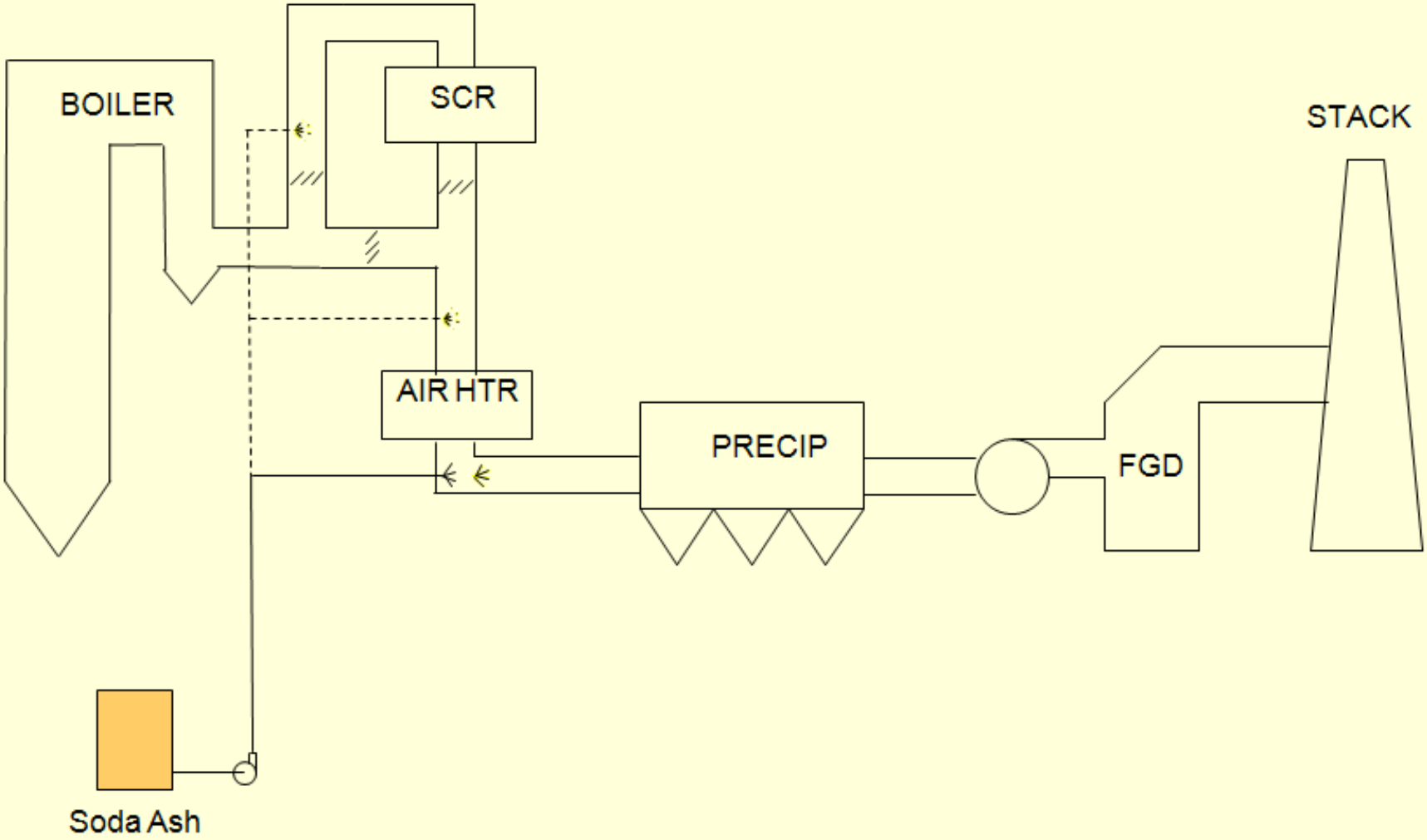
REINHOLD ENVIRONMENTAL Ltd.

2013 NOx-Combustion Round Table & Expo Presentations

February 18 & 19, 2013, in Salt Lake City, UT / Hosted by PacifiCorp

$S0_3$ MITIGATION LOCATIONS



$S0_3$ MITIGATION UPSTREAM OF SCR

- Benefits:
  - Removes SO_3 prior to Air Heater. Minimizes risk of ABS and H_2SO_4 issues.
  - May allow operation with reduced AH Exit Gas Temperature
  - Lowers SCR required operating temperature and allows Units without economizer bypass to achieve lower operating loads
  - SO_3 removal has Hg^- removal benefits with ACI and in precip from native unburned carbon.

$S0_3$ MITIGATION UPSTREAM OF SCR

- Risks:
  - Sodium may poison catalysts.
  - Does Lower Halogen concentrations means less Hg oxidation across SCR?
  - Higher molar ratio may be required for SO_3 removal

$S0_3$ MITIGATION BETWEEN SCR AND AIR HEATER

- Benefits:
  - Removes SO_3 prior to Air Heater. Minimizes risk of ABS and H_2SO_4 issues.
  - May allow operation with reduced AH Exit Gas Temperature
  - SO_3 removed has Hg^- removal benefits with ACI and in precip from native unburned carbon
- Risks:
  - Some Units have IDHX installed in this location

Noteworthy Observations

- Upstream Mitigation has been successful in meeting SO_3 removal targets and allowing reduced operating loads.
- No sodium catalyst deactivation issues to date.
- All units running below 700 degree range operating below MATS Hg limit per stack CEMS.
- Preliminary testing indicates higher mercury removal at precip outlet with SO_3 mitigation in service.
- Testing in 2013 to quantify this and other issues.