UCC 149-2

UNION CARBIDE

INTERNAL CORRESPONDENCE

MINING AND METALS DIVISION • P. O. BOX 579, NIAGARA FALLS, NEW YORK 14302

To (Name) Mr. J. L. Myers
Division UCC Mining and Metals
Location Niagara Falls, NY

Date September 19, 1973

Originating Dept. "Calidria" Asbestos

Answering letter date

Copy to Messrs. R. E. Byrne, Jr.
V. D. Holt
R. J. Kronkhyte
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File

Subject Evaluation of King City RG-244 Production Facility

Based on observations made during a three-week visit at our King City plant (August 8-29, 1973), it is concluded that only a moderate increase (Ca 5-10%) in RG-244 production can be realized from our present facilities. However, as even a modest increase is of importance at this time, it is felt that the following recommendations should be fully considered as possible means of meeting this objective.

1. The assignment of a shift foreman to supervise RG-244 production on a full-time basis (1 shift per day) for an undetermined period.
2. The addition of 1/2 man per shift primarily to assist on the grinding and bagging portion of the circuit.
3. That we review and modify, wherever feasible, our present product quality specifications.
4. To institute a formal program aimed at better defining the variables which effect product quality.
5. To evaluate, under the direction of the shift foreman assigned, improvements in our present production system which could be beneficial to production and/or product quality.

It is hoped that the reasoning behind these recommendations will be clarified by the attached report.

G. L. Dickson

GLD:cjb
Attachment

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SEP 21 1973
WM. C. THURBER

EVALUATION OF KING CITY RG-244 PRODUCTION

by

G. L. Dickson

September 19, 1973

UNION CARBIDE CORPORATION
Mining and Metals Division
Niagara Falls, New York

UCC 009330

BACKGROUND

As stated in J. L. Myers' letter to F. H. Larrison, dated July 31, 1973, there is an obvious need to increase the amount of RG-244 available for sale. Although domestic deliveries have been maintained at a satisfactory level, export shipments are being backlogged and the condition of our warehouse inventories continues to weaken. The latter is quite evident from Table I (attached) which presents the end of the month RG-244 inventories for 1973. Since the first of the year, we have reduced our total inventory by about 1/3 (224 tons vs. 153 tons). (It should be noted that since the RG-244 circuit has been operating on a 21-shift per week schedule (4/28/73), the decrease in domestic inventory has only dropped from 164 tons to 153 tons.) However, assuming that the present indications of a steadily growing demand for RG-244 are correct, we can expect a continuing decrease in inventory. Therefore, it would appear that our only alternatives are to reduce our sales effort or to increase production. Of the two, the latter is the more palatable from both a marketing and economic viewpoint.

PRESENT KING CITY RG-244 PRODUCTION RATES

Table II contains RG-244 production figures for 1973. Since operating on a 21-shift schedule, the weekly production rate has averaged approximately 35,826 pounds, or 5,118 pounds per day. Thus, the actual production rate is somewhat less than the theoretical capacity of 5,500 pounds per day. If the tabulated data is correct, we should expect to be able to obtain at least an additional five tons per month of product. Based on this premise, plus the possibility that an even greater efficiency could result, the following recommendations are made.

1. Supervision of RG-244 Production

RG-244 (and SX-24) sales for the first seven months of 1973 have averaged about $84M per month. It, therefore, represents our largest product in both dollar sales and Gross Margin ($/ton). In addition to this, it is the only truly "technical" product which we now manufacture. Because of this, the production of 244 should command considerable attention. At this time, it does not receive this consideration because of the inordinate demands placed on the production staff by their responsibilities in the main plant.

No attempt has been made to estimate the possible effect on production which could result from increased supervision. However, because of the need for additional product, it is felt that a trial period of several months is justified. In addition to performing duties related to normal operation, it would seem that a full-time supervisor could also be of considerable assistance with the Phase II expansion which is now in the engineering stage. Also, there are several projects scheduled for last month, but were not completed, which he could investigate. Among these are: (1) Determining the feasibility of bypassing the Bauer mill and feeding the thickened underflow directly to the primary Reitz mill; (2) determine if the scavenger circuit can be eliminated; and (3) improving the flow of ground product through the bagging equipment. An important function of his would be to program routine maintenance (changing press cloths, cleaning treatment tanks, etc.) to coincide with downtime due to other reasons.

2. Additional Manpower

At the present time, the production of RG-244 is carried out by two men: a bagger and a wet-end operator. Although the latter has a large number

TABLE I

"CALIDRIA" RG-244 INVENTORY LISTING FOR 1973*

(Pounds)

Date	King City	Atlanta	Cleveland	Columbus	Dallas	Hammond
12/31/72	224,320	34,740	16,170	14,010	32,360	18,950
1/31/73	225,700	14,690	22,900	30,330	31,350	5,850
2/28/73	189,100	33,240	17,150	13,530	30,940	14,210
3/30/73	142,090	45,140	19,830	8,800	23,920	11,180
4/30/73	119,000	33,580	16,750	45,870	22,870	10,590
5/31/73	135,400	23,200	9,380	30,730	21,240	5,040
6/30/73	119,740	34,400	1,040	23,230	20,070	12,520
7/31/73	129,670	16,840	190	29,730	18,630	26,320
8/31/73	159,320	29,960	9,050	30,930	--	7,010

Houston	Kansas City	Livonia	Metuchen	St.Louis	Torrance	Total
14,920	5,540	36,850	43,550	7,120	--	448,530
10,890	13,560	43,090	48,570	7,080	--	454,010
21,510	11,710	29,790	32,880	6,730	--	400,790
20,850	10,210	16,740	28,660	5,960	--	333,380
16,320	8,500	19,290	30,480	3,760	--	327,010
15,770	8,500	33,380	25,520	3,450	--	311,610
11,860	17,640	43,030	31,760	1,390	--	316,680
10,360	14,840	25,920	20,010	340	--	292,850
9,110	10,920	34,960	10,360	--	4,270	305,890

*Does not include King City SX-24 inventory. Does include off-spec material.

TABLE II

"CALIDRIA" RG-244 WEEKLY PRODUCTION RECORD*

(Pounds)

Week Ending	No. of Shifts	Total Production	Average Per Shift	Off-Spec Production	% Off-Spec Production	Rejected Production
1/6/73	12	23,800	1,983	3,850	16.2	
1/13/73	15	26,950	1,797	1,750	6.5	
1/20/73	15	28,175	1,878	7,000	24.8	
1/27/73	18	30,100	1,672	8,050	26.7	
2/3/73	18	29,050	1,614	8,750	30.1	
2/10/73	15	20,300	1,353	9,800	48.3	750
2/17/73	18	29,400	1,633	11,900	40.5	750
2/24/73	15	22,225	1,482	5,600	25.2	
3/3/73	18	29,750	1,653	7,350	24.7	
3/10/73	15	23,800	1,568	10,850	45.6	1400
3/17/73	18	26,390	1,466	10,850	41.1	
3/24/73	18	28,105	1,561	4,550	16.2	350
3/31/73	15	26,180	1,745	3,150	12.0	350
4/7/73	18	23,800	1,322	7,000	29.4	700
4/14/73	18	32,200	1,789	17,500	54.3	
4/21/73	- - - - - - - - Complete Records Not Available - - - - - - - - - - - - - - - -					
4/28/73	21	35,245	1,678	5,250	14.9	
5/5/73	21	40,950	1,950	9,100	22.2	
5/12/73	21	36,750	1,750	11,900	32.4	
5/19/73	21	38,850	1,850	14,350	37.0	
5/26/73	21	43,085	2,052	10,150	23.6	
6/2/73	21	34,265	1,632	24,850	72.5	350
6/9/73	21	29,505	1,405	11,900	40.3	
6/16/73	21	32,200	1,533	9,450	29.3	
6/23/73	21	36,050	1,717	15,050	41.7	
6/30/73	21	33,950	1,617	8,750	25.8	
7/7/73	21	29,400	1,400	12,250	41.7	
7/14/73	21	39,900	1,900	19,250	48.2	
7/21/73	21	31,150	1,483	4,900	15.7	
7/28/73	21	38,430	1,830	8,750	22.8	
8/4/73	21	37,660	1,793	5,600	14.9	
Average	21	35,826	1,706	---	--	

*Includes SX-24 Production

of duties to perform, he is able to operate his end of the circuit on a continuous basis most of the time. However, the bagger, because of circumstances beyond his control, operates the milling and bagging equipment considerably less than eight hours per day. Therefore, it is felt that additional labor, e.g., 1/2 man per shift, would help insure better utilization of this equipment.

In general, the bagging equipment is down whenever the operator is obtaining and preparing packaging materials for use (pallets, skids, bags); during lunch breaks, while transporting palletized material to the warehouse; and a variety of other minor reasons. Loss of bagging time also results when he is required to assist the wet-end operator change filter cloths, or whenever any cleaning in the bagging area is required. The latter, out of necessity, is often relegated to a position of minor importance. It was also observed that twice during the three-week period a bagger failed to report for work, which resulted in a minimum of eight hours lost production. With extra labor available, this could be avoided.

3. A Review of Our Present Product Specifications

It is quite evident that considerable product loss results in attempting to meet our present product specifications. The loss is due to a slowdown in one or more phases of the circuit whenever product quality drops. For instance, the rate of feed going to the Raymond mill is normally reduced to compensate for low-polyester viscosity tests. Also, as has been shown by several trials, the full filtering and drying capacity of this system cannot be realized because of the adverse effect of these operations on product viscosity. There is no question that we are attempting to produce and sell a quality product at a premium price, but, as is well known, we have made considerable concessions in the past relating to the sale of off-specification material and have not been faulted for it as yet. It is, therefore, possible that our specifications are unnecessarily high for some applications for which we are being penalized by lowering our production rate.

4. The Evaluation of the Critical Process Variables Which Effect Production Rate and Quality

After several years of commercial production, we still do not have a good understanding of how to make RG-244. Much effort has gone into this project, both in King City and Niagara Falls. However, a special effort is now warranted as production problems can expect to increase once the Phase II expansion is in production. It is suggested that this be a joint effort between King City and Niagara Falls and that, if acceptable, the King City effort be coordinated by the RG-244 supervisor. It is also recommended that if such a program is considered feasible, that he visit the laboratory in Niagara Falls as soon as possible for a complete interchange of information. (A limited amount of work attempting to correlate slurry viscosity and product quality was carried out last month. The results will be reported as soon as laboratory testing in Niagara Falls has been completed.)

5. Evaluation of Present Production Circuit and Operating Procedures

The rated annual capacity of the main components of the RG-244 production circuit are as follows (based on 90% operational time):

Primary Reitz Mill	1900 tons
Secondary Reitz Mill	1473 "
Filter Press	1261 "
Rotary Dryer	1000 "
Raymond Mill	1230 "

This data indicates that the dryer should be the limiting factor in the sytem, although this was not made evident during this study. In fact, at one time during the week of August 26, the dryer was shut down because of lack of storage for dried (unground) material. Also, it should be possible to increase the dryer output by reducing the amount of downtime in this section of the circuit. For a 30-day period (July 26 - August 26), the dryer was out of operation for the following reasons:

Lack of feed	- 19.0 hours
No operator	- 4.5 "
Repairs (extruder, star valve, etc.)	- 13.5 "
Elevator repairs	- 5.0 "
Change filter cloths	- 4.0 "
Power loss	- 1.0 "
Miscellaneous	- 3.0 "
TOTAL	- 50.0 hours

This cannot be considered excessive, but does indicate that some loss is occurring which cannot be directly attributed to the dryer itself. In addition, as previously mentioned, it may be possible to obtain an incremental increase in dryer output if optimum filtering and drying conditions are better defined. An attempt was made to do this last month by increasing both the normal filtering pressure (45 psi to 50 psi) and the speed of the cake storage belt (+10%). Although the moisture content ran about 1.10%, the polyester viscosity of the product was lower than normal, which was generally agreed was due to these changes in operating conditions. The actual test was somewhat obscured by the fact that it was subsequently discovered that a solenoid valve controlling the sodium silicate addition was not functioning properly, and it was not possible to determine when this problem originated.

According to the rated capacities, the Raymond mill should not be a limiting factor in the system. However, when low-viscosity material is being produced, the feed to the mill is decreased to help compensate. Under normal conditions, the Raymond mill is run at a power loading of about 29 amps, but at times this goes as low as 21 amps. Samples were obtained (product bin and Raymond milled) during one of these times and are presently being tested in our laboratory to investigate more accurately the effect of our present grinding system on polyester viscosity.

Tests were carried out by Messrs. Holt and Marsten last month to determine the bagging rate of our present equipment. Their results show that it should be possible to decrease the filling time by about 1/3 if slightly larger bags are used. (Details of their tests will be reported by them.) However, there is an associated problem involving the flow of ground product from the storage portion of the bagger to the bagging chamber which has still not been rectified. The feeling is that this can be corrected, but again it will involve time and effort on the part of someone who is presently not available.

The chemical treatment process appears to be adequate and normally functions satisfactorily. An exception to this was the incident of the stuck solenoid valve previously mentioned. It was observed that it is the policy of the wet-end operator to shut down this system whenever he makes up a batch of

dilute acetic acid. This was discussed with Messrs. Larrison, Marsten, and Kronkhyte, and it was concluded that this precaution is not normally required. This change in procedure is not vital, as it occurs only 2-3 times per week, but it does exemplify how minor inefficiencies can develop without adequate supervision.

A brief survey regarding the loss of finished product was also made last month. The information obtained indicated that loss due to breakage (in-plant, during transportation, and in warehouses) is inconsequential. Also, as sample shipments averaged less than 90 pounds per month, there is no chance to obtain additional salable product in these two areas. There is an undetermined amount of spillage during bagging, especially with tuck-in sleeve type bags, but again this is not of major proportions. However, a solution should be found to correct this situation if for no other reason than to alleviate the dust problem which is created.

As Table II shows, there has been a small amount of "rejected" production made this year, although it is still in inventory. It is suggested that this material be reappraised and, if possible, be sold to certain customers either as regular product or off-spec material.

G. L. Dickson
9/19/73