FEB 17 1983

ANACONDA ALUMINUM COMPANY MEMO

DATE: 2/10/83

SUBJECT: Columbia Falls Casting Pilot Facility

FROM/LOCATION: D. Bates/C. Falls

TO/LOCATION: Dist.

Now that the Columbia Falls casting pilot facility is essentially complete, it might be worthwhile to review where we now stand and where we intend to go.

The pilot plant consists of a single furnace servicing a vertical DC casting machine. It also includes a A622 degassing unit, a ceramic foam filter, and a A729 CO2 system. It is set up to cast a single strand with a maximum length of approx. 200" and a maximum weight of approx. 16,000 lbs. Ingot cross-sections up to any conceivable size may be cast. Complete technical specifications are included on an attached sheet.

Immediate plans call for a series of tests to augment the large ingot trials performed in Sebree last summer. Initial efforts will be directed at resolving the problems brought to light by the Sebree trials; later efforts will attempt to refine the Sebree casting practice and establish operating limits for the alloys and sizes in question. A timetable and summary outline of our current experimental program is also attached.

We estimate that the above-mentioned program will conclude in the early summer. At that point, we intend to begin design work for retrofitting this station to EMC, assuming that an AFC can be approved by that time. Included in the EMC package will be provisions for Alcan's Autocast and pulsed water. Means for upgrading the existing crane to permit the lifting of a larger ingot are also being investigated. A project outline and timetable for this undertaking are in preparation.

Also in preparation is an AFC for the installation of a large sheet ingot saw which is currently in Columbia Falls, but has never been installed. The use of this saw would permit substantial cost savings, since we now have to send large ingot to Spokane for metallographic sectioning.

D Bates

D. Bates

Dist:



ARCF00002471

## Furnace
Gross Capacity- 114,700 lbs
Tapable Capacity- 102,700 lbs
Heel- 12,000 lbs
BTU input,max- 7.86 mm BTU/hr
Refractory (hearth and lower sidewalls)- A. P. Green DV38 85% Alumina
Burners- Three roof-mounted, flat flame
Damper- mechanical, flue mounted, pressure actuated
Fluxing System- none

## Casting Machine
Type- Vertical DC, externally guided
Mfgr- Loma
Cylinder- 12" dia., double acting
Cylinder Stroke- 258"
Cylinder Capacity- 169,000 lbs @ 1500 psi
Guides- twin opposed, two high, teflon shoes
Drop Speed- 0-10 ipm
Strands- 1 by design. More if needed.

## Molten Metal Treatment

### Degassing
Type- Single chamber A622
Construction- Refractory-lined steel
Heating- 5 immersion burners
Process Gas- Argon,chlorine mix
Idle Capacity- TBD
Tapable- TBD
Controls- Manual

### Particulate Removal
Type- Ceramic foam
Size- 7X7X2 to 15X15X2, dependent upon flow rate.
Pore size- Various

### Start Assist System
Type- A729 CO2 System
Supply- Cryogenic liquid in 384 lb capacity bottle, non-refrigerated
Delivery Rate- 0-50 cfm CO2 gas
Mixing System- Centrifugal booster pump
Controls- Manual start, automatic cycling

### Water System
Type- once-through, well water supply, evaporation pond discharge
Water Pretreatment- None
Water Posttreatment- None
Flow Rate- 0-500 gpm design
Pressure- 0-70 psi at mold, regulated
Temperature- 47 deg F, constant
Metering- in-line turbine meter
Flow control- Manual globe valve

## Controls, Instrumentation, and Automation
Furnace temp- Suspended bath thermocouple, L&N controller with 24 hr circular chart recorder
Trough temp- Portable thermocouple with strip chart recorder; portable digital pyrometer.
Drop speed- tach-generator driven off hydraulic fluid, dial indication. Speed is manually controlled with an elecronic hydraulic valve. System does not currently have a feedback control system, but could probably be easily modified.
Water flow- turbine meter. Meter electronics have ability to drive a



ARCF00002472

chart, other output capabilities. Water system does not have automatic flow control capability as presently constructed.

Process Automation- None

Crane
Type- Bridge
Gross Capacity- 20,000 lb
Net Capacity- 16,000 lb (with 4000 lb ingot grab)

Miscellaneous
Argon Supply- Cryogenic liquid
Chlorine Supply- Compressed liquid, 150 lb bottle
Mold Lubrication- Continuous, Lincoln injector system with four injectors



ARCF00002473