BIG RIVER
STEEL

ECO-FRIENDLY WATER TREATMENT PLANT
INTRODUCTION
1st PHASE:

- 150 Tn EAF
- 150 Tn LF
- 150 Tn RH
- CSP (6 Stands)
- PLS/SPM/CGL/BAF

INTRODUCTION | BIG RIVER STEEL
TUNNEL FURNACE+CSP
CCM
EAF + LF + RH
COLD MILL + GALVANIZED LINE

1st Phase: 1,5 Mtpy
2nd Phase: 3 Mtpy
CHALLENGES
DESIGN PREMISES

- Do not mix circuits
- Reduce investment & operation cost
- Easy operation and maintenance
- Independent and efficient operation
- Complete in 14 months
- Reduce works onsite
CIVIL DESIGN & EXECUTION

- Proximity of New Madrid, Missouri.
- New Madrid area contains the highest level of seismicity in the central and eastern parts of the United States.
- Very high water level.
- Drain pumps needed and sheet piling must be used.
- Reduce excavations as much as possible.
PIPING DESIGN

- Avoid Corrosion
- Pipes towards buildings ALL buried.
- HDPE pipes

- Tight Project schedule.
- Reduce erection time, waste material and cost.
- PREFABRICATED pipe.
OPERATION & SOFTWARE

- Fully Automated system
- Easy operation and maintenance.

- Efficiency
- Reduce Operational Cost
- Automation and signals gathering improve operation.
MELTSHOP AREA

- NCW EAF+LF+RH
- NCW EAF SPRAYS
- NCW GAS DUCT
- CW DEGASSER
- ELECTRICAL ROOM
HSM (CSP) AREA

- PRETREATMENT
- CW CCM
- NCW HSM +CCM
- CW HSM
- CW LAMINAR
- ELECTRICAL ROOM
COLD MILL AREA

- NCW COLD MILL
- WASTE WATER
- ELECTRICAL ROOM
PROCESS TECHNOLOGY
PRETREATMENT

PROCESS WATER

EFFLUENTS TREATMENT
PRETREATMENT
IRON REMOVAL

**DEEP WELLS**
Iron Content 5 ppm

**REQUIREMENTS**
Iron Content 0.1 ppm

Reliable technology with low operations costs and low investment .... **NEEDED**

**OXIDATION + FILTRATION**

High retention time needed, civil works increasing, important power consumption, iron removal limited

**GREEN SAND**

High chemical consumption, high cost, iron removal limited

**DMI 65 MEDIA**

Not previous aerations needs. Low chemical consumption. High performance.
Catalytic Filtration media

- Tailor made for the removal of Manganese & Iron.
- Silica sand based granular material, its active ingredients are permanently fused into the grain.
- DMI-65 performs role of catalyst to promote oxidation of iron and manganese in solution into precipitate.
- Also performs highest quality mechanical filtration.

Potassium Permanganate not required
Wide pH range
Up to 10 years operation

WATER QUALITY...

- INDUSTRIAL WATER (IRON REMOVED)
- SOFTENED WATER
- DEMI WATER
- EDI WATER
PRETREATMENT

WATER: River

FLOW: 800 m³/h F

IRON REMOVAL

RO / SOFTENER

READY FOR FUTURE
PROCESS WATER
COMMON TECHNOLOGY

ALL FILTER SYSTEMS INCLUDE
RING FILTERS ONLY

Side filtration 10% NCW
Total Filtration CW

CONTACT SYSTEMS WITH
DECANTING BASINS

(2 UNIT MINIMUM)

SUBMERSIBLE PUMPS IN
SCALE PITS AND SLUDGE
MANAGEMENT

( STAINLESS & VORTEX)
NCW EAF+LF

WATER: Clean

PRESSURE: 7 bar

FLOW: 1892 m³/h

T DROP: 15ºC

FUTURE EXPANSION
NCW Sprays

WATER: Clean

PRESSURE: 7 bar

FLOW: 3100 m3/h

T DROP: 15°C

FUTURE EXPANSION
NCW Gas Duct

WATER: Clean

PRESSURE: 5,5 bar

FLOW: 3350 m³/h

T DROP: 25 ºC

CLOSE CIRCUIT

FUTURE EXPANSION
CW Degasser

**WATER:** Dirty

**PRESSURE:** 4 bar

**FLOW:** 1040 m³/h

**TSS outlet:** 80 ppm
NCW HSM & CCM

WATER: Clean

PRESSURE: 7 bar

FLOW: 4180 m3/h

FUTURE EXPANSION
**CW CCM**

**WATER:** Dirty

**PRESSURE:** 16/8 bar

**FLOW:** 1165 m³/h

**FUTURE EXPANSION**

2x7 mts decanters

**PROCESS & TECHNOLOGY | BIG RIVER STEEL**
NCW Gas Duct

WATER: Dirty

FLOW: 8000 m³/h

PRESSURE: 13/6 bar

4X 11 mts. decanter

FUTURE EXPANSION
WATER: Dirty

PRESSURE: 2/12 bar

FLOW: 7100 m3/h

25% FILTERED
NCW Cold Mill

WATER: Clean

PRESSURE: 6.5 bar

FLOW: 3055 m³/h

FUTURE EXPANSION

PROCESS & TECHNOLOGY | BIG RIVER STEEL
Remove from the waste water and cooling towers blowdown:

- Oils
- Solids
- Heavy metals
- Adjust pH

Accomplish Discharge Limits

Water Reuse

Zero Liquid Discharge
Waste Water

WATER: Waste

PRESSURE: 2 bar

FLOW: 100/180 m3/h

OIL REMOVAL (DAF)

PH CONTROL
EFFICIENCY
OPERATIONAL COSTS
Low Water Consuming Equipment Selected:

- 12000 m³/h (53000 GPM) filtered.
- Ring Filters reduce drastically backwash water.
- Only 4 m³ per battery.

Sludge Dewatering:

- Installed a Press Plate per Contact Circuit.
- Humidity values up to 20%
- Water recovered.

Water Reuse

- Water used more than one time
- Blowdown distribution system
WATER

NCW Meltshop → Purges Manifold → CW HSM → WASTE WATER TREATMENT → WASTE WATER COLD MILL
NCW Gas Duct → Purges Manifold → CW CCM → WASTE WATER TREATMENT → WASTE WATER COLD MILL
NCW EAF Spray → Purges Manifold
NCW HSM & CCM → Purges Manifold
NCW Cold Mill → Purges Manifold
Pump Selection: “More is better” (NCW)

“NCW Pumps feed different areas with different simultaneity. Better to split in more pumps and keep soft starter than big pump.”
ENERGY

• In contact circuits (CW) with flow difference depending on product mix.

• All Cooling Towers fans, due to temperature variations.
CHEMICALS

Close collaboration between BRS / Cheamtreat/ Russula

Chemical signals link to main system

Fast Response to system changes (Oil spillages, etc)
• NEW TECHNOLOGY IMPLEMENTED PUSHING TOWARDS MOBILE DEVICES.
• WIFI COVERAGE IN WHOLE WATER FACILITY.
• MONITORIZE WHENEVER, WHEREVER
THANK YOU

Juan Kessler

jkessler@russula.com

www.russula.com