OPERATIONS

Presented by:

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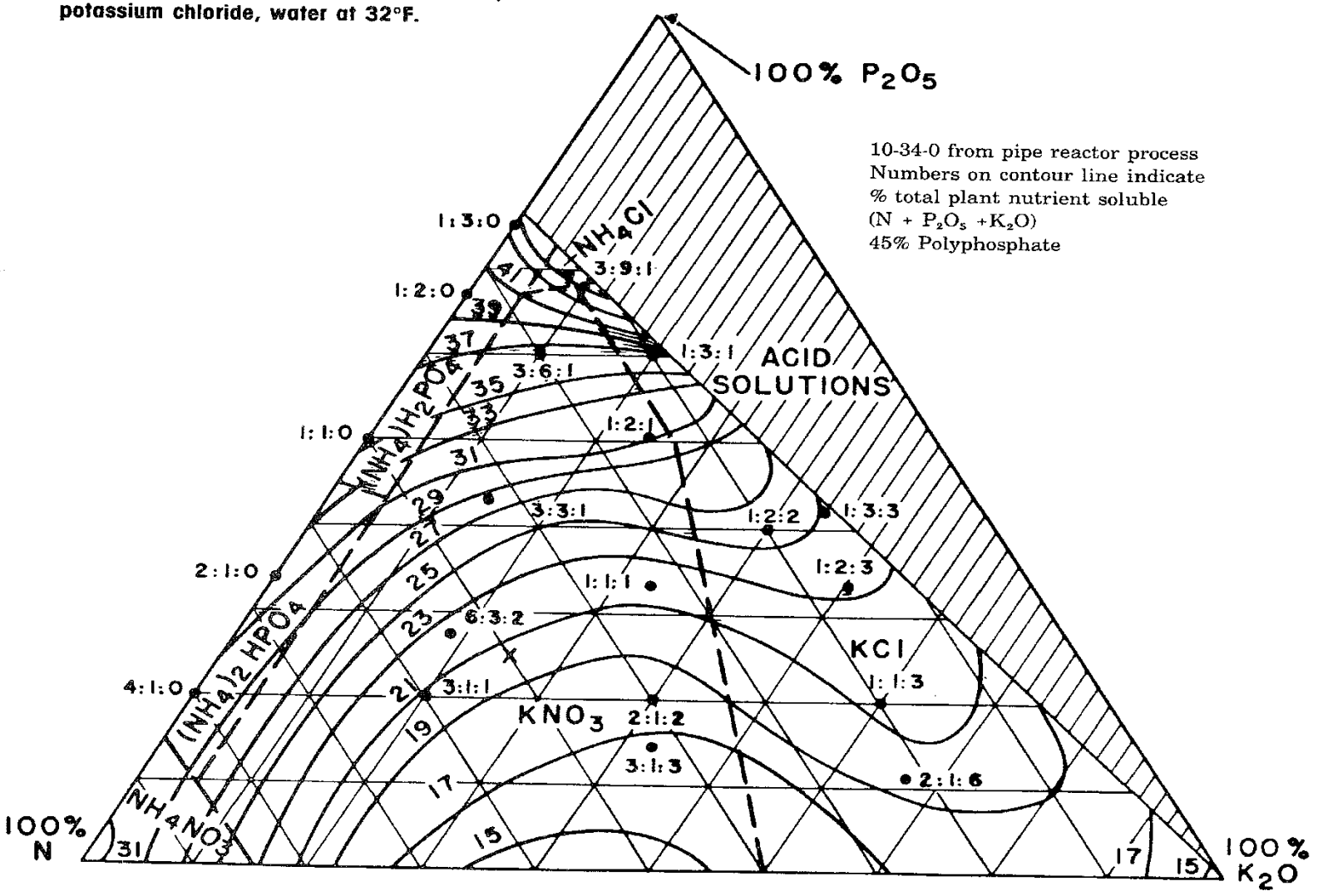
UREA

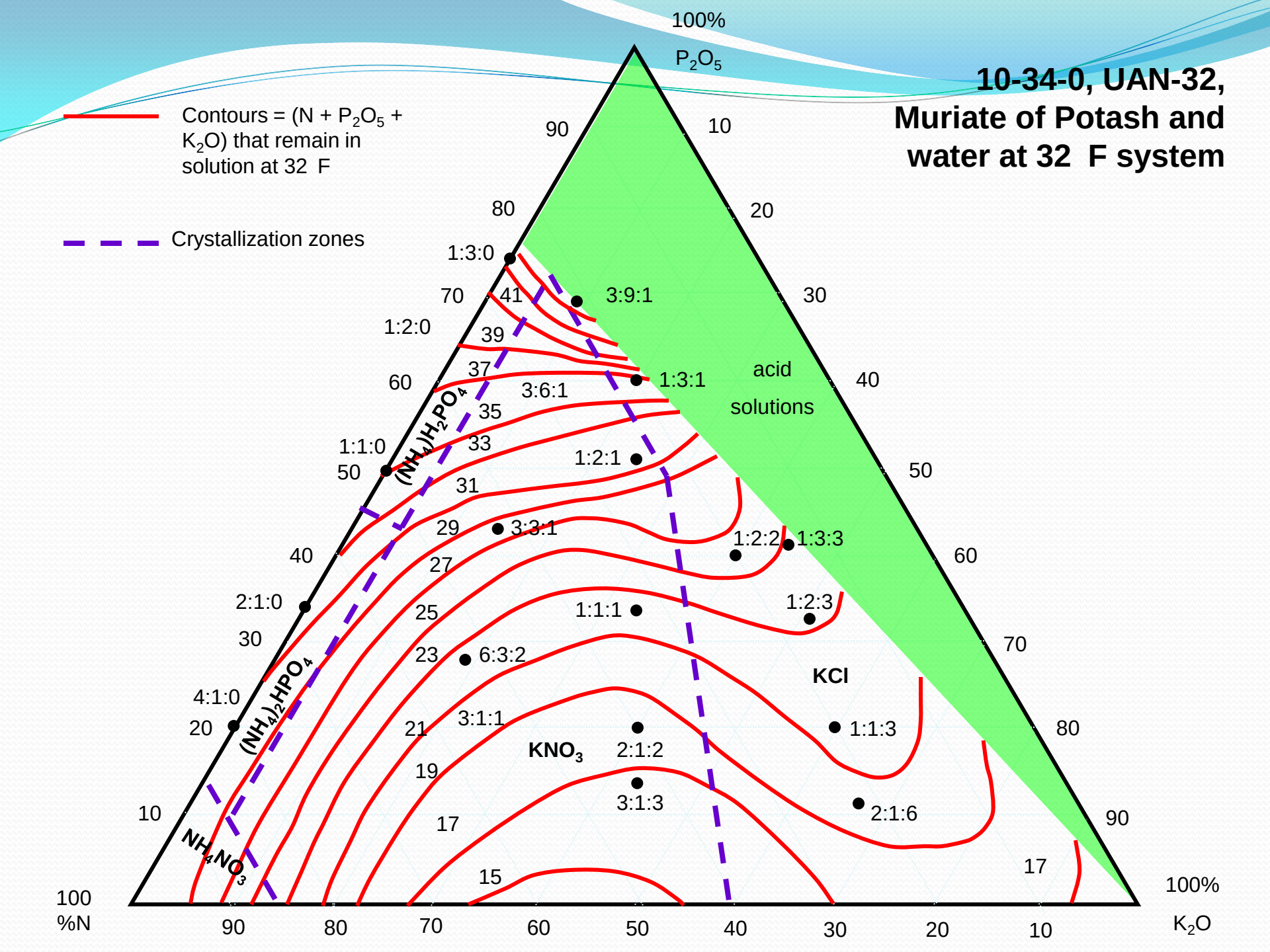
- **Urea is made by reacting (CO_2) with anhydrous ammonia (NH_3) under 3,000 psi (pounds per square inch) pressure and at 350°** (200 atm).
- **$CO_2 + 2\ NH_3 = CO(NH_2)_2 + H_2O$**
- **The removal of water that occurs during the reaction is referred to as "dehydration."**
- **The resulting molten mixture is further processed into either prills or granules.**
- **Making A Liquid Solution**

Liquid Urea

- Heat Of Solution In Water
- 108 btu/lb
- 216,000 btu/ton
- Endothermic Reaction
- Cost Of Heating Water
- Salt Temperature At Different Concentration

Figure 3.6: System 10-34-0, UAN solution, potassium chloride, water at 32°F.




10-34-0, UAN-32, Muriate of Potash and water at 32 F system
Contours = (N + P_2O_5 + K_2O) that remain in solution at 32 F
Crystallization zones
100% P_2O_5
100% K_2O
100 %N
acid solutions
$(NH_4)H_2PO_4$
$(NH_4)_2HPO_4$
NH_4NO_3
KNO_3
KCl
1:3:0
1:2:0
1:1:0
2:1:0
4:1:0
3:9:1
1:3:1
3:6:1
1:2:1
3:3:1
1:2:2
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1:2:3
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6:3:2
3:1:1
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3:1:3
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KOH

- $KOH + HCl \longrightarrow KCl + H_2O$
- Takes High Temps And Catalyst To Reverse Action
- $KOH + HNO_3 \longrightarrow KNO_3 + H_2O$
- Highly Exothermic
- NOx emission potential

Receiving and Unloading Materials Into the Plant

- HAVE ALL PERTINENT SHIPPING INFORMATION, BOLs, DOT requirement, etc.
- REVIEW AND UNDER STAND MSDS AND RMP/PSM REQUIREMENTS
- HAZARDOUS MATERIALS RECEIVING

Filling Liquid Storage Tanks

- Make Sure Inbound Transport Is Connected to the Correct Storage Tank
- Open All Appropriate Valves and Close Others
- Contain All Leaks
- Check Tank Inventory Prior To Transfer
- Wear Proper PPE
- Close All Appropriate Valves Upon Completion Of Transfer
- Complete All Documentation and Record Ending Inventory

Secondary and Micro Nutrients

Use Good Quality Micro Products = Improved Blending

Pay Attention to Order Of Addition, pH, etc

Be Careful Of Point Introduction Precipitation

Make Sure Adequate Mixing Time Prior To Loading

? Truck Mixing Of Blends

Pesticides

- MSDS
- PPE
- Order Of Addition, pH,
- Chemical Compatibility
- Wetting Agent
- T

HOUSEKEEPING

- Keep Leaks Repaired
- Keep Spills To A Minimum And Cleaned Up
- Avoid Contamination
- Keep Good Records
- Retain Samples
- Documentation
- HOUSEKEEPING MUST BE A TOP PRIORITY

Appearance Value – Cross Contamination

- A Product Is Only As Good As The Skill It Was Made
- Contamination Can Be Disastrous To A Blend
- Dries That Go Into Blends Must Be Segregated
- Alley Ways Must Not Be Allowed To Co-Mingle

Scale Care and Standard Weights

- Certified Equipment
- Clean Equipment Works Properly
- Load Cells
- Mass Meters
- Keep It Clean And Calibrated

ANALYTICAL WORK

Sampling

- Inbound Materials
- Outbound Materials
- Retain Samples

Actions Taken After Receipt of Analytical Reports

- QA/QC
- Customer Service
- KNOW WHAT YOU DO AND DO IT WELL

PERSONNEL RESPONSIBILITIES

- Safety And Quality Are Everyone's Business
- Be Properly Trained
- Understand All Products
- Chemistry (basic understanding)

Training

- Haz-ops Trained. What Level?
- PPE
- Safety Meetings/Documentation
- Understanding Of the Process
- Response To Releases, etc.
- Understanding Of Chemistry

Supervision

- If You Are Not Committed To Training
- If You Are Not Committed To Proper Equipment
- If You Are Not Committed To Safety
- Don’t Make These Products And Have Someone Toll Them For You


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STOP
WRONG WAY
DO NOT ENTER