E. STEWART

MONSANTO COMPANY
Sauget, Illinois

March 8, 1972

To: Supervisory Personnel

EMISSION INVESTIGATION

Date of Incident:	February 29, 1972, 7 - 11 PM
Location:	Department 213, Acid Unit #9
Kind of Emission:	SO_3
Result of Emission:	Complaints from public Three B&O railroad personnel reported ill
Cause of Emission:	Bypassed interlock (required by operating instructions) No adequate corrective action available to regain process control.
Investigating Committee:	Gene Maurer Richard Rhodes Gary Smith Bill Birk Clarrie Buckley Bob Mc Cutchan, Chairman

/ghw

DSW 296667

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EMISSION INVESTIGATION

A. Time Sequence of Events

1.	2/21 or 2/22	The flow indicator on the 98% acid was PM'ed. To do this the interlock was bypassed to avoid shutting down the department. Instrument was ok.
2.	2/28 (days)	Operator Jethro Smith states that during this time period the flow interlock was being bypassed. If so, production supervision was not informed.
3.	2/29, early on days	A planned shutdown occurred.
4.	2/29, 6:10 PM	The unit was started up. The flow indicator interlock was bypassed which is normal procedure for startup.
5.	About 7 PM	The 98% acid pump stopped undetected. It is estimated that the emission began 2 - 3 minutes later.
6.	7:05 - 7:10 PM	Operator Rhodes noticed on the panel that the level in the oleum tower had increased. He suspected that the oleum pump had stopped. He checked and this was correct. Because a shutdown of the 98% acid pump causes a shutdown of the oleum pump through another interlock, Rhodes then checked the 98% acid pump. It too had stopped. He decided immediately to shut down. He glanced at the stack, the emission had already begun.
7.	7:10 PM	Rhodes informed Night Superintendent Womack that he had shutdown and the circumstances.
8.	7:45 PM	Foreman Klobuchar was called in regard to repairs being made on a duct. Mr. Womack also mentioned the shutdown. Mr. Klobuchar stated at that time there would be a further emission problem on starting up again, lasting 1 - 4 hours.
9.	_____	Maintenance found that the 98% acid pump had stopped because the motor starter fuse clips had failed. They were replaced.
10.	8:10 PM	Unit started up again.
11.	8:15 PM	Complaint from Rush City

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A. Time Sequence of Events (continued)

12.	8:48 PM	Complaint from East St. Louis Police Department (they had been called by B&O Railroad)
13.	9:15 - 9:30 PM	Tried to switch the 98% acid flow to interlock, but it wouldn't run. Cause undetermined. It was decided to run on bypass that night and look for the problem on days, 3/1.
14.	9:30 PM	Emission had abated.
15.	10:00 PM	State of Illinois informed of emission.
16.	11:00 PM	Stack back to normal.
17.	3/1, days	It was found that the sulfur burner high temperature transmation unit was bad. It was also found that the interlock on the transmation unit was wired in series with the 98% acid flow interlock, whereas Dwg. TS-D-10074 Rev. 1 showed it wired independently. This is why the 98% acid flow interlock could not be put into service the night before.

B. Discussion

1. What caused the SO_3 emission on 2/29/72?

The interlock on the 98% acid pump was being bypassed as per startup instructions at the time the pump stopped (fuse clips failed). This allowed oleum to be formed in the Brink demisters and allowed SO_3 to be blown into the atmosphere. This emission lasted an estimated 5 minutes before the unit was shut down. This process upset would have not occurred if the 98% acid pump had not been bypassed at the time. (See attached process schematic).

An emission of longer duration then occurred on start-up. With the present equipment the only way to dilute the oleum in the demisters is to run the 98% acid absorber and blower. This causes an emission. In other words, there is presently no acceptable way of regaining process control. (See attached memo dated 5/13/69).

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2. Is this the only way SO_3 emissions occur?

No. There are a variety of circumstances that can cause the demisters to become saturated with oleum, but once they are, there will be an emission.

B. Discussion (continued)

3. Why is there a by-pass on the 98% acid pump interlock?

Present reasons:

(a) The 98% acid flow indication does not operate on a start-up until the DP cell sensing legs have been bled of air.

(b) The 98% acid pump is interlocked with the blower. During oil firing after a lengthy shutdown, however, the blower must be operated without the 98% acid pump running.

4. Were communications adequate?

No, at two levels. First, Trainee Carl Hartman made the comment that the unit had been "run on by-pass for a week". When questioned by the investigating committee, Operator Jethro Smith stated that the unit was on by-pass on the day shift Monday, 2/28. Supervision (Maurer and Klobuchar) did not know that was the case.

Second, after the second startup (8:10 PM), first-line supervision was not told of the emission problem and complaints until after higher management and pollution control personnel were already involved.

5. Did WGK Production or Maintenance personnel know the sulfur burner high temperature transmation interlock was being by-passed at the same time as when the 98% acid pump interlock was bypassed?

No. This instrumentation was installed during the last quarter of 1970. According to TS-D-10074 Rev. 1 the two interlocks were independent. It was not known that the actual installation was different.

C. Specific Recommendations

1. Emphasize to operators the importance of keeping supervision informed when an interlock is being by-passed. This information must also be communicated to the next shift.

Responsibility: Production Supervision
EDC: 3/8/72

2. Wire the sulfur burner high temperature transmation interlock independent of the 98% acid pump interlock.

Responsibility: Maintenance
EDC: 3/6/72

3. Revise operating procedure and train operators to bleed DP cell sensing legs on 98% acid pumps, and to put interlock back into service, before proceeding with a start-up.

Responsibility: Production Supervision
Confirm feasibility of above: 3/8/72

4. Evaluate the best method for eliminating the need to run the 98% acid pump with the interlock bypassed.

Responsibility: Maint./TSD/Production
EDC: 4/15/72

5. Evaluate the best method for reducing or eliminating SO_3 emission when demisters are saturated with oleum.

Responsibility: TSD/Engineering Sales
EDC: First status report due 4/15/72

6. Provide safer access (stairs or caged ladder) to second level at the 98% acid flow instrumentation. Improve lighting in the same area. Evaluate the need for a shower.

Responsibility: Maintenance/Production
EDC: 5/1/72

D. General Recommendation

1. Revise the procedure for Air Emission Control and Reporting to insure that all the right personnel are informed at the right time to handle all contingencies arising from an emission.

Responsibility: Environmental Control Group
EDC: 4/15/72

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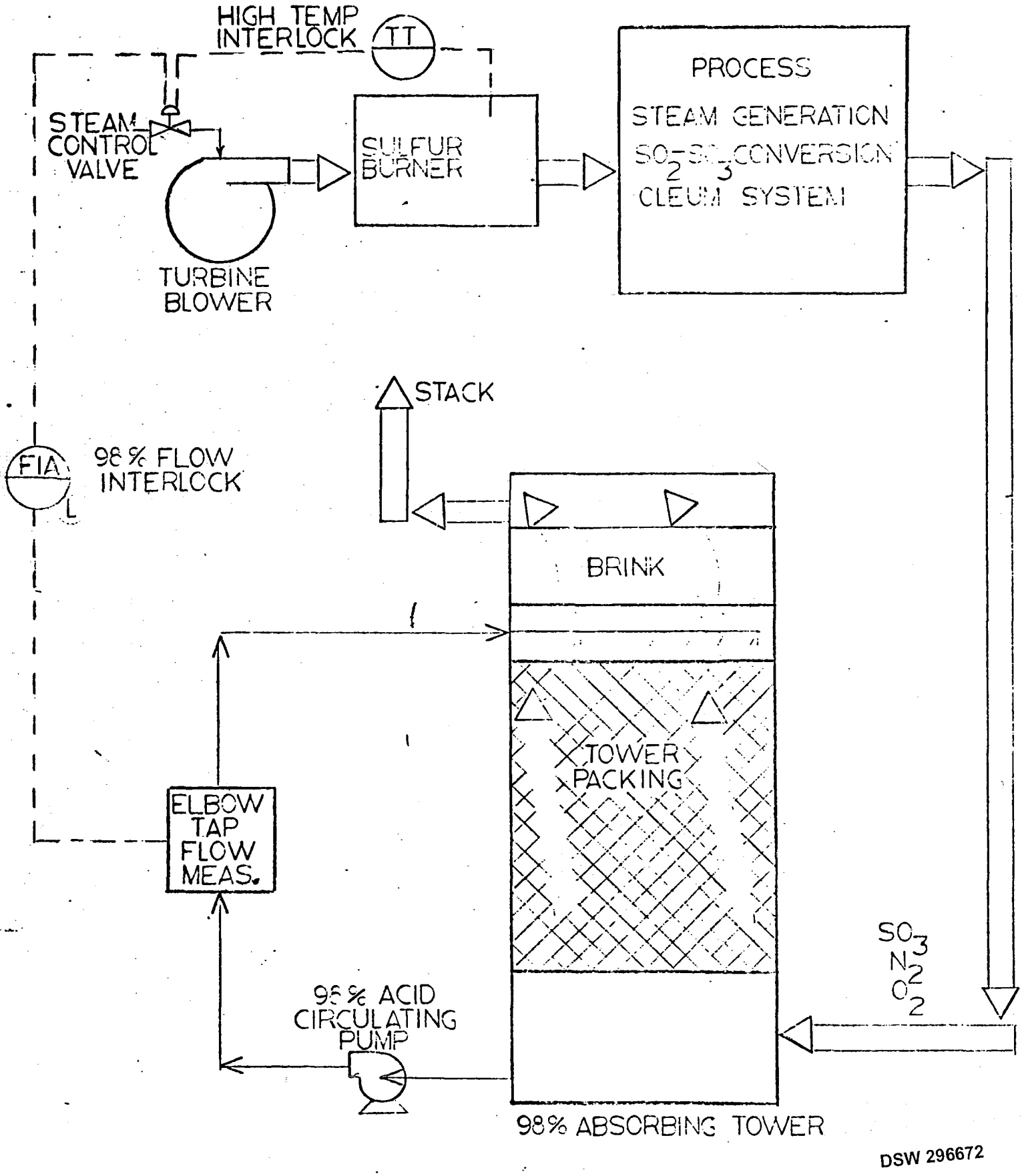
SULFURIC ACID PROCESS SCHEMATIC



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