



Research and Test Reactors pH & Conductivity Technical Specifications 2014 TRTR Conference

Cindy Montgomery, Project Manager
Research and Test Reactors Licensing Branch
August 6, 2014

Purpose and Recommended Values

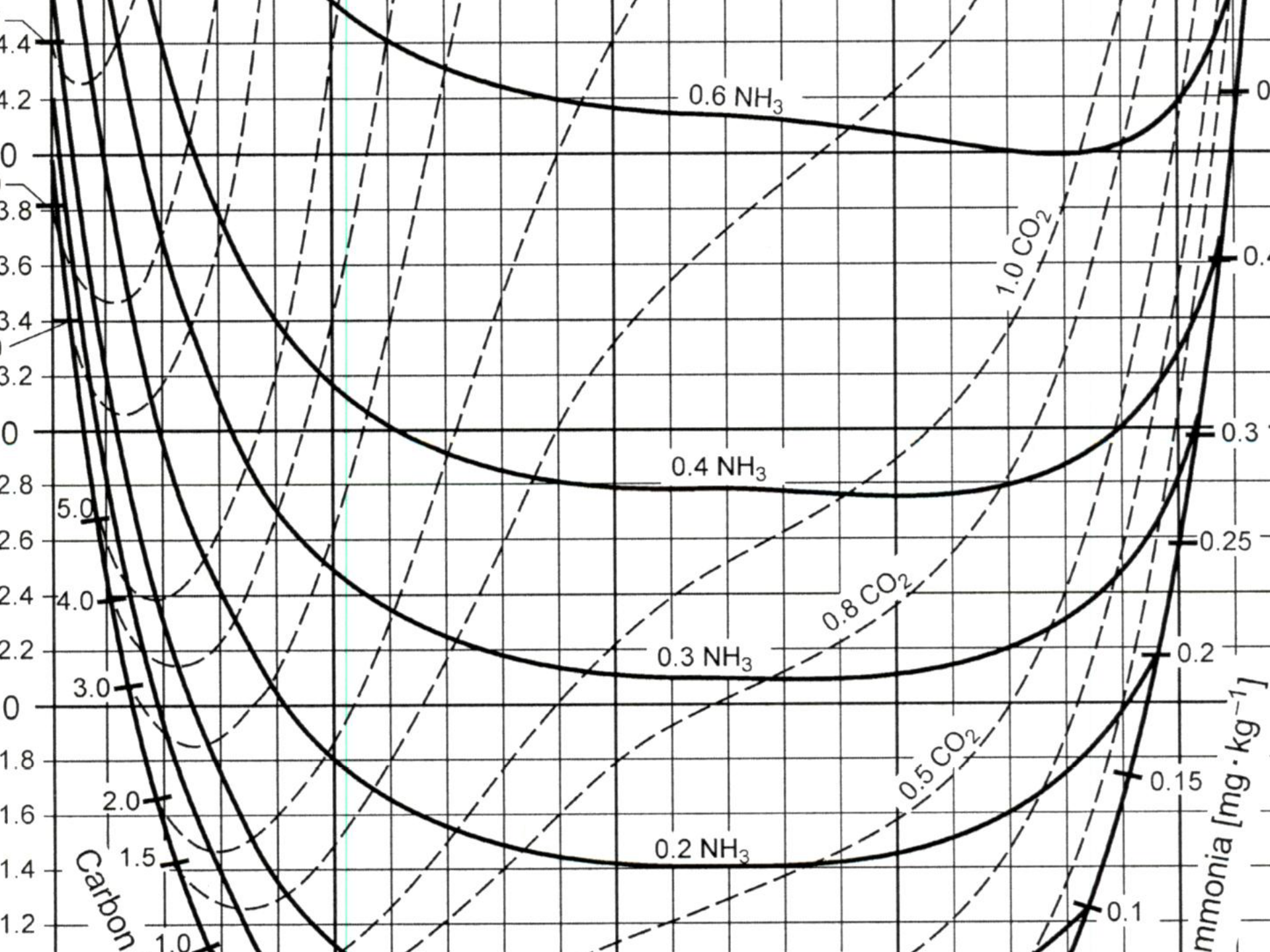
- pH
 - minimize corrosion of aluminum
 - $5.5 > \text{pH} < 7.5$
- Conductivity
 - limit the concentrations of particulate and dissolved contaminants that could be made radioactive
 - maintain water clarity
 - $\sigma = 5 \text{ microsiemens/cm } (\mu\text{S/cm})$

pH and Conductivity

- What pH is physically possible
 - given a particular conductivity
- Open pool water
 - Rapidly absorbs CO_2
 - Atmosphere contains 400 ppm CO_2 by volume (400 micromole CO_2 /mole atm)
 - In equilibrium with the atm, open pool contains 0.601 mg/L mass concentration of CO_2 in liquid water

High Purity Water— Measurement Challenges

- Each pool is unique which adds to the uncertainty in measurement
 - Sample containers
 - Airborne particles
 - Electrolytes from reference electrodes
 - Water temperature



Path forward

- Update NUREG-1537
- Resolve issue for License Renewals
- Ensure consistency with
 - ASTM 5128
 - USP 645
 - ISO 3696

pH & Conductivity

Questions??