SC ALUM SA TULCEA

Approved
General Director
PhD. Eng. Gheorghe DOBRA

Plan to perform activities regarding production, maintenance, repairs and investment during the year - 2018

For 2018 there were analyzed the production schedule and the requirements regarding the works, materials, personnel costs in order to achieve the production plan and maintenance work, factory arrangements, at each installation level.

There were set the specific consumptions and operating technological parameters for Sierra Leone bauxite.

Also for alumina production and raw materials specific consumptions optimization it is envisaged to continue the cooperation with research institutes and consultancy companies from Romania and France (Technical University of Civil Engineering Bucharest, IPROLAM Bucharest, Amber Development, ICPA Bucharest)

A. Production and Mechanical & Electrical Departments

Considering all activities at the programmed production level for 2018 the number of employees was established at 713.
For the optimal production activity were carried out theoretical and practical training to all staff, both professional training and related to health and safety at work.

For 2018, according to the employee training program, courses will be organized for a number of 200 persons for activities such as: chemical operators (2 classrooms), courses for the authorization of ANRE for the employees in the production and maintenance-repair departments (chemists operators, welders, locksmiths, electricians, operational staff)

Also it is considered to assure the reauthorization of employees working as crane operators, stoker, load binder, forklift driver and authorized installer of natural gas, whose permits expire this year (according ISCIR prescriptions).
It will be carried out training courses for employees of the company for the transition to the new standards SR EN ISO 9001: 2015, SR EN ISO 14001: 2015 and SR EN 50001:2011. Also will be carried out training courses for laboratory accreditation (ISO 17025). Thus, all the leaders, managers and internal auditors will follow training courses in the field, in total 40 persons.

Also, starting with the autumn of 2018, it will begin his a training course for Technological Foreman (metallurgy) 2 years long. Number of employees: 28.

Work	Organization chart	Of which administrative personnel	Personnel activity
Production activity	**386**	**13**	Provides technical operations for the production of alumina
Mechanical & Electrical activity	**169**	**11**	Ensure the Maintenance and repair of equipment for the technological flow and participate at investments works
Transportation	**43**	**3**	Ensure the bauxite supply for grinding and also ensure the domestic transport needs. Rest of bauxite and alumina transport services being outsourced.
Planing	**13**	**8**	Provides production and repairs planning
Other activities	**102**	**64**	Auxiliaries and general services activities (commercial, financial, HR, IT, health and safety and environment, investment, laboratories)
TOTAL	**713**	**99**	

B. Production Activity

For the year 2018 it was budgeted a level of production of 522,000 tones alumina, out of which 472,700 tones calcined alumina. Deliveries to Alro Slatina 402,921 tones calcined alumina. Shipping to export / others 69,000 tones alumina calcined. Other sales are in amount of 77,999 tons aluminum hydroxide.

There were established the technological equipment used primarily in order to achieve the planned production. There were established the operating parameters for Sierra Leone (1,570,886 tons) bauxite processing.
There are made action plans for reducing specific consumption of bauxite, caustic and thermal energy.

It is considered to study the possibility of using red slurry as a raw material for other industrial activities (construction, agriculture, etc.). Continue pilot scale tests to use red mud to improve acidic soils. Continuing the physical-chemical characterization tests of the red mud in cooperation with ECOIND Bucharest (leachability tests).

It is taken into consideration the continuation of developing new products, for special applications, and increasing the amounts of these products in total production of Alum. The products are: dry hydrate, calcined alumina containing alpha phase greater than 70%, low soda alumina.

At the end of the 3rd quarter, dry, milled and sorted hydration plants will be put into operation, which will ensure the possibility of obtaining three different types depending on the granulometric distribution obtained. (0-45 microns, 45-100 microns, 0-100 microns). The production capacity is 8 t / h for the production of dry hydrate and 6 t / h for the production of milled hydrate (0-45 microns).

Month	Calcined alumina production t/month	Alumina production t/month
January	**40,920**	**44,330**
February	**36,960**	**40,040**
March	**40,920**	**44,330**
April	**32,300**	**42,900**
May	**41,850**	**44,330**
June	**40,500**	**42,900**
July	**41,850**	**44,330**
August	**41,850**	**44,330**
September	**39,000**	**42,900**
October	**34,000**	**44,330**
November	**40,500**	**42,900**
December	**41,850**	**44,380**
Total	**472,000**	**522,000**

C. Department Maintenance-Repairs Activities

C1. Maintenance and repairs activities

Main activity of the Department of Maintenance and Repair is keeping in running the installation and repairing the equipment according the approved Plan for Revisions and Repairs.

The budget for these activities in 2018 has a value of **4,175,114 USD** out of which **1,917,175** USD represents repairs that will be performed by third companies, **2,086,077** USD represents repairs done in-house and **171,862** USD there are maintenace services.

Major repairs performed by other companies:

- Repair electrical motors and coolers - 139,999 USD
- Repair Building Grinding - 110,000 USD
- Repair crane bridge at Hydrate storage area - 140,000 USD

- Repair facade building at Digestion Building - 40,000 USD
- Repair building at Lime station - 30,000 USD
- Rehabilitation of tower cranes - 30,000 USD
- Repair Grinding Mill no 4 - 25,000 USD
- Repair of waterproofing buildings - 40,000 USD
- Thermoinsulations for pipes and tanks e - 150,000 USD*
- Repair for turbine and generator CKTR 12MW - 400,000 USD
- Repair refractory masonry for Static Kiln - 40,000 USD
- Repair refractory masonry for Rotary kiln no 3 - 40,000USD
- Boiler C2Ap Nr, 2 – repairs - 92,000 USD
- Turbocharger revisions TK 250 - 29,000 USD
- Repair and overhaul of heavy machinery (car park) - 251,675 USD
- Repairs Internal Rail ways - 50,000 USD

Major repairs performed with own forces:

- Repairs conveyor belts – 67,332 USD
- Repairs bauxite grinding mills – 93,612 USD
- Repairs on digestion batteries – 76,451 USD
- Repairs tanks DN 20 m – 66,459 USD
- Repairs tanks DN 35 m (major repairs) – 50,281 USD
- Repairs precipitation tanks – 28,320 USD
- Repairs on Static Calciner (1 repair) – 68,023 USD
- Repairs on Rotary Calciner no 3 – 45,950 USD
- Repairs bag filter – 80,606 USD
- Repairs for Kelly Filters – 19,930 USD
- Repairs boilers – 27,345 USD
- Repairs compressors – 61,828 USD
- Repairs pumps – 591,000 USD

C2. Investment activities implemented with own forces

Maintenance and Repair department also develops specific activities to achieve with own forces putting into operation of approved investment objectives.

Investments implemented with own forces

- Install new plate heat exchangers for recovery the process heat
- Install electro-pumps having an increased energy efficiency compared with the existing ones
- Adaptation of modern heat exchangers to replace previous positions
- Replacement of reducers with modern models

Maintenance and repair department personnel also participate in tracking and completion of the works of investments made by third companies and provide the conditions necessary for the function of these investments.

C3. Continuous Improvement Activities

Besides maintenance and repair works, alike the planned investment, the Maintenance and Repair department have activities in accordance with approved plans to continuously improve the ALUM's operation of the equipment and installations, works to reduce energy consumption (air, industrial water, air, energy Electric), works to reduce specific consumption of raw materials and energy (air, industrial water, electricity), to increase capacity of the installed production equipment, work for environmental protection, continuing the implementation of the predictive maintenance in Alum.

Activities performed

- Continuation of the program to optimize the lighting in plant installations by replacing old incandescent lighting with new systems using LED technology.
- Assembly facility flocculant preparation solution for dosing in the Red Filtration technological process
- Mounting of speed changers purchased under the Energy Efficiency Program.
- Performing the installation of the technological pipelines according to the technical proposal made by Amber Development for the fine primer classification facility by using a modified hydroseparator.
- Extension of the calcined alumina loading system in trucks, in parallel with the loading of wagons
- Replacement of demineralised water pipes used in the heating system with pregnant liquor
- Extend the heating system for strong liquor using the heat of the filtered pregnant liquor

D. Investments Activity

The ALUM's investment program for 2018 amounts 14,419,000 USD and comprises a total of 20 investment projects, divided into the following chapters:

- **Chapter 1 - Environmental projects to ensure operational continuity and increase the life of the red mud storage deposit-** includes a total of 3 investment projects requiring a forecast budget of 2,185,000 USD;
- **Chapter 2 - Projects for efficient and safe operation of industrial facilities -** includes a total of 10 investment projects requiring a forecast budget of 6,572,000 USD;
- **Chapter 3 - Projects to reduce the energy consumption proposed to ANRE -** includes a number of 5 investment projects requiring a forecast budget of 1,705,000 USD;
- **Chapter 4 - New ALUM products -** includes 2 projects of which one investment project co-funded by EU funds requiring a forecast budget of 3,957,000 USD in 2018 ;

The investment projects are required to be implemented for compliance with environmental regulation, technological process safe operation for alumina production, reduce the specific consumption of heat, electricity and raw materials and for production diversification in Alum.

E. Budget proposed

Alum's budget for 2018 provides total revenue of 190,892,830 USD from the sales of calcined alumina and hydrate.
Total expenditures budgeted required for the production of 522,000 tons is 184,596,322 USD.
Thus, in the budget for 2018 is estimated a profit in amount of 5,893,359 USD.

Unit production costs are budgeted at 205.38 USD/ton of hydrate and 356.61 USD/ton for calcined alumina.

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