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APR 13 1951

Lima, April 9, 1951

MEMORANDUM to: A. R. Merz  
From: R. P. Koenig  
Subject: Research Department

MR. KOENIG  
MR. SAWYER  
MR. MITCHELL  
MR. STARR  
MR. DAVID  
MRS. BRYAN  
MR. REINBERG  
MR. SPENCER  
MR. LITTLEFIELD  
MR. SMITH  
ORDER  
TRAFFIC  
PURCHASING  
ALLOY  
METAL  
ENGINEERING  
FILE

1. This will acknowledge receipt of a copy of E. H. Gates' letter of April 3, 1951 to yourself. I am pleased to have the benefit of such a clear statement of the organization and other aspects of the Research Department.

2. At this moment I should like to inject the thought that work on Zinc Plant (i.e. electrolytic zinc plant) Leach Residue Treatment might well be deferred, or given a low priority - as it is not unlikely that such residue may well be added to the feed for the Sterling process.

3. Furthermore, during the start up period of the new zinc facilities, it is good business to

- (a) get as much as we reasonably can in the way of profit out of the plants, by using the capacity for raw feed rather than the lower content residue, and
- (b) not encumber the operating personnel with a complication such as residue treatment will inevitably entail.

It is my feeling that all residues of any potential value be stored for subsequent re-treatment when the propitious moment is at hand. I think that in respect of zinc lead residues this time (due to the Sterling process) is not yet here.

4. Should any of those to whom this memorandum is addressed have opinions contrary to the above he is requested to put them forth so that whatever is done about this matter is generally agreed to.

(Draft signed by R.P.K.)

RPK-tg  
Enclosure.

cc. NYO (5) ✓

Reinberg, W.C. Smith, M.B. Littlefield

ARM (4)

JDS (2)

L. Addicks, Bel Air, Maryland

Research Department  
La Oroya.

April 3, 1951.

Mr. A. R. Merz,  
Manager of Operations,  
La Oroya.

Dear Sir:

RESEARCH DEPARTMENT

The following discussion concerning the Research Department and its place in the Corporation covers the basic aims of the department, the internal organization, and program of work as well as can be determined over the near future.

There are three main classes of work that can be done by this department that cover the Department's basic purpose.

1. To check for the production departments, industrial processes for their practical operations under Oroya conditions, and to contribute to new developments in metallurgical processes. The greater the use the company can make of these facilities, the greater it will benefit in cutting down on costly delays and expensive alterations through unchecked designs that have to do with type of manpower, altitude, plant and shop facilities, and in general, conditions in Oroya that are different than elsewhere. Also, the contributions to new techniques of operation, designs for new equipment, and new process developments serve to keep the Corporation more on a level with other progressive companies rather than always a step or two behind times by only adopting for use the processes and techniques previously developed by others.
2. To continually keep up to date advances in analytical chemistry and spectrographic techniques for the control of processes under new conditions, and more precise and effective control methods for our present operations.
3. To have the facilities available to all departments of the Corporation for handling the many types of unusual analyses and test work needed by the operating departments, and which are not amenable to handling within their own laboratories. Special determinations calling for involved techniques and specialized equipment has been a long maintained service to the operating staff.

To accomplish this work effectively, the internal organization of the Research Department is comprised of four sections,

1. Analytical Chemistry Laboratory
2. Spectrographic Laboratory
3. Research Design Section
4. Metallurgical Research Section.

These four sections are, for the most part, closely interdependent and work as a unit in carrying out assigned research

projects. For the satisfactory accomplishment of metallurgical research work, proper facilities for practically any type of metallurgical analyses must be provided by the chemistry and spectrographic sections. The research design section must be in close contact with the laboratory to transpose experimental evidence into sound design. Also, the development of specialized equipment for the analytical sections' new or changing techniques, and including laboratory rearrangements, revisions, and maintenance of equipment is the continual duty of the design section. Experience has shown this organizational plan to be exceptionally effective.

There are two serious weaknesses originating outside the Department that are most difficult for us to overcome in carrying out our assignments with dispatch.

First is our dependence upon the overloaded Oroya shops in getting jobs done. We are not in a position, by the nature of our work, to expect the service from the shops that is often needed in carrying out our projects. The shops are perpetually overloaded with much needed maintenance work and new work to keep in good condition and extend the present operations. This means indefinite delays in finishing up our jobs. We need to start new jobs while marking time waiting for equipment or apparatus to carry on with the old work. This leads to a congestion within the Department of half finished work and the abandonment of useful work that would help in many cases in cutting down the need for the shops to spend time and effort in maintaining equipment that should be improved. As vitally concerned observers, we see this condition as an ever broadening spiral that is held in check to some extent by the postponement or abandonment of all work that should be done for the Corporation's well being but is not done except for those items essential for a day to day operation. Such postponement of this work seems to be rather a negative approach to progress. To send work away for fabrication has been suggested. This would serve for standard or proven equipment, but would not be satisfactory for equipment in process of development. We feel that an organizational set-up and/or additional shop facilities for handling a greater shop load could be justified.

Second is our complete dependence upon the quality of our personnel for the accomplishment of the high quality results expected of this department. In the operating departments, where are a substantial number of jobs that require of the operators a close following of precise directions on routine work, and so long as this requirement is filled, the operator has completed his responsibilities. In research metallurgy, a man must think constructively; that is difficult for a man not so constituted. Also by the nature of things, a man who can think usually demands a higher salary, and if he does not get it at C. de P. he goes elsewhere. We are continually short of the proper calibre research men because of this, as well as the scarcity of such men. We have long been trying to keep our salary scales on an equal footing with the operating departments. It is felt that such a policy has cost us much, but should it be changed there would, no doubt, be tremendous dissatisfaction among the operators who feel that their work of producing metals is of greater importance. From a non-research viewpoint, we understand this feeling. We, alone, cannot decide this issue.

Current Research Program. In the metallurgical research section, we have four main projects under investigation and a number of others which have been explored and are awaiting further work when possible. These projects are:

1. Silver Parting Research Program.
2. Experimental Work on Cadmium Recovery.
3. Zinc Plant Leach Residue Treatment.
4. The Recovery of Tin and Indium from the Electric Smelting of Copper Dross.

Silver Parting Research Program. The ultimate objective and the manner in which it is being accomplished has already been covered in my memo to you of March 27, 1951. Briefly, this research is mainly for the purpose of evaluating the Thum cell process for clean operation, ease in taking metal inventories, and general practicality of the operation under the best operating techniques that we can establish. Also, we are testing an aluminum Thum type cell which appears to have many advantages over the standard concrete cell. The data we obtain from this program will be of considerable value in the ultimate design of a practical plant that can work with minimum trouble right from the start of operations.

Experimental Work on Cadmium Recovery Project. The present laboratory investigation comprises a study of techniques for pelletizing the lead blast furnace fume for the purpose of concentrating cadmium by selective fuming operations. Previous work on fuming the cadmium from this product failed because of excessive dusting of the charge and arsenic contamination. We are checking in the laboratory a scheme proposed to me by Mr. W. C. Smith at a recent conference in Lima and which was reviewed in detail with Mr. Koenig at that time. The basic idea is to reduce dusting and facilitate handling of the lead fume by pelletizing. This operation would be followed by: first, arsenic elimination by roasting under oxidizing conditions; and second, concentration of cadmium in a fume by roasting under reducing conditions. Exploratory tests in progress indicate that the proposed process may have considerable merit, and it is planned as the next step to continue this laboratory work on a quantitative basis for detailed information.

Zinc Plant Leach Residue Treatment. Considerable work had been done on this project by the time it was unavoidably dropped because of the urgent need for work on the Huaymanta Betts Plant. This work is now reopened and a report on laboratory results will be forthcoming shortly.

The recovery of Tin and Indium for Electric Smelting of Copper Dross. The work on this project has been intermittent but is progressing slowly. The small Detroit rocking furnace needed for this work is tied-up to a large extent on the reduction of tin dross to lead-tin bullion. We can only make use of this equipment during short intervals in between these regular tin dross reducing operations.

We could easily be swamped with research projects, all of which would be highly useful to our present and future operations. Some of the work that has been explored or seriously considered but temporarily set aside because of lack of shop facilities or personnel shortage is as follows:

1. Properly designed equipment for zinc sulfate production.
2. Electrolytic zinc plant leach control by instrumentation.
3. Continuous sheet lead casting for Huaymanta lead starting sheets.
4. Production of ferro-manganese by electric furnace smelting.
5. Electrolytic zinc dust as a more efficient material for zinc plant solution purification.

Very truly yours,

(SIGNED)

E. H. Gates

FOR Mr Robert P. Koenig

LAWRENCE ADDICKS

BEL AIR

MARYLAND

COPY

A-41

"Con paciencia se gana el cielo".

"Gato con guantes no caza ratones".

Lima, April 5, 1957

ROBERT P. KOENIG

PRESIDENT

CERRO DE PASCO COPPER CORPORATION  
40 WALL STREET, NEW YORK



C O P Y

CERRO DE PASCO COPPER CORPORATION

March 29, 1951.

To: Mr. R. P. Koenig  
From: A. R. Merz  
Subject: Silver Parting

Please refer to my memorandum on this subject dated March 26, 1951. The preliminary reply by Mr. Gates referred to in that memorandum is attached.

I share with Mr. Gates the feeling that Mr. Addicks' concern about the aluminum cell of the Thum type is not justified. You will note that Messrs. Gates and W. C. Smith have agreed that direct comparison of concrete and aluminum cells should be made in the test installation. We are confident that the aluminum cell will prove itself superior, but also agree that proof is required. Such proof was the object of the test program recommended.

ARM:p

Enclosure

cc: RPK--Oroya  
NYO  
JDS  
WCS  
JWH  
EHG

(R. 10-20-50)

Research Department  
La Oroya.

March 27, 1951.

Mr. A. R. Merz,  
Manager of Operations,  
La Oroya.

Dear Sir: Silver Parting.

With reference to Mr. Koenig's memo to you dated March 16, 1951 on the above subject which included an attached note from Mr. Addicks, I feel that there are no serious issues at stake with respect to our aim of getting into operation a parting plant that will produce high grade silver with maximum effectiveness and minimum effort and cost.

The ultimate objective of the silver parting research program, as we see it, comprises the following main points.

1. To gain information and experience for the design of a plant that is most easily amenable to a scrupulously neat and tidy operation with minimum effort expended.
2. To obtain the data necessary for designing a plant whose intake of dore' metal will be nearly 100% converted to finished refined metals. Circulating loads of precious metals at present going back to the anode residue plant should be completely eliminated.
3. To study plant operations that have the highest possible amenability to precise metallurgical accounting procedure. It is our aim to be able to account accurately for all metals in the plant on short notice with the least amount of effort and upset to operating schedules.
4. To study the most effective techniques of good plant operation under the assumption that the staff will be unskilled and inexperienced. We have always had to bear in mind that the turnover of operating staff usually is considerably higher here than elsewhere.
5. To be able in general to evaluate with sound judgement this type of operation through first hand operating experience here in Oroya.

The method by which we plan to carry out the program is to set up a Thum cell type of plant in the old experimental Betts refinery building. Such a plant as presently being installed will serve three important purposes:

- a) To determine and correct before a permanent installation is made, any faults in the carefully planned operating techniques and equipment designed to accomplish the above mentioned points under the working conditions here in Oroya.

- b. To have on hand at the conclusion of the program a full complement of equipment that has been completely proven by Croya operators. This equipment would be ready for rapid installation in the present parting plant building with little expenditure of time and labor.
- c. To be able to treat without appreciable interruption the full load of C de P's precious metal production during the interim period of adapting the present parting plant building to accommodate a Thum cell type of operation.

In the above work, we are assuming that the present parting plant will install and operate the Thum type cells presumably for an extended period prior to the completion of an entirely new parting plant which has been proposed for the Huaymanta area.

We do not feel that Mr. Addick's concern over the use of the aluminum Thum type cell is justified. We have had one of these full scale cells in operation off and on over long periods here in the Research laboratory with nothing but excellent results so far. This cell makes a much more neat, tidy, and trim installation than the concrete cell. The electrical contacts are found to be much more positive. The cell is amenable to better cleanup; there are no irregular surfaces or carbon blocks with cracks or interstices for the silver to be tied up. The cells are light, easily moved, and if damaged can be replaced in a matter of minutes. It is inconceivable to us that a row of similar cells would cause difficulties. But, if such proves to be the case under full scale operation, these cells could be replaced by concrete cells with little trouble, and without appreciable interruption of the program.

At Mr. W. C. Smith's suggestion, we are going to set up some concrete Thum cells together with the aluminum cells and operate them in accordance with standard Thum cell techniques. This should show up or invalidate by direct comparison the advantages that appear to be present in the aluminum cell.

With Mr. Pagel's investigation of silver parting plant practice in the United States, we will be in that much better position to make comparisons for the final choice of an operating technique that meets best our requirements.

Very truly yours,

(sgd).

E. H. Gates

cc: ARM (3 extra)  
ILB  
DAR  
RFP  
File

CERRO DE PASCO COPPER CORPORATION

40 WALL STREET, NEW YORK 5, N. Y.

March 12, 1951

A. 36

Memorandum to: R. P. Koenig  
From: L. Addicks  
Subject: Silver Parting

1. As you requested, I am epitomizing my remarks of last Wednesday on the silver parting problem at Oroya.

2. If you rebuild the parting plant either in its present location or near the copper refinery, I should change to a standard Thum cell. It is much easier to operate than a multiple vertical system, will give a cleaner parting unless the latter is expertly handled, does not require addition agents to control the deposit, and above all makes no anode scrap and gives a good ratio of concentration. At present you have virtually an electrolytic parting plant followed by an old-fashioned sulphuric acid parting plant. This flowsheet is undesirable from the point of view of process losses and difficulty of obtaining a running inventory. Floor space, power cost and labor are all relatively minor items at Oroya, and the only adverse point is the ease of bare-faced stealing. No plant dealing with our tonnage can be operated safely without proper 24-hour supervision.

3. I think the experimental work contemplated for developing an improved Thum cell design is a mistake and should be dropped. The present cell is the outcome of many years' experience in many hands. An aluminum cell may work perfectly, but we are introducing one of those chemical unknowns unnecessarily, as well as injecting delays in the rapid planning for a new plant, confusing research with operations and taking needed manpower from other research problems. We have very little to gain and much to lose. As a general principle, I think we should accept the well-tried work of others wherever possible and use our research capacity in meeting our special problems of altitude and ore impurities. We have done remarkable work here in lead and copper refining and have plenty ahead in ore concentrating and recovery of smelter by-products.

Handwritten Original  
Signed By  
Lawrence Addicks

LA:ay  
cc:G.P.S.  
W.C.S.

Lima, March 16, 1951.

Memorandum to: A. R. Merz

From: R. P. Koenig

Herewith copy of a memo from L. Addicks in respect to Silver Parting. As you probably will have gathered I have had a sort of an intuitive feeling that the so-called silver parting research program might very well be reviewed from the point of view of what the ultimate objective is. It always appeared to me that the parting of silver was a process which had been engaged in for a long while by others who were technically competent and therefore I was and still am dubious about trying to "gild the lilly" in Oroya. I will be glad to have the reaction of those on your staff who know about this matter.

RHK:tv  
Encls.

cc: NYO (4)  
W.C. Smith  
ARM (3)  
L. Addicks ✓

Original signed by  
Robert P. Koenig

CERRO DE PASCO COPPER CORPORATION

40 Wall Street, New York 5, N. Y.

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Handwritten Original  
Signed By  
Lawrence Addicks.

LA:ay  
cc. G.P.S.  
W.C.S.