Presentation Outline

- Safety Moment
- Design & Operating Standards
- Environmental Inputs – Outputs
- Water
- Solid Waste
- Emissions
Safety Moment

Use the right tools
GCC Smelters:

- EIA for Approval
- International Construction Standards
- International Standards
- Local Standards
- Consent to Operate
- Corporate Social Responsibility
The Environment

Raw Materials, Air & Natural Gas

Sea Water, Municipal Water, Rain & Chemicals

Air Emissions

Water Treatment

Treated Emissions

Safe disposal & Irrigation
IN: Seawater, Municipal Water, Rain, & Chemical

- Seawater Effluent: Chemical Treatment/Aeration
  (16,000 m³/h. Caustic soda is used for pH correction)
- Freshwater Effluent: Chemical Treatment/Oil Removal
- Sewage: Sewage Treatment
- Rain Water: Chemical Treatment, if required

Almost all TSE is used for irrigation
Solid Waste

Sources of Rejects/By-Products

- Normal Operations:
  - Non-Hazardous (for Disposal & Recycling)
  - Process By-Products (carbon powder, CCM, scrap, etc.)

- Start-Up: Process By-Products (pots & other units)

- Power Outage: Process By-Products (August 2010)

- Construction Phase: Excess materials & waste
Types of Waste – End Use

- Non-Hazardous Waste – Disposal Locally
- Hazardous Waste – Treatment/Disposal Locally
- Recyclable Waste – Paper, Plastic, Steel Locally
- Aluminium Dross – Processed for Cold Metal
- Spent Potliner (SPL) – Use in other Industries
Solid Waste Management

Color coded/labeled waste skips – segregate at the source

- All Items in Green and Brown Skips are to be sold. Do not deposit any other materials or wastes in them. Deposit only reasonably clean materials in them.

- Unwanted wooden pallets for sale to be stacked here. Do not keep damaged pallets.
Before & After Cleanup
**Emissions**

**Combustion Products NOx, Carbon Dioxide**

- Fluoride
- Sulphur Dioxide

**Power & Casting**

- Fluoride
- Sulphur Dioxide
- VOC
- Particulates

**Reduction**

- Fluoride
- Sulphur Dioxide
- Carbon Dioxide
- Particulates

**Carbon (Bake Furnaces)**

- FTP
Emissions

In: Natural Gas, Air, & Raw Materials
Out: Emissions, Dust, & Gases (HF, SO2, CO2, NOx, SOx)

Installed:
- Dust Collectors
- Fume Treatment Plants
- Carbon Fume Treatment Canters
- Power Low Nox Burners

Treated Emissions
Fume Treatment Plants
Purpose of FTP:-

- Gas suction to capture:
  - HF (hydrogen fluoride) gases
  - HF particulates,
  - SO$_2$ (Sulphur Dioxide)
  - CO$_2$

- Booster Fans trigger Forced Gas Suction during pot tendering activities. *(min/eliminates fume escape)*

- Al$_2$O$_3$ (primary alumina) used to scrub gases. (Also enriched and fed back as secondary alumina)

- Dust monitoring instruments provide live feedback to operators & allow identification of emissions

- Seawater/wet scrubbing clean sulphur dioxide (SO$_2$). *Seawater effluent is treated & released*
Power Plant – Contribution to Low Emissions

- Installed Equipment
  - Highly Efficient State of the Art equipment – 4GT Frame 9FA in Combined Cycle Configuration
  - Large Gas Turbines – More efficient than smaller gas turbines
  - Dry Low NOx burners on GTs
  - Seawater Cooling Tower – Reduces seawater temperature rise

- Fuel
  - Natural Gas only
  - Low Sulfur Content
Efficient Operation

- Higher efficiency means lower amount of emissions, less CO2
- Regular tuning of GTs ensures minimum NOx & CO production

Active Emission Control

- Selective Catalytic Reduction (SCR) for NOx reduction – to 5ppm; via catalyst in Combined Cycle Stack in combination with injecting aqueous ammonia

Continuous improvement

- Improvements to operating regime and installed equipment improve efficiency & reduce environmental impact.
Sustainability

Social

Economic

Environmental

Bearable

Equitable

Sustainable

Viable
Thank you

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