

Which Battery?

Delivering quality

ALCAD



Choosing the right battery technology



Choosing the Right Battery

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Operating Challenges

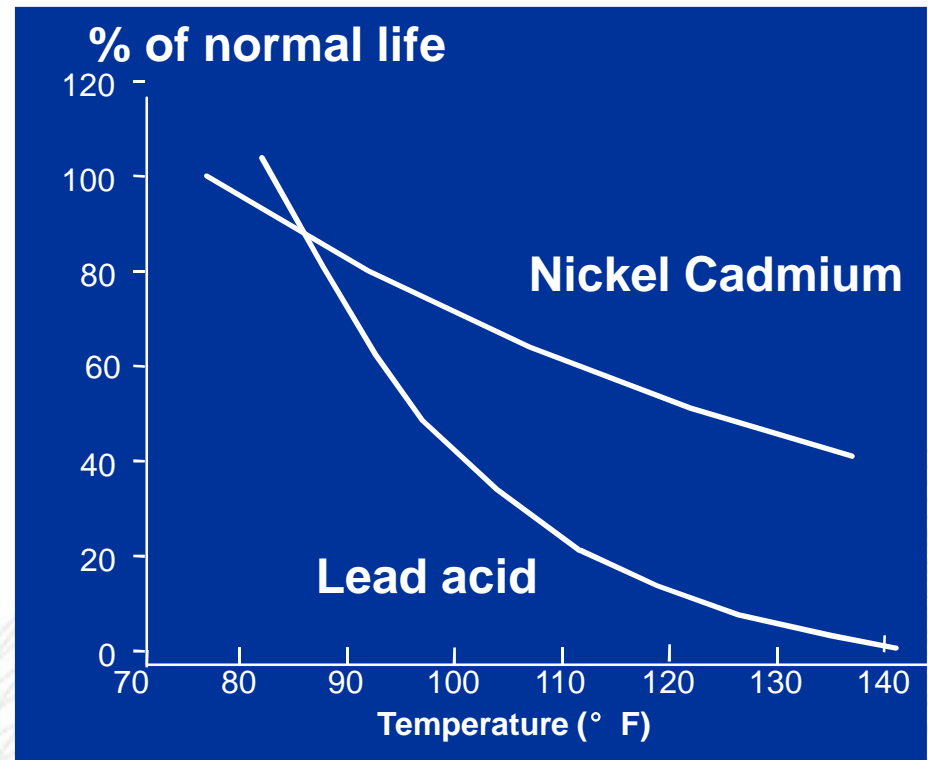
- High temperature operation
- Low temperature operation
- Failure problems
- Maintenance requirements
- IEEE guidelines
- Design life vs Warranty

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High Temperature Operation

- **Lead Acid**
 - Life is cut 50% for every 15° F over 77° F
- **Nickel Cadmium**
 - Life is cut 20% for every 15° F over 77° F

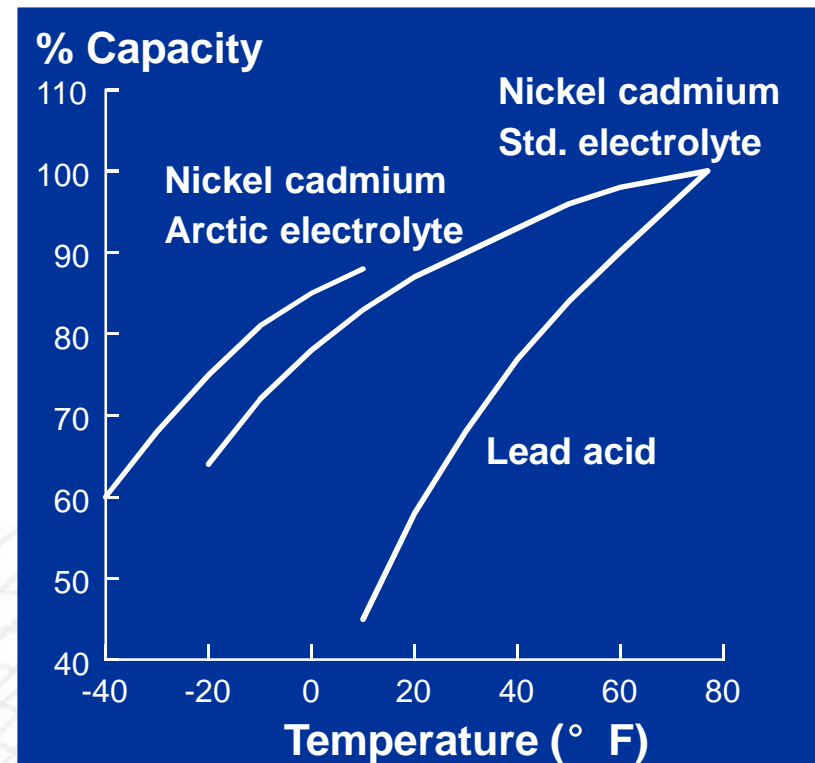


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Low Temperature Operation

- **Nickel cadmium can operate to - 40° F**
- **Avoid freezing with Lead**
- **No danger of freezing with NiCad**



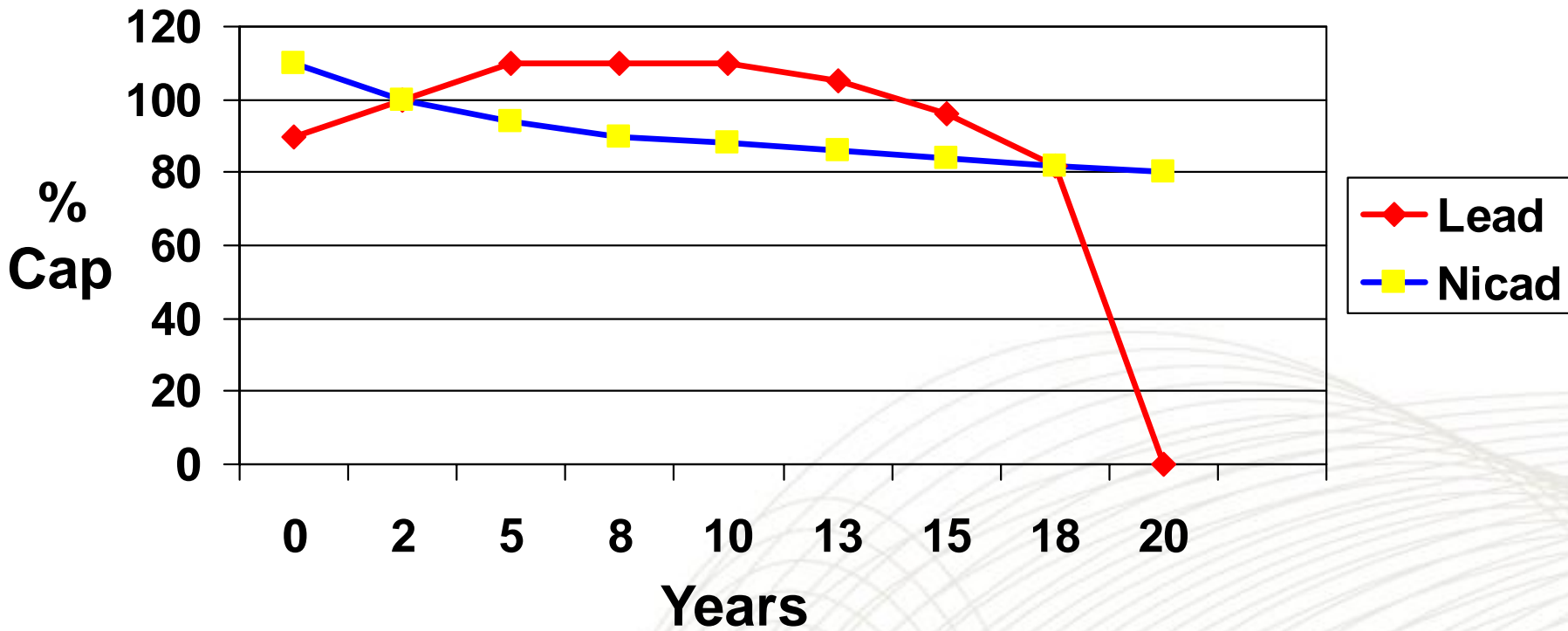
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End of Life Difference

- **LEAD loses Performance before Capacity**
 - Batteries removed from service for mechanical failure reasons, not capacity reduction
 - Sudden, urgent
- **NICAD loses Capacity before Performance**
 - Batteries removed when they can now longer do the job not because of mechanical deterioration
 - Planned change out, not urgent

Life Curve, Failure Styles



Why Nicad?



Maintenance Procedures	IEEE 450 Lead Acid	IEEE 1106 Nickel Cadmium	IEEE P1168 VRLA
Visual inspection	Monthly	Quarterly	Monthly
Pilot cell reading	Monthly	Quarterly	Monthly
Float voltage –bat	Monthly	Quarterly	Monthly
Float voltage -cells	Quarterly	Semi-annually	Semi-annually

Why Nicad?



Characteristic	Lead Acid	Nickel Cadmium
Overcharge abuse	Poor	Excellent
Overdischarge abuse	Not below 1.6vpc	OK to reverse
Storage discharged	Max 24 hrs	Several years
Freshening charge	1-6 months	12 months
Temperature range	50 – 70 °F	-40 to 130 ° F
Vibration resistance	Poor/good	Excellent
Design life	10-14 yrs	20-25 yrs
Plate life	15 yrs	25 yrs
Vented gas (vented cell)	Hydrogen/oxygen/acid	Hydrogen/oxygen