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VINYL WINTERIZATION AND OPERATIONS PROGRAM1983-1984TABLE OF CONTENTS

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I. INTRODUCTION

The winter of 1981-1982 proved to be one of the coldest the Aberdeen area has seen in years. The severe weather resulted in substantial lost production, excessive energy costs and significant freeze damage to Vinyl Area equipment. The winter painfully highlighted the Vinyl area's lack of preparedness for cold weather operation. Many wasted days and manpower was devoted to replacing freeze damaged equipment and thawing out of most of the balance. In reviewing the 1981 winter's performance the Vinyl Area was deficient in two primary areas:

Lack Of Adequate Freeze Protection For Vinyl Piping And Equipment.
Many piping runs froze simply because they weren't insulated or were insulated to a poor standard. Critical instrumentation was rendered useless because leads were packed with an incorrect mixture of anti-freeze. Many tracers simply weren't functional, etc. and

Lack Of Winter Operations Training For Vinyl Operations Personnel.
Operations response to cold weather was more reactive rather than preventative. No winter operations training was conducted and it showed. Many tracers weren't activated because no one knew where they all were. Operator's daily routines were not structured towards cold weather operation, etc.

In efforts to avoid a repeat performance, an extensive winterization project was developed in the spring and this manual was written to document Aberdeen's winter operations plan. The whole thrust of our efforts will be directed towards preventing a unit freeze up rather than reacting to a freeze up after it occurs.

Our goals for this coming winter will be:

No operator injuries as a result of cold weather operation and

No major downtime as a result of cold weather operation.

The winter of 1982-83 showed significant improvement over the previous winter. The majority of vinyl piping and equipment was properly insulated. Winter operation training in the vinyl area helped to minimize equipment damage and downtime.

II. Safety Aspects Of Winter Operation

Winter time operation can pose safety hazards beyond normal operations and consequently requires additional care and precautions.

Icy Surfaces and Associated Slipping Hazards

Hot Steam Tracers

Increased Risk Of External Power Failure

Cold Weather Exposure Problems

Losing Instrument Control Due To Wet Instrument Air

Potential To Freeze And Break Process Lines And Or Equipment

Personnel Working In Unfamiliar Areas

All of the above pose potentially serious safety problems. Careful planning of work, additional supervisory staffing during WINTER ALERTS, enhanced operator awareness, and development of routine winter job responsibilities will be our route to safely coping with severe cold weather operating conditions. The attached program along with proper training is directed towards our goals of:

No Operator Injuries As A Result Of Cold Weather Operation And

No Major Downtime As A Result Of Cold Weather Operation

Icy Surfaces- Slippery surfaces should not only be recognized but special precautions should be taken such as:

Spreading Sand And Salt Or

Roping Off The Slippery Areas To Prevent Personnel Entry

Hot Tracers- In 1982 three 1st aid cases were incurred due to minor burns due to exposed steam tracers. While most of the tracing has been upgraded and insulated for personnel protection, we must keep our guard up. Our steam tracing runs well above 250° F and in cold weather can burn you before you even feel it. Further, if you are handling steam hoses you'll need leather or other heavy gloves, cotton gloves do not provide adequate insulation for your hands. In 1983, there were no 1st aid cases due to tracer burns.

Power Failures - During ice or snow storms there is an increased risk of external power failure due to power lines getting "knocked down". This is especially important in the reactor areas and requires a heightened awareness of Emergency Systems, such as EMERGENCY AMS KILL SYSTEMS, EMERGENCY INSTRUMENT AIR SYSTEM, and the EMERGENCY COOLING WATER SYSTEM. Field Operator mobility may be impaired due to slippery surfaces, panel operators need to recognize this fact and be responsive for Emergency Panel Kills.

Cold Weather Exposure- All operating personnel should prepare for the worst and come equipped to spend long hours in cold weather (including panel operators). Cold weather can be comfortable if we dress for the occasion. As a minimum I would recommend:

Hard Hat Liner

Thermal Underwear Or Insulated Coveralls

Warm Gloves

Ski Hat And

Water Proof Boots

The company has provided some of the above, the balance you should use your own judgment based on the job requirements.

DRESS FOR THE OCCASION AND YOUR OWN COMFORT.

INSTRUMENT LOSS- The occassion may occur when you may lose instrument control due to ice formation in the process instrument air system. Some instrumentation may give faulty readings due to cold weather impairment. As a general practice you should assume the worst and act accordingly. FIELD-PANEL COMMUNICATION AND TEAMWORK CAN HANDLE THESE SITUATIONS AND RESTORE INSTRUMENT CONTROL. The main point is don't play the guessing game, operations and instrument support will be on hand to help correct problems.

ANTICIPATE PROBLEMS!

POTENTIAL TO FREEZE AND BREAK PROCESS LINES OR EQUIPMENT- While special precautions and procedures have been developed to prevent freeze damage to piping and equipment the smart operator will be aware it can happen and pre-think what he would do in various senarios if freeze damage did occur:

- How would freeze damage impact?
- Where can equipment be isolated?
- Safety Implications?
- Etc.

PERSONNEL WORKING IN UNFAMILIAR AREAS

During unusual winter conditions some personnel may be assigned to work in areas different and somewhat unfamiliar to their nornal assignment. In most cases they'll be working closely with experienced personnel but the key is:

IF YOU HAVE QUESTIONS ASK!

Experienced personnel should watch out for others working in their area as well as themselves.

Finally, the above are typical safety problems which one might encounter during a severe cold weather operation. All the situations and scenarios which could occur are beyond the scope and volume of this manual. A few words of guidance:

ANTICIPATE PROBLEMS

EXPECT THE UNEXPECTED

MURPHY'S LAW IS AGAINST US AND

ANY WINTER CAN POTENTIALLY BE THE WORST ON RECORD

III. Common Pitfalls Of Winter Operations

A. Reactor Areas

As we move into severe cold weather periods, it is well worth the time to review critical areas where freeze-ups can bottle neck plant operations. Three simple but important points to remember are:

Water Freezes At 32°F

VCM Freezes at -244°F

Water In VCM Will Freeze and Form a Slush at 32°F

Since it rarely gets to -244°F in Monroe County, it is safe to say we can forget about pure VCM freezing. Water is the key culprit, and anytime the temperature gets below 32°F our guard should be up. Unfortunately, in a suspension PVC process, water is likely to be in many places throughout the unit. Any major freeze ups have a high potential to curtail operations, be the problem in the charge system, reactor instrumentation, recovery system, cooling water, reactor cleaning system, or EPA Systems. The PVC process in itself generates a significant amount of heat to offset freezing complications, therefore, the key is to keep the unit running. This involves every operator closely monitoring his area of responsibility and quickly responding to minor problems as they occur. The following are key elements to successful winter operation.

DEVELOP A WEATHER AWARENESS AND KNOW THE WINTER ALERT PLAN

Recognition of upcoming cold weather and activating the winter operations steps before the cold weather moves in, is perhaps the most important step to keep the unit on-line. In order to keep vinyl operations personnel informed on weather conditions, a 24 hourly weather scanner was installed in the Vinyl Shift Supervisor's Office. When cold weather is forecast, the Operations Superintendent or Operations Supervisor will activate the WINTER ALERT plan which is detailed in Section IV WINTER ALERT Plan Activation. The plan addresses:

- Staffing Considerations
- Operator Responsibilities
- Operations Guidelines

Become familiar with the plan and your responsibilities.

THOROUGH AND TIMELY STEAM AND ELECTRIC TRACER ACTIVATION

It is cost prohibitive to operate our steam and electric tracers throughout the winter months (December, January, and February). It has been estimated that the steam tracing in the plant uses approximately 14,000 lb/hr. of steam which is a cost of \$95/hr. or \$2,280/day. While we should not hesitate turning on the tracing in anticipation of extreme cold weather, we should not hesitate to turn off the tracing as weather permits. In the face of severe cold weather it is important to activate and check tracer operation before the cold weather strikes.

THOROUGH AND TIMELY STEAM AND ELECTRIC TRACER ACTIVATION (Continued)

Inactive steam tracers will be first items to freeze. DON'T LET THIS HAPPEN. Operators in conjunction with engineers have spent a lot of time and effort identifying and listing steam supply valves corresponding steam traps and circuit locations for electric tracing. These lists should be used in the TRACER ACTIVATION and problem tracers repaired quickly.

PROTECT AGAINST WET INSTRUMENT AIR

In order to have reactor instrumentation and valves operate properly in below freezing conditions, it is extremely important to have dry instrument air. The tell tale sign of wet instrument air are numerous valves sticking due to water condensing and ice forming in the solenoids or instrument air lines. The most important winter parameter in the instrument air system is air dryer performance which is indicated by the dew point. The dew point is just that, it is the temperature where water will condense (form dew) out of the instrument air. If it is below freezing when the water condenses, it will freeze and "block" air flow to instruments and valves. The dew point of the instrument air going to the reactor area is indicated by an LED readout and circular chart recorder located inside the Deltech air dryer aluminum building southeast of No. 8 and No. 9 air compressors. It is normally the Utility Operators responsibility to monitor air dryer performance. During winter operation periods supervisory personnel and Chief Operators should keep a close track of dew point performance by recording dew point readings. If the instrument air system gets wet it will become necessary to blow out air lines at strategic points in order to purge the system of water. Bleeders on air surge drums in the units should be cracked open to allow any water in the system to bleed out.

BEWARE OF THE AIR!KEEP THE RECOVERED MONOMER WARM

In order to prevent ice fromation in the VCM receivers and subsequent slush blockage of the VCM charge meters, it is important to keep the recovered monomer warm. This is easily done by closing back on the cooling water going to the RVCM condenser in the Recovery Areas. A small amount of water should be maintained to all of the condensers to prevent the cooling water lines from freezing. The Recovered Monomer piping leaving the condensers should be warm to the touch. Heating coils have also been installed on the bottom of all VCM receivers to help add additional small amounts of heat.

MAINTAIN ADEQUATE WATER REMOVAL FROM THE RVCM RECEIVERS

Keeping the RVCM warm is half of the battle. If 50°F RVCM at 15% per batch contacts 16°F FVCM at 85% per batch the combined temperature will be about 21°F. If there's water in the RVCM it will freeze form a slush and stop up the VCM charge turbine meters. It is critical to remove all water from the RVCM before prepumping or charging a batch. Make sure when you drain the RVCM receivers to the Batch Water Stripper or Blow-down tank that all the water is drained and then drain extra. Watch for a pressure rise in the batch water stripper or blowdown tank. Take the time to do a complete drainage job.

KEEP THE CAT BOMB HPSW LINES FROM FREEZING

Although the HPSW lines to the cat. bombs are insulated, they are not traced and will freeze if water is not flowing slowly through the small piping. Following a charge or kill a small water flow should be maintained to the reactor sample port through the bomb. Reactors cannot be charged or killed if the water lines to the cat bomb freeze. DON'T LET THE CAT BOMB WATER FREEZE.

BEWARE OF FAULTY DELUGE SYSTEM TRIPS

For obvious reasons it is highly undesirable to have faulty deluge system trips during severe cold weather. The deluge system will remain in operation during winter conditions for fire protection, but any signs of a system problems should be treated on the highest priority as instrument help will be on-hand. If necessary the system can be blocked in and a man assigned to stay with the cut-on valves.

AN APPROPRIATE DELUGE TRIP CAN SAVE PERSONNEL AND EQUIPMENT, A FAULTY DELUGE TRIP CAN TURN A REACTOR MODULE INTO A GLACIER IN COLD WEATHER.

KEEP THE NEW MODULE SEAL OIL SYSTEM WARM

In 1981 a total of 6 seals were lost on the 4 New Module reactors during a cold 3-day period, due to ice balls forming in the seal oil. Since that time steam coils have been installed in these seal oil tanks to keep the seal oil warm. The key is to keep the seal oil warm (not hot) to prevent ice formation. The old module has been equipped with electric traced and insulated seal oil lines. Seal oil temperatures will be recorded in order to monitor Duraseal operation.

DRAIN WATER FROM IDLE EQUIPMENT TO PREVENT FREEZE DAMAGE

Significant freeze damage occurred in the winter of 1981/1982 simply because idle equipment was not drained. In order to prevent freeze damage, equipment should be kept recirculating or drained as a general practice. Idle equipment in VCM service should be recovered, blanked and drained if necessary.

Items include spare chemwash pumps, spare service water pumps, etc.

CLOSELY MONITOR COOLING TOWER OPERATIONS

While the PVC process can generate significant amounts of heat, the cooling towers can remove even more if not properly operated. Since last winter automatic cooling tower fan controls have been installed on all the Vinyl Towers to control the cooling water at 55° F. This will help prevent ice formation on the towers which can seriously damage the cooling towers.

It may be further necessary to take banks off-line or cut off a recirculation pump in order to keep the cooling water about 55° F.

B. Dryer Areas

The dryer areas are not quite as susceptible to freeze problems as the reactors, but do require special winter attention, as bottlenecks in the dryer can be just as devastating as bottlenecks in the reactor areas.

DON'T LET SLURRY RECIRCULATION LINES FREEZE

Slurry lines not recirculating are to be flushed with water to be followed by draining and blowing out the lines with air.

FROZEN SLURRY RECIRCULATION LINES ARE UNACCEPTABLE!

DRAIN IDLE EQUIPMENT & PIPING TO PREVENT FREEZE DAMAGE

PVC slurry like water will freeze at 32⁰ F. The two constituents in the reactor and dryer area are slurry and water. Both can freeze, both can halt production.

Every operating personnel on-shift has an important job to do. Team-work and good communications will be key in a successful winter operation.

IV. WINTER ALERT PLAN ACTIVATION

A. Criteria And Activation Responsibility

In order to maintain Vinyl Operations and protect Vinyl Area Equipment from freeze damage it will be necessary to closely monitor upcoming weather conditions and activate winter operations plans before the severe weather hits the area. In the event of forecasted subfreezing conditions for an extended period of time, it will become necessary for the Vinyl Operations Superintendent or the Vinyl Operations Supervisor to declare a Vinyl WINTER ALERT with immediate implementation of the associated action steps.

The Vinyl Operations Superintendent and Vinyl Operations Supervisor will be responsible for monitoring upcoming weather conditions on a daily basis. A 24 hour/day weather scanner has also been installed in the Vinyl Shift Supervisor's office to keep Vinyl personnel apprised of upcoming weather conditions.

Typical criteria to warrant a WINTER ALERT would include any of the following:

Forecasted snow, sleet, freezing rain, or ice storm.

Forecasted temperatures to be below 32° F for 24 hours consecutively

Forecasted temperatures to be below 20° F for any period of time.

The key to the WINTER ALERT Program is to be prepared and ready before the cold weather strikes rather than attempting to thaw the unit following a freeze-up. In order to accomplish this we must depend on forecasted weather conditions and there will likely be some "false alarms" as the weather service forecasts are not near 100% accuracy.

"AN OCCASIONAL FALSE ALERT IS ACCEPTABLE. A UNIT FREEZE-UP BECAUSE WE FAILED TO DECLARE A WINTER ALERT IN THE FACE OF SEVERE WEATHER IS UNACCEPTABLE"

B. WINTER ALERT ACTION STEPS

When a WINTER ALERT is declared the following 12 action steps will be taken:

1. Activation of all electric tracing per master list by Chief Operator. (Refer To Section VII Steam And Electric Tracer Master List.)
2. Activation of all steam tracing per master lists by reactor "A" operators.
3. Winter Protection Checklists will be activated and completed by each operator on a shift basis. (Refer To Section V. Winter Protection Check Lists).

B. WINTER ALERT ACTION STEPS (Continued)

4. Notification of Off-Shift Vinyl Operating personnel scheduled for the upcoming shift of the WINTER ALERT and determination if attendance is a problem. (Refer To Section VI Vinyl Department Personnel which will list employees by shift, their telephone number and town of residence.) This will be done by the Vinyl Operation Supervisor.

5. Since every operator will have an assignment, it will be necessary to operate with full staffing during the WINTER ALERT as follows:

- 1- Chief Operator
- 3- Lead Operators
- 2- "A" Operators - Reactors
- 2- "A" Operators - Dryers

If the operating shifts are not staffed to full-strength, coverage should be arranged by the Shift Supervisor for his shift and the upcoming shift.

6. The Vinyl Operations Superintendent will notify the Mechanical Superintendent, Plant Superintendent, Chief Process Engineer, and Director of Administrative Services as support from these area will likely be required.

7. The Mechanical Superintendent will arrange for a 24 hour/day maintenance support team to include:

- 1- Instrument Technician
- 2- "A" Mechanics

The maintenance support team will remain in force until the WINTER ALERT is over as determined by the Mechanical Superintendent in conjunction with the Vinyl Operations Superintendent.

8. The Vinyl Operations Superintendent will arrange for additional operating supervision during Winter Alerts as follows:

Day Shift 7 a.m. - 7 p.m.
 Vinyl Operations Superintendent-
 Vinyl Operations Supervisor - '

Night Shift 7 p.m. - 7 a.m.
 An Additional Vinyl Shift Supervisor
 Vinyl Operations Engineer - J. M. Edwards

B. WINTER ALERT ACTION STEPS (Continued)

These personnel will be responsible for overseeing the WINTER ALERT PROGRAM on shift and in the field. They will provide troubleshooting assistance as required. The additional supervision will remain in force until the WINTER ALERT is declared over by the Vinyl Operations Superintendent or Operations Supervisor.

9. Depending on the severity of the WINTER ALERT and road conditions, the Vinyl Operations Superintendent will contact the Director of Administrative Services to arrange accommodations for off-shift personnel at the Shelaine Court and Restaurant.
10. The Director of Administrative Services will place a purchasing department representative on "stand-by" in the event emergency purchases are required.
11. On-shift personnel will keep apprised of upcoming weather conditions by the Weather Alert radio scanner which is installed in the Vinyl Shift Supervisor's office.
12. A separate Winter Log Book for WINTER ALERT periods will be kept in the Vinyl Shift Supervisor's office and record weather related problems experienced on-shift. These may include freeze damage, line freeze-up, etc. This will be especially beneficial to document winter problems and help assist future winter protection efforts. All problems, however minor, should be written down to prevent them from happening again.
13. All reactors will be placed on 5385 production when a WINTER ALERT is declared. There are several reasons for this:
 - a. High calcium stearate level should enhance dryer rates.
 - b. Gels and associated filter changes will take a second priority.
 - c. Reactors will be chem washed each batch which is not conducive to optimal wire and cable properties.
 - d. There will be a minimum of dump line-ups switching which takes up valuable operator time.
 - e. There will be a minimum of dryer cleaning which takes up valuable operator time and could potentially slow up the reactor areas.
14. WINTER ALERT follow-up - A WINTER ALERT HIT LIST will be written up outlining action steps and responsibility for corrective measures. The list should help alleviate problem areas prior to the next cold weather spell. This list will be compiled from information written in the Winter Log Book. Be Sure to Use the Book.

C. WINTER ALERT STAFFING

In the event of a WINTER ALERT condition, the following staffing will be instituted:

DAYS 7 a.m. - 7 p.m.

Vinyl Operations Supervisor -
Vinyl Operations Superintendent -
Shift Supervisor
Lead Operator - New Reactor Module
Lead Operator - Old Reactor Module
Lead Operator - Dryers
"A" Operator - New Reactor Module
"A" Operator - Old Reactor Module
"A" Operator - Rotary Dryers
"A" Operator - Fluid Bed Dryer
CHIEF OPERATOR
2 - "A" Mechanics
1 - Instrument Technician "A"
1 - Purchasing Agent (Stand-By)

NIGHTS 7 p.m. - 7 a.m.

Vinyl Operations Engineer - J. M. Edwards, Jr.
2 Shift Supervisors
Chief Operator
Lead Operator - New Reactor Module
Lead Operator - Old Reactor Module
"A" Operator - New Reactor Module
"A" Operator - Old Reactor Module
"A" Operator - Rotary Dryers
"A" Operator - Fluid Bed Dryer

2 - "A" Mechanics
1 - Instrument Technician "A"
1 - Purchasing Agent (Stand-By)

- NOTE: * 1st Notification Call List By Operations Superintendent to Advise a WINTER ALERT is in effect.
- ** 1st Notification Call List By Operations Supervisor to Advise a WINTER ALERT is in effect.

Aberdeen Temperature	369-6471
Columbus Air Force Base Weather	1-434-7798
Aberdeen Area Temperature	256-8512

IV.

C. VINYL DEPARTMENT PERSONNEL AND SUPPORT AREA INFORMATION

<u>Name</u>	<u>Position</u>	<u>Telephone No.</u>	<u>Town of Residence</u>
*Joe Ware	Plant Superintendent	1-327-5018	Columbus
*Dave Hollis	Opera. Superintendent	369-6422	Aberdeen
*Chris Turner	Opera. Supervisor	369-7381	Aberdeen
*Mike Nathan	Vinyl Operations Engineer	369-8613	Aberdeen
*Rodger Collins	Shift Supervisor	369-6184	Aberdeen
Tommy Cummings	Production Scheduler	369-6058	Westfield

"A" Shift

**Bobby Hawkins	Shift Supervisor	343-8832	Hamilton
Doug Spann	Chief Operator	1-205-698-8562	Crews, AL
Jerry Eastman	Lead Operator	1-205-698-9494	Sulligent, AL
Jimmy Tate	Lead Operator	256-7455	Aberdeen
A. C. Pettus	Lead Operator	369-6636	Aberdeen
Bob Newman	"A" Operator - Reactors	369-4030	Aberdeen
Lander Keaton	"A" Operator - Reactors	343-5301	Hamilton
Nathaniel Wilson	"A" Operator - Dryers	369-4354	Aberdeen
Reubin Gates	"A" Operator - Dryers	343-5426/369-6566	Aberdeen
Verneeta Blanchard	Utility	369-6855 (Brother)	Aberdeen

"B" Shift

**Don Johnson	Shift Supervisor	256-8279	Splunge
Bud Stone	Chief Operator	1-205-698-9324	Sulligent, AL
Harold Sanders	Lead Operator	256-5562	Becker
O. C. Pace	Lead Operator	256-2830	Becker
Reggie Jones	Lead Operator	No Phone	Aberdeen
Jeff Shields	"A" Operator - Reactors	256-4820	Amory
Fred Davis	"A" Operator - Reactors	369-7779	Aberdeen
Huston Smith	"A" Operator - Dryers	369-6549	Aberdeen
Charles Kinsey	"A" Operator - Dryers	369-7926	Hatley
Ernestine Carter	Utility	369-7193	Aberdeen

"C" Shift

**Ray McGee	Shift Supervisor	369-6674	Aberdeen
Steve Kilgore	Chief Operator	1-205-698-8497	Sulligent, AL
David Sprowell	Lead Operator	343-5100	Hamilton
Bill King	Lead Operator	256-7086	Greenwood Springs
Walter West	Lead Operator	369-8236	Greenwood Springs
Lee Childers	"A" Operator - Reactors	256-8670	Wren
Charles Morris	"A" Operator - Reactors	343-8849	Hamilton
Charlie Polk	"A" Operator - Dryers	369-2891	Aberdeen
Brooks Cowley	"A" Operator - Dryers	256-7277	Amory
Gary Funderburk	Utility	369-4021	Gattman

<u>Name</u>	<u>Position</u>	<u>Telephone No.</u>	<u>Town of Residence</u>
<u>"D" Shift</u>			
**Alton Reeves -	Shift Supervisor	369-6919	Hamilton
Sam Stokes	Chief Operator	1-447-3489	Okolona
R. C. Towery	Lead Operator	1-651-4087	Smithville
J. D. Sims	Lead Operator	1-651-4455	Greenwood Springs
Bob Morgan	Lead Operator	369-9464	Aberdeen
Willie Jackson	"A" Operator - Reactors	369-6338	Aberdeen
Darnell Perry	"A" Operator - Reactors	369-2092	Okolona
Freddie Franks	"A" Operator - Dryers	369-7723	Aberdeen
Cleveland Brown	"A" Operator - Dryers	1-494-5474	West Point
D. W. Clark	Utility		
Willie Malone	General Helper		
David Covington	General Helper		

Yard Department

*Dean Honeycutt	Yard Supervisor	343-5595	Hamilton
Tom Bales	Yard Operator		Aberdeen
Milton Threadgill	Yard Operator (A Shift)	369-6734	Greenwood Springs
Roy Ray	Yard Operator (B Shift)	343-8419	Hamilton
Jimmy Brewer	Yard Operator (C Shift)	369-2155	Greenwood Springs
Needham Stahl	General Helper		
Horace Lindsey	Yard Operator		
Bernard Garth	Yard Operator		

KEY SUPPORT PERSONNELMaintenance & Mechanical Engineering

*Rick Snowden	Mechanical Superintendent	1-327-7382	Columbus
Jerry Horstman	Maintenance Superintendent	369-6005	Aberdeen
G. Morgan/C. Davis	Maintenance Supervisor, I&E	369-8780	Aberdeen
Randy Polk	Sr. Mechanical Engineer	1-327-6766	Aberdeen
Gil Morgan	Contract Supervisor	369-6522	Aberdeen
*Dan Miller	Maintenance Engineer	1-356-6274	Columbus

Process Engineering

Dick Frohreich	Chief Process Engineer	1-328-3628	Columbus
Veldon Messick	Senior Process Engineer	327-0741	Columbus
Vernon Thornhill	Senior Process Engineer	369-8952	Aberdeen

Administrative Services

*Joe Higginbotham	Dir. of Adminis. Services	1-327-0827	Columbus
Joan Pope	Buyer	Unlisted	Aberdeen

Note: * 1st Notification Call List By Operations Superintendent To Advise A WINTER ALERT Is In Effect.

** 1st Notification Call List By Operations Supervisor To Advise A WINTER ALERT Is In Effect.

Aberdeen Temperature	369-6471
Columbus Air Force Base Weather	1-434-7798
Aberdeen Area Temperature	256-8512

D. MECHANICAL AND PROCESS ENGINEERING ROLE DURING WINTER ALERT CONDITIONS

Mechanical or Process Engineering personnel will be assigned on-shift coverage to provide technical and supervisory support during severe winter conditions when necessary. These individuals will work closely with the Vinyl Operations Supervisor on days and the Vinyl Operations Engineer on the night shift. The selected individuals are extremely knowledgeable on 1983 Winterization/Energy programs and have demonstrated good trouble shooting abilities.

Some of their key contributions are envisioned to be:

1. Conducting area tours especially concentrating on critical operating areas where problems could impact on continued Vinyl Operations, specifically monitoring the following:
 - a. Survey overall panel operations for unusual conditions.
 - b. Survey cooling tower operation (temperatures, optimum bank on-line, optimum pumps on-line, any freeze problems, etc.)
 - c. Survey charge system status, (VCM temperature, water temperature control, methocel charge system status, any problems with water injection to initiator bombs.)
 - d. Keep an eye out for potential freeze impact on idle equipment.
 - e. Survey Recovery System Operation (RVCM temperature, seal flow's, general operating status.)
 - f. Survey status of Dryer Recirculation loops. (which loops are active, idle loops flushed and drained, etc.)
 - g. Survey reactor agitator seal systems, (seal oil temperatures, seal flows, system pressure, etc.)
 - h. Survey steam and electric tracing on a spot basis.
 - g. Survey EPA Systems and Operation (Incinerator, batch water strippers, blow down tank.)
2. Keep appraised of upcoming weather conditions.
3. Be alert and responsive to winter or any safety problems you may see in the operating areas.

D. MECHANICAL AND PROCESS ENGINEERING ROLE DURING WINTER ALERT CONDITIONS

4. Work closely with Operators and Supervisors as trouble spots arise. Keep an open ear and an open mind.
5. If numerous problems do occur it may be necessary to go to "zone" supervision mode and the engineer will be asked to supervise activities in a certain area be they operations or maintenance coordination.
6. Participate in shift change and various coordination meetings.
7. Assist in documenting winter problems in the Winter Log Book and aid in developing both short and long term solutions.
8. Prepare work orders regarding trouble areas.
9. Become familiar with quality aspects of PVC resin production.

These individuals are key in the respect they are "Rovers", trouble-shooters, and can provide supervisory support.

V. OPERATOR CHECKLISTS

Following are the winterization checklists for Vinyl operations personnel listed below:

- A. Chief Operator
- B. Lead Operator - New Module
- C. Lead Operator - Old Module
- D. Lead Operator - Dryers
- E. "A" Operator - New Module
- F. "A" Operator - Old Module
- G. "A" Operator - Rotary and Fluid Bed Dryers

These lists should be considered in addition to the normal daily checklists for each operating personnel position. The list touches on the major items but one should use his/her own judgment on other items known to be problems during freezing conditions.

WINTER PROTECTION
CHECK LIST
CHIEF OPERATOR

Name _____

Date _____

Objective: You are responsible for: monitoring and preventing key support equipment from freezing; providing guidance to Vinyl Operators; and assisting as a troubleshooter as required. Particular emphasis should be placed on:

Cooling Tower Operation

Dryer Recirculation Lines

Incinerator Operation (On-Line and Spare)

Instrument Air Dryer Performance

Deluge System Problems

Batch Water Strippers

As a Chief Operator your broad experience will be invaluable to work in concert with the Shift Supervisor to provide appropriate guidance to both field and panel operators. Our goal is to keep the unit on-line in a safe, efficient, and environmentally sound manner.

1. Any cold weather presents hazardous slipping problems, watch your footing. Put down salt or sand in bad areas. Rope area off if necessary. There's also alot of exposed steam tracing which caused 3 first aid cases in the winter of 1981, watch out! Less experienced operators, utilities or general helpers may be assigned to you and your area. Consider yourself their "big brother". Watch out for them as well as yourself and give them any pointers you can. _____
2. Steam and electric tracer operation is critical in winter operation. At the beginning of each shift you should check all steam and electric tracers to ensure all is operational. On the front end of a WINTER ALERT this will be your most important responsibility.

Electric tracing checks will consist of two items. First, field checking each electric tracer breaker to ensure it's on. Second, field checking any current lights to tracers in the field. A list of Electric Tracers, Breaker Nos. and Location, and current light location has been included in SECTION VI B. All electric tracing breakers have been relocated to separate breaker boxes.

_____ Checked once per shift.

- Steam tracing checks will consist of checking the steam tracer supply valve and the corresponding trap and checking that the tracer is active and hot. A list of tracers, their location, and brass tag identification number has been included in SECTION VI A. Steam Tracer List.

_____ Checked once per shift.

3. WET INSTRUMENT AIR CAN QUICKLY SHUTDOWN THE PLANT. The instrument air dryer is normally monitored by the utility operator but as added insurance, the Chief Operator will check and record the dewpoint four times per shift from the LED Readout and also note the highest dewpoint recorded on the circular chart. Remember the dew point will indicate the temperature at which water will condense out of the instrument air and subsequently freeze. The dewpoint should run less than -30°F . The dewpoint LED readout and recorder are located in the Deltech air dryer metal shed, southeast of number 8 and 9 air compressors.

_____ $^{\circ}\text{F}$ 1st Check	_____ $^{\circ}\text{F}$ 3rd Check
_____ $^{\circ}\text{F}$ 2nd Check	_____ $^{\circ}\text{F}$ 4th Check
_____ $^{\circ}\text{F}$ Highest temperature on recorder	

4. COLD RVCM CAN CAUSE WATER IN THE RVCM TO FREEZE. Twice per shift the exit temperature on the RVCM condensers should be checked by hand, it should be warm, not hot to the touch. If it's cold the cooling water to the condenser should be pinched back (but not completely closed to prevent the cooling water line from freezing).

_____ Time: Old Module 1st check
_____ Time: Old Module 2nd Check
_____ Time: New Module 1st Check
_____ Time: New Module 2nd Check

5. Cooling tower operation requires special attention in the winter periods to prevent tower damage and erratic reactor operation. Cooling tower fan controls were installed on all vinyl towers to control the water at 55°F . There may be situations where additional steps may be required to maintain the 55°F cooling water temperature such as shutting off the two expansion towers, but keeping a small flow going to the by-pass lines to keep return header from freezing. All vinyl towers are to be checked 3 times per shift. The checks will consist of reviewing stable performance as indicated by panel temperature readouts and physically inspecting each tower for icing.

_____ Review Panel Temperature Control

_____ D-500, D-600, D-700 Towers

_____ (3 Times/Shift)

_____ Review Panel Temperature Control

_____ New Unit Towers

_____ (3 Times/Shift)

_____ Field Check For Icing

_____ D-300 & D-400 Towers

_____ (3 Times/Shift)

_____ Field Check For Icing

_____ D-500, D-600, D-700 Tower

_____ (3 Times/Shift)

_____ Field Check For Icing

_____ New Unit Towers

_____ (3 Times/Shift)

As any problems arise you should maintain close contact with Panel Operators.

6. Survey areas for stagnant water lines which might break. Open water bleeders as necessary, preferably route water to sewer with hose to prevent creating icy surfaces. Areas to watch for are utility stations, safety shower/eyewash stations, mechanical seal flush lines to idle pumps, water make-up lines to new and old module recovery system, flush lines to recovery system equipment, etc.

_____ New Module

_____ Old Module

7. Maintain close contact with panel operator regarding RVCN receivers draining. Any draining problems on the RVCN receivers deserves immediate attention. It is essential that water be removed from RVCN and the BDT and BWS maintained at a temperature where a clear indication of drainage will be obvious. Review this with each reactor module panel operator. They are to contact you immediately should a drainage problem arise. _____
8. Check each and every dryer area slurry recirculation line with the responsible Dryer "A" Operator. Lines not recirculating are to be flushed with water and blown empty with air once per shift.
 - _____ - V-10 Recirculation from 501 blend tank
 - _____ - Pond Resin Recirculation from 550 series blend tank
 - _____ - V-11 Recirculation from 501 blend
 - _____ - V-11 Recirculation from 407
 - _____ - V-10 Recirculation from 502, 747 Blend Tanks
 - _____ - V-11 Recirculation From 502, 747 Blend Tanks
 - _____ - Fluid Bed Recirculation From 502, 747 Blend Tanks.
 - _____ - Drain Line From Fluid Bed Scrubber to 654 Blend Tank.
9. Assist In Permitting Maintenance Work.
10. Whenever the ambient temperature drops below 20°F, the AMS Kill System for each reactor is to be checked on a once per shift basis. The checkout will consist of a small AMS injection into the reactor by cycling the automatic AMS valves. The system is to be checked for proper valve operation and positive indication of AMS addition. The Lead Operator for the module, the reactor module "A" Operator, and the Chief Operator will be responsible for the checkouts with the Lead Operator coordinating timing for each reactor. The checkout is to be done after dump is complete and before rinse to sewer. Responsibilities will be as follows: 1) Lead Operator - will be responsible for cycling the automatic valves using the manual addition button and checking lights on close panel indication, 2) Chief Operator - will be responsible for checking the automatic valve operation in the field, and 3) Reactor "A" Operator - will be responsible for checking AMS pot for positive outage indication by measuring level before and after the AMS addition.

OLD MODULE AMS AUTOMATIC VALVE OPERATION

_____ 300
 _____ 400
 _____ 500
 _____ 600
 _____ 700

NEW MODULE AMS AUTOMATIC VALVE OPERATION

_____ 741
 _____ 742
 _____ 743
 _____ 744
 _____ 745

11. The following items are to be checked on both incinerators in addition to normal checks on a once per shift basis:

<u>East</u>	<u>West</u>	
-------------	-------------	--

_____	_____	Check safety shower for water flow by turning on eyewash station for a few seconds. (Safety shower is electric traced and insulated and should not freeze.)
_____	_____	Check steam trap for proper operation.
_____	_____	Check and record readings for water flow to scrubber.
_____	_____	Check and record readings for total water flow to incinerator.

12. Just prior to the end of shift collect each operator's check sheets and review with Supervisor.

_____ CHIEF OPERATOR CHECK SHEETS
 _____ LEAD OPERATOR - NEW MODULE
 _____ LEAD OPERATOR - OLD MODULE

____ LEAD OPERATOR - DRYERS
____ "A" OPERATOR - OLD MODULE
____ "A" OPERATOR - NEW MODULE
____ "A" OPERATOR - ROTARY DRYERS
____ "A" OPERATOR - FLUID BED DRYER

This list should be considered in addition to the normal daily checklist. The list touches on the major items but you should use your judgment on other items you know to be problems during the freeze conditions.

If you have any questions regarding this check list you should contact your Supervisor.

Name _____

Date _____

WINTER PROTECTION
CHECK LIST
LEAD OPERATOR - NEW MODULE

Objective: You are responsible for closely monitoring the new module and the incinerator panel operation to insure problems are detected and responded to quickly to keep the equipment on-line.

1. When the unit is on WINTER ALERT all reactors are to be charged with 5385 until the WINTER ALERT is passed. _____
2. Reactors are to be chem washed after each and every batch to keep the chem wash system hot and on-line. _____
3. It's extremely important to keep the recovery system running at all times and warm during winter alerts. If its going to be a while between recoveries (more than 1 hour) strip the new unit blowdown tank. This will keep heat going into the system and prevent a recovery system freeze-up. _____
4. Drain both RVCN receivers to blow down tank frequently to prevent water accumulation and associated line freeze-ups. It is very important to keep water from contacting cold VCM as a slush will form, stopping the turbine meters. _____
5. Do not prepump any RVCN into the fresh VCM receiver. _____
6. If charging gets bogged down it is advisable to hold one reactor down for repeat false charges and recovery to keep lines from freezing and systems hot. The false charge should consist of:
 - 100 CTS H₂O
 - 100 CTS RVCN
 - 50 Gallons Methocel

Consult supervisor before doing this. _____

7. Keep supervisor advised of operating problems with the following critical instrumentation:

	<u>REACTOR PRESSURE TRANSMITTER</u>	<u>COOLING WATER FLOW TRANSMITTER</u>
741	_____	_____
742	_____	_____
743	_____	_____
744	_____	_____
745	_____	_____

7. (Continued)
as well as the following instrumentation:

K. O. tank pressure control _____
FVCM receiver level _____
East RVCM receiver level _____
West RVCM receiver level _____
BDT pressure transmitter _____
Incinerator flow transmitter _____
RVCM receiver pressure transmitters _____

8. Monitor the RVCM receiver temperature on panel indication every hour. Notify supervisor if it drops below 32° F.

(A.M. and P.M.) 7:00 8:00 9:00 10:00 11:00 12:00 1:00 2:00 3:00 4:00 5:00 6:00

Temp. ° F _____

9. Monitor the tower cooling water temperatures each hour. The fan controls are set to maintain a 55° F cooling water temperature.

(A.M. and P.M.) 7:00 8:00 9:00 10:00 11:00 12:00 1:00 2:00 3:00 4:00 5:00 6:00

Temp. ° F _____

Notify the shift supervisor if the cooling water temperature drops below 50° F.

10. Beware if your VCM meters start counting slowly or start drifting far apart. Slush may be forming in the RVCM receiver. VCM may actually be going through much faster than meters are reading and there's a chance of overfilling the reactor. Stop the charge and notify supervisor immediately. _____
11. Don't take chances on valves without indications. Get field operator to verify position and notify supervisor for repair. We'll have instrumentation personnel on shift. _____
12. Whenever the ambient temperature drops below 20°F, the AMS Kill System for each reactor is to be checked on a once per shift basis. The checkout will consist of a small AMS injection into the reactor by cycling the automatic AMS valves. The system is to be checked for proper valve operation and positive indication of AMS addition. The Lead Operator for the module, the reactor module "A" Operator, and the Chief Operator will be responsible for the checkouts with the Lead Operator coordinating timing for each reactor. The checkout is to be done after dump is complete and before rinse to sewer. Responsibilities will be as follows: 1) Lead Operator - will be responsible for cycling the automatic valves using the manual addition button and checking lights on panel for open and close indication, 2) Chief Operator - will be responsible for checking the automatic valve operation in the field, and 3) Reactor "A" Operator - will be responsible for checking AMS pot for positive outage indication by measuring level before and after AMS addition.

<u>Open Light</u>	<u>Close Light</u>	
_____	_____	741
_____	_____	742
_____	_____	743
_____	_____	744
_____	_____	745

13. We had some failures of the Emergency AMS Kill System which dumped large quantities of AMS into various reactors. Keep a close eye on peculiar reactors that have no call for cooling water. Notify supervisor and have the field operator check the AMS pot on that reactor. DO NOT RECOVER until advised by the supervisor to do so. _____

WE DO NOT WANT TO CONTAMINATE THE UNITS RVCM WITH HIGH AMS LEVELS.
THE REACTOR WILL BE HELD DOWN IF THIS HAPPENS.

This list should be considered in addition to the normal daily check-list. The list touches on the major items but you should use your judgment on other items you know to be problems during freeze conditions.

If you have any questions regarding this check list you should contact your supervisor.

Name _____

Date _____

WINTER PROTECTION
CHECKLIST
LEAD OPERATOR - OLD MODULE

Objective: You are responsible for monitoring the old module, the Batch Water stripper, and the Emission Recovery System to ensure problems are detected and responded to quickly to keep the equipment on-line.

1. When the unit is on WINTER ALERT all reactors are to be charged with 5385 until the WINTER ALERT is passed. _____
2. Reactors are to be chem washed after each and every batch to keep the chem wash system hot and on-line. _____
3. It's extremely important to keep the recovery system running at all times and warm during WINTER ALERTS. If it is going to be a while between recoveries (more than 1 hour) strip the Batch Water Strippers using the main recovery system. This will keep heat going into the system and prevent a recovery system freeze-up. _____
4. Drain both RVCM to Batch Water Strippers frequently to prevent water accumulation and associated line freeze ups. It is very important to keep water from contacting cold VCM as a slush will form, stopping the turbine meters. _____
5. If charging gets bogged down it is advisable to hold one reactor down for repeat false charges and recovery to keep lines from freezing and keep systems hot. The false charge should consist of:

100 CTS H₂O

100 CTS FVCM

50 Gallons Methocel

Consult Supervisor before doing this. _____

6. Keep Supervisor advised of operating problems with the following critical instrumentation:

An instrument technician will be on shift to make any repairs.

	<u>Reactor Pressure Transmitter</u>	<u>Cooling Water Flow Trans.</u>
D-300	_____	_____
D-400	_____	_____
D-500	_____	_____
D-600	_____	_____
D-700	_____	_____

WINTER PROTECTIONCHECKLISTLEAD OPERATOR - OLD MODULE

6. (Continued)

As well as the following critical instrumentation:

Steam Pressure: _____
 FVCM Receiver Level _____
 N. RVCM Receiver Level _____
 S. RVCM Receiver Level _____
 RVCM Receiver Pressures _____
 701 ERS Pressure _____
 N. Batch Water Stripper Pressure _____
 S. Batch Water Stripper Pressure _____
 N. Batch Water Stripper Level _____
 S. Batch Water Stripper Level _____
 K. O. Tank Pressure Controller _____

7. Monitor the cooling water temperatures on D-500/D-600 cooling tower.

(A.M. & P.M.) 7:00 8:00 9:00 10:00 11:00 12:00 1:00 2:00 3:00 4:00 5:00 6:00

Temp. ° F _____

Notify the Shift Supervisor immediately if the cooling water temperature drops below 50° F.

The tower is equipped with an automatic fan control to control water at 55° F.

8. Beware if your VCM meters start counting slowly or start drifting far apart. Slush may be forming in the RVCM receiver. VCM may be going through much faster than meters are actually reading and there is a chance of over-filling the reactor. Stop the charge and notify supervisor. _____
9. Don't take chances on valves without position indications. Get field operator to verify position and notify Supervisor for repairs. We'll have instrumentation personnel on shift. _____

WINTER PROTECTIONCHECKLISTLEAD OPERATOR - OLD MODULE

10. Whenever the ambient temperature drops below 20°F, the AMS Kill System for each reactor is to be checked on a once per shift basis. The checkout will consist of a small AMS injection into the reactor by cycling the automatic AMS valves. The system is to be checked for proper valve operation and positive indication of AMS addition. The Lead Operator for the module, the reactor module "A" Operator, and the Chief Operator will be responsible for the checkouts with the Lead Operator coordinating timing for each reactor. The checkout is to be done after dump is complete and before rinse to sewer. Responsibilities will be as follows: 1) Lead Operator - will be responsible for cycling the automatic valves using the manual addition button and checking lights on panel for open and close indication, 2) Chief Operator - will be responsible for checking the automatic valve operation in the field, and 3) Reactor "A" Operator - will be responsible for checking AMS pot for positive outage indication by measuring level before and after AMS addition.

<u>Time</u>	<u>Open Light</u>	<u>Close Light</u>	
_____	_____	_____	300
_____	_____	_____	400
_____	_____	_____	500
_____	_____	_____	600
_____	_____	_____	700

11. We had some failures of the Emergency AMS Kill System which dumped large quantities of AMS into various reactors. Keep a close eye on peculiar reactors that have no call for cooling water. Notify Supervisor and have the field operator check the AMS pot on that reactor. DO NOT RECOVER THE REACTOR until advised by the Supervisor to do so. _____

WE DO NOT WANT TO CONTAMINATE THE UNITS RVCM WITH HIGH AMS LEVELS. THE REACTOR WILL BE HELD DOWN IF THIS HAPPENS.

This list should be considered in addition to the normal daily checklist. The list touches on the major items but you should use your judgment on other items you know to be problems during freeze conditions.

If you have any questions regarding this checklist you should contact your Supervisor.

Name _____

Date _____

WINTER PROTECTION
CHECKLIST
LEAD OPERATOR - DRYERS

Objective: You are responsible for monitoring the rotary and fluid bed dryers to ensure problems are detected and responded to quickly to keep the equipment on-line.

1. Keep Supervisor advised of operating problems with the following critical instrumentation.

An instrument technician will be on shift to make any repairs.

Dryers	<u>Rotary Dryers</u>		
	<u>Torque Controller</u>	<u>Inlet Temperature Transmitter</u>	<u>Outlet Temperature</u>
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____
6	_____	_____	_____
7	_____	_____	_____
8	_____	_____	_____

Fluid Bed Dryer

Backmix Resin Temperature Indicator/Controller (TIC-503)	_____
Backmix Inlet Air Temperature Indicator/Controller (TIC-507)	_____
Resin Discharge Temperature Indicator/Controller (TIC-506)	_____
Plugflow Inlet Air Temperature Indicator/Controller (TIC-508)	_____
Hot Water Coil Temperature Indicator/Controller (TIC-505)	_____
South Centrifuge Torque Indicator/Controller (JIC-501)	_____
North Centrifuge Torque Indicator/Controller (JIC-502)	_____
Backmix Section P Indicator/Controller (PDIC-503)	_____

2. Monitor each dryer closely to watch for Bird Centrifuge problems, i.e. pluggage and pin shearing, and for backup problems in the transfer systems. Although watching for these problems is part of your daily routine, it is especially critical to identify and correct these problems during freezing weather conditions. The longer the dryer is down, the greater potential there is for slurry lines to break.

Name _____

Date _____

WINTER PROTECTION
CHECK LIST
NEW MODULE REACTOR "A" OPERATOR

Objective: You are responsible for preventing equipment from freezing in your area and keeping the new module on-line.

1. Any cold weather presents hazardous slipping problems. Watch your footing. Put down salt or sand in bad areas. There's also a lot of exposed steam tracing which caused 3 first aid cases in the winter of 1981, watch out! A utility or a general helper may be assigned to you and your area. These are relatively inexperienced in the reactor areas, consider yourselves their "big brothers". Watch out for them as well as yourself and give them any pointers you can.
2. Keep water bleeding to catalyst charge bombs and to drain when not in use to prevent freezing.

Times Checked

741	_____	_____	
742	_____	_____	Check twice per shift.
743	_____	_____	
744	_____	_____	
745	_____	_____	

3. Keep steam on both seal oil recirculation tanks to keep them warm, not hot, to prevent seal oil header freeze up. Check temperatures four times per shift.

East

West

Time _____ °F	Time _____ °F
Time _____ °F	Time _____ °F
Time _____ °F	Time _____ °F
Time _____ °F	Time _____ °F

4. Keep a good steam supply going to the coils of the area drum shelter. Check the trap operation.

5. Cut back water flow to both RVCM condensers in recovery area to keep RVCM going to receivers warm. (This will prevent ice formation in receivers). Don't completely shut water off in order to prevent cooling water line from freezing. Check twice per shift.

Time _____

6. Check the blowdown tank temperature. Set point should be 125° F.
Time _____ Check twice per shift.
7. Steam hoses should be blown empty and stored in a warm area when not in use. A supply of extra steam hoses will be kept in the MCC Building _____.
8. Keep water and steam at utility stations bleeding to prevent freezeup. _____
9. After each batch is dumped, the dump line is to be completely drained by opening the bleeders on the discharge of each slurry pump and allowing any liquid to gravity flow back through the header. The case drains on both slurry pumps should be opened to allow flush water in the dump box to drain to the sewer.
10. Check recovery knockout tanks frequently to make sure they stay warm. Cut back on cooling water to recirculation cooler if necessary. Do not shut water completely off or line will freeze. _____
11. Put makeup water into knockout tanks frequently to prevent line freeze ups. _____
12. Check seal water separators to make sure they stay warm. Cut back on cooling water to seal water coolers if necessary. Do not shut water completely off or lines will freeze.
13. Put makeup water into the seal water separators frequently to prevent line freeze ups.

14. Routinely monitor discharge pressure of recovery compressors. If its over 75 psig advise supervisor and start trouble shooting.
 - possibly high receiver pressure
 - possible plug between compressors and receivers
 - seal water separator too high a level
15. Keep safety showers bleeding to prevent freeze up.

16. Any water accumulation will prevent slipping potential. A supply of salt will be kept in the MCC Building as well as a drum of sand in the unit. Slippery areas should be sprinkled with salt sand or roped off to prevent slipping injuries. _____

17. It will be important to frequently check the lip seal flushes and spray head flushes on each reactor to insure flow is maintained to prevent freeze-up.

(AM & PM)	Lip Seal Flush			Spray Head Flush		
	9:00	1:00	5:00	9:00	1:00	5:00
741	_____	_____	_____	_____	_____	_____
742	_____	_____	_____	_____	_____	_____
743	_____	_____	_____	_____	_____	_____
744	_____	_____	_____	_____	_____	_____
745	_____	_____	_____	_____	_____	_____

18. Keep cooling water to the methocel makeup tank jacket bleeding to prevent freezing.

19. Keep bleeder going upstream of control valve for charge water temperature control to prevent freezing. _____
20. Keep bleeder upstream of cold water make-up filter to steam heater going to prevent freezing. _____
21. Whenever the ambient temperature drops below 20°F, the AMS Kill System for each reactor is to be checked on a once per shift basis. The checkout will consist of a small AMS injection into the reactor by cycling the automatic AMS valves. The system is to be checked for proper valve operation and positive indication of AMS addition. The Lead Operator for the module, the reactor module "A" Operator, and the Chief Operator will be responsible for the checkouts with the Lead Operator coordinating timing for each reactor. The checkout is to be done after dump is complete and before rinse to sewer. Responsibilities will be as follows: 1) Lead Operator - will be responsible for cycling the automatic valves using the manual addition button and checking lights on panel for open and close indication, 2) Chief Operator - will be responsible for checking the automatic valve operation in the field, and 3) Reactor "A" Operator - will be responsible for checking AMS pot for positive outage indication by measuring level before and after AMS addition.

<u>Time</u>	<u>Initial Outage</u>	<u>Final Outage</u>	
_____	_____	_____	741
_____	_____	_____	742
_____	_____	_____	743
_____	_____	_____	744
_____	_____	_____	745

22. Steam trap supply valves should be checked once per shift and the corresponding trap(s) checked to be sure the tracing is hot and functioning. _____
23. The 2-ME addition system on 745 should be drained and water left bleeding after each charge.

This list should be considered in addition to the normal daily checklist. The list touches on the major items but you should use your judgment on other items you know to be problems during freeze conditons.

If you have any questions regarding this check list you should contact you supervisor.

Name _____

Date _____

WINTER PROTECTION
CHECK LIST
OLD MODULE REACTOR "A" OPERATOR

Page 1 of 4

Objective: You are responsible for preventing equipment from freezing in your area and keeping the old module and emissions recovery system on line. You will be given additional back-up support from the utility as required.

1. Any cold weather presents hazardous slipping problems, watch your footing. Put down salt or sand in bad areas. Rope off area if necessary. There's also a lot of exposed steam tracing which caused 3 first aid cases in the winter of 1981, watch out! A utility or a general helper may be assigned to you and your area. These personnel are relatively inexperienced in the reactor areas. Consider yourselves their "big brothers". Watch out for them as well as yourself and give them any pointers you can.

2. Keep water bleeding to catalyst charge bombs and to sewer when not in use to keep from freezing.

Times Checked

D-300 _____

D-400 _____

D-500 _____

D-600 _____

D-700 _____

Check twice per shift

3. Cut back water flow to both RVCN condensers in the recovery area to keep RVCN going to receivers warm and prevent ice formation in the receivers. (Don't cut off water completely or line will freeze).
 Time _____ Check twice per shift.

4. Cut back water flow to RVCN condenser on top of roof in ERS to keep RVCN going to receivers warm and prevent ice formation in the receivers. (Don't cut off water completely or line will freeze.)
 _____ Check twice per shift.

5. Keep bleeders going to PVA makeup water lines.

WINTER PROTECTION
CHECK LIST

Page 2 of 4

OLD MODULE REACTOR "A" OPERATOR

6. Keep a bleeder going on hot water tank makeup water line upstream of on/off control valve by cold water filter.

7. Keep bleeder going upstream of control valve on cold water for charge water temperature control to keep from freezing.

8. A low point drain was installed on the water rinse line just north of the hot water charge tank downstream of the on/off control valve. All bleeders upstream of the control valve should also be opened to allow this section of the line to drain. Don't let the rinse line freeze! The line should be drained if it won't be used for a one hour period.

9. Keep water and steam bleeding at utility stations to keep from freezing.

10. Maintain a good steam flow to the coils of the area drum shelter. Check the trap operation. _____
11. Steam hoses not in use should be blown empty and stored indoors to prevent freezing. A supply of extra steam hoses will be kept in the old control room.
12. Keep water going to K.O. tank recirculation cooler. To prevent exchanger from freezing and breaking. _____
13. Calcium stearate will freeze at 40° F. Once calcium stearate freezes, it is not reusable. Do not store outside of the calcium stearate storage room. The steam space heater should be turned on when the ambient temperature approaches 40°F.
14. Routinely monitor discharge pressure of recovery compressors. If it is over 75 psig advise supervisor and start trouble shooting.
 - possibly high receiver pressure
 - possible plug between compressors and receivers
 - seal water separator too high a level

WINTER PROTECTION
CHECK LIST
OLD MODULE REACTOR "A" OPERATOR

Page 3 of 4

15. Check recovery knock out tanks frequently to make sure they stay warm. Cut back on cooling water to recirculation cooler if necessary. Do not shut water completely off or line will freeze.

16. Keep safety showers bleeding to prevent freeze ups. _____
17. Put water into knockout tanks frequently to prevent line freeze-ups. _____
18. Put makeup water into the seal water separators frequently to prevent line freeze-ups. _____
19. Check seal water separators to make sure they stay warm. Cut back on cooling water to seal water coolers if necessary. Do not shut water completely off or lines will freeze.
20. Keep some cooling water going to shells on emission recovery seal water subcoolers to keep from freezing and breaking. _____
21. It will be important to frequently (3 times/shift) check the lip seal flushes and spray head flushes on each reactor to insure flow is maintained to prevent freeze-up.

(A.M & P.M.)	<u>Lip Seal Flush</u>			<u>Spray Head Flush</u>		
	<u>9:00</u>	<u>1:00</u>	<u>5:00</u>	<u>9:00</u>	<u>1:00</u>	<u>5:00</u>
D-300	_____	_____	_____	_____	_____	_____
D-400	_____	_____	_____	_____	_____	_____
D-500	_____	_____	_____	_____	_____	_____
D-600	_____	_____	_____	_____	_____	_____
D-700	_____	_____	_____	_____	_____	_____

22. Keep some cooling water going shell on ERS condenser on roof of recovery building to keep from freezing and breaking. _____
23. Monitor temperature of fresh receiver and notify supervisor if goes below 32° F. There's a temperature gauge on the 1st platform.
 _____ (Twice per shift)

WINTER PROTECTION
CHECK LIST
OLD MODULE REACTOR "A" OPERATOR

Page 4 of 4

24. After each batch is dumped, the dump line is to be completely drained by opening the bleeders on the discharge of each slurry pump and allowing any liquid to gravity flow back through the header. The case drains on both slurry pumps should be opened to allow flush water in the dump box to drain to the sewer.
25. Whenever the ambient temperature drops below 20°F, the AMS Kill System for each reactor is to be checked on a once per shift basis. The checkout will consist of a small AMS injection into the reactor by cycling the automatic AMS valves. The system is to be checked for proper valve operation and positive indication of AMS addition. The Lead Operator for the module, the reactor module "A" Operator, and the Chief Operator will be responsible for the checkouts with the Lead Operator coordinating timing for each reactor. The checkout is to be done after dump is complete and before rinse to sewer. Responsibilities will be as follows: 1) Lead Operator - will be responsible for cycling the automatic valves using the manual addition button and checking lights on panel for open and close indication, 2) Chief Operator - will be responsible for checking the automatic valve operation in the field, and 3) Reactor "A" Operator - will be responsible for checking AMS pot for positive outage indication by measuring level before and after AMS addition.

<u>Time</u>	<u>Initial Outage</u>	<u>Final Outage</u>	
_____	_____	_____	300
_____	_____	_____	400
_____	_____	_____	500
_____	_____	_____	600
_____	_____	_____	700

26. Steam trap supply valves should be checked once per shift and the corresponding trap(s) checked to be sure the tracing is hot and functioning.
27. Keep water bleeding through experimental CTA pot for D-700 to keep HPSW line from freezing.

This list should be considered in addition to the normal daily checklist. The list touches on the major items but you should use your judgment on other items you know to be problems during freeze conditions.

If you have any questions regarding this check list you should contact your supervisor.

NAME _____

DATE _____

WINTER PROTECTION
CHECK LIST
DRYER "A" OPERATOR

Objective: You are responsible for preventing equipment in your area from freezing and keeping all dryers on-line. You will be given additional backup support as needed.

Particular emphasis should be placed on:

Dryer Recirculation Lines

Fluid Bed Dryer Operation

1. In conjunction with the Chief Operator, every dryer area slurry recirculation line needs to be checked once per shift. Lines not recirculating are to be flushed with water and blown empty with air once per shift.

<u>Time</u>	<u>Line</u>	<u>Status</u>
_____	V-10 Recirculation Line From 501 Blend Tank	_____
_____	Pond Resin Recirculation Line From 550 Series Blend Tanks	_____
_____	V-11 Recirculation Line From 501 Blend Tank	_____
_____	V-11 Recirculation Line From 407 Blend Tank	_____
_____	V-10 Recirculation Lines From 502 and 747 Blend Tanks	_____
_____	V-11 Recirculation Lines From 502 and 747 Blend Tanks	_____
_____	Fluid Bed Recirculation Lines From 502 and 747 Blend Tanks	_____
_____	Drain Line From Fluid Bed Scrubber to 654 Blend Tank	_____

2. Although temporary sheds will be built around the slurry pumps for 407, 501, 502, and 747 blend tanks and steam will be injected, there are still several potential freeze points in these systems. The following items should be checked on a once per shift basis:

_____ All idle (spare) slurry transfer pumps servicing 407, 501, 502, and 747 blend tanks have case drains open with mechanical seal flush lines open.

_____ All bleeders upstream of automatic flush valves west of slurry pumps are to be cracked open.

WINTER PROTECTION
CHECK LIST
DRYER "A" OPERATOR

Special caution should be taken when entering area under temporary sheds since there will be water on the ground from bleeders and condensed steam.

3. The following items on the fluid bed dryer are to be checked on a twice per shift basis:

Time

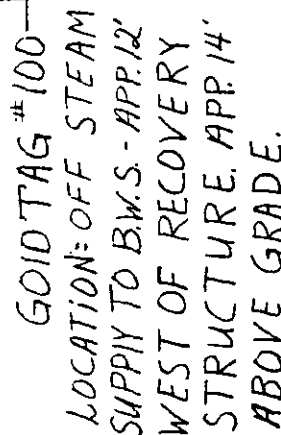
- | | | |
|-------|-------|---|
| _____ | _____ | The water scrubber pumpover pump drain casing is to be open and flush water line on the suction of the pump is to be cracked open when the pump is not in use. |
| _____ | _____ | The spare scrubber recirculation pump case drain is to be open and the mechanical seal flush line open. |
| _____ | _____ | Crack open bypass and control valve for make-up water to the scrubber to allow water flow. Since this action will continually add water to the scrubber, a more frequent check of the scrubber level is needed. |
| _____ | _____ | The spare hot water recirculation pump case drain is to be opened and the suction valve is to be cracked open. |
| _____ | _____ | Check all utility water stations to make sure supply valve is cracked and water is flowing. Run water hoses to local sewers. Stations are located: |
| | | a. Grade level by hot water tank. |
| | | b. Grade level by plugflow supply blower. |
| | | c. Second grating level on north side by scrubber. |
| | | d. Bird level. |

4. Keep water bleeding on water make-up line to the glycerine tank to keep line from freezing.
5. Keep glycerine solution recirculating through the hydrometer loop to keep this line from freezing.
6. Crack open the bypass valve on the cooling water temperature control loop for both fluid bed transfer blowers to allow some water to flow through these lines.
7. Check the cooling water supply lines to #1 and #2 transfer blower after-coolers to make sure some water is flowing through these lines.

This list should be considered in addition to the normal daily checklist. The list touches on the major items but you should use your judgment on other items known to be problems during freezing conditions.

VI. A. STEAM TRACE LOCATION DRAWINGS

Steam trace location drawings for old and new reactor module areas are included in the following pages.



WEST-STEAM SUPPLY TO B.W.S.

GOID TAG #100—
LOCATION: OFF STEAM
SUPPLY TO B.W.S. - APP. 12'
WEST OF RECOVERY
STRUCTURE. APP. 14'
ABOVE GRADE.

LOCATION: AT
STANION NORTH
OF R.V.C.M.
COLLECT TANK,
GOLD TAG #23

→ TO SEAL H2O
OUTLET LINES FROM
BOTH R.V.C.M.
COLLECT TANK
PUMPS.
- TRAPS WEST OF
WEST PUMP.

[illegible]

CONOCO CHEMICALS

ABERDEEN R. COLLINS
MISSISSIPPI

OLD MODULE

STEAM TRACING TO :-

EMISSION RECOVERY SCALE:

APPD:
DATE:

GOLD TAGS
No. 433-100

→ TO A/B RECOVERY COMPRESSORS,
VAC. PUMPS, SEAL H₂O CONTROLLERS
& PIPING, PRESSURE TRANS.
- TRAPS - (2) GRADE LEVEL, NORTH OF
SEAL H₂O PUMPS.

GOLD TAG #109
LOCATION: SAME
AS GOLD TAG
#108
→ TO AUTO. DIS-
CHARGE VALVE
OFF P.V.A. CHARGE
PUMP. DISCHARGE
SIDE OF P.V.A.
CHARGE METER.
- TRAPS - EAST OF
VALVE.

GOLD TAG
#108

LOCATION - 2ND LEVEL, SOUTH SIDE
OF RECOVERY AREA.

STEAM SUPPLY TO
SMALL JET.

STEAM SUPPLY THAT SERVES PRE-HEATER.

→ TO DRAIN LINE OFF K.O. TANKS. RECIRCULATION
PUMP TO WHERE DRAIN LINE FROM L.R.S.
SYSTEM TIES IN, MAKE UP H₂O LINE TO
BOTH SEAL H₂O SEPARATORS.
- TRAPS - (2) ONE SOUTH OF H.P.S.W. PUMPS
& ABOVE GRADE - ONE AT MIDWIE
STATION - WEST SIDE OF RECOVERY BUILDING.

→ TO H.P.S.W. FLUSH TO BACK FLUSH FILTER,
SEAL H₂O FLUSH TO NORTH & SOUTH K.O.
TANK RECIRCULATION PUMPS, INLET
PROCESS VALVE TO BACK FLUSH FILTER.
H.P.S.W. LINE BACK TO PUMP H₂O FLUSH TO
LEVEL WELLS & SIGHT GLASS BOTH K.O.
TANKS.

- TRAPS - AT STATION SOUTH
OF H.P.S.W. PUMPS, 8' ABOVE
GRADE, EAST TRAP.

GOLD TAG #101
GOLD TAG #102

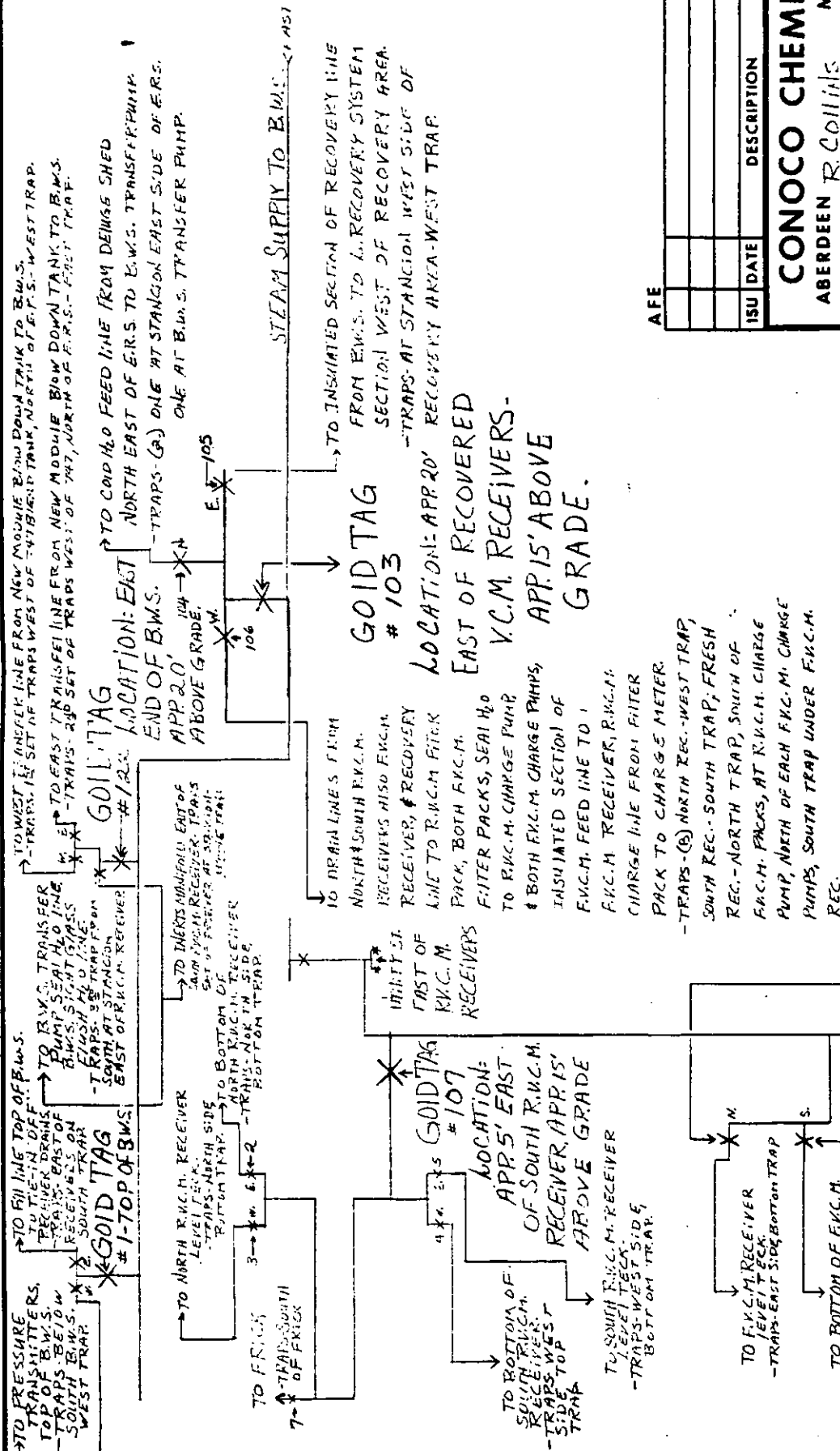
LOCATION: 1ST LEVEL, NORTH EAST OF
NORTH K.O. TANK RECIRCULATION
PUMP, APP. 10' ABOVE GRADE.

ISU	DATE	DESCRIPTION	BY	CKD	APD

CONOCO CHEMICALS
ABERDEEN ROLLING MISSISSIPPI

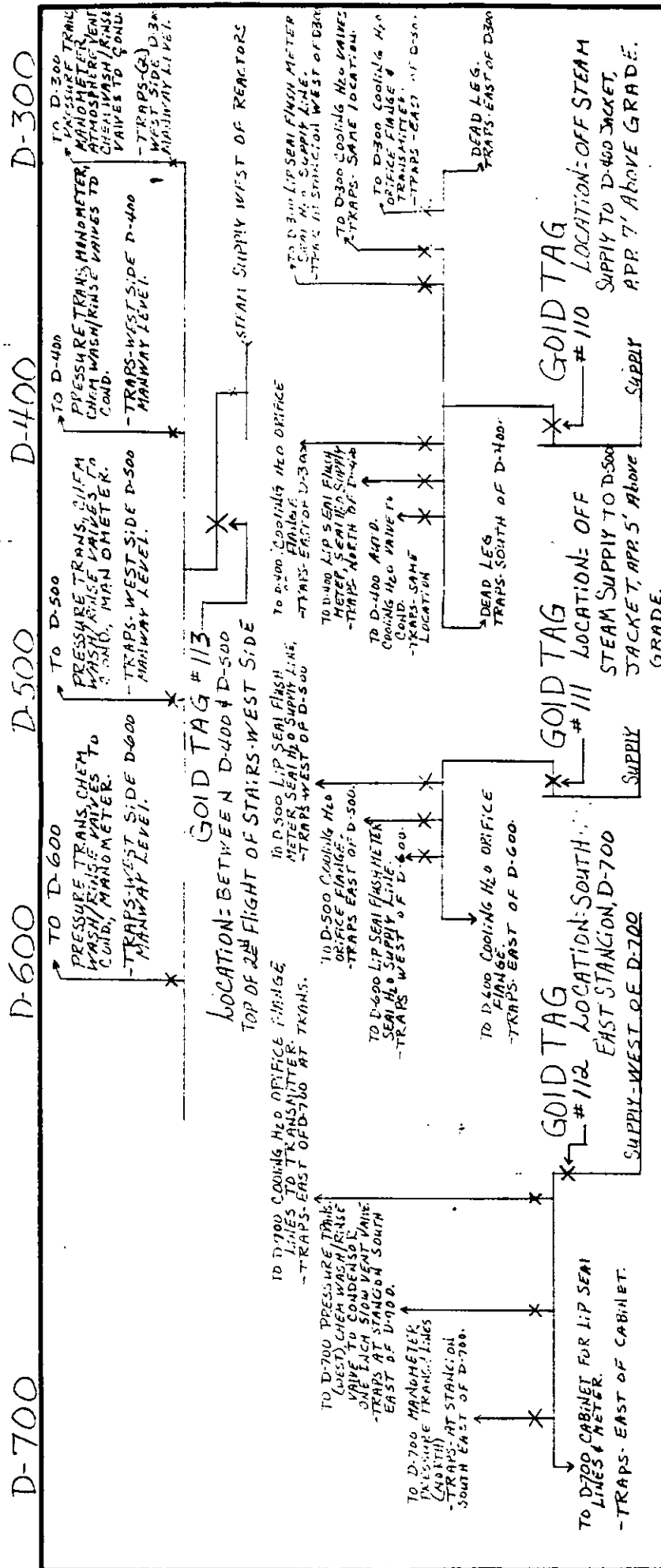
OLD MODULE
STEAM TRACING TO
L. RECOVERY AREA SCALE:

APPD:
DATE:
No. # 101-102-108-109



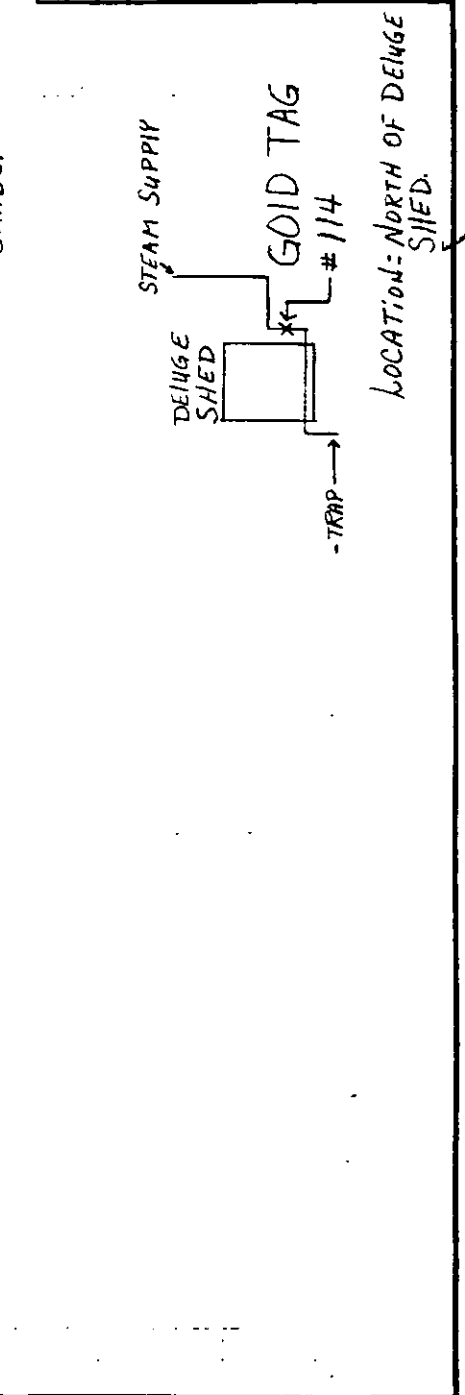
LOCATION: EAST OF F.V.C.M.
RECEIVER, APP. 4' ABOVE GRADE.

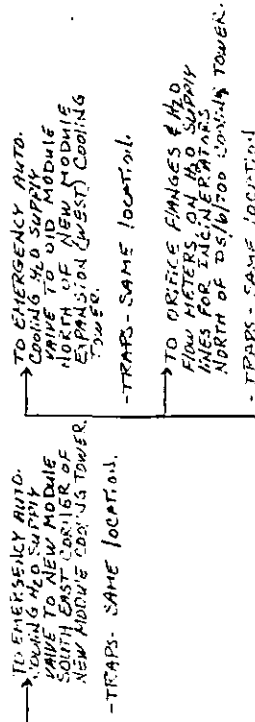
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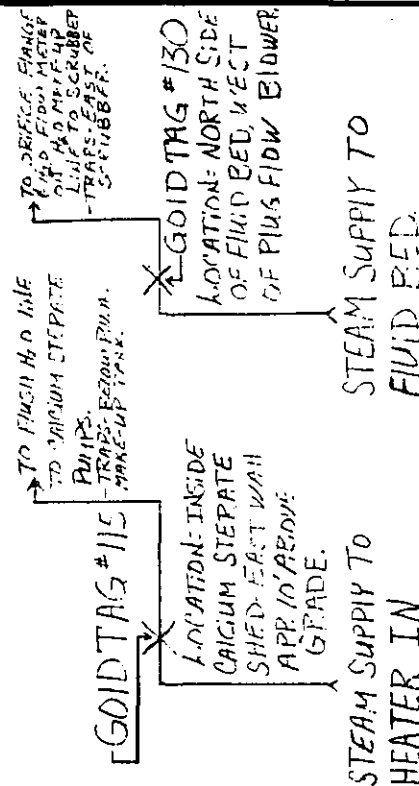
ISU	DATE	DESCRIPTION	BY	CKD	APD

CONOCO CHEMICALS	
ABERDEEN	MISSISSIPPI
R. COLLINS	
OLD MODULE	
STEAM TRACING TO REACTOR AREA SCALE:	
APPD:	No. 10-11-12-13-14
DATE:	





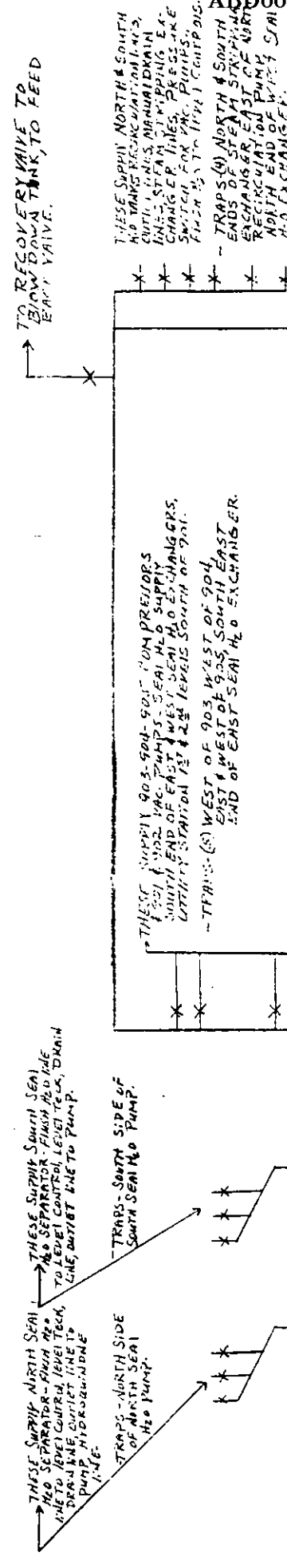
GOLD TAG #126



FLUID BED DRYER	AFB								
STEAM TRACING									
GOLD TAG #130	ISU	DATE	DESCRIPTION	BY	CRD	APD			
OLD MODULE									
STEAM TRACING TO									
CALCIUM STERATE									
SHED- GOLD TAG #115									

CONOCO CHEMICALS

ABERDEEN	R. COLLINS	MISSISSIPPI
NEW/OLD MODULES		
STEAM TRACING TO EMERGENCY AUTO.		
COOLING H ₂ O SUPPLY VALVES SCALE:		
APPD: DATE:		
No. GOLD TAG #126		



SECOND LEVEL

STEAM SUPPLY
STEAM TRACE SUPPLY VALVE
GOLD TAG #116

LOCATION: 1ST LEVEL RECOVERY AREA
EAST OF SOUTH REGENERATION PUMP.

DATE	2021 OF SOUTH RECREATION FUND			
ISU DATE	DESCRIPTION	BY	CKD	APD

CONOCO CHEMICALS

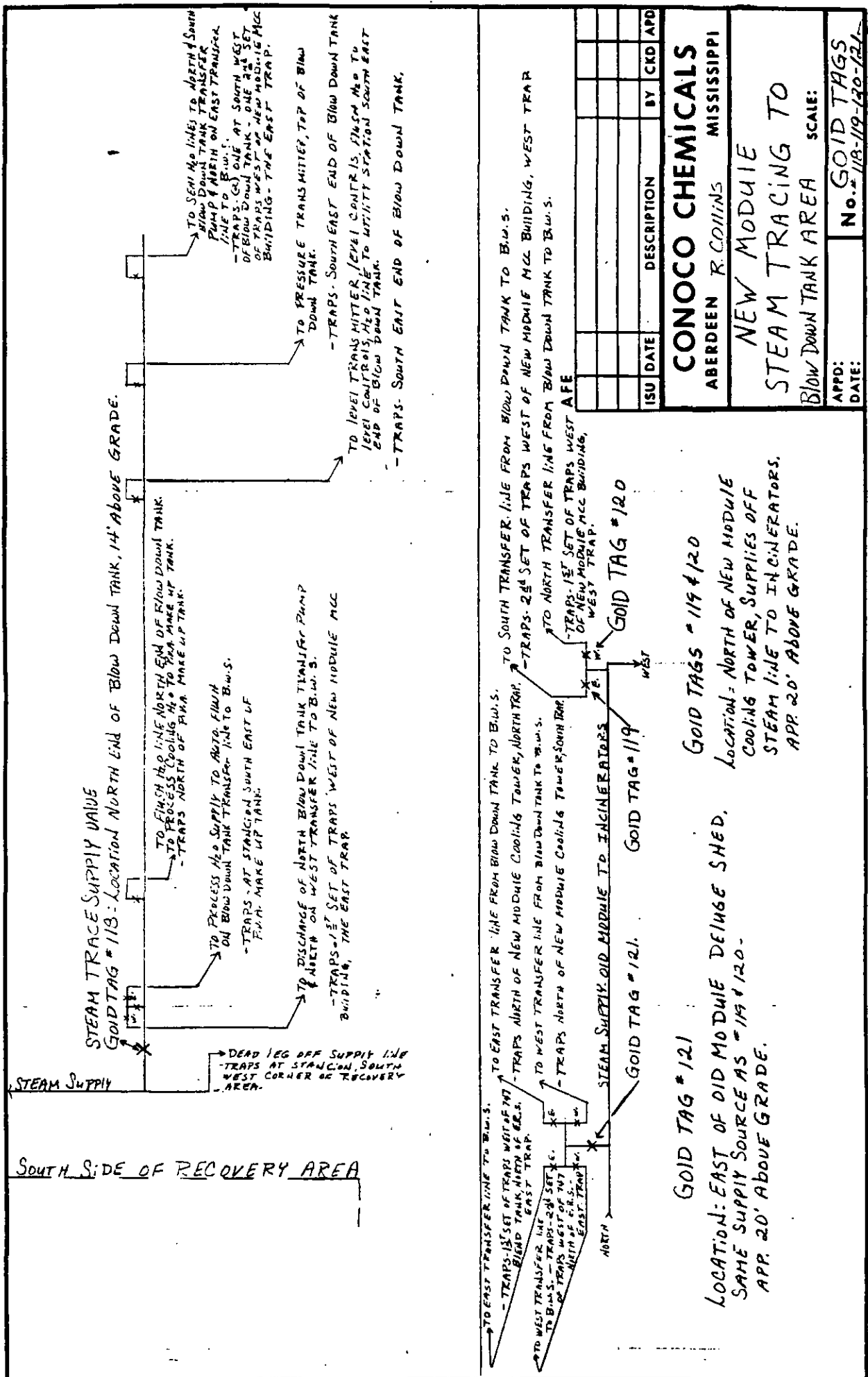
ABERDEEN R. COLLINS

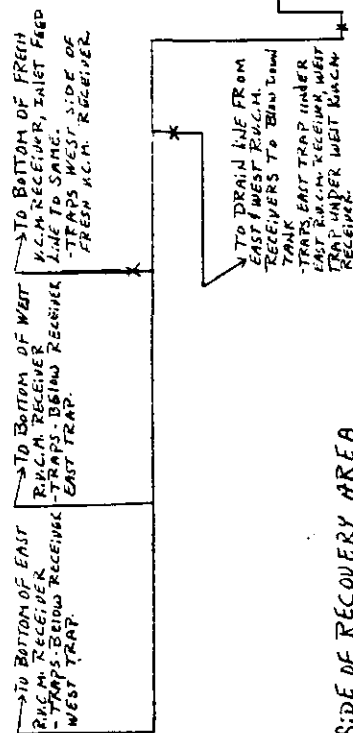
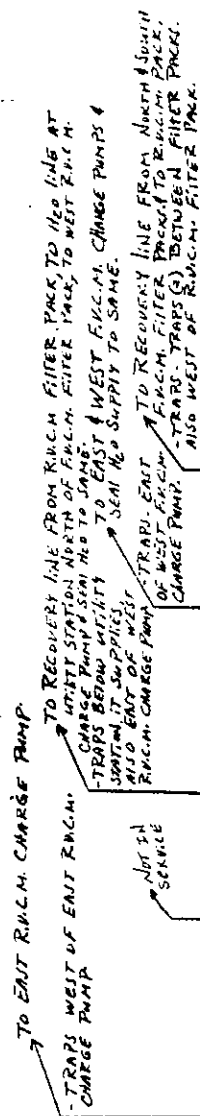
NEW MODULE

RECOVERY AREA SCALE:

APPD: _____
DATE: _____

No. GOLD TAG #116





SOUTH SIDE OF RECOVERY AREA

STEAM TRACE SUPPLY VALVE

GOLD TAG # 117

LOCATION: SIDE OF ROUNDRY AREA NORTH OF
EVC. M. FILTER PAKS., APP. 14' ABOVE GRADE,

TO UTILITY STATION

TO HOT & COLD H₂O MAKE UP LBS, UNITS & METER
TO P.W.A. MAKE UP TANK.
- TRAPS - AT STATION SOUTH OF P.W.A.
MAKE UP TANK. TOP TRAP.

GOLD TAG #127

LOCATION: SOUTH SIDE OF
RECOVERY AREA NORTH OF
FVC, M. FILTER PACKS, APPROX.
ABOVE GRADE.

STEAM SUPPLY

A F E

[illegible]

CONOCO CHEMICALS

ABERDEEN
R. COLLINS
MISSISSIPPI

NEW MODULE

STEAM TRACING TO V.C.M. CHARGE

AREA & PVA MAKEUP LINES SCALE:

APPO:	N- GOLD TAGS
-------	--------------

No. # 117-127

STEAM SUPPLY ← NORTH
 SOUTH →
 STEAM TRACE
 SUPPLY VALVE.
 GOLD TAG #123

LOCATION: EAST OF 743 OFF
 STEAM STRIPPING SUPPLY HEADER,
 APP. 14' ABOVE GRADE.

TO BACK FLUSH PRESS. INLET LINE
 SUPPLY PUMP DISCHARGE LINE TO
 BACK FLUSH SYSTEM.

TRAPS SOUTH EAST OF
 NORTH H₂O TANK
 RECIRCULATION PUMP.

TO SEAL H₂O PUMP
 PRESSURE
 CONTROL VALVE
 PRESSURE SWITCH.

TRAPS NORTH OF NORTH
 SEAL H₂O PUMP.

TO PRESSURE SWITCH
 TO NORTH & SOUTH H₂O
 PUMPS.

TRAPS EAST OF NORTH PUMP.

TO SIGHT GLASS ON
 SEAL H₂O SURGE TANK.
 TRAPS NORTH EAST SIDE
 OF TANK.

TO WEST SEAL ON
 SUPPLY TANK.
 TRAPS WEST SIDE OF
 TANK.

TO EAST SEAL ON
 SUPPLY TANK.
 TRAPS EAST SIDE
 OF TANK.

EAST

NORTH

TO HPSM CONTROLLER FOR RECOVERY AREA.
 -TRAPS AT CONTROLLER.

AFE

ISU	DATE	DESCRIPTION	BY	CKD	APD

CONOCO CHEMICALS

ABERDEEN R. COLLINS MISSISSIPPI

NEW MODULE
 STEAM TRACING TO SERVICE
 SEAL H₂O PUMP AREA SCALE:

APPD:
 DATE:

No. GOLD TAG #123

VI. B. Electric/Heat Tracing Locations

Electric/heat tracing locations for old module, new module, and dryer areas are included in the following pages.

HEAT TRACING PANEL #101
Located in Refrig. Bldg. 1st Flr.

	Thermo.		Thermo.
1. Thermostat Control for circuits 3 & 5 below.	#1	2. Calcium Sterate meter pump disch. lines, old mod.	
3. Air lines to silos 685-680.	#1	4. HPSW flush for fluid bed dryer centrifuge.	#3
5. Air lines to silos 684-677.	#1	6. Safety shower @ Blowers for f. b. dryer.	#2
7. Methocol & OMS lines, CRD.	#4	8.	
9. Methocol makeup pump suction & disch. lines, CRD.	#4	10.	
11. Methocol Charge Line to Rxs', CRD.	#4	12.	
13. Thermostat control for circuits 7, 9, & 11 above.	#4	14.	
15. VCM lines from Recovery condensers to bottom of RVCM tanks CRD.	#5	16.	
17. VCM Charge Line CRD.		18.	
19. Light glass on vertical VCM tanks CRD.	#6	20.	
21.		22.	
23.		24.	
25.		26.	
27.		28.	
29.		30.	

HEAT TRACING PANEL #102
 Located in New Module M C C
 Thermo.

1. Spare -		2. Breathing air line top of condenser RX D-745.	Thermo. #9
3. Deltec Compressor & Drain Line.	#12	4. Breathing Airline top of RX D-745.	#10
5. Hydroquinone meter pump suction & disch.	#7	6. Safety showers for D-745.	#11
7. Safety showers in New Module.	#8	8.	
9. Spare		10.	
11. Spare		12.	
13.		14.	
15.		16.	
17.		18.	
19.		20.	
21.		22.	
23.		24.	
25.		26.	
27.		28.	
29.		30.	

HEAT TRACING PANEL #103
Located in D-700 M C C

	Thermo.		Thermo.
1. Methocel charge line, Old Mod.	#14	2. Control thermostat for circuits 4 & 8 below.	#15
3. D O P Line to D600 RX.	#13	4. RVCM collect tank lines, Old Mod.	#15
5. D O P Line to D500 RX.	#13	6. V-11 Fire Valve House & top walkway V-11 17A.	#17
7. D O P Line to D700 RX.	#13	8. RVCM Line to storage tanks.	#15
9. Control thermostat for circuits 3,5,7,11, & 13.	#13	10.	
11. D O P Line to D300 RX.	#13	12.	
13. D O P Line to D400 RX.	#13	14.	
15. Methocel Charge line, Old Mod.	#16	16.	
17.		18.	
19.		20.	
21.		22.	
23.		24.	
25.		26.	
27.		28.	
29.		30.	

HEAT TRACING PANEL #104
Located in D-700 M C C

Thermo.		Thermo.	
1.	-	2. Safety showers, Old Mod.	#22 & 22A
3.		4. Fresh air line to bottom of D-700.	#23
5.		6. Safety shower on top of D-700.	#24
7.		8. Fresh air line at slurry tanks 502 & 747.	#21
9.		10. Caustic tank eyewash & shower Old Mod.	#20
11. RVCN & VCM & inert vent lines, Old Mod.	#19	12. Cooling Tower water line & flow inst. for incinerator.	#26-26A-26B
13.		14. Inert vent Old Unit.	#18
15.		16. Spare	
17. Flame arrestor for incinerator.	#25	18. Inert vent line to incinerator.	#28
19. Water from Cooling Tower 4 to incin.	#27	20.	
21. Water from Cooling Tower 4 to incin.	#27	22.	
23.		24.	
25.		26.	
27.		28.	
29.		30.	

XII. PERSONNEL POLICY DURING WINTER COVERAGE

In the event hazardous weather conditions exist that would require implementing emergency measures to keep the plant in operation, the Company may require employees as necessary to stay at a local motel to ensure that they are able to report for their scheduled shifts. Should employees be required to stay at a motel the Company would pay for meals and lodging. Employees would not be compensated for time spent at the motel which is consistent with current wage and hour law requirements.

Separate from the above, the Company may at its discretion offer lodging to employees who do not feel they can return home safely due to hazardous road conditions. The Company's offer in this situation would be optional to the employee. Employees who accept such an offer will do so with the understanding that they will not be entitled to any compensation while staying at the motel.

Should it become necessary to call employees at the motel to have them report to work outside of their regular shifts they would be compensated according to the call-in pay procedure outlined in Article XII of our collective bargaining agreement.