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Swenson Filter Dryer Issues
Dated: 1959

Recovered from site on March 6 2021

cc: J. B. Hazle
C. P. Johnson
H. R. Nicklaus

April 10, 1959

COPY

Mr. Walter Carbonne
Wilputte Coke Oven Division
40 Rector Street
New York 6, N. Y.

Dear Walter:

At Mr. Hazle's suggestion, we are calling your attention to certain conditions at the new Sulphate Plant.

The new water pump which supplies water to the Swenson filter was put into operation March 19th. It supplies water at the pressure and volume recommended by Swenson. We are unable thus far to obtain salt consistently below .1% moisture as quoted in letter from Mr. Wethly to Mr. J. H. McDaniel, February 11, 1957.

The acid content exceeds that of the salt produced on the old unit. We had hoped that the chemical characteristics of the salt be at least equal to that produced on the old unit. We would appreciate your comments and suggestions.

Yours very truly,

Interlake Iron Corporation

RBC

R. B. Chamberlin,
Asst. Superintendent, Coke Plant

RBC:lb

Allied Chemical Corporation

WILPUTTE COKE OVEN DIVISION

40 RECTOR STREET • NEW YORK 6, N. Y. • HANOVER 2-7300

April 16, 1959

Mr. R. B. Chamberlin,
Asst. Superintendent, Coke Plant
Interlake Iron Corporation,
11236 Torrence Avenue,
Chicago 17, Illinois.

Dear Reggie:

Thank you for your letter of April 10, advising us of the condition occurring at your new sulfate plant, with particular reference to the operation of the Swenson unit.

We believe that the unfavorable moisture and acid contents of the production salt from this filter-dryer unit should be corrected, and to insure this we have assigned Ralph Hall to meet a Swenson service representative at your plant on Thursday, April 23.

We assure you that we will concentrate on the correction of these conditions, and trust that you will be satisfied with the action taken.

Very truly yours,

Walter E. Carbone
Project Manager

WEC:vjv

Copy sent to
a PJ
NPN

RBC
APR 17 1959

INTERLAKE IRON CORPORATION

INTEROFFICE CORRESPONDENCE

TO: Mr. H. R. Nicklaus

April 27, 1959

FROM: E. R. Michaelson

SUBJECT: The Swenson Filter Dryer

COPIES TO:

On April 23, 1959, Mr. R. Hall of Wilputte and Mr. B. Strong of Swenson Dryer Company arrived on a pre-arranged visit to the new sulphate unit. The object of the visit was to inspect the dryer and attempt to better its performance in respect to reducing the moisture and acid content of the finished sulphate. The moisture content at present (even with the installation of the new water pump) ranges between .1% and .3%. The acid content ranges between .07% and .15%. Customer specifications most generally call for moisture content below .1% and acidity below .05%.

However, upon the arrival of the above gentlemen, no sulphate was available for drying, because of a necessary partial kill early in the morning to relieve a plugged tail pipe in the crystalizer. An inspection of the dryer showed numerous wear holes in the filter screen, particularly at the outer edges of the screen. After ascertaining that spare screen sections were available and conversation with Mr. Ferguson, a decision was reached to replace the entire twelve screen sections; a job which Mr. Strong stated would take four to five hours. This much time was available before dryer operation would be necessary.

The job of removing the old screens was very tedious and time consuming so that in a period of five hours only two sections were changed.

The suction duct between the de-mister and the dryer proper was removed so that it could be examined for salt deposits. No deposits were found.

In answer to the question concerning the short life of the screens, Mr. Strong stated that single screens such as our dryer has, may last from four months to a year. Longer screen life can be obtained by installing an undercover or second screen of coarser mesh upon which the filter screen would be laid. Mr. Hall stated that he had never before seen a single screen sulphate dryer and that previous to our dryer's installation had been concerned about it and inquired about it from Swenson. Swenson assured him that a single screen dryer would be satisfactory.

Mr. Hall's and Mr. Strong's recommendation was the installation of an undercover screen, consequently no other screen sections will be replaced until this recommendation is decided upon. Also the dryer performance in respect to moisture and acid content will wait until the screen change.

Two slurry feed nozzles were taken by Mr. Strong for reboring to size 11/16" and 3/4". The present 5/8" nozzle in our opinion doesn't give sufficient feed to the dryer- necessitating too much dryer operating time. Mr. Strong returned the rebored nozzles the following day.

According to Mr. Strong, a Swenson representative has called three or four times at our gate, requesting conversation with Mr. Chamberlin or myself and has not been able to reach either of us. I have never been contacted in this respect and according to Mr. Chamberlin he hasn't either. Mr. Strong was told that we would gladly receive their representative and show him the sulphate unit if so desired.

Mr. Hall and Mr. Strong were told that on kill day which at present is the Friday in the week, the dryer could be idle for from six to eight hours.

E.R. Michaelson
E.R. Michaelson

mh

INTERLAKE IRON CORPORATION

INTEROFFICE CORRESPONDENCE

TO: Mr. H. R. Nicklaus May 18, 1959

FROM: E. R. Michaelson

SUBJECT: Swenson Filter Dryer

COPIES TO:

On May 6, 1959, a Mr. R. Strong and Mr. L. Lawyer, Swenson Dryer people, arrived at the new sulphate unit to make the following repairs to the filter-dryer. The extent of the repair work to be done was evidently an outcome of Mr. Strong's and Mr. Hall's recommendations from their visit to the unit April 23, this year.

(1) Replace all twelve screen sections on dryer. An undercover screen was not to be installed.

(2) Replace bad hinges on spray and inspection doors. Also re-fit cover on feed trough to prevent splashing.

(3) Remove doctor Blade (knife), sharpen and re-install.

(4) Replace and tighten all bolts and nuts on machine.

(5) Remove, inspect and re-install coke spray header.

(6) Remove old packing from dryer drum shaft and repack.

(7) Install a rotometer in water line to screen rinse nozzles.

Mr. Lawyer was to supervise our machinists in performing the above repairs. Removal of the old screens started at noon on May 6 and continued into the forenoon of May 7. Ten screen sections were replaced May 7. The perforated drum on which the screens are placed required welding at a seam. This was done May 8 and the two remaining screens installed. The periphery of the filter screens was packed May 9. All listed repairs were completed May 9 with the exception of item 6. This will be done when proper packing is received. The elbow pump motor was installed and as of May 9, the unit was ready to be put into operation.

On Monday, May 11, the unit was put back into operation. Mr. R. Hall and Mr. R. Strong arrived on the morning of May 12 to conduct tests on the filter dryer. The purpose was to achieve specification moisture and acidity in the finished sulphate. Feed nozzle size, drum speed, exhauster by-pass position and coke rinse nozzle size were varied. The following is a synopsis of results obtained.

Test No.	1	2	3	4
Feed nozzle size (inches)	5/8	11/16	11/16	11/16
Coke thickness (inches)	1/2	1	± 1	3/4
Elutriation to cone	Wide open		-	-
Elutriation to feed nozzle (open)	Partial		3/4	3/4
Coke rinse sprays (3) g.p.m.	1.8	3	3	3
Drum speed per rev. sec.	70	70	70	53
Production rate tons/hr	1.0	2.16	1.94	2.07
Pressure drop across mesh (H_2O)	0.7	0.6	0.6	.06
Pressure in receiver 11 Hg	1.6	2.2	2.2	1.7
Exhauster bypass position (open)	3/8	1/4	1/4	1/4
Air temperature to dryer °C	148	158	158	156
Salt- % H_2O	.07	.11	.20	.16
Salt- % H2804	.093	.110	.098	.12

The filter dryer at present is operating under conditions set up in test No. 4. Daily analyses for May 14, 15 and 16 show moistures of .20, .30, and .20, and acidity figures of .086, .071 and .075. Improvement over previous operation is very slight, if any. At Mr. Hall's suggestion, the concentration of salt in the crystalizer is maintained lower (24%); giving a slightly larger crystal which might wash and dry better, thus improving the moisture and acid content of the salt. Also, the next set of screens for the dryer will be coarser (16 mesh) instead of the present 40 mesh.

E. R. Michaelson

E. R. Michaelson

mh

Allied Chemical Corporation

WILPUTTE COKE OVEN DIVISION

40 RECTOR STREET • NEW YORK 6, N. Y. • HANOVER 2-7300

INTERLAKE IRON CORP. RECEIVED MAY 20 1959 ACCOUNTING DEPT.

May 19, 1959

Mr. H. R. Nicklaus
Asst. General Superintendent
Interlake Iron Corporation
11236 Torrence Ave.
Chicago 17, Ill.

Dear Nick:

With reference to Mr. R. N Hall's recent trip to your South Chicago plant regarding the operation of Swenson Top Feed Filter-Dryer, we are pleased to enclose three copies of his report covering this visit.

You will note from this report that there is still some difficulty in producing salt within specification moisture content.

The use of full cone sprays for cake rinse in place of the present flat or fish-tail type sprays may reduce the acidity to a point where moisture of product may be more readily controlled. We have advised Swenson in this regard and hope to have an early remedial measure.

Regarding exhauster noise that is so evident from time to time, as reported by Ralph, it is Swenson's feeling that there may be deposits or blockages of salt in the piping and in order to ascertain the extent of this, we should appreciate if you would inspect exhauster and suction piping by removing suction inlet. The results of your findings would materially assist in our analysis of the problem.

We should appreciate your advice in this matter at an early date.

Yours very truly,

Frans Wethly
Executive
Vice President

FW/c

cc: Mr. J. B. Hazle, Gen. Works Mgr.
Cleveland, Ohio

5-20-59
1 copy to J B H.
1 copy to RBC - asking RBC to prepare the reply

HRN

INTERLAKE IRON CORPORATION
SOUTH CHICAGO, ILLINOIS (404-C)

May 15, 1959

Re: Visit, Ammonium Sulfate Plant - Swenson Top Feed Filter-Dryer

After having completed repairs and changes to top feed filter-dryer unit, the writer, accompanied by Mr. R. Strong of Swenson, visited the Interlake Iron Corporation, South Chicago plant for a two day period to observe unit in operation.

All repairs originally contemplated as outlined in my memo of April 29 had been completed and unit was in good mechanical condition.

For purpose of convenience, this report will deal with subject matter as follows:

(A) - Recent equipment changes
(B) - Current operating data and analyses
(C) - Suggested operating practice for improved performance

A. - Recent Equipment Changes

Filter-dryer was completely re-fitted with new 35 x 40 mesh drum screens.

Design of screen caulking bars was altered to facilitate removal and ease of handling

All hinges on washing access doors were replaced with heavier stainless steel hinge bars and hinges.

Feed box was corrected to prevent splashing from top.

Wash manifolds were removed, flushed and cleared of foregin material.

Drum knife setting now established at 3/16"

Cleaned and repaired rubber dam on dryer drum

Replaced broken rotameter on screen rinse water line

B. - Current operating data and analyses

The following is a summary of tests made, complete with water and acid analyses:

INTERLAKE (404-C) - Visit to Ammonium Sulfate Plant, May 15, 1959 (Cont'd)

May 12, 1959

	TEST NO 1	2	3	4
Feed Nozzle Size	5/8"	11/16"	11/16"	11/16"
Cake Thickness	1/2" to 5/8"	1" to 1-1/8"	±1"	3/4"
Elutriation to cone	Wide Open	Wide Open	Wide Open	Wide Open
Elutriation to feed nozzle	Partial	Partial	3/4 open	3/4 open
Cake Rinse Sprays (3) gpm total	1.8	3.0	3.0	3.0
Drum Speed per Revolution	70 Secs.	70 Secs.	70 Secs.	53 Secs.
Production Rate-Tons/Hour	1.0	2.16	1.94	2.07
Pressure Drop Across Mesh - H_2O	0.7	0.6	0.6	0.6
Pressure in Receiver - "HG	1.6	2.2	2.2	1.7
Exhauster By-pass position	3/8 open	1/4 open	1/4 open	1/4 open
Air Temperature to Dryer - °C	148	158	158	156
Salt - $\%H_2O$	0.070	0.110	0.020	0.160
Analysis - $\%H_2SO_4$	0.093	0.110	0.098	0.120

Dryer drum speeds checked as follows:

No. 2 - 70 seconds per revolution
No. 3 - 53 seconds per revolution
No. 4 - 35 seconds per revolution

C. - Suggested operating practice for improved performance

(1) Use large feed nozzle (11/16") and large water spray nozzles.
(2) Minimize operating time.
(3) Adjust elutriation at hopper cone and feed nozzle to promote an even flow of slurry to dryer drum. An excess of liquor should not be employed.
(4) Adjust feed distributor bars in feed box to evenly distribute slurry across face of dryer drum.
(5) Maintain maximum water rate (200 cc's) through flowmeter to screen rinse solution line.
(6) Operate with air temperature of 154-158°C at inlet to dryer.
(7) Exhauster is over-sized for purpose of drying with large volume of low temperature air. For this reason, exhauster by-pass should be open a small amount.
(8) Entire unit to be washed thoroughly once every three hours of operation.
(9) Wash demister in receiver when differential reaches two inches water.
(10) Observe action in front of dryer dam. If salt builds-up or accumulates on face of dam, the dam should either be replaced or washed free of deposits (made pliable).

R. N. Hall

RNH/ky

INTERLAKE IRON CORPORATION

INTEROFFICE CORRESPONDENCE

TO: Mr. H. R. Nicklaus

May 25, 1959

FROM: E. R. Michaelson

SUBJECT: Connersville Exhauster- Sulphate

COPIES TO: Mr. R. B. Chamberlin

The inlet elbow to the exhauster was removed for inspection on May 18, 1959. A fine, packed deposit of salt was observed on the walls of the exhauster. The inlet and outlet piping to the exhauster was clean. The deposit in the exhauster was removed by washing with water. During the washing the impeller was turned over by hand to be sure that the entire wall area was cleaned. The wash water was drained out at a trap on the discharge side at the lower floor.

It was thought that the oil addition to the inlet of the exhauster might be packing the salt and therefore should be eliminated. However, Mr. R. Strong of Swenson, who was present at the inspection checked with the Connersville people and was told that the oil addition was necessary.

A wash out valve was installed in conjunction with the oil inlet fitting, enabling operators to shut oil flow off when the exhauster is down and introduce washing water for impeller and wall cleaning. This is being done once every 24 hours on the day turn. This procedure has not had any noticeable effect on decreasing exhauster noise which has been excessive from the very beginning. However, it may stop the numerous power failures which have occurred recently; usually when putting the exhauster in service.

My comment on Mr. Hall's suggested operating practices for improved performance is that they are a generalization of operating practice as followed at the sulphate unit.

E. R. Michaelson

E. R. Michaelson

mh

R.B.C.
MAY 28 1959