Level Transmitter

Indicates the amount of level in Sump 12. This flow is controlled with valve AO-306.

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AI-360 Spent HCl from Vinyl II to MX-801 Flow Transmitter

Indicates the amount of spent HCl flow coming from Vinyl II. This flow is controlled with valve AO-318.

DI-348 Sump 12 Low Level Switch

Indicates when the Sump gets a low level. This will shutdown the P-812 pumps to keep from wrecking the pumps. This switch is labeled DI-348.

HAZARDS AND PROTECTION

Waste Water from Trench

The biggest hazard with the contents of Sump 12 is there could be anything in it. The trench system that goes into Sump 12 comes from the Caustic Area, acid sample points and diked area and drains the Brine Area, Liquefaction Area, and Cell Area. It usually has a small amount of caustic in it; however, on cell startups, the cells area dumped to Sump 12. The contents may also contain hot condensate. Rubber gloves should always be worn, and monogoggles are required.

Noise

As in any part of the block, hearing protection should be worn.

Rotating Equipment

As in any area, extra caution should be given when working around rotating equipment. Loose shirt tails, long hair, and fingers should be kept away from rotating equipment. The pumps in this area are P-812 A/B.

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AI-360 Spent HCl from Vinyl II to MX-801 Flow Transmitter

Indicates the amount of spent HCl flow coming from Vinyl II. This flow is controlled with valve AO-318.

DI-348 Sump 12 Low Level Switch

Indicates when the Sump gets a low level. This will shutdown the P-812 pumps to keep from wrecking the pumps. This switch is labeled DI-348.

HAZARDS AND PROTECTION

Waste Water from Trench

The biggest hazard with the contents of Sump 12 is there could be anything in it. The trench system that goes into Sump 12 comes from the Caustic Area, acid sample points and diked area and drains the Brine Area, Liquefaction Area, and Cell Area. It usually has a small amount of caustic in it; however, on cell startups, the cells area dumped to Sump 12. The contents may also contain hot condensate. Rubber gloves should always be worn, and monogoggles are required.

Noise

As in any part of the block, hearing protection should be worn.

Rotating Equipment

As in any area, extra caution should be given when working around rotating equipment. Loose shirt tails, long hair, and fingers should be kept away from rotating equipment. The pumps in this area are P-812 A/B.

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AI-360 Spent HCl from Vinyl II to MX-801 Flow Transmitter

Indicates the amount of spent HCl flow coming from Vinyl II. This flow is controlled with valve AO-318.

DI-348 Sump 12 Low Level Switch

Indicates when the Sump gets a low level. This will shutdown the P-812 pumps to keep from wrecking the pumps. This switch is labeled DI-348.

HAZARDS AND PROTECTION

Waste Water from Trench

The biggest hazard with the contents of Sump 12 is there could be anything in it. The trench system that goes into Sump 12 comes from the Caustic Area, acid sample points and diked area and drains the Brine Area, Liquefaction Area, and Cell Area. It usually has a small amount of caustic in it; however, on cell startups, the cells area dumped to Sump 12. The contents may also contain hot condensate. Rubber gloves should always be worn, and monogoggles are required.

Noise

As in any part of the block, hearing protection should be worn.

Rotating Equipment

As in any area, extra caution should be given when working around rotating equipment. Loose shirt tails, long hair, and fingers should be kept away from rotating equipment. The pumps in this area are P-812 A/B.

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ECOLOGY AREA D-803 A/B SECTION

TANKS AND VESSELS

D-803 A

D-803 A is a 590,000 gallon capacity tank with a chlorobutyl rubber lining which is not degradable by hypochlorites. It has a polyethylene lining under the bottom of the tank, and is cathodically protected to prevent corrosion. This tank is used to store waste water and scrubber effluent until it can be treated in WP-800. The contents normally contain from 0-10% caustic.

D-803 B

D-803 B is a 590,000 gallon capacity tank with a chlorobutyl rubber lining which is not degradable by hypochlorites. It has a polyethylene lining under the bottom of the tank and is cathodically protected to prevent corrosion. This tank is used to store waste water and scrubber effluent until it can be treated in WP-800. The contents normally contain from 0-10% caustic.

D-803 A/B Sump

This is the sump for D-803 A/B diked in area that collects rain water or leaks and is pumped into one of the D-803 tanks.

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ECOLOGY AREA D-803 A/B SECTION

TANKS AND VESSELS

D-803 A

D-803 A is a 590,000 gallon capacity tank with a chlorobutyl rubber lining which is not degradable by hypochlorites. It has a polyethylene lining under the bottom of the tank, and is cathodically protected to prevent corrosion. This tank is used to store waste water and scrubber effluent until it can be treated in WP-800. The contents normally contain from 0-10% caustic.

D-803 B

D-803 B is a 590,000 gallon capacity tank with a chlorobutyl rubber lining which is not degradable by hypochlorites. It has a polyethylene lining under the bottom of the tank and is cathodically protected to prevent corrosion. This tank is used to store waste water and scrubber effluent until it can be treated in WP-800. The contents normally contain from 0-10% caustic.

D-803 A/B Sump

This is the sump for D-803 A/B diked in area that collects rain water or leaks and is pumped into one of the D-803 tanks.

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ECOLOGY AREA D-803 A/B SECTION

TANKS AND VESSELS

D-803 A

D-803 A is a 590,000 gallon capacity tank with a chlorobutyl rubber lining which is not degradable by hypochlorites. It has a polyethylene lining under the bottom of the tank, and is cathodically protected to prevent corrosion. This tank is used to store waste water and scrubber effluent until it can be treated in WP-800. The contents normally contain from 0-10% caustic.

D-803 B

D-803 B is a 590,000 gallon capacity tank with a chlorobutyl rubber lining which is not degradable by hypochlorites. It has a polyethylene lining under the bottom of the tank and is cathodically protected to prevent corrosion. This tank is used to store waste water and scrubber effluent until it can be treated in WP-800. The contents normally contain from 0-10% caustic.

D-803 A/B Sump

This is the sump for D-803 A/B diked in area that collects rain water or leaks and is pumped into one of the D-803 tanks.

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VALVES

Valve to D-803 A/B

This valve is a DO valve. It runs wide open or closed. When D-803 A/B is in the fill or drain step, this valve is open. When D-803 A/B is in the wait step, the valve is closed. This valve is labeled DO-440 and is located in the piperack south of WP-800.

Valve to D-803 A

This valve is a DO valve. It runs wide open or closed. This valve is open whenever D-803 A is in the fill or drain step. This valve is labeled DO-422 and is located on the north side of D-803 A.

Valve to D-803 B

This valve is a DO valve. It runs wide open or closed. This valve is open whenever D-803 B is in the fill or drain step. This valve is labeled DO-432 and is located on the south side of D-803 A.

P-806 to D-803 B

This valve is a DO valve. It runs wide open or closed. This valve is open when the sump gets a high level and P-806 is running and is calling to go to D-803 B. This valve is labeled DO-434 and is located on the south side of D-803 B.

D-803 TO WP-800/Trench Flow Control Valve (Larger)

This valve is the larger of the two control valves that control the flow from the D-803's to WP-800 or the trench. It can also control the flow from Sump 12 or WP-800 to the D-803's. This valve is labeled AO-301 and is located south of WP-800.

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VALVES

Valve to D-803 A/B

This valve is a DO valve. It runs wide open or closed. When D-803 A/B is in the fill or drain step, this valve is open. When D-803 A/B is in the wait step, the valve is closed. This valve is labeled DO-440 and is located in the piperack south of WP-800.

Valve to D-803 A

This valve is a DO valve. It runs wide open or closed. This valve is open whenever D-803 A is in the fill or drain step. This valve is labeled DO-422 and is located on the north side of D-803 A.

Valve to D-803 B

This valve is a DO valve. It runs wide open or closed. This valve is open whenever D-803 B is in the fill or drain step. This valve is labeled DO-432 and is located on the south side of D-803 A.

P-806 to D-803 B

This valve is a DO valve. It runs wide open or closed. This valve is open when the sump gets a high level and P-806 is running and is calling to go to D-803 B. This valve is labeled DO-434 and is located on the south side of D-803 B.

D-803 TO WP-800/Trench Flow Control Valve (Larger)

This valve is the larger of the two control valves that control the flow from the D-803's to WP-800 or the trench. It can also control the flow from Sump 12 or WP-800 to the D-803's. This valve is labeled AO-301 and is located south of WP-800.

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VALVES

Valve to D-803 A/B

This valve is a DO valve. It runs wide open or closed. When D-803 A/B is in the fill or drain step, this valve is open. When D-803 A/B is in the wait step, the valve is closed. This valve is labeled DO-440 and is located in the piperack south of WP-800.

Valve to D-803 A

This valve is a DO valve. It runs wide open or closed. This valve is open whenever D-803 A is in the fill or drain step. This valve is labeled DO-422 and is located on the north side of D-803 A.

Valve to D-803 B

This valve is a DO valve. It runs wide open or closed. This valve is open whenever D-803 B is in the fill or drain step. This valve is labeled DO-432 and is located on the south side of D-803 A.

P-806 to D-803 B

This valve is a DO valve. It runs wide open or closed. This valve is open when the sump gets a high level and P-806 is running and is calling to go to D-803 B. This valve is labeled DO-434 and is located on the south side of D-803 B.

D-803 TO WP-800/Trench Flow Control Valve (Larger)

This valve is the larger of the two control valves that control the flow from the D-803's to WP-800 or the trench. It can also control the flow from Sump 12 or WP-800 to the D-803's. This valve is labeled AO-301 and is located south of WP-800.

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D-803 to WP-800/Trench Flow Control Valve (Smaller)

This valve is the smaller of the two control valves that control the flow from the D-803's to WP-800 or the trench. It also can control the flow from Sump 12 or WP-800 to the D-803's. This valve is labeled AO-302 and is located south of WP-800.

P-806 TO D-803 A - This valve is a DO valve. It runs wide open or closed. This valve is open when the sump gets a high level and P-806 is running, and is called to go to D-803 A. This is a fail open valve. This valve is labeled DO-424 and is located on the north side of D-803 A.

MECHANICAL EQUIPMENT

P-804 A/B

These pumps pump out of D-803 A or B to WP-800 or to the outfall trench.

P - 806

This is the sump pump for the D-803 diked-in area. It is used to pump rain water or any leaks that may occur inside the diked-in area to D-803 A or B.

INSTRUMENTATION

AI-422 - D-803A Level Transmitter

Indicates the amount of level in D-803 A.

DI-423 - D-803A High Level Switch

Indicates when the level in D-803 A has reached its high level set point.

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D-803 to WP-800/Trench Flow Control Valve (Smaller)

This valve is the smaller of the two control valves that control the flow from the D-803's to WP-800 or the trench. It also can control the flow from Sump 12 or WP-800 to the D-803's. This valve is labeled AO-302 and is located south of WP-800.

P-806 TO D-803 A - This valve is a DO valve. It runs wide open or closed. This valve is open when the sump gets a high level and P-806 is running, and is called to go to D-803 A. This is a fail open valve. This valve is labeled DO-424 and is located on the north side of D-803 A.

MECHANICAL EQUIPMENT

P-804 A/B

These pumps pump out of D-803 A or B to WP-800 or to the outfall trench.

P - 806

This is the sump pump for the D-803 diked-in area. It is used to pump rain water or any leaks that may occur inside the diked-in area to D-803 A or B.

INSTRUMENTATION

AI-422 - D-803A Level Transmitter

Indicates the amount of level in D-803 A.

DI-423 - D-803A High Level Switch

Indicates when the level in D-803 A has reached its high level set point.

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D-803 to WP-800/Trench Flow Control Valve (Smaller)

This valve is the smaller of the two control valves that control the flow from the D-803's to WP-800 or the trench. It also can control the flow from Sump 12 or WP-800 to the D-803's. This valve is labeled AO-302 and is located south of WP-800.

P-806 TO D-803 A - This valve is a DO valve. It runs wide open or closed. This valve is open when the sump gets a high level and P-806 is running, and is called to go to D-803 A. This is a fail open valve. This valve is labeled DO-424 and is located on the north side of D-803 A.

MECHANICAL EQUIPMENT

P-804 A/B

These pumps pump out of D-803 A or B to WP-800 or to the outfall trench.

P - 806

This is the sump pump for the D-803 diked-in area. It is used to pump rain water or any leaks that may occur inside the diked-in area to D-803 A or B.

INSTRUMENTATION

AI-422 - D-803A Level Transmitter

Indicates the amount of level in D-803 A.

DI-423 - D-803A High Level Switch

Indicates when the level in D-803 A has reached its high level set point.

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AI-432 - D-803B Level Transmitter

Indicates the amount of level in D-803 B.

DI-433 - D-803 High Level Transmitter

Indicates when the level in D-803 B has reached its high level set point.

AI-314 - D-803 A/B to WP-800 Trench Flow Transmitter (High Range) - Indicates the flow from the D-803's to WP-800 or the trench. This is the high range of the two transmitters. This flow is controlled with valves AO-301 and AO-302.

AI-330 - D-803 A/B to WP-800 Trench Flow Transmitter (Low Range) - Indicates the flow from the D-803's to WP-800 or the trench. This is the low range of the two transmitters. This flow is controlled with valves AO-301 and AO-302.

DI-437 - D-803A/B Sump High Level Switch

Indicates when the level in the diked-in area sump reaches its high level set point. This activates the start switch for P-806 which pumps the sump to D-803 A/B.

HAZARDS AND PROTECTION

Cell Effluent

Cell effluent is a corrosive effluent that is about 0-10% caustic. Minimum requirements are rubber gloves and monogoggles. Slicker suit and face shield are required when rodding out bleeds.

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AI-432 - D-803B Level Transmitter

Indicates the amount of level in D-803 B.

DI-433 - D-803 High Level Transmitter

Indicates when the level in D-803 B has reached its high level set point.

AI-314 - D-803 A/B to WP-800 Trench Flow Transmitter (High Range) - Indicates the flow from the D-803's to WP-800 or the trench. This is the high range of the two transmitters. This flow is controlled with valves AO-301 and AO-302.

AI-330 - D-803 A/B to WP-800 Trench Flow Transmitter (Low Range) - Indicates the flow from the D-803's to WP-800 or the trench. This is the low range of the two transmitters. This flow is controlled with valves AO-301 and AO-302.

DI-437 - D-803A/B Sump High Level Switch

Indicates when the level in the diked-in area sump reaches its high level set point. This activates the start switch for P-806 which pumps the sump to D-803 A/B.

HAZARDS AND PROTECTION

Cell Effluent

Cell effluent is a corrosive effluent that is about 0-10% caustic. Minimum requirements are rubber gloves and monogoggles. Slicker suit and face shield are required when rodding out bleeds.

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AI-432 - D-803B Level Transmitter

Indicates the amount of level in D-803 B.

DI-433 - D-803 High Level Transmitter

Indicates when the level in D-803 B has reached its high level set point.

AI-314 - D-803 A/B to WP-800 Trench Flow Transmitter (High Range) - Indicates the flow from the D-803's to WP-800 or the trench. This is the high range of the two transmitters. This flow is controlled with valves AO-301 and AO-302.

AI-330 - D-803 A/B to WP-800 Trench Flow Transmitter (Low Range) - Indicates the flow from the D-803's to WP-800 or the trench. This is the low range of the two transmitters. This flow is controlled with valves AO-301 and AO-302.

DI-437 - D-803A/B Sump High Level Switch

Indicates when the level in the diked-in area sump reaches its high level set point. This activates the start switch for P-806 which pumps the sump to D-803 A/B.

HAZARDS AND PROTECTION

Cell Effluent

Cell effluent is a corrosive effluent that is about 0-10% caustic. Minimum requirements are rubber gloves and monogoggles. Slicker suit and face shield are required when rodding out bleeds.

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NO FOR DISSEMINATE

Rotating Equipment

As in any area, extra caution should be taken when working around rotating equipment. Loose shirt tails and sleeves, long hair, and fingers should be kept away from rotating equipment. The pumps in the D-803 area (P-804 A/B, P-806) are auto start/stop pumps.

Noise

As in any part of the block, hearing protection should be worn.

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Rotating Equipment

As in any area, extra caution should be taken when working around rotating equipment. Loose shirt tails and sleeves, long hair, and fingers should be kept away from rotating equipment. The pumps in the D-803 area (P-804 A/B, P-806) are auto start/stop pumps.

Noise

As in any part of the block, hearing protection should be worn.

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Rotating Equipment

As in any area, extra caution should be taken when working around rotating equipment. Loose shirt tails and sleeves, long hair, and fingers should be kept away from rotating equipment. The pumps in the D-803 area (P-804 A/B, P-806) are auto start/stop pumps.

Noise

As in any part of the block, hearing protection should be worn.

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ECOLOGY AREA - WP-800 SECTION

TANKS AND VESSELS

WP-800

WP-800 is a concrete designed 50' x 100' x 10' high rectangular tank of 300,000 gallons capacity. It has a leachate system that collects the underground water into a sump. The tank is used to collect spent cell effluent from scrubbers, waste water from Sump 12 and D-803 A/B. The contents are recirculated and treated for hypochlorites and pH and then transferred to the Outfall. It is located north of the Cl₂ cell area and west of the H₂ Recovery Unit.

MX-800

MX-800 is a titanium mixer, located in the re-circulation line at the discharge of the P-802 pumps. HCl and sodium thiosulfate are added at the mixer's inlet to treat for hypochlorites and pH. pH and ORP probes are located on the outlet of the mixer. The contents can go back into WP-800, D-803 A/B or to the Outfall if the pH and hypochlorites are in spec. The mixer is located south of WP-800.

D-801

D-801 is an FRP tank, 12' x 24' high, containing 34% HCl. The capacity of this tank is 20,000 gallons. The HCl is stored in D-801 to pH treat the contents of WP-800 and the Outfall. It is located in a diked area west of WP-800.

D-800

D-800 is an FRP tank, 12' x 24' high, containing sodium thiosulfate. The capacity of this tank is 20,000 gallons. Sodium thiosulfate is stored in D-800 to treat for hypochlorites in WP-800, the Outfall, H₂ Recovery, and T. S. S. It is located in the diked area west of WP-800 and is north of D-801.

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ECOLOGY AREA - WP-800 SECTION

TANKS AND VESSELS

WP-800

WP-800 is a concrete designed 50' x 100' x 10' high rectangular tank of 300,000 gallons capacity. It has a leachate system that collects the underground water into a sump. The tank is used to collect spent cell effluent from scrubbers, waste water from Sump 12 and D-803 A/B. The contents are recirculated and treated for hypochlorites and pH and then transferred to the Outfall. It is located north of the Cl₂ cell area and west of the H₂ Recovery Unit.

MX-800

MX-800 is a titanium mixer, located in the re-circulation line at the discharge of the P-802 pumps. HCl and sodium thiosulfate are added at the mixer's inlet to treat for hypochlorites and pH. pH and ORP probes are located on the outlet of the mixer. The contents can go back into WP-800, D-803 A/B or to the Outfall if the pH and hypochlorites are in spec. The mixer is located south of WP-800.

D-801

D-801 is an FRP tank, 12' x 24' high, containing 34% HCl. The capacity of this tank is 20,000 gallons. The HCl is stored in D-801 to pH treat the contents of WP-800 and the Outfall. It is located in a diked area west of WP-800.

D-800

D-800 is an FRP tank, 12' x 24' high, containing sodium thiosulfate. The capacity of this tank is 20,000 gallons. Sodium thiosulfate is stored in D-800 to treat for hypochlorites in WP-800, the Outfall, H₂ Recovery, and T. S. S. It is located in the diked area west of WP-800 and is north of D-801.

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ECOLOGY AREA - WP-800 SECTION

TANKS AND VESSELS

WP-800

WP-800 is a concrete designed 50' x 100' x 10' high rectangular tank of 300,000 gallons capacity. It has a leachate system that collects the underground water into a sump. The tank is used to collect spent cell effluent from scrubbers, waste water from Sump 12 and D-803 A/B. The contents are recirculated and treated for hypochlorites and pH and then transferred to the Outfall. It is located north of the Cl₂ cell area and west of the H₂ Recovery Unit.

MX-800

MX-800 is a titanium mixer, located in the re-circulation line at the discharge of the P-802 pumps. HCl and sodium thiosulfate are added at the mixer's inlet to treat for hypochlorites and pH. pH and ORP probes are located on the outlet of the mixer. The contents can go back into WP-800, D-803 A/B or to the Outfall if the pH and hypochlorites are in spec. The mixer is located south of WP-800.

D-801

D-801 is an FRP tank, 12' x 24' high, containing 34% HCl. The capacity of this tank is 20,000 gallons. The HCl is stored in D-801 to pH treat the contents of WP-800 and the Outfall. It is located in a diked area west of WP-800.

D-800

D-800 is an FRP tank, 12' x 24' high, containing sodium thiosulfate. The capacity of this tank is 20,000 gallons. Sodium thiosulfate is stored in D-800 to treat for hypochlorites in WP-800, the Outfall, H₂ Recovery, and T. S. S. It is located in the diked area west of WP-800 and is north of D-801.

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D-801 Area Sump

D-801 Area Sump is a small sump inside the diked area for D-801. This sump collects any liquids, (rain, acid leaks, etc.) that accumulate inside the diked area. P-808 is a sump pump used to pump any of this liquid into WP-800.

WP-800 Area Sump

WP-800 Area Sump, also known as the leachate system, collects underground and surface water into a small sump, and pumps it back into WP-800.

D-800 Area Sump

D-800 area sump is a small sump inside the diked area for D-800. This sump collects any liquids (rain, sodium thiosulfate leaks, etc.) that accumulates inside the diked area. P-807 is a sump pump used to pump any of this liquid to WP-800.

VALVES

Sodium Thiosulfate to WP-800: This valve is used to control the amount of sodium thiosulfate used in WP-800 to kill hypochlorites. This valve is labeled AO-311 and is located on the first deck of ecology structure.

Sodium Thiosulfate Inlet to D-800: This valve is used whenever we get a truckload of sodium thiosulfate. The tank truck is hooked up at this valve and is only opened after verifying it is sodium thiosulfate. This valve is labeled DO-331 and is located on the north side of D-800.

HCl to MX-800: This valve is used to control pH of contents being pumped from WP-800. This valve is labeled AO-313 and is located at MX-800.

Sodium Thiosulfate to MX-800: This valve is used to kill hypochlorites from the contents of WP-800 being fed to MX-800. A Cl₂ spill could occur if hypochlorites are not treated. This valve is labeled AO-312 and is located west of MX-800.

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D-801 Area Sump

D-801 Area Sump is a small sump inside the diked area for D-801. This sump collects any liquids, (rain, acid leaks, etc.) that accumulate inside the diked area. P-808 is a sump pump used to pump any of this liquid into WP-800.

WP-800 Area Sump

WP-800 Area Sump, also known as the leachate system, collects underground and surface water into a small sump, and pumps it back into WP-800.

D-800 Area Sump

D-800 area sump is a small sump inside the diked area for D-800. This sump collects any liquids (rain, sodium thiosulfate leaks, etc.) that accumulates inside the diked area. P-807 is a sump pump used to pump any of this liquid to WP-800.

VALVES

Sodium Thiosulfate to WP-800: This valve is used to control the amount of sodium thiosulfate used in WP-800 to kill hypochlorites. This valve is labeled AO-311 and is located on the first deck of ecology structure.

Sodium Thiosulfate Inlet to D-800: This valve is used whenever we get a truckload of sodium thiosulfate. The tank truck is hooked up at this valve and is only opened after verifying it is sodium thiosulfate. This valve is labeled DO-331 and is located on the north side of D-800.

HCl to MX-800: This valve is used to control pH of contents being pumped from WP-800. This valve is labeled AO-313 and is located at MX-800.

Sodium Thiosulfate to MX-800: This valve is used to kill hypochlorites from the contents of WP-800 being fed to MX-800. A Cl₂ spill could occur if hypochlorites are not treated. This valve is labeled AO-312 and is located west of MX-800.

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D-801 Area Sump

D-801 Area Sump is a small sump inside the diked area for D-801. This sump collects any liquids, (rain, acid leaks, etc.) that accumulate inside the diked area. P-808 is a sump pump used to pump any of this liquid into WP-800.

WP-800 Area Sump

WP-800 Area Sump, also known as the leachate system, collects underground and surface water into a small sump, and pumps it back into WP-800.

D-800 Area Sump

D-800 area sump is a small sump inside the diked area for D-800. This sump collects any liquids (rain, sodium thiosulfate leaks, etc.) that accumulates inside the diked area. P-807 is a sump pump used to pump any of this liquid to WP-800.

VALVES

Sodium Thiosulfate to WP-800: This valve is used to control the amount of sodium thiosulfate used in WP-800 to kill hypochlorites. This valve is labeled AO-311 and is located on the first deck of ecology structure.

Sodium Thiosulfate Inlet to D-800: This valve is used whenever we get a truckload of sodium thiosulfate. The tank truck is hooked up at this valve and is only opened after verifying it is sodium thiosulfate. This valve is labeled DO-331 and is located on the north side of D-800.

HCl to MX-800: This valve is used to control pH of contents being pumped from WP-800. This valve is labeled AO-313 and is located at MX-800.

Sodium Thiosulfate to MX-800: This valve is used to kill hypochlorites from the contents of WP-800 being fed to MX-800. A Cl_2 spill could occur if hypochlorites are not treated. This valve is labeled AO-312 and is located west of MX-800.

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HCl to D-801 from Solvents: This valve acts as the level control valve for D-801. This valve is labeled AO-314 and is located on the north wall of the D-801 diked area.

Auto H₂O Valve to T-800: This valve is used to maintain a H₂O flow to scrub the HCl vapors off D-801. This valve is labeled AO-315 and is located inside the D-801 diked area.

Auto Block Valve Ejector on P-809 Suction: This valve is used to prime the suction line on the P-809's. This valve is labeled DO-335 and is located on the first deck of the ecology structure.

Auto Block Valve Plant Air to J-802 Ejector: This valve is used to supply air to the ejector so it can prime the suction line on the P-809's. This valve is labeled DO-325 and is located on the first deck of the ecology structure.

Auto Block Valves on WP-800 Recycle: These valves are DO valves. They run either wide open or closed. These valves can change position in different steps. There are several other valves that work with these valves. These valves are labeled DO-326, 327, 328, and 329. They are located on the southeast side of WP-800.

Auto P-802 Recycle Control Valve to WP-800: This valve is used to recycle the contents of WP-800 until it is treated to a desired pH. This valve is labeled AO-307 and is located southeast of WP-800.

Auto WP-800 Level Control Valve (Small): This valve is used to drain WP-800. It drains either to D-803's or to the Outfall. When draining to the Outfall, it ramps open slowly, watching ditch pH. This valve, known as the small level control valve, is labeled AO-309 and is located south of the P-809's.

Auto WP-800 Level Control Valve (Large): This valve, known as the big valve, is used to drain WP-800 to D-803's or to the Outfall. It ramps open slowly to the Outfall after the small valve is ramped open. It provides maximum flow to the Outfall or to D-803's. This valve is labeled AO-308 and is located south of the P-809's.

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HCl to D-801 from Solvents: This valve acts as the level control valve for D-801. This valve is labeled AO-314 and is located on the north wall of the D-801 diked area.

Auto H₂O Valve to T-800: This valve is used to maintain a H₂O flow to scrub the HCl vapors off D-801. This valve is labeled AO-315 and is located inside the D-801 diked area.

Auto Block Valve Ejector on P-809 Suction: This valve is used to prime the suction line on the P-809's. This valve is labeled DO-335 and is located on the first deck of the ecology structure.

Auto Block Valve Plant Air to J-802 Ejector: This valve is used to supply air to the ejector so it can prime the suction line on the P-809's. This valve is labeled DO-325 and is located on the first deck of the ecology structure.

Auto Block Valves on WP-800 Recycle: These valves are DO valves. They run either wide open or closed. These valves can change position in different steps. There are several other valves that work with these valves. These valves are labeled DO-326, 327, 328, and 329. They are located on the southeast side of WP-800.

Auto P-802 Recycle Control Valve to WP-800: This valve is used to recycle the contents of WP-800 until it is treated to a desired pH. This valve is labeled AO-307 and is located southeast of WP-800.

Auto WP-800 Level Control Valve (Small): This valve is used to drain WP-800. It drains either to D-803's or to the Outfall. When draining to the Outfall, it ramps open slowly, watching ditch pH. This valve, known as the small level control valve, is labeled AO-309 and is located south of the P-809's.

Auto WP-800 Level Control Valve (Large): This valve, known as the big valve, is used to drain WP-800 to D-803's or to the Outfall. It ramps open slowly to the Outfall after the small valve is ramped open. It provides maximum flow to the Outfall or to D-803's. This valve is labeled AO-308 and is located south of the P-809's.

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HCl to D-801 from Solvents: This valve acts as the level control valve for D-801. This valve is labeled AO-314 and is located on the north wall of the D-801 diked area.

Auto H₂O Valve to T-800: This valve is used to maintain a H₂O flow to scrub the HCl vapors off D-801. This valve is labeled AO-315 and is located inside the D-801 diked area.

Auto Block Valve Ejector on P-809 Suction: This valve is used to prime the suction line on the P-809's. This valve is labeled DO-335 and is located on the first deck of the ecology structure.

Auto Block Valve Plant Air to J-802 Ejector: This valve is used to supply air to the ejector so it can prime the suction line on the P-809's. This valve is labeled DO-325 and is located on the first deck of the ecology structure.

Auto Block Valves on WP-800 Recycle: These valves are DO valves. They run either wide open or closed. These valves can change position in different steps. There are several other valves that work with these valves. These valves are labeled DO-326, 327, 328, and 329. They are located on the southeast side of WP-800.

Auto P-802 Recycle Control Valve to WP-800: This valve is used to recycle the contents of WP-800 until it is treated to a desired pH. This valve is labeled AO-307 and is located southeast of WP-800.

Auto WP-800 Level Control Valve (Small): This valve is used to drain WP-800. It drains either to D-803's or to the Outfall. When draining to the Outfall, it ramps open slowly, watching ditch pH. This valve, known as the small level control valve, is labeled AO-309 and is located south of the P-809's.

Auto WP-800 Level Control Valve (Large): This valve, known as the big valve, is used to drain WP-800 to D-803's or to the Outfall. It ramps open slowly to the Outfall after the small valve is ramped open. It provides maximum flow to the Outfall or to D-803's. This valve is labeled AO-308 and is located south of the P-809's.

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MECHANICAL EQUIPMENT

P-802 A/B: These pumps pump the contents of WP-800 to several places. They can be used to recycle the contents through MX-800 for pH and hypochlorite treating, pump to the outfall trench, or pump to D-803 A/B.

P-803: This is the pump for the leachate system on WP-800. It pumps the contents of this sump back into WP-800.

P-809 A/B: These pumps pump out of WP-800 to the carb tower. The effluent is used instead of using good cell effluent on the carb tower to help eliminate waste and to save money. It also pumps to T-505 for pH control.

P-801 A/B: These pumps pump 34% HCl out of D-801 to several places. It is used in MX-800 to treat the content of WP-800, used on outfall to pH treatment, and used on T. S. S. for pH treating.

P-808: This is the pump for the leachate system for D-801. It pumps the contents of this sump to WP-800.

P-800 A/B: These pumps are the sodium thiosulfate pumps for D-800. IT pumps sodium thiosulfate to MX-800 for hypochlorite treating. It pumps straight to WP-800 and to T. S. S. for hypochlorite treating.

P-807: This is the pump for the leachate system for D-800. It pumps the contents of this sump to WP-800.

INSTRUMENTATION

AI-337 - Sodium Thiosulfate to WP-800: Indicates the amount of sodium thiosulfate to WP-800. This flow is controlled with valve AO-311.

AI-336 - Sodium Thiosulfate to MX-800: Indicates the amount of sodium thiosulfate to MX-800. This flow is controlled with valve AO-312.

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MECHANICAL EQUIPMENT

P-802 A/B: These pumps pump the contents of WP-800 to several places. They can be used to recycle the contents through MX-800 for pH and hypochlorite treating, pump to the outfall trench, or pump to D-803 A/B.

P-803: This is the pump for the leachate system on WP-800. It pumps the contents of this sump back into WP-800.

P-809 A/B: These pumps pump out of WP-800 to the carb tower. The effluent is used instead of using good cell effluent on the carb tower to help eliminate waste and to save money. It also pumps to T-505 for pH control.

P-801 A/B: These pumps pump 34% HCl out of D-801 to several places. It is used in MX-800 to treat the content of WP-800, used on outfall to pH treatment, and used on T. S. S. for pH treating.

P-808: This is the pump for the leachate system for D-801. It pumps the contents of this sump to WP-800.

P-800 A/B: These pumps are the sodium thiosulfate pumps for D-800. IT pumps sodium thiosulfate to MX-800 for hypochlorite treating. It pumps straight to WP-800 and to T. S. S. for hypochlorite treating.

P-807: This is the pump for the leachate system for D-800. It pumps the contents of this sump to WP-800.

INSTRUMENTATION

AI-337 - Sodium Thiosulfate to WP-800: Indicates the amount of sodium thiosulfate to WP-800. This flow is controlled with valve AO-311.

AI-336 - Sodium Thiosulfate to MX-800: Indicates the amount of sodium thiosulfate to MX-800. This flow is controlled with valve AO-312.

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MECHANICAL EQUIPMENT

P-802 A/B: These pumps pump the contents of WP-800 to several places. They can be used to recycle the contents through MX-800 for pH and hypochlorite treating, pump to the outfall trench, or pump to D-803 A/B.

P-803: This is the pump for the leachate system on WP-800. It pumps the contents of this sump back into WP-800.

P-809 A/B: These pumps pump out of WP-800 to the carb tower. The effluent is used instead of using good cell effluent on the carb tower to help eliminate waste and to save money. It also pumps to T-505 for pH control.

P-801 A/B: These pumps pump 34% HCl out of D-801 to several places. It is used in MX-800 to treat the content of WP-800, used on outfall to pH treatment, and used on T. S. S. for pH treating.

P-808: This is the pump for the leachate system for D-801. It pumps the contents of this sump to WP-800.

P-800 A/B: These pumps are the sodium thiosulfate pumps for D-800. IT pumps sodium thiosulfate to MX-800 for hypochlorite treating. It pumps straight to WP-800 and to T. S. S. for hypochlorite treating.

P-807: This is the pump for the leachate system for D-800. It pumps the contents of this sump to WP-800.

INSTRUMENTATION

AI-337 - Sodium Thiosulfate to WP-800: Indicates the amount of sodium thiosulfate to WP-800. This flow is controlled with valve AO-311.

AI-336 - Sodium Thiosulfate to MX-800: Indicates the amount of sodium thiosulfate to MX-800. This flow is controlled with valve AO-312.

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AI-338 - HCl to MX-800: Indicates the amount of HCl to MX-800. This flow is controlled with valve AO-313.

AI-306 - MX-800 pH Probe: Indicates the pH of MX-800. This probe is located on the outlet of MX-800.

AI-316 - MX-800 pH Probe: Indicates the pH of MX-800. This probe is located on the outlet of MX-800.

AI-307 - MX-800 Orp Probe

Measures the amount of Cl_2 in MX-800's effluent. This probe is located on the outlet of MX-800.

AI-333 - P-802 Recycle Flow: Indicates the amount of recycle flow back to WP-800. This flow is controlled with valve AO-307.

AI-332 - P-802 to Ditch: Indicates the amount of flow out of WP-800 to the ditch. This flow is controlled with valves AO-308 and 309.

AI-331 - WP-800 Level Transmitter: Indicates the amount of level in WP-800. This level is controlled with valves AO-308 and AO-309.

AI-342 D-800 Level Transmitter: Indicates the amount of level in D-800.

AI-339 D-801 Level Transmitter: Indicates the amount of level in D-801. This level is controlled with valve AO-314.

AI-340 - HCl to D-801 from Solvents: Indicates the amount of HCl flow coming into D-801 from Solvents. This flow is controlled with valve AO-314.

AI-341 - Water Flow to T-800: Indicates the amount of H_2O flow going to T-800. This flow is controlled with valve AO-315.

AI-357 - D-800 High Level Switch: Indicates when D-800 has a high level. Note that this transmitter is an AI, not a DI. This transmitter is an AI because the high level works off a millivolt reading instead of a manual switch.

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AI-338 - HCl to MX-800: Indicates the amount of HCl to MX-800. This flow is controlled with valve AO-313.

AI-306 - MX-800 pH Probe: Indicates the pH of MX-800. This probe is located on the outlet of MX-800.

AI-316 - MX-800 pH Probe: Indicates the pH of MX-800. This probe is located on the outlet of MX-800.

AI-307 - MX-800 Orp Probe
Measures the amount of Cl_2 in MX-800's effluent. This probe is located on the outlet of MX-800.

AI-333 - P-802 Recycle Flow: Indicates the amount of recycle flow back to WP-800. This flow is controlled with valve AO-307.

AI-332 - P-802 to Ditch: Indicates the amount of flow out of WP-800 to the ditch. This flow is controlled with valves AO-308 and 309.

AI-331 - WP-800 Level Transmitter: Indicates the amount of level in WP-800. This level is controlled with valves AO-308 and AO-309.

AI-342 D-800 Level Transmitter: Indicates the amount of level in D-800.

AI-339 D-801 Level Transmitter: Indicates the amount of level in D-801. This level is controlled with valve AO-314.

AI-340 - HCl to D-801 from Solvents: Indicates the amount of HCl flow coming into D-801 from Solvents. This flow is controlled with valve AO-314.

AI-341 - Water Flow to T-800: Indicates the amount of H_2O flow going to T-800. This flow is controlled with valve AO-315.

AI-357 - D-800 High Level Switch: Indicates when D-800 has a high level. Note that this transmitter is an AI, not a DI. This transmitter is an AI because the high level works off a millivolt reading instead of a manual switch.

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AI-338 - HCl to MX-800: Indicates the amount of HCl to MX-800. This flow is controlled with valve AO-313.

AI-306 - MX-800 pH Probe: Indicates the pH of MX-800. This probe is located on the outlet of MX-800.

AI-316 - MX-800 pH Probe: Indicates the pH of MX-800. This probe is located on the outlet of MX-800.

AI-307 - MX-800 Orp Probe
Measures the amount of Cl_2 in MX-800's effluent. This probe is located on the outlet of MX-800.

AI-333 - P-802 Recycle Flow: Indicates the amount of recycle flow back to WP-800. This flow is controlled with valve AO-307.

AI-332 - P-802 to Ditch: Indicates the amount of flow out of WP-800 to the ditch. This flow is controlled with valves AO-308 and 309.

AI-331 - WP-800 Level Transmitter: Indicates the amount of level in WP-800. This level is controlled with valves AO-308 and AO-309.

AI-342 D-800 Level Transmitter: Indicates the amount of level in D-800.

AI-339 D-801 Level Transmitter: Indicates the amount of level in D-801. This level is controlled with valve AO-314.

AI-340 - HCl to D-801 from Solvents: Indicates the amount of HCl flow coming into D-801 from Solvents. This flow is controlled with valve AO-314.

AI-341 - Water Flow to T-800: Indicates the amount of H_2O flow going to T-800. This flow is controlled with valve AO-315.

AI-357 - D-800 High Level Switch: Indicates when D-800 has a high level. Note that this transmitter is an AI, not a DI. This transmitter is an AI because the high level works off a millivolt reading instead of a manual switch.

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AI-356 - D-801 High Level Switch: Indicates when D-801 has a high level. Note that this transmitter is an AI, not a DI. This transmitter is an AI because the high level works off a millivolt reading instead of a manual switch.

AI-317 - MX-800 ORP Probe: Measures the amount of Cl_2 in MX-800's effluent. This probe is located on the outlet of MX-800.

DI-358 - D-800 Area Sump High Level Switch: Indicates when the level gets high in the sump. The level is controlled with P-807.

DI-361 - D-801 Area Sump High Level Switch: Indicates when the level gets high in the sump. The level is controlled with P-808.

DI-340 - WP-800 Sump High Level Switch: Indicates when the level gets high in the sump. The level is controlled with P-803.

HAZARDS AND PROTECTIONS

HCl: One of the hazards in this area is 34% HCl. This is stored in and pumped from D-801 to be used in MX-801 north ditch pH additions, and in MX-800 to pH treat contents of WP-800. HCl is a very corrosive acid. Minimum requires for line openings or handling of HCl is slicker suit, face shield, rubber boots, and rubber gloves.

Cell Effluent: This is also known as scrubber effluent. It is 10% caustic that is used to scrub Cl_2 in the scrubbers. The cell effluent absorbs as much Cl_2 as possible before being dumped into WP-800. From here it is treated and sent to the outfall. Cell effluent is very corrosive and can cause serious chemical burns. Minimum requirements for handling cell effluent are rubber gloves, rubber boots, and monogoggles. Line openings require an additional slicker suit and face shield.

Hypochlorites

This is the Cl_2 that is absorbed in the cell effluent. If this is not treated, Cl_2 vapors would be released when treating for pH, causing a

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AI-356 - D-801 High Level Switch: Indicates when D-801 has a high level. Note that this transmitter is an AI, not a DI. This transmitter is an AI because the high level works off a milivolt reading instead of a manual switch.

AI-317 - MX-800 ORP Probe: Measures the amount of Cl_2 in MX-800's effluent. This probe is located on the outlet of MX-800.

DI-358 - D-800 Area Sump High Level Switch: Indicates when the level gets high in the sump. The level is controlled with P-807.

DI-361 - D-801 Area Sump High Level Switch: Indicates when the level gets high in the sump. The level is controlled with P-808.

DI-340 - WP-800 Sump High Level Switch: Indicates when the level gets high in the sump. The level is controlled with P-803.

HAZARDS AND PROTECTIONS

HCl: One of the hazards in this area is 34% HCl. This is stored in and pumped from D-801 to be used in MX-801 north ditch pH additions, and in MX-800 to pH treat contents of WP-800. HCl is a very corrosive acid. Minimum requires for line openings or handling of HCl is slicker suit, face shield, rubber boots, and rubber gloves.

Cell Effluent: This is also known as scrubber effluent. It is 10% caustic that is used to scrub Cl_2 in the scrubbers. The cell effluent absorbs as much Cl_2 as possible before being dumped into WP-800. From here it is treated and sent to the outfall. Cell effluent is very corrosive and can cause serious chemical burns. Minimum requirements for handling cell effluent are rubber gloves, rubber boots, and monogoggles. Line openings require an additional slicker suit and face shield.

Hypochlorites

This is the Cl_2 that is absorbed in the cell effluent. If this is not treated, Cl_2 vapors would be released when treating for pH, causing a

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DO 127601
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AI-356 - D-801 High Level Switch: Indicates when D-801 has a high level. Note that this transmitter is an AI, not a DI. This transmitter is an AI because the high level works off a millivolt reading instead of a manual switch.

AI-317 - MX-800 ORP Probe: Measures the amount of Cl_2 in MX-800's effluent. This probe is located on the outlet of MX-800.

DI-358 - D-800 Area Sump High Level Switch: Indicates when the level gets high in the sump. The level is controlled with P-807.

DI-361 - D-801 Area Sump High Level Switch: Indicates when the level gets high in the sump. The level is controlled with P-808.

DI-340 - WP-800 Sump High Level Switch: Indicates when the level gets high in the sump. The level is controlled with P-803.

HAZARDS AND PROTECTIONS

HCl: One of the hazards in this area is 34% HCl. This is stored in and pumped from D-801 to be used in MX-801 north ditch pH additions, and in MX-800 to pH treat contents of WP-800. HCl is a very corrosive acid. Minimum requires for line openings or handling of HCl is slicker suit, face shield, rubber boots, and rubber gloves.

Cell Effluent: This is also known as scrubber effluent. It is 10% caustic that is used to scrub Cl_2 in the scrubbers. The cell effluent absorbs as much Cl_2 as possible before being dumped into WP-800. From here it is treated and sent to the outfall. Cell effluent is very corrosive and can cause serious chemical burns. Minimum requirements for handling cell effluent are rubber gloves, rubber boots, and monogoggles. Line openings require an additional slicker suit and face shield.

Hypochlorites

This is the Cl_2 that is absorbed in the cell effluent. If this is not treated, Cl_2 vapors would be released when treating for pH, causing a

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DO 127602
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Cl₂ spill. This is also corrosive. Minimum requirements are rubber gloves and monogoggles.

Sodium Thiosulfate: Sodium thiosulfate is a clear, amber-to-brown solution with a sulfur-like odor. It is used to kill hypochlorites. Minimum requirements are rubber gloves and monogoggles.

Rotating Equipment: As in any area, extra caution should be given when working around rotating equipment. Loose shirt tails and sleeves, long hair, and fingers should be kept away from rotating equipment. The pumps in WP-800 Area (P-802 A/B, P-801 A/B, P-800 A/B, P-809 A/B, P-803, P-807, and P-808) are auto start/stop pumps.

Fiberglass Equipment: Some of the vessels and lines in the WP-800 Area are constructed of fiberglass. Caution should be used when tightening flanges. Never tighten flanges as tight as metal flanges. They may crack. Also, never beat on fiberglass equipment. One could puncture or crack the equipment.

Noise: This unit is located next to Power II. As in any part of the block, hearing protection should be worn.

OPERATING DISCIPLINE

Sodium Thiosulfate: Whenever we receive a load of sodium thiosulfate, a sample must be taken off the truck and analyzed to assure that it is pure sodium thiosulfate. When the sample has been verified it is pure sodium thiosulfate, the truck can then be unloaded. Also, the sample should never have any settled volumes. If it has any, the truck should be sent back.

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Cl₂ spill. This is also corrosive. Minimum requirements are rubber gloves and monogoggles.

Sodium Thiosulfate: Sodium thiosulfate is a clear, amber-to-brown solution with a sulfur-like odor. It is used to kill hypochlorites. Minimum requirements are rubber gloves and monogoggles.

Rotating Equipment: As in any area, extra caution should be given when working around rotating equipment. Loose shirt tails and sleeves, long hair, and fingers should be kept away from rotating equipment. The pumps in WP-800 Area (P-802 A/B, P-801 A/B, P-800 A/B, P-809 A/B, P-803, P-807, and P-808) are auto start/stop pumps.

Fiberglass Equipment: Some of the vessels and lines in the WP-800 Area are constructed of fiberglass. Caution should be used when tightening flanges. Never tighten flanges as tight as metal flanges. They may crack. Also, never beat on fiberglass equipment. One could puncture or crack the equipment.

Noise: This unit is located next to Power II. As in any part of the block, hearing protection should be worn.

OPERATING DISCIPLINE

Sodium Thiosulfate: Whenever we receive a load of sodium thiosulfate, a sample must be taken off the truck and analyzed to assure that it is pure sodium thiosulfate. When the sample has been verified it is pure sodium thiosulfate, the truck can then be unloaded. Also, the sample should never have any settled volumes. If it has any, the truck should be sent back.

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Cl₂ spill. This is also corrosive. Minimum requirements are rubber gloves and monogoggles.

Sodium Thiosulfate: Sodium thiosulfate is a clear, amber-to-brown solution with a sulfur-like odor. It is used to kill hypochlorites. Minimum requirements are rubber gloves and monogoggles.

Rotating Equipment: As in any area, extra caution should be given when working around rotating equipment. Loose shirt tails and sleeves, long hair, and fingers should be kept away from rotating equipment. The pumps in WP-800 Area (P-802 A/B, P-801 A/B, P-800 A/B, P-809 A/B, P-803, P-807, and P-808) are auto start/stop pumps.

Fiberglass Equipment: Some of the vessels and lines in the WP-800 Area are constructed of fiberglass. Caution should be used when tightening flanges. Never tighten flanges as tight as metal flanges. They may crack. Also, never beat on fiberglass equipment. One could puncture or crack the equipment.

Noise: This unit is located next to Power II. As in any part of the block, hearing protection should be worn.

OPERATING DISCIPLINE

Sodium Thiosulfate: Whenever we receive a load of sodium thiosulfate, a sample must be taken off the truck and analyzed to assure that it is pure sodium thiosulfate. When the sample has been verified it is pure sodium thiosulfate, the truck can then be unloaded. Also, the sample should never have any settled volumes. If it has any, the truck should be sent back.

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T. S. S. SECTION

T. S. S. Section: The function of this Unit is to dissolve the solids in the clarifier bottoms stream, discharging a clear effluent to the outfall trench in order to comply with the Federal and State regulations covering the discharge of Total Suspended Solids (T.S.S.) from the Plant.

Process Flows: The clarifier bottoms are first mixed with sodium thiosulfate to kill the hypochlorites, then with HCl and recirculated liquid which is discharged into a tank and maintained at a pH of 2.0. The flow from the tank is split; part of it recirculates, and the rest discharges to the trench after a final acid injection point for additional pH control. Process water is added to the tanks' vent scrubber to scrub the CO₂ vapors produced and to dilute the contents of the tank.

TANKS AND VESSELS

D-810: D-810 IS A 12' X 24' high FRP tank with a capacity of 20,000 gallons. This tank is used as a holding tank for clarifier bottom solids with a controlled pH of 2. It is located inside a diked area north of the H₂ Recovery Unit.

T-810: T-810 is a gas scrubber located on top of D-810. It is an 18 inch in diameter by 9 feet high scrubber with four feet of one inch Kynar Saddles Packing.

SP-810: SP-810 serves as a pressure relief and vacuum breaking device for D-810. It is made out of FRP. The dimensions are two feet in diameter by three feet high.

SP-811: SP-811 serves as a seal pot for D-810 overflow line.

MX-810: MX-810 is the primary mixer in the line to the tank. This is where the HCl is added to the clarifier bottoms and starts the reaction to remove the solids. The pH is dropped in this mixer from a pH of 11 to 12, down to a pH of 2. It is also located inside the diked area.

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T. S. S. SECTION

T. S. S. Section: The function of this Unit is to dissolve the solids in the clarifier bottoms stream, discharging a clear effluent to the outfall trench in order to comply with the Federal and State regulations covering the discharge of Total Suspended Solids (T.S.S.) from the Plant.

Process Flows: The clarifier bottoms are first mixed with sodium thiosulfate to kill the hypochlorites, then with HCl and recirculated liquid which is discharged into a tank and maintained at a pH of 2.0. The flow from the tank is split; part of it recirculates, and the rest discharges to the trench after a final acid injection point for additional pH control. Process water is added to the tanks' vent scrubber to scrub the CO₂ vapors produced and to dilute the contents of the tank.

TANKS AND VESSELS

D-810: D-810 IS A 12' X 24' high FRP tank with a capacity of 20,000 gallons. This tank is used as a holding tank for clarifier bottom solids with a controlled pH of 2. It is located inside a diked area north of the H₂ Recovery Unit.

T-810: T-810 is a gas scrubber located on top of D-810. It is an 18 inch in diameter by 9 feet high scrubber with four feet of one inch Kynar Saddles Packing.

SP-810: SP-810 serves as a pressure relief and vacuum breaking device for D-810. It is made out of FRP. The dimensions are two feet in diameter by three feet high.

SP-811: SP-811 serves as a seal pot for D-810 overflow line.

MX-810: MX-810 is the primary mixer in the line to the tank. This is where the HCl is added to the clarifier bottoms and starts the reaction to remove the solids. The pH is dropped in this mixer from a pH of 11 to 12, down to a pH of 2. It is also located inside the diked area.

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DO 127607
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T. S. S. SECTION

T. S. S. Section: The function of this Unit is to dissolve the solids in the clarifier bottoms stream, discharging a clear effluent to the outfall trench in order to comply with the Federal and State regulations covering the discharge of Total Suspended Solids (T.S.S.) from the Plant.

Process Flows: The clarifier bottoms are first mixed with sodium thiosulfate to kill the hypochlorites, then with HCl and recirculated liquid which is discharged into a tank and maintained at a pH of 2.0. The flow from the tank is split; part of it recirculates, and the rest discharges to the trench after a final acid injection point for additional pH control. Process water is added to the tanks' vent scrubber to scrub the CO₂ vapors produced and to dilute the contents of the tank.

TANKS AND VESSELS

D-810: D-810 IS A 12' X 24' high FRP tank with a capacity of 20,000 gallons. This tank is used as a holding tank for clarifier bottom solids with a controlled pH of 2. It is located inside a diked area north of the H₂ Recovery Unit.

T-810: T-810 is a gas scrubber located on top of D-810. It is an 18 inch in diameter by 9 feet high scrubber with four feet of one inch Kynar Saddles Packing.

SP-810: SP-810 serves as a pressure relief and vacuum breaking device for D-810. It is made out of FRP. The dimensions are two feet in diameter by three feet high.

SP-811: SP-811 serves as a seal pot for D-810 overflow line.

MX-810: MX-810 is the primary mixer in the line to the tank. This is where the HCl is added to the clarifier bottoms and starts the reaction to remove the solids. The pH is dropped in this mixer from a pH of 11 to 12, down to a pH of 2. It is also located inside the diked area.

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MX-811: MX-811 is the secondary mixer located in the discharge line to the ditch.

VALVES

Process Water to T-810: This valve is used to control the process water to T-810, being used to scrub the CO₂ vapors and dilute the contents of the tank. This valve is labeled AO-401. This valve normally runs the in flow control mode of the operation. It is located on the east side of D-810.

Sodium Thiosulfate to MX-810: This valve is used to add sodium thiosulfate to kill the hypochlorites in D-810. Without this we could have a Cl₂ spill out of T-810. The valve is labeled AO-402 and is located on the first deck of the ecology structure. This valve normally runs in flow control.

Clarifier Bottoms to MX-810: This valve is used to control the Clarifier Bottoms to the T. S. S. Unit. This valve normally runs in flow control. The valve is labeled AO-216 and is located west of D-102 in the piperack.

HCl to MX-810: This valve is used to control the pH of the clarifier bottoms to D-810. This valve has two different control schemes. It can control in local pH control or cascade control. This valve is labeled AO-403 and is located north of the P-810's.

Recycle Valve Back to D-810: This valve is used to control the recycle flow at a constant rate. It responds in conjunction with the flow to the ditch. If the valve to the ditch opens, the recycle valve closes to maintain a constant flow. This valve is labeled AO-405 and is located west of the P-810's.

D-810 LCV Flow to Ditch: This valve is used to maintain a constant level in D-810. It is labeled AO-406 and is located west of the P-810's.

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MX-811: MX-811 is the secondary mixer located in the discharge line to the ditch.

VALVES

Process Water to T-810: This valve is used to control the process water to T-810, being used to scrub the CO₂ vapors and dilute the contents of the tank. This valve is labeled AO-401. This valve normally runs the in flow control mode of the operation. It is located on the east side of D-810.

Sodium Thiosulfate to MX-810: This valve is used to add sodium thiosulfate to kill the hypochlorites in D-810. Without this we could have a Cl₂ spill out of T-810. The valve is labeled AO-402 and is located on the first deck of the ecology structure. This valve normally runs in flow control.

Clarifier Bottoms to MX-810: This valve is used to control the Clarifier Bottoms to the T. S. S. Unit. This valve normally runs in flow control. The valve is labeled AO-216 and is located west of D-102 in the piperack.

HCl to MX-810: This valve is used to control the pH of the clarifier bottoms to D-810. This valve has two different control schemes. It can control in local pH control or cascade control. This valve is labeled AO-403 and is located north of the P-810's.

Recycle Valve Back to D-810: This valve is used to control the recycle flow at a constant rate. It responds in conjunction with the flow to the ditch. If the valve to the ditch opens, the recycle valve closes to maintain a constant flow. This valve is labeled AO-405 and is located west of the P-810's.

D-810 LCV Flow to Ditch: This valve is used to maintain a constant level in D-810. It is labeled AO-406 and is located west of the P-810's.

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MX-811: MX-811 is the secondary mixer located in the discharge line to the ditch.

VALVES

Process Water to T-810: This valve is used to control the process water to T-810, being used to scrub the CO₂ vapors and dilute the contents of the tank. This valve is labeled AO-401. This valve normally runs the in flow control mode of the operation. It is located on the east side of D-810.

Sodium Thiosulfate to MX-810: This valve is used to add sodium thiosulfate to kill the hypochlorites in D-810. Without this we could have a Cl₂ spill out of T-810. The valve is labeled AO-402 and is located on the first deck of the ecology structure. This valve normally runs in flow control.

Clarifier Bottoms to MX-810: This valve is used to control the Clarifier Bottoms to the T. S. S. Unit. This valve normally runs in flow control. The valve is labeled AO-216 and is located west of D-102 in the piperack.

HCl to MX-810: This valve is used to control the pH of the clarifier bottoms to D-810. This valve has two different control schemes. It can control in local pH control or cascade control. This valve is labeled AO-403 and is located north of the P-810's.

Recycle Valve Back to D-810: This valve is used to control the recycle flow at a constant rate. It responds in conjunction with the flow to the ditch. If the valve to the ditch opens, the recycle valve closes to maintain a constant flow. This valve is labeled AO-405 and is located west of the P-810's.

D-810 LCV Flow to Ditch: This valve is used to maintain a constant level in D-810. It is labeled AO-406 and is located west of the P-810's.

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HCl to MX-811: As of right now, we do not use this mixer, but it is available if needed. The valve is not shown on the graphics, but is labeled AO-404 and is located west of MX-811.

MECHANICAL EQUIPMENT

P-810 A/B: These pumps pump out of the tank at a constant rate of 150 gpm, and the flow split between re-circulation and the flow to the trench for level control.

P-811: This is the sump pump for the T. S. S. Unit diked area. This pump pumps the diked area to the ditch.

INSTRUMENTATION

AI-401 Flow Transmitter on Water to T-810: Indicates the amount of water to T-810. This flow is controlled with valve AO-401.

AI-402 Flow Transmitter on Sodium Thiosulfate to MX-810: Indicates the amount of sodium thiosulfate to MX-810. This flow is controlled with valve AO-402.

AI-451 Flow Transmitter on Clarifier Bottoms to MX-810: Indicates the amount of clarifier bottoms going to MX-810. This flow is controlled by valve AO-216.

AI-403 Flow Transmitter on HCl to MX-810: Indicates the amount of acid flow going to MX-810. This flow is controlled with valve AO-403.

AI-405 Flow Transmitter on P-810's Total Flow: Indicates the amount of total flow the P-810's are putting out.

AI-406 Flow Transmitter on P-810's Flow to Ditch: Indicates the amount of flow out of T. S. S. to the ditch. This flow is controlled with valve AO-406.

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HCl to MX-811: As of right now, we do not use this mixer, but it is available if needed. The valve is not shown on the graphics, but is labeled AO-404 and is located west of MX-811.

MECHANICAL EQUIPMENT

P-810 A/B: These pumps pump out of the tank at a constant rate of 150 gpm, and the flow split between re-circulation and the flow to the trench for level control.

P-811: This is the sump pump for the T. S. S. Unit diked area. This pump pumps the diked area to the ditch.

INSTRUMENTATION

AI-401 Flow Transmitter on Water to T-810: Indicates the amount of water to T-810. This flow is controlled with valve AO-401.

AI-402 Flow Transmitter on Sodium Thiosulfate to MX-810: Indicates the amount of sodium thiosulfate to MX-810. This flow is controlled with valve AO-402.

AI-451 Flow Transmitter on Clarifier Bottoms to MX-810: Indicates the amount of clarifier bottoms going to MX-810. This flow is controlled by valve AO-216.

AI-403 Flow Transmitter on HCl to MX-810: Indicates the amount of acid flow going to MX-810. This flow is controlled with valve AO-403.

AI-405 Flow Transmitter on P-810's Total Flow: Indicates the amount of total flow the P-810's are putting out.

AI-406 Flow Transmitter on P-810's Flow to Ditch: Indicates the amount of flow out of T. S. S. to the ditch. This flow is controlled with valve AO-406.

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HCl to MX-811: As of right now, we do not use this mixer, but it is available if needed. The valve is not shown on the graphics, but is labeled AO-404 and is located west of MX-811.

MECHANICAL EQUIPMENT

P-810 A/B: These pumps pump out of the tank at a constant rate of 150 gpm, and the flow split between re-circulation and the flow to the trench for level control.

P-811: This is the sump pump for the T. S. S. Unit diked area. This pump pumps the diked area to the ditch.

INSTRUMENTATION

AI-401 Flow Transmitter on Water to T-810: Indicates the amount of water to T-810. This flow is controlled with valve AO-401.

AI-402 Flow Transmitter on Sodium Thiosulfate to MX-810: Indicates the amount of sodium thiosulfate to MX-810. This flow is controlled with valve AO-402.

AI-451 Flow Transmitter on Clarifier Bottoms to MX-810: Indicates the amount of clarifier bottoms going to MX-810. This flow is controlled by valve AO-216.

AI-403 Flow Transmitter on HCl to MX-810: Indicates the amount of acid flow going to MX-810. This flow is controlled with valve AO-403.

AI-405 Flow Transmitter on P-810's Total Flow: Indicates the amount of total flow the P-810's are putting out.

AI-406 Flow Transmitter on P-810's Flow to Ditch: Indicates the amount of flow out of T. S. S. to the ditch. This flow is controlled with valve AO-406.

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CO₂ Vapors: The CO₂ vapors are a result of the neutralization process (when the acid is added to the bottom solids). It is a colorless, odorless gas, and is vented out of T-810.

Sodium Thiosulfate: Sodium thiosulfate is a clear amber-to-brown solution with a sulfur-like odor. It is used to react with the hypochlorites in the bottom solids. When handling, minimum requirements to be worn are monogoggles and rubber gloves.

Rotating Equipment: As in any area, extra caution should be taken when working around rotating equipment. Loose shirt tails, long hair, and fingers should be kept away from rotating equipment. The pumps in the T. S. S. Area (P-810 A/B and P-811) are auto start/stop pumps.

Fiberglass Equipment: The lines and equipment in the T. S. S. area are mostly constructed of fiberglass. Caution should be used when tightening flanges. Never tighten flanges as tight as metal flanges. They may crack. Also, never beat on fiberglass lines. You could puncture or crack the lines.

H₂ Recovery: It is important to know that the T. S. S. Unit is located by H₂ Recovery. When any job is done in the T. S. S. Area, consideration should be given to the potential of creating a fire or explosion in the H₂ Recovery Unit.

Noise: This unit is located between H₂ Recovery and Power II. Both are high noise areas. As in any part of the block, hearing protection should be worn.

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CO₂ Vapors: The CO₂ vapors are a result of the neutralization process (when the acid is added to the bottom solids). It is a colorless, odorless gas, and is vented out of T-810.

Sodium Thiosulfate: Sodium thiosulfate is a clear amber-to-brown solution with a sulfur-like odor. It is used to react with the hypochlorites in the bottom solids. When handling, minimum requirements to be worn are monogoggles and rubber gloves.

Rotating Equipment: As in any area, extra caution should be taken when working around rotating equipment. Loose shirt tails, long hair, and fingers should be kept away from rotating equipment. The pumps in the T. S. S. Area (P-810 A/B and P-811) are auto start/stop pumps.

Fiberglass Equipment: The lines and equipment in the T. S. S. area are mostly constructed of fiberglass. Caution should be used when tightening flanges. Never tighten flanges as tight as metal flanges. They may crack. Also, never beat on fiberglass lines. You could puncture or crack the lines.

H₂ Recovery: It is important to know that the T. S. S. Unit is located by H₂ Recovery. When any job is done in the T. S. S. Area, consideration should be given to the potential of creating a fire or explosion in the H₂ Recovery Unit.

Noise: This unit is located between H₂ Recovery and Power II. Both are high noise areas. As in any part of the block, hearing protection should be worn.

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CO₂ Vapors: The CO₂ vapors are a result of the neutralization process (when the acid is added to the bottom solids). It is a colorless, odorless gas, and is vented out of T-810.

Sodium Thiosulfate: Sodium thiosulfate is a clear amber-to-brown solution with a sulfur-like odor. It is used to react with the hypochlorites in the bottom solids. When handling, minimum requirements to be worn are monogoggles and rubber gloves.

Rotating Equipment: As in any area, extra caution should be taken when working around rotating equipment. Loose shirt tails, long hair, and fingers should be kept away from rotating equipment. The pumps in the T. S. S. Area (P-810 A/B and P-811) are auto start/stop pumps.

Fiberglass Equipment: The lines and equipment in the T. S. S. area are mostly constructed of fiberglass. Caution should be used when tightening flanges. Never tighten flanges as tight as metal flanges. They may crack. Also, never beat on fiberglass lines. You could puncture or crack the lines.

H₂ Recovery: It is important to know that the T. S. S. Unit is located by H₂ Recovery. When any job is done in the T. S. S. Area, consideration should be given to the potential of creating a fire or explosion in the H₂ Recovery Unit.

Noise: This unit is located between H₂ Recovery and Power II. Both are high noise areas. As in any part of the block, hearing protection should be worn.

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AI-434 T. S. S. pH Probe: Indicates the pH on the T. S. S. Unit. It is located between the mixer and D-810.

AI-454 T. S. S. pH Probe: Indicates the pH on the T. S. S. Unit. It is located between the mixer and D-810.

AI-464 T. S. S. pH Probe: Indicates the pH on the T. S. S. Unit. It is located between the mixer and D-810.

AI-456 D-810 Level Transmitter: Indicates the level in D-810. This level is controlled with valve AO-406.

DI-452 D-810 High Level Switch: Indicates when D-810 gets a high level. This does not indicate a level. It's just a switch that indicates on or off. When the level is high, the switch is on. When the level is below the switch, the switch is off.

AI-455 T. S. S. Sump Level Transmitter: Indicates the level in the sump inside the T. S. S. diked area.

DI-410 T. S. S. Sump High Level Switch Indicates when the sump in the T. S. S. dike area gets a high level. This switch indicates on or off. When the level is high, the switch is on. When the level is below the switch, the switch is off.

HAZARDS AND PROTECTION

HCl: One of the greatest hazards in this area is HCl. This is used in MX-810 to pH control D-810 at a 2 pH. HCl (Hydrochloric Acid) is a very corrosive acid. Minimum requirements for HCl line opening or handling is a slicker suit, face shield, rubber gloves and rubber boots.

Bottom Solids: This is the clarifier bottoms that is pumped to T. S. S. for neutralization. The bottom solids contain some excess caustic, to a pH of 11 to 12, saturated salt, about 100 ppm hypochlorites and solids in suspension which are mainly calcium and magnesium carbonates and hydroxides. Releasing solids to the Outfall could violate our water permit and result in costly fines. Minimum requirements for a line opening is slicker suit, face shield, rubber gloves, and rubber boots.

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AI-434 T. S. S. pH Probe: Indicates the pH on the T. S. S. Unit. It is located between the mixer and D-810.

AI-454 T. S. S. pH Probe: Indicates the pH on the T. S. S. Unit. It is located between the mixer and D-810.

AI-464 T. S. S. pH Probe: Indicates the pH on the T. S. S. Unit. It is located between the mixer and D-810.

AI-456 D-810 Level Transmitter: Indicates the level in D-810. This level is controlled with valve AO-406.

DI-452 D-810 High Level Switch: Indicates when D-810 gets a high level. This does not indicate a level. It's just a switch that indicates on or off. When the level is high, the switch is on. When the level is below the switch, the switch is off.

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DI-410 T. S. S. Sump High Level Switch: Indicates when the sump in the T. S. S. dike area gets a high level. This switch indicates on or off. When the level is high, the switch is on. When the level is below the switch, the switch is off.

HAZARDS AND PROTECTION

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AI-454 T. S. S. pH Probe: Indicates the pH on the T. S. S. Unit. It is located between the mixer and D-810.

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DI-452 D-810 High Level Switch: Indicates when D-810 gets a high level. This does not indicate a level. It's just a switch that indicates on or off. When the level is high, the switch is on. When the level is below the switch, the switch is off.

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HAZARDS AND PROTECTION

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LOW PRESSURE SCRUBBER SECTION

TANKS AND VESSELS

SP-250: SP-250 is a 6 ft. in diameter F. R. P. seal pot designed for a 2" water seal. It has a 42" inlet connecting to the wet Cl₂ header, and a 36" outlet connecting to the Venturi scrubber, J-250.

J-250: J-250 is an FRP Venturi with a titanium nozzle, designed for 15,000 ACFM. This is equivalent to 100,000 lbs. per hour of Cl₂ gas. The cell effluent design is 2,000 gpm at 60 psig nozzle pressure. Under these conditions, the Venturi will hold 4" water vacuum at the inlet and will have 95% scrubbing efficiency.

T-250: T-250 is a 6 ft. in diameter FRP packed tower with two 10 ft. sections packed with 2" Intalox Kynar saddles. The approximate overall height of the tower is 64 feet. It is supported by a structure and has a flanged removable bottom with an overflow flange. The liquid contents of the tower bottom are continuously recirculated through the lower section of packing by P-251 A/B, keeping the lower section of packing wet at all times.

VALVES

P-250 PCV to D-301: This valve is used to control the cell effluent line pressure to ecology. The valve protects the line from pressuring up too quickly, knocking the line out of the rack. This valve is located north of P-250's and is labeled AO-322 on the Ecology Can.

P-305 A/B to Ecology: This valve is used to keep the cell effluent header pressure up on line to ecology when the P-250's are down. This valve is a DO which means it is wide open or closed. This is another way of protecting the line from hammering out the rack. The valve is labeled DO-334. It is a fail open valve. It is located south of the P-250's.

Process Water to T-250: This valve is used to wash T-250 when the differential pressure gets too high. This indicates plugging

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LOW PRESSURE SCRUBBER SECTION

TANKS AND VESSELS

SP-250: SP-250 is a 6 ft. in diameter F. R. P. seal pot designed for a 2" water seal. It has a 42" inlet connecting to the wet Cl₂ header, and a 36" outlet connecting to the Venturi scrubber, J-250.

J-250: J-250 is an FRP Venturi with a titanium nozzle, designed for 15,000 ACFM. This is equivalent to 100,000 lbs. per hour of Cl₂ gas. The cell effluent design is 2,000 gpm at 60 psig nozzle pressure. Under these conditions, the Venturi will hold 4" water vacuum at the inlet and will have 95% scrubbing efficiency.

T-250: T-250 is a 6 ft. in diameter FRP packed tower with two 10 ft. sections packed with 2" Intalox Kynar saddles. The approximate overall height of the tower is 64 feet. It is supported by a structure and has a flanged removable bottom with an overflow flange. The liquid contents of the tower bottom are continuously recirculated through the lower section of packing by P-251 A/B, keeping the lower section of packing wet at all times.

VALVES

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LOW PRESSURE SCRUBBER SECTION

TANKS AND VESSELS

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VALVES

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Process Water to T-250: This valve is used to wash T-250 when the differential pressure gets too high. This indicates plugging

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problems with T-250. It is important not to leave this valve open because it will dilute the cell effluent in T-250, thus preventing it to scrub Cl_2 if a spill was to occur. This valve is located top deck of ecology and is labeled AO-321 on the Ecology Mod Can.

Cell Effluent to T-250 (Top): This valve is used to add cell effluent to T-250 when the Cl_2 probes detect Cl_2 . It is also a backup system for recirculating flow failure. This valve is located on top of ecology and is labeled AO-323 on the Ecology Mod Can. It is a fail open valve.

Cell Effluent to J-250: This valve is used to supply cell effluent to J-250. This valve opens in the event of a high cell header pressure. The cell effluent flow is regulated by the Mod to maintain a Cl_2 header pressure of 2" water. This valve is located on the middle deck of ecology and is labeled AO-324. This is also a fail open valve and can be found on the Ecology Mod Can.

P-251 Recirculation T-250 (Bottom): This valve is used to recycle the cell effluent in T-250 to keep the packing wet at all times. This valve normally runs open, and the flow is controlled by variable drive pump P-251A. This valve also works with the cell effluent valve to J-251 during cell startups. This valve is labeled AO-327 and is located on the second deck of ecology.

MECHANICAL EQUIPMENT

P-250 A/B: These pumps supply fresh cell effluent to all of ecology. The header pressure on cell effluent to ecology is maintained by the P-305's, but if the scrubbers were activated, the P-250's would start up and control. These pumps are 2400 volt pumps with a capacity of 3,000 gpm. These pumps are located on the west side of D-301 and are auto start pumps.

P-305 A/B: These pumps maintain the header pressure on the cell effluent supply to the Ecology Area. They maintain the line pressure to prevent the P-250's from hammering the line out of the piperack. These pumps are located on the southeast side of D-301. It is important to know that these pumps supply the cell effluent feed to the Caustic Plant.

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problems with T-250. It is important not to leave this valve open because it will dilute the cell effluent in T-250, thus preventing it to scrub Cl_2 if a spill was to occur. This valve is located top deck of ecology and is labeled AO-321 on the Ecology Mod Can.

Cell Effluent to T-250 (Top): This valve is used to add cell effluent to T-250 when the Cl_2 probes detect Cl_2 . It is also a backup system for recirculating flow failure. This valve is located on top of ecology and is labeled AO-323 on the Ecology Mod Can. It is a fail open valve.

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P-251 Recirculation T-250 (Bottom): This valve is used to recycle the cell effluent in T-250 to keep the packing wet at all times. This valve normally runs open, and the flow is controlled by variable drive pump P-251A. This valve also works with the cell effluent valve to J-251 during cell startups. This valve is labeled AO-327 and is located on the second deck of ecology.

MECHANICAL EQUIPMENT

P-250 A/B: These pumps supply fresh cell effluent to all of ecology. The header pressure on cell effluent to ecology is maintained by the P-305's, but if the scrubbers were activated, the P-250's would start up and control. These pumps are 2400 volt pumps with a capacity of 3,000 gpm. These pumps are located on the west side of D-301 and are auto start pumps.

P-305 A/B: These pumps maintain the header pressure on the cell effluent supply to the Ecology Area. They maintain the line pressure to prevent the P-250's from hammering the line out of the piperack. These pumps are located on the southeast side of D-301. It is important to know that these pumps supply the cell effluent feed to the Caustic Plant.

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problems with T-250. It is important not to leave this valve open because it will dilute the cell effluent in T-250, thus preventing it to scrub Cl_2 if a spill was to occur. This valve is located top deck of ecology and is labeled AO-321 on the Ecology Mod Can.

Cell Effluent to T-250 (Top): This valve is used to add cell effluent to T-250 when the Cl_2 probes detect Cl_2 . It is also a backup system for recirculating flow failure. This valve is located on top of ecology and is labeled AO-323 on the Ecology Mod Can. It is a fail open valve.

Cell Effluent to J-250: This valve is used to supply cell effluent to J-250. This valve opens in the event of a high cell header pressure. The cell effluent flow is regulated by the Mod to maintain a Cl_2 header pressure of 2" water. This valve is located on the middle deck of ecology and is labeled AO-324. This is also a fail open valve and can be found on the Ecology Mod Can.

P-251 Recirculation T-250 (Bottom): This valve is used to recycle the cell effluent in T-250 to keep the packing wet at all times. This valve normally runs open, and the flow is controlled by variable drive pump P-251A. This valve also works with the cell effluent valve to J-251 during cell startups. This valve is labeled AO-327 and is located on the second deck of ecology.

MECHANICAL EQUIPMENT

P-250 A/B: These pumps supply fresh cell effluent to all of ecology. The header pressure on cell effluent to ecology is maintained by the P-305's, but if the scrubbers were activated, the P-250's would start up and control. These pumps are 2400 volt pumps with a capacity of 3,000 gpm. These pumps are located on the west side of D-301 and are auto start pumps.

P-305 A/B: These pumps maintain the header pressure on the cell effluent supply to the Ecology Area. They maintain the line pressure to prevent the P-250's from hammering the line out of the piperack. These pumps are located on the southeast side of D-301. It is important to know that these pumps supply the cell effluent feed to the Caustic Plant.

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P-251 A/B: These pumps recirculate at a design rate of 400 gpm, keeping the lower section of packing wet at all times. These pumps also provide the re-circulation for the startup Venturi J-251. P-251 A is the main pump and is equipped with a variable speed drive. P-251 B is only used as an installed spare. The capacity of each pump is 800 gpm.

INSTRUMENTATION

AI-344 - Total Cell Effluent Flow to Scrubbers: Indicates the amount of cell effluent makeup flow is going to the scrubbers. It is located south of WP-800.

AI-346 - Cell Effluent Flow Transmitter to J-250: Indicates the amount of cell effluent flow going to J-250. This flow is controlled by valve AO-324.

AI-345 - Fresh Cell Effluent to T-250 : Indicates the amount of cell effluent flow being made up to T-250. This flow is controlled with valve AO-323.

AI-350 - T-250 Level Transmitter: Indicates the level in T-250. This level is controlled with valve AO-323.

AI-347 - Water to T-250 Flow Transmitter: Indicates the process water flow to T-250. This flow is controlled with AO-321.

DI-367 - Water Flow Switch to SP-250: This switch is to indicate that there is a water flow going to SP-250. This flow ensures that SP-250 stays full and sealed.

DI-355 - SP-250 Level Switch: Indicates the level in SP-250. This level is controlled with a manually restricted valve.

AI-349 - T-250 Differential Pressure Transmitter: Indicates the amount of differential pressure across T-250.

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P-251 A/B: These pumps recirculate at a design rate of 400 gpm, keeping the lower section of packing wet at all times. These pumps also provide the re-circulation for the startup Venturi J-251. P-251 A is the main pump and is equipped with a variable speed drive. P-251 B is only used as an installed spare. The capacity of each pump is 800 gpm.

INSTRUMENTATION

AI-344 - Total Cell Effluent Flow to Scrubbers: Indicates the amount of cell effluent makeup flow is going to the scrubbers. It is located south of WP-800.

AI-346 - Cell Effluent Flow Transmitter to J-250: Indicates the amount of cell effluent flow going to J-250. This flow is controlled by valve AO-324.

AI-345 - Fresh Cell Effluent to T-250 : Indicates the amount of cell effluent flow being made up to T-250. This flow is controlled with valve AO-323.

AI-350 - T-250 Level Transmitter: Indicates the level in T-250. This level is controlled with valve AO-323.

AI-347 - Water to T-250 Flow Transmitter: Indicates the process water flow to T-250. This flow is controlled with AO-321.

DI-367 - Water Flow Switch to SP-250: This switch is to indicate that there is a water flow going to SP-250. This flow ensures that SP-250 stays full and sealed.

DI-355 - SP-250 Level Switch: Indicates the level in SP-250. This level is controlled with a manually restricted valve.

AI-349 - T-250 Differential Pressure Transmitter: Indicates the amount of differential pressure across T-250.

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P-251 A/B: These pumps recirculate at a design rate of 400 gpm, keeping the lower section of packing wet at all times. These pumps also provide the re-circulation for the startup Venturi J-251. P-251 A is the main pump and is equipped with a variable speed drive. P-251 B is only used as an installed spare. The capacity of each pump is 800 gpm.

INSTRUMENTATION

AI-344 - Total Cell Effluent Flow to Scrubbers: Indicates the amount of cell effluent makeup flow is going to the scrubbers. It is located south of WP-800.

AI-346 - Cell Effluent Flow Transmitter to J-250: Indicates the amount of cell effluent flow going to J-250. This flow is controlled by valve AO-324.

AI-345 - Fresh Cell Effluent to T-250 : Indicates the amount of cell effluent flow being made up to T-250. This flow is controlled with valve AO-323.

AI-350 - T-250 Level Transmitter: Indicates the level in T-250. This level is controlled with valve AO-323.

AI-347 - Water to T-250 Flow Transmitter: Indicates the process water flow to T-250. This flow is controlled with AO-321.

DI-367 - Water Flow Switch to SP-250: This switch is to indicate that there is a water flow going to SP-250. This flow ensures that SP-250 stays full and sealed.

DI-355 - SP-250 Level Switch: Indicates the level in SP-250. This level is controlled with a manually restricted valve.

AI-349 - T-250 Differential Pressure Transmitter: Indicates the amount of differential pressure across T-250.

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AI-329 - T-250 Cl₂ Probes: Indicates the amount of Cl₂ coming out of T-250 stack.

AI-309 - T-250 Cl₂ Probes: Indicates the amount of Cl₂ coming out of T-250 stack.

AI-319 - T-250 Cl₂ Probes: Indicates the amount of Cl₂ coming out of T-250 stack.

AI-352 - T-250 pH Probes: Indicates the pH of the recycled cell effluent to determine how much more Cl₂ can be absorbed.

AI-362 - T-250 pH Probe: Indicates the pH of the recycled cell effluent to determine how much more Cl₂ can be absorbed.

AI-372 - T-250 pH Probe: Indicates the pH of the recycled cell effluent to determine how much more Cl₂ can be absorbed.

AI-383 - T-250 Temperature Probe: Indicates the mid temperature in T-250.

AI-384 - T-250 Temperature Probe: Indicates the bottom temperature in T-250.

AI-382 - T-250 Temperature Probe: Indicates the top temperature in T-250.

HAZARDS AND PROTECTION

Cell Effluent: Cell effluent is one of the hazards in this area. Cell effluent is a light (10% caustic) that is used to scrub the Cl₂ vapors. When scrubbing the Cl₂ vapors, the cell effluent will heat up due to the reaction. Minimum requirements for cell effluent are monogoggles and rubber gloves.

Cl₂ Gas: Cl₂ gas is one of the hazards in this area. It is a green gas that is toxic and corrosive. It will cause respiratory problems and eye irritation. Minimum requirements for Cl₂ gas is monogoggles and mouth-bit respirator when approaching a leak upwind or for escape only. A full-face canister mask is required when catching a Cl₂ sample or working on or near a leak.

AI-329 - T-250 Cl₂ Probes: Indicates the amount of Cl₂ coming out of T-250 stack.

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AI-383 - T-250 Temperature Probe: Indicates the mid temperature in T-250.

AI-384 - T-250 Temperature Probe: Indicates the bottom temperature in T-250.

AI-382 - T-250 Temperature Probe: Indicates the top temperature in T-250.

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Rotating Equipment: As in any area, extra precaution should be given when working around rotating equipment. Loose shirt tails, long hair, and fingers should be kept away from rotating equipment. The P-250's and P-251's are auto start/stop pumps, and extra precaution should be taken.

Noise: The Low Pressure Scrubber is located next to Power II and H₂ Recovery. As in any part of the block, hearing protection should be worn.

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Rotating Equipment: As in any area, extra precaution should be given when working around rotating equipment. Loose shirt tails, long hair, and fingers should be kept away from rotating equipment. The P-250's and P-251's are auto start/stop pumps, and extra precaution should be taken.

Noise: The Low Pressure Scrubber is located next to Power II and H₂ Recovery. As in any part of the block, hearing protection should be worn.

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Rotating Equipment: As in any area, extra precaution should be given when working around rotating equipment. Loose shirt tails, long hair, and fingers should be kept away from rotating equipment. The P-250's and P-251's are auto start/stop pumps, and extra precaution should be taken.

Noise: The Low Pressure Scrubber is located next to Power II and H₂ Recovery. As in any part of the block, hearing protection should be worn.

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STARTUP SCRUBBER SYSTEM SECTION

TANKS AND VESSELS

T-250: A 6 ft. in diameter FRP packed tower with two 10 foot sections packed with 2" Intalox Kynar saddles. The column is 64 feet tall and is supported by a structure. The liquid contents of the tower bottom are continuously recirculated through the lower section of the packing.

J-251: J-251 is an F. R. P. Venturi scrubber that is 16" in diameter with an all titanium nozzle and draft of 4" water at 2,000 cfm gas flow.

VRD-251: A 2 feet in diameter by 4 feet high FRP vacuum breaker designed for a maximum vacuum of 8" water.

VALVES

AUTO pH Control Valve (AO-323): This valve will maintain a pH of 12 or 13, depending on if one or two circuits of cells are being energized. This valve also maintains level in T-250.

Startup Header Pressure Control Valve (AO-325): When J-251 is in the "sweep" step, this valve is used to control the vacuum at -4" water.

Process Water to VRD-251: This small manual valve is used to maintain a process water flow to VRD-251. Without this, a level would not be maintained, and vacuum would be lost on the startup header.

Scrubber Block Valves on S-1 through S-8: These 12" block valves are located at each series. These valves are opened up during startup operation or when we want to sweep the covers.

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STARTUP SCRUBBER SYSTEM SECTION

TANKS AND VESSELS

T-250: A 6 ft. in diameter FRP packed tower with two 10 foot sections packed with 2" Intalox Kynar saddles. The column is 64 feet tall and is supported by a structure. The liquid contents of the tower bottom are continuously recirculated through the lower section of the packing.

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VALVES

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Startup Header Pressure Control Valve (AO-325): When J-251 is in the "sweep" step, this valve is used to control the vacuum at -4" water.

Process Water to VRD-251: This small manual valve is used to maintain a process water flow to VRD-251. Without this, a level would not be maintained, and vacuum would be lost on the startup header.

Scrubber Block Valves on S-1 through S-8: These 12" block valves are located at each series. These valves are opened up during startup operation or when we want to sweep the covers.

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STARTUP SCRUBBER SYSTEM SECTION

TANKS AND VESSELS

T-250: A 6 ft. in diameter FRP packed tower with two 10 foot sections packed with 2" Intalox Kynar saddles. The column is 64 feet tall and is supported by a structure. The liquid contents of the tower bottom are continuously recirculated through the lower section of the packing.

J-251: J-251 is an F. R. P. Venturi scrubber that is 16" in diameter with an all titanium nozzle and draft of 4" water at 2,000 cfm gas flow.

VRD-251: A 2 feet in diameter by 4 feet high FRP vacuum breaker designed for a maximum vacuum of 8" water.

VALVES

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Startup Header Pressure Control Valve (AO-325): When J-251 is in the "sweep" step, this valve is used to control the vacuum at -4" water.

Process Water to VRD-251: This small manual valve is used to maintain a process water flow to VRD-251. Without this, a level would not be maintained, and vacuum would be lost on the startup header.

Scrubber Block Valves on S-1 through S-8: These 12" block valves are located at each series. These valves are opened up during startup operation or when we want to sweep the covers.

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MECHANICAL EQUIPMENT

P-251 A/B: These pumps are used to supply cell effluent to J-251 and recirculate cell effluent back to T-250. P-251 A is a variable speed drive (VSD) pump and is used to maintain a small recirculation flow to keep column contents wet while the scrubber is not in use.

INSTRUMENTATION

Startup Header Pressure Transmitters: These header pressure transmitters are located in the piperack north of D-201 and are used for startup purposes only.

Water Flow Switch to VRD-251: This switch is located at VRD-251. It alarms when water flow is lost and and couldn't be maintained.

pH Transmitters on P-251'S Suction: These transmitters are located on the suctions of the P-251's. The probes let the Mod5 know when the cell effluent has scrubbed all of the Cl_2 it can. This is called spent cell effluent. If fresh cell effluent wasn't added when a low pH is reached, a spill would occur out of the top of T-250.

Both Cl_2 Probes on T-250: These probes are located on the top of T-250. These probes let us know when Cl_2 is released out of the top of T-250.

Total Cell Effluent Flow to T-250/J-251: This flow meter monitors flows during test functions/steps of the Mod5. This is one way to let us know if the variable speed drive pump (P-251A) is working properly. This flow is located on the discharge of the P-251's.

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MECHANICAL EQUIPMENT

P-251 A/B: These pumps are used to supply cell effluent to J-251 and recirculate cell effluent back to T-250. P-251 A is a variable speed drive (VSD) pump and is used to maintain a small recirculation flow to keep column contents wet while the scrubber is not in use.

INSTRUMENTATION

Startup Header Pressure Transmitters: These header pressure transmitters are located in the piperack north of D-201 and are used for startup purposes only.

Water Flow Switch to VRD-251: This switch is located at VRD-251. It alarms when water flow is lost and and couldn't be maintained.

pH Transmitters on P-251'S Suction: These transmitters are located on the suctions of the P-251's. The probes let the Mod5 know when the cell effluent has scrubbed all of the Cl_2 it can. This is called spent cell effluent. If fresh cell effluent wasn't added when a low pH is reached, a spill would occur out of the top of T-250.

Both Cl_2 Probes on T-250: These probes are located on the top of T-250. These probes let us know when Cl_2 is released out of the top of T-250.

Total Cell Effluent Flow to T-250/J-251: This flow meter monitors flows during test functions/steps of the Mod5. This is one way to let us know if the variable speed drive pump (P-251A) is working properly. This flow is located on the discharge of the P-251's.

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MECHANICAL EQUIPMENT

P-251 A/B: These pumps are used to supply cell effluent to J-251 and recirculate cell effluent back to T-250. P-251 A is a variable speed drive (VSD) pump and is used to maintain a small recirculation flow to keep column contents wet while the scrubber is not in use.

INSTRUMENTATION

Startup Header Pressure Transmitters: These header pressure transmitters are located in the piperack north of D-201 and are used for startup purposes only.

Water Flow Switch to VRD-251: This switch is located at VRD-251. It alarms when water flow is lost and couldn't be maintained.

pH Transmitters on P-251'S Suction: These transmitters are located on the suctions of the P-251's. The probes let the Mod5 know when the cell effluent has scrubbed all of the Cl_2 it can. This is called spent cell effluent. If fresh cell effluent wasn't added when a low pH is reached, a spill would occur out of the top of T-250.

Both Cl_2 Probes on T-250: These probes are located on the top of T-250. These probes let us know when Cl_2 is released out of the top of T-250.

Total Cell Effluent Flow to T-250/J-251: This flow meter monitors flows during test functions/steps of the Mod5. This is one way to let us know if the variable speed drive pump (P-251A) is working properly. This flow is located on the discharge of the P-251's.

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HAZARDS AND PROTECTIVE MEASURES

CHEMICALS

Cell Effluent: This is the most widely used chemical in this area (besides Cl_2 when the scrubbers are in use). This is a corrosive substance. If contact is made with eyes or skin, flush immediately with water for 15 minutes. Minimum safety equipment when performing a line opening in cell effluent service is face shield, slicker suit, and rubber gloves.

Chlorine Gas: Cl_2 is a toxic and corrosive chemical. If Cl_2 is inhaled, evacuate to a Cl_2 free atmosphere and report to Medical, if necessary. Always wear breathing air, slicker suit, and rubber gloves while performing a line opening in Cl_2 service.

ROTATING EQUIPMENT

P-251 A/B: Always be careful while working around rotating equipment. P-251's have coupling guards, but some of the shaft is still exposed. Keep loose fitting clothing, long hair, and dangling objects away from these dangerous areas. While working on shafts, seals, couplings, etc., always make sure the pump is properly tagged and racked out per CA II Block Procedure.

NOISE: None

SPILLS: If you see a Cl_2 spill while making a round, always report it to the control room. Never try to repair a Cl_2 leak with a mouth bit respirator. These are for escape purposes only.

As with Cl_2 spills, always report them to the control room and stay away until the proper safety equipment can be worn if the leak needs to be blocked in.

If a line opening is required to remove a pH probe to be acidized, wear proper safety equipment. Always wear minimum block safety equipment when handling acids and buffers that are needed to acidize these probes.

Always follow S&LP standards when cross-tying any process. Be sure to use a double block and bleed setup with a check valve on

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Cell Effluent: This is the most widely used chemical in this area (besides Cl_2 when the scrubbers are in use). This is a corrosive substance. If contact is made with eyes or skin, flush immediately with water for 15 minutes. Minimum safety equipment when performing a line opening in cell effluent service is face shield, slicker suit, and rubber gloves.

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ROTATING EQUIPMENT

P-251 A/B: Always be careful while working around rotating equipment. P-251's have coupling guards, but some of the shaft is still exposed. Keep loose fitting clothing, long hair, and dangling objects away from these dangerous areas. While working on shafts, seals, couplings, etc., always make sure the pump is properly tagged and racked out per CA II Block Procedure.

NOISE: None

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NOISE: None

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As with Cl_2 spills, always report them to the control room and stay away until the proper safety equipment can be worn if the leak needs to be blocked in.

If a line opening is required to remove a pH probe to be acidized, wear proper safety equipment. Always wear minimum block safety equipment when handling acids and buffers that are needed to acidize these probes.

Always follow S&LP standards when cross-tying any process. Be sure to use a double block and bleed setup with a check valve on

every cross-tie. (See your S&LP Standard for the proper way to set up a double block and bleed).

Always take precautions when transferring hoses, valves and piping from one service to another. Make sure hoses are clean and dry before connecting them to another service. Always take extra precautions when connecting air or N₂ hoses to Cl₂ service. A very little amount of water or moisture can do a lot of damage to a dry carbon steel Cl₂ line.

Always throw away plastic tubing when you are finished using it (if it was used in hazardous service). Never use blue water hose, N₂ hose, or green air hose to drain any type of chemical from a tank or line. Talk to your supervisor first and get a chemical hose for this job. Never substitute a utility hose for a chemical hose.

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HIGH PRESSURE SCRUBBER

TANKS AND VESSELS

J-252: A Venturi scrubber used to scrub high pressure Cl_2 ; example, startup of circuit through C-201, PSV's Liquefaction, Purification, sniff header, tail gas system, T-505 Overhead (O. H.), etc. The Venturi design is based on a 95% completion of the reaction between NaOH and Cl_2 . It also has a nozzle that lets through 750 gpm of cell effluent at 40 psig cell effluent pressure.

T-252: This is a packed tower filled with 255 cubic feet of #2 Intalox saddle packing used to ensure good contact between cell effluent and chlorine. J-252 discharges into this tower.

VALVES

Fresh Cell Effluent to T-252: This is used to control the level and the pH in T-252. This valve can be found on the Ecology Can in the control room labeled as AO-411.

Fresh Cell Effluent to J-252: This is used to add fresh cell effluent to J-252. It is also used to control the flow through J-252. This control is from the Ecology Can in the Control Room and is labeled AO-412.

T-252 Recycle Control Valve: Flow controls the recycle to T-252, keeping cell effluent on packing at all times. This valve is found on the Ecology Can in the Control Room and is labeled AO-413.

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HIGH PRESSURE SCRUBBER

TANKS AND VESSELS

J-252: A Venturi scrubber used to scrub high pressure Cl_2 ; example, startup of circuit through C-201, PSV's Liquefaction, Purification, sniff header, tail gas system, T-505 Overhead (O. H.), etc. The Venturi design is based on a 95% completion of the reaction between NaOH and Cl_2 . It also has a nozzle that lets through 750 gpm of cell effluent at 40 psig cell effluent pressure.

T-252: This is a packed tower filled with 255 cubic feet of #2 Intalox saddle packing used to ensure good contact between cell effluent and chlorine. J-252 discharges into this tower.

VALVES

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Fresh Cell Effluent to J-252: This is used to add fresh cell effluent to J-252. It is also used to control the flow through J-252. This control is from the Ecology Can in the Control Room and is labeled AO-412.

T-252 Recycle Control Valve: Flow controls the recycle to T-252, keeping cell effluent on packing at all times. This valve is found on the Ecology Can in the Control Room and is labeled AO-413.

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VALVES

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Fresh Cell Effluent to J-252: This is used to add fresh cell effluent to J-252. It is also used to control the flow through J-252. This control is from the Ecology Can in the Control Room and is labeled AO-412.

T-252 Recycle Control Valve: Flow controls the recycle to T-252, keeping cell effluent on packing at all times. This valve is found on the Ecology Can in the Control Room and is labeled AO-413.

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J-252 Recycle Flow Control Valve: This is a fail open valve. It controls the recycle flow to J-252. This valve can be controlled from the Control Room on the Ecology Can labeled AO-414.

Process Water to T-252 Flow Control Valve: The process water flow is measured and controlled by this valve. This flow is set in a wash mode by the Mod5 computer. This can be controlled from the Mod5 Ecology Can. The valve is labeled AO-415.

N₂ to D-252 Control Valve: Controls N₂ pressure inside D-252 and pushes Cl₂ gas to J-252. The valve is labeled AO-420 on the Ecology Can on the Mod5 System.

Cl₂ from C-201 A/B to D-252 and J-252 Control Valve: Controls the gas flow from C-201 A/B to J-252 located on the head tank deck east of T-210. The valve is labeled AO-410 on the C-201A/B Mod5 Can.

P-252 A/B Suction, Discharge, Bleeds, and Seal: All manual block valves located at P-252 pump. The valve normally is open except when off-line pump is back spinning or valves are tagged.

Cell Effluent to T-252 Bleed Valve Upstream: The valve is located between AO-411 and the upstream manual block valve. This is a manual block valve.

Cell Effluent to T-252 Bleed Valve Downstream: The valve is located between AO-411 and the downstream manual block valve. This is a manual block valve.

P-250 A/B Suction, Discharge, Bleeds, Common Suction Valve: All manual block valves located west of D-301 at P-250 pumps. All valves are normally open except when tagged.

N₂ Block Valve at D-252: This valve is located south of D-252 upstream of AO-420. This is a manual block valve.

Block Valve on P-250 Pressure Control Loop to D-301 and D-316 A: This valve is located north of P-250 pumps above AO-322. The valve is normally closed. This is a manual block valve.

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J-252 Recycle Flow Control Valve: This is a fail open valve. It controls the recycle flow to J-252. This valve can be controlled from the Control Room on the Ecology Can labeled AO-414.

Process Water to T-252 Flow Control Valve: The process water flow is measured and controlled by this valve. This flow is set in a wash mode by the Mod5 computer. This can be controlled from the Mod5 Ecology Can. The valve is labeled AO-415.

N₂ to D-252 Control Valve: Controls N₂ pressure inside D-252 and pushes Cl₂ gas to J-252. The valve is labeled AO-420 on the Ecology Can on the Mod5 System.

Cl₂ from C-201 A/B to D-252 and J-252 Control Valve: Controls the gas flow from C-201 A/B to J-252 located on the head tank deck east of T-210. The valve is labeled AO-410 on the C-201A/B Mod5 Can.

P-252 A/B Suction, Discharge, Bleeds, and Seal: All manual block valves located at P-252 pump. The valve normally is open except when off-line pump is back spinning or valves are tagged.

Cell Effluent to T-252 Bleed Valve Upstream: The valve is located between AO-411 and the upstream manual block valve. This is a manual block valve.

Cell Effluent to T-252 Bleed Valve Downstream: The valve is located between AO-411 and the downstream manual block valve. This is a manual block valve.

P-250 A/B Suction, Discharge, Bleeds, Common Suction Valve: All manual block valves located west of D-301 at P-250 pumps. All valves are normally open except when tagged.

N₂ Block Valve at D-252: This valve is located south of D-252 upstream of AO-420. This is a manual block valve.

Block Valve on P-250 Pressure Control Loop to D-301 and D-316 A: This valve is located north of P-250 pumps above AO-322. The valve is normally closed. This is a manual block valve.

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J-252 Recycle Flow Control Valve: This is a fail open valve. It controls the recycle flow to J-252. This valve can be controlled from the Control Room on the Ecology Can labeled AO-414.

Process Water to T-252 Flow Control Valve: The process water flow is measured and controlled by this valve. This flow is set in a wash mode by the Mod5 computer. This can be controlled from the Mod5 Ecology Can. The valve is labeled AO-415.

N₂ to D-252 Control Valve: Controls N₂ pressure inside D-252 and pushes Cl₂ gas to J-252. The valve is labeled AO-420 on the Ecology Can on the Mod5 System.

Cl₂ from C-201 A/B to D-252 and J-252 Control Valve: Controls the gas flow from C-201 A/B to J-252 located on the head tank deck east of T-210. The valve is labeled AO-410 on the C-201A/B Mod5 Can.

P-252 A/B Suction, Discharge, Bleeds, and Seal: All manual block valves located at P-252 pump. The valve normally is open except when off-line pump is back spinning or valves are tagged.

Cell Effluent to T-252 Bleed Valve Upstream: The valve is located between AO-411 and the upstream manual block valve. This is a manual block valve.

Cell Effluent to T-252 Bleed Valve Downstream: The valve is located between AO-411 and the downstream manual block valve. This is a manual block valve.

P-250 A/B Suction, Discharge, Bleeds, Common Suction Valve: All manual block valves located west of D-301 at P-250 pumps. All valves are normally open except when tagged.

N₂ Block Valve at D-252: This valve is located south of D-252 upstream of AO-420. This is a manual block valve.

Block Valve on P-250 Pressure Control Loop to D-301 and D-316 A: This valve is located north of P-250 pumps above AO-322. The valve is normally closed. This is a manual block valve.

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P-250 A/B Pressure Control Valve: This valve controls the pressure on the line going to the scrubbers. This valve goes open when P-250 pumps kick on. The valve is located north of the P-250's and is labeled AO-322 on the Mod5 computer.

Auto Valve from P-305's: This stays in the open position at all times and is located south of the P-250's ground level. This valve is found on the Mod5 computer and is labeled DO-334. It is a fail open valve.

MECHANICAL EQUIPMENT

P-252 A/B: These pumps are used to re-circulate the cell effluent in T-252, keeping the packing wet. It also supplies cell effluent to J-252. These pumps are located on the east side of WP-800 and are auto start pumps.

P-250 A/B: These pumps supply fresh cell effluent to all of Ecology. On the high pressure scrubber, these pumps add cell effluent to J-252 and to the top of T-252. These pumps are 2400 volt pumps with a capacity of 3,000 gpm. They are located on the west side of D-301 and are auto start pumps.

P-305 A/B: These pumps maintain the header pressure on the cell effluent supply to the Ecology Area. They maintain the line pressure to prevent the P-250's from hammering the line out of the piperack. These pumps are located on the southeast side of D-301. It is important to know that these pumps supply the cell effluent feed to the Caustic Plant.

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MECHANICAL EQUIPMENT

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INSTRUMENTATION

T-252 pH Probe at Suction of P-252 (AI-407): Indicates the pH of the recycled cell effluent to determine how much more Cl_2 can be absorbed. This pH is controlled with valve AO-411.

T-252 pH Probe at Suction of P-252 (AI-417): Indicates the pH of the recycled cell effluent to determine how much more Cl_2 can be absorbed. This pH is controlled with valve AO-411.

T-252 pH Probe at Suction of P-252 (AI-427): Indicates the pH of the recycled cell effluent to determine how much more Cl_2 can be absorbed. This pH is controlled with valve AO-411.

P-252 Total Flow Transmitter to Top of T-252 and J-252: Indicates the total recycled cell effluent off the P-252's to T-252 and to J-252. This flow is controlled with valves AO-413 and AO-414.

Temperature Probe on Bottom of T-252 (AI-442): Indicates the temperature on the bottom of T-252. This helps indicate the reaction of the cell effluent scrubbing the Cl_2 .

T-252 Level Transmitter (AI-460): Indicates the level in T-252. This level is controlled with valve AO-412.

T-252 Level Transmitter (AI-470): Indicates the level in T-252. This level is controlled with valve AO-412.

Pressure Transmitter at J-252 (AI-459): Indicates the pressure on the Cl_2 line coming from ~~T-210~~ going to J-252.

~~T-210~~
D-252

P-252 Discharge Flow Transmitter to Top of T-252 (AI-413): Indicates the flow of the P-252 discharge to the top of T-252. This flow is controlled with valve AO-413 and can also be affected by valve AO-414.

Process Water Flow Transmitter to Top of T-252 (AI-415): Indicates the process water flow to the top of T-252. This flow is controlled with valve AO-415.

T-252 Differential Pressure Transmitter (AI-457): Indicates the amount of differential pressure across T-252.

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INSTRUMENTATION

T-252 pH Probe at Suction of P-252 (AI-407): Indicates the pH of the recycled cell effluent to determine how much more Cl_2 can be absorbed. This pH is controlled with valve AO-411.

T-252 pH Probe at Suction of P-252 (AI-417): Indicates the pH of the recycled cell effluent to determine how much more Cl_2 can be absorbed. This pH is controlled with valve AO-411.

T-252 pH Probe at Suction of P-252 (AI-427): Indicates the pH of the recycled cell effluent to determine how much more Cl_2 can be absorbed. This pH is controlled with valve AO-411.

P-252 Total Flow Transmitter to Top of T-252 and J-252: Indicates the total recycled cell effluent off the P-252's to T-252 and to J-252. This flow is controlled with valves AO-413 and AO-414.

Temperature Probe on Bottom of T-252 (AI-442): Indicates the temperature on the bottom of T-252. This helps indicate the reaction of the cell effluent scrubbing the Cl_2 .

T-252 Level Transmitter (AI-460): Indicates the level in T-252. This level is controlled with valve AO-412.

T-252 Level Transmitter (AI-470): Indicates the level in T-252. This level is controlled with valve AO-412.

Pressure Transmitter at J-252 (AI-459): Indicates the pressure on the Cl_2 line coming from ~~T-210~~ going to J-252.
D-252

P-252 Discharge Flow Transmitter to Top of T-252 (AI-413): Indicates the flow of the P-252 discharge to the top of T-252. This flow is controlled with valve AO-413 and can also be affected by valve AO-414.

Process Water Flow Transmitter to Top of T-252 (AI-415): Indicates the process water flow to the top of T-252. This flow is controlled with valve AO-415.

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Process Water Flow Transmitter to Top of T-252 (AI-415): Indicates the process water flow to the top of T-252. This flow is controlled with valve AO-415.

T-252 Differential Pressure Transmitter (AI-457): Indicates the amount of differential pressure across T-252.

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T-252 Stack Cl₂ Probe (AI-458): Indicates the amount of Cl₂ being released out of T-252. Valve AO-411 is used to scrub the Cl₂ that is indicated on this probe.

T-252 Stack Cl₂ Probe (AI-468): Indicates the amount of Cl₂ being released out of T-252. Valve AO-411 is used to scrub the Cl₂ that is indicated on this probe.

T-252 Stack Cl₂ Probe (AI-478): Indicates the amount of Cl₂ being released out of T-252. Valve AO-411 is used to scrub the Cl₂ that is indicated on this probe.

Temperature Probe T-252 Stack (AI-441): Indicates the temperature at the top of T-252. This helps indicate the reaction of the cell effluent scrubbing the Cl₂.

HAZARDS AND PROTECTIONS

Cell Effluent: Cell effluent is one of the hazards in this area. Cell effluent is a light (10%) caustic that is used to scrub the Cl₂ vapors. When scrubbing the Cl₂ vapors, the cell effluent will heat up due to the reaction. Minimum requirements for cell effluent are monogoggles and rubber gloves.

Cl₂ Gas: Cl₂ gas is one of the hazards in this area. It is a green gas that is toxic and corrosive. It will cause respiratory problems and eye irritation. Minimum requirements for Cl₂ gas is monogoggles and mouth bit respirator when approaching a leak upwind or for escape only. A full face canister mask is required when catching a Cl₂ sample or when working on or near a leak.

Rotating Equipment: As in any area, extra precaution should be given when working around rotating equipment. Loose shirt tales, long hair, and fingers should be kept away from rotating equipment. The P-250's and P-252's are auto start/stop pumps, and extra precaution should be taken.

Noise: The High Pressure Scrubber is located next to Power II and H₂ Recovery. As in any part of the block, hearing protection should be worn.

T-252 Stack Cl₂ Probe (AI-458): Indicates the amount of Cl₂ being released out of T-252. Valve AO-411 is used to scrub the Cl₂ that is indicated on this probe.

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T-252 Stack Cl₂ Probe (AI-478): Indicates the amount of Cl₂ being released out of T-252. Valve AO-411 is used to scrub the Cl₂ that is indicated on this probe.

Temperature Probe T-252 Stack (AI-441): Indicates the temperature at the top of T-252. This helps indicate the reaction of the cell effluent scrubbing the Cl₂.

HAZARDS AND PROTECTIONS

Cell Effluent: Cell effluent is one of the hazards in this area. Cell effluent is a light (10%) caustic that is used to scrub the Cl₂ vapors. When scrubbing the Cl₂ vapors, the cell effluent will heat up due to the reaction. Minimum requirements for cell effluent are monogoggles and rubber gloves.

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Rotating Equipment: As in any area, extra precaution should be given when working around rotating equipment. Loose shirt tails, long hair, and fingers should be kept away from rotating equipment. The P-250's and P-252's are auto start/stop pumps, and extra precaution should be taken.

Noise: The High Pressure Scrubber is located next to Power II and H₂ Recovery. As in any part of the block, hearing protection should be worn.

FINAL OUTFALL SECTION

VALVES

Sump 12 Level Control Valve: This valve is physically located over Sump 12 which is north of the cell area. It controls the level in Sump 12 to prevent the trenches in the block from overflowing. This valve is labeled AO-306 and is located on the Mod5 Can 300 System "A".

Outfall Trench Flow Control Valve: This valve controls the flow into the Outfall Trench according to the pH of the first trench pH probes. Under normal operating conditions, this valve is fully open.

Sodium Thiosulfate from D-800: This valve controls the flow of sodium thiosulfate from D-800 storage tank into the mixer for the outfall trench flows. It is located in the east/west piperack north of Sump 12.

Spent HCl from Vinyl II: This valve is used as an additional HCl source to MX-801 mixer to control the pH in the outfall trench. This is 34% HCl from the Vinyl II Plant. It is located upstream of MX-801.

Spent HCl from Methanes: This valve controls the HCl flow from the Methanes Plant. It is located upstream of MX-801 north of Sump 12. When this spent HCl is available, it is the preferred choice for pH control.

First Trench HCl Addition: This valve is a backup pH controller or the primary pH controller when the spent HCl from CMP or 34% HCl from Vinyl II is not available. It can also serve as a flow controller and is located south of D-601.

Second Trench HCl Addition: This is the smaller of the two valves at this point located north of HRU #2. It adds HCl to the trench to control the pH at a given setpoint.

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FINAL OUTFALL SECTION

VALVES

Sump 12 Level Control Valve: This valve is physically located over Sump 12 which is north of the cell area. It controls the level in Sump 12 to prevent the trenches in the block from overflowing. This valve is labeled AO-306 and is located on the Mod5 Can 300 System "A".

Outfall Trench Flow Control Valve: This valve controls the flow into the Outfall Trench according to the pH of the first trench pH probes. Under normal operating conditions, this valve is fully open.

Sodium Thiosulfate from D-800: This valve controls the flow of sodium thiosulfate from D-800 storage tank into the mixer for the outfall trench flows. It is located in the east/west piperack north of Sump 12.

Spent HCl from Vinyl II: This valve is used as an additional HCl source to MX-801 mixer to control the pH in the outfall trench. This is 34% HCl from the Vinyl II Plant. It is located upstream of MX-801.

Spent HCl from Methanes: This valve controls the HCl flow from the Methanes Plant. It is located upstream of MX-801 north of Sump 12. When this spent HCl is available, it is the preferred choice for pH control.

First Trench HCl Addition: This valve is a backup pH controller or the primary pH controller when the spent HCl from CMP or 34% HCl from Vinyl II is not available. It can also serve as a flow controller and is located south of D-601.

Second Trench HCl Addition: This is the smaller of the two valves at this point located north of HRU #2. It adds HCl to the trench to control the pH at a given setpoint.

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VALVES

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Second Trench HCl Addition: This is the smaller of the two valves at this point located north of HRU #2. It adds HCl to the trench to control the pH at a given setpoint.

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Second HCl Addition: This is the larger of the two valves located north of HRU #2. When the smaller valve is fully open, this valve opens to control the pH in the outfall trench. It can also be used as a flow controller.

MX-801: This is a mixing pot for the trench effluent where the sodium thiosulfate and HCl from Methanes are added for ORP and pH control. It is located in the east/west piperack south of T-206.

INSTRUMENTATION

First Addition HCl Flow Transmitter: This transmitter is located under the steps that cross the lowboy piperack into the Hydrogen Recovery Area by T-206. It measures the HCl flow to the trench for pH control.

Second Addition HCl Flow Transmitter: This transmitter is located in the east/west piperack north of GT-2. It measures the HCl flow through the two valves that are used at the second addition point for pH control.

Spent H_2SO_4 Flow Transmitter: This transmitter is located west of T-201 on P-204 A/B discharge line. It measures the H_2SO_4 flow being dumped from T-201 into the outfall trench. It also helps in lining out T-201 level.

Both Primary pH Probes: These probes are in the trench south of T-602. Their function is to measure the pH in the trench and send the signal to the HCl valve for pH control.

Both Secondary pH Probes: These probes are located in the trench north of HRU #2. They measure the pH in the trench at that point and send the signal to the two HCl valves used for pH control there.

Both Final Outfall pH Probes: These probes are located at the end of the outfall trench near Chlorine Road. They indicate the pH of the liquid leaving CA II. This is only an indication, and HCl is not added here.

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Second HCl Addition: This is the larger of the two valves located north of HRU #2. When the smaller valve is fully open, this valve opens to control the pH in the outfall trench. It can also be used as a flow controller.

MX-801: This is a mixing pot for the trench effluent where the sodium thiosulfate and HCl from Methanes are added for ORP and pH control. It is located in the east/west piperack south of T-206.

INSTRUMENTATION

First Addition HCl Flow Transmitter: This transmitter is located under the steps that cross the lowboy piperack into the Hydrogen Recovery Area by T-206. It measures the HCl flow to the trench for pH control.

Second Addition HCl Flow Transmitter: This transmitter is located in the east/west piperack north of GT-2. It measures the HCl flow through the two valves that are used at the second addition point for pH control.

Spent H_2SO_4 Flow Transmitter: This transmitter is located west of T-201 on P-204 A/B discharge line. It measures the H_2SO_4 flow being dumped from T-201 into the outfall trench. It also helps in lining out T-201 level.

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Outfall Orp: This probe is located near the flume at the final outfall. It measures the amount of Cl_2 vapors being released from the trench.

Outfall T. S. S. Probe

Chlorine Canal pH Probe: This probe indicates the pH in the main canal going back to the river. It is located in the canal by the bridge going to AS&TC.

HAZARDS AND PROTECTIVE MEASURES

Chemical: There are two types of chemicals in this area that could present a hazard to employees working in the area. These chemicals are hydrochloric acid (HCl) and sulfuric acid (H_2SO_4). These acids are used for pH control and are added to the trench south of D-601 and north of HRU #2. They are very corrosive and toxic. Minimum requirements for handling these acids are slicker suit, face shield, rubber boots, and rubber gloves.

Falling and Tripping: This area is relatively free and clear of tripping hazards, although the possibility of falling exists when the operator is cleaning the skimmer at the final outfall.

Noise: Ear protection is required in this area since the noise level has been recorded above 85 decibels at times, especially in the area north of HRU #2 and south of C-601.

SPILLS

Hydrochloric Acid (HCl) Spill: HCl emits very strong and toxic fumes when it is spilled on the ground. It should be washed up with water immediately. In all cases the cause of the spill should be corrected as soon as possible.

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Spent Sulfuric Acid Spill: Sulfuric acid also emits strong and toxic fumes when exposed to the atmosphere. In the event of a spill, it should be washed up with water immediately. The area should be barricaded until the leak (spill) is corrected.

Excess Hypos: If the hypochlorite in the trench gets too high, toxic vapors will be released to the atmosphere. To control the hypochlorites in the trench, we add sodium thiosulfate. It should be noted that sodium thiosulfate is very expensive and should be used very sparingly. Also, too much sodium thiosulfate will cause the trench to be a milky color.

Total Suspended Solids (T. S. S.): Solids will be released into the trench if we are having high pH problems in D-810. A pH of 2 is desired to keep the solids level to a minimum.

Cell Effluent: Cell effluent is a very corrosive and, in case of a spill, it should be washed with water and the area barricaded until the spill/leak is repaired.

Oil: In case of an oil spill, efforts should be made to keep it out of the trenches. Oil sorb and/or diapers should be used to contain the spill. The used oil sorb and diapers should be placed in fiber pacs, labeled, and placed in the hazard waste area for disposal.

Sulfuric Acid Line Opening: When opening sulfuric acid line/equipment, a full acid suit, rubber boots, rubber gloves, hood and a respirator, and monogoggles should be used.

Hydrochloric Acid Line Opening (HCl): When opening HCl lines/equipment, a slicer suit, face shield, monogoggles, rubber boots, and rubber gloves should be used.

Bleeding Down Sulfuric Acid and Hydrochloric Acid Lines: To bleed down sulfuric and hydrochloric acid lines, a full acid suit is required, along with rubber boots, rubber gloves, monogoggles, and a hood.

The primary hazard that exists when acidizing trench pH probes is the possibility of Cl_2 being released due to high hypochlorites. In this case, a respirator should be used, along with rubber gloves and a face shield.

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Cross-tying flows should be avoided as much as possible. In the event a cross-tie is used, the materials being used must be carefully considered. On all cross-ties, a double block and bleed with a check valve must be used. This is done to help prevent contamination of the two process flows.

When moving hoses, valves, piping, etc., from one service to another, it should be known what type of service it came from and what type of service it is going to be used in to avoid the possibility of a chemical reaction.

OPERATING DISCIPLINE

Outfall Composite Sample: The Outfall composite sample is the most important sample in the block. This is a required E. P. A sample that is to be caught at midnight each night. When the sample is caught, it is poured into two bottles; one for CA II and one for Environmental. It is important to know that this composite is a refrigerated composite. When catching the composite, the compositor should be shook up, poured into a jar with no vapor space, capped, tagged with the Environmental sample tag filled out, and placed back into the refrigerator. The plastic bottle for Ca II should be filled and capped. The remainder of the sample in the compositor should be dumped out and the compositor washed out. The compositor should then be placed back into the refrigerator. The sample should be taken into the lab, recorded on the log sheet, and analyzed for pH and hypochlorites. pH should run from approximately 1.0 to 4.0 pH, and there should be no hypochlorites. There should never be a settled volume of solids in the sample. We are limited to <100 pounds of Total Suspended Solids (T. S. S.) per day. We are also monitored by the E. P. A for salt, chlorates, and metals. We also check for excess sodium thiosulfate. It is important to understand that this flow returns to the Mississippi River and is monitored by the E. P. A. Violation of the E. P. A permits could result in fines and possibly jail terms for knowingly exceeding E. P. A's permit limits. Always report problems with outfall immediately to supervisor. Another important note is to never use metal fittings on the compositor at outfall. A metal tubing fitting on the compositor is enough to give us a non-compliance. Always make sure the outfall is clear and free of oil or any debris. Remember, a non-compliance is not only a fine from the E. P. A. It is bad publicity for Dow.

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T.P.H. Sample: T. P. H., which stands for Total Purgable Halocarbons, is a required E. P. A. sample. This sample measures all chlorinated organics that pass through our outfall. The E. P. A. permit allows us a 3# daily discharge with a 6# maximum discharge. Some of the chlorinated organics that may show up outfall include chloroform, carbon tet, and methocel from spent acid from Methanes. The sample, which is caught every Tuesday, is a composite of four grab samples. The samples are caught at 6:00 a.m., 12 noon, 6:00 p.m., and the last one at 12 midnight. These grab samples are to be caught in special grab sample bottles provided by Environmental, filled with no vapor space, capped, and tagged with the environmental sample tag provided which indicates date, time caught and noting that it is a grab sample. The sample should then be placed in the refrigerator. At midnight, all four grab samples should be mixed in a clean jar then poured into two special sample jars provided by Environmental, filled with no vapor space, capped, tagged with the Environmental sample tag which indicates outfall number, date, time of samples, for what it is to be analyzed, name, and noting that it is a composite. Also attach all tags from the grab samples and send back the grab sample bottles. Knowingly violating the E. P. A.'s permits could be punishable by fines and possibly jail terms. Remember, a non-compliance is not only a fine from the E. P. A., it is bad publicity for Dow.

Residual Cl₂ Sample: The residual Cl₂ sample is an E. P. A. required sample that is caught every day by the people from Environmental Services. The E. P. A. permit allows us no more than 1.4# daily and no more than 28.6# per month. Residual Cl₂ in the outfall is caused by hypochlorites being released into streams going through our permitted outfall. An Orp probe (AI-324) has been added to our outfall to detect when we are getting hypos in the outfall. Sodium thiosulfate from D-800 is normally added at all times to help eliminate the residual Cl₂ problem. If we happen to exceed our daily maximum, extra samples will be required to get the concentration down below our daily maximum limit. The number of extra samples to be caught will be determined by how far we are out of spec and the number of samples to get it back into spec. When the number of extra samples has been determined, they will be caught in equal time spans for the remainder of the day. Example: If 24 extra samples are needed and there are 12 hours left in the day, one sample will have to be caught every 1/2 hour, and brought to Environmental to be analyzed. If any of the extra samples show residuals, additional samples will be required again based on the

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amount of residuals shown. Knowingly violating the E. P. A. permits could be punishable by fines and possible jail terms. Remember, a non-compliance is not only a fine from the E. P. A., it is bad publicity for Dow.

T. S. S. Sample: T. S. S., which stands for Total Suspended Solids, is a required E. P. A. sample. This sample measures all solids that pass through our permitted outfall. The E. P. A. permit allows us a maximum of 2,420 pounds daily. Sand, clarifier bottoms from S-101 are some of the examples of what total suspended solids are. This sample is run by the Environmental people from our daily composite sample. A good indication of a potential T. S. S. problem is a cloudy outfall. As with any environmental problem, immediate attention should be given to the problem and the supervisor and the boardman notified. Knowingly violating the E. P. A.'s permit could be punishable by fines and possible jail terms. Remember, a non-compliance is not only a fine from the E. P. A., it is bad publicity for Dow.

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