

ENCLOSURE 1

AT&T ROUND CELL

NUCLEAR UTILITY

USER'S COUNCIL

CHARTER

CHARTER

DATE: May 8, 1996

TITLE: AT&T Round Cell Nuclear Utility User's Council

REVISION: 0

CHAIR: Duke Power

MEMBERS: Lucent Technologies
Arizona Public Service
ComEd (Commonwealth Edison)
Duke Power Company
GPU Nuclear
Wyle Laboratories
Wolf Creek Nuclear Operating Corporation

PURPOSE AND SCOPE:

The purpose of the User's Council is to bring together knowledge and experience of AT&T Lineage 2000 Round Cell Batteries in order to address immediate industry and regulatory concerns of performance and behavioral characteristics that have evolved from recent testing and operating experience. Long term, the team will collectively work to resolve questions and issues that are unique to Nuclear Utility applications and address applicability of IEEE standards.

OPERATING AGREEMENT:

The Council shall conduct business using Robert's Rules of Order. Group positions and rulings shall be established by consensus of majority members present at meetings. Urgent issues will be resolved between meetings utilizing written correspondence and balloting of active members.

EXPECTATIONS:

1. Evaluate charging methods for high specific gravity Round Cells
 - Available battery capacity following Performance Test recharge
 - Available battery capacity following an unplanned discharge on-line

2. Identify and resolve concerns that apply to Standard Technical Specifications
3. Identify and determine applicability of IEEE Standards
4. Review historical problems and lessons learned
5. Develop position on testing and correlation of internal cell impedance/resistance to cell performance
6. Investigate performance and behavioral characteristics of high and low specific Round Cells
7. Establish communication between member and methods of data pooling
8. Investigate root cause(s) of Palo Verde and Braidwood battery capacity loss

MILESTONES GOALS:

- | | |
|---|--------------------|
| ◆ Next Meeting in Charlotte, NC | - 5/22 & 23/96 |
| ◆ Issue report documenting results of recharge testing | - Approx. 9/96 |
| ◆ Issue root cause reports for Palo Verde and Braidwood battery loss of capacity | - Approx. 9/96 |
| ◆ Issue report addressing cell impedance/resistance testing Vs cell performance | - Approx. 10/96 |
| ◆ Establish group position on applicability of IEEE Standards and present to IEEE Standards Board | - Fall 96 IEEE Mtg |
| ◆ Document position and basis of Standard Technical Specification issues | - After IEEE Mtg |

Expectations

Discussion/Action/Sponsor/Completion Date

1. Evaluate charging methods for high specific gravity Round Cells

- Available battery capacity following Performance Test recharge

Discussion: Discharge testing has indicated that 100% capacity is not available immediately following recharging after a battery Performance Test. In order to fully understand this phenomenon, additional testing may need to be performed to determine the characteristics of constant current and constant potential charging.

Action: Evaluate and compare both constant current and constant potential charging.

- Available battery capacity following an unplanned discharge on-line

Discussion: After an unplanned discharge on-line, plants will use their permanent plant constant potential chargers at float potential to charge the batteries. An issue has been raised concerning the charge return rate using this method of charging and the available safety margin.

Action: Evaluate effectiveness of constant potential charging at float voltage following an on-line discharge. Determine rate of charge return and evaluate safety margin over accident duty cycle.

Sponsor: APS

Completion Date: Preliminary - Approx. 6/96
Final - Approx. 9/96

Expectations

Discussion/Action/Sponsor/Completion Date

2. Identify and provide recommendations to resolve concerns that apply to Technical Specifications

Discussion: With the unique characteristics of AT&T Round Cells, generic parameters and Surveillance Requirements need to be evaluated for applicability.

Action: Review Standardized Technical Specification for applicability. Document positions and basis.

Sponsor: APS

Completion Date: (90 days following resolution of IEEE 450 issue)

Expectations

Discussion/Action/Sponsor/Completion Date

3. Identify and determine applicability of IEEE Standards

IEEE Std. 450

Discussion: Due to the unique design and characteristics of AT&T Round Cells, clarification of IEEE Std. 450 is required.

Action: Request a Standards interpretation based on data submitted from User's Council.

IEEE Std 485

Discussion: IEEE Std. 485 is normally used for sizing (including various margins) lead-acid batteries used at Nuclear Stations. Due to unique design and characteristics of AT&T Round Cells, clarification of IEEE Std. 485 is required.

Action: Request a Standards interpretation based on data submitted from User's Council.

Sponsor: ComEd

Completion Date: (Request submitted prior to fall 96 IEEE Working Group meeting)

Expectations

Discussion/Action/Sponsor/Completion Date

4. Review historical problems and lessons learned

Discussion: Significant problems and lessons learned during service need to be shared with the group from both a historical perspective and on-going basis.

Action: Research problem history and record on-going problems and lessons learned. Solicit input and share with the group.

Sponsor: GPUN

Completion Date: Initial Rollout Approx. 6/96

Expectations

Discussion/Action/Sponsor/Completion Date

5. Develop position on testing and correlation of internal cell impedance/resistance to cell performance

Discussion: ComEd, Braidwood Nuclear Station has been taking internal cell impedance measurements on designated strings of Round Cells and comparing values with battery Performance Test results. The emphasis is to establish a correlation between cell impedance and capacity. This testing also explores the effect of entrapped gases generated during charging on cell impedance.

Action: Document test results and determine validity of correlation and benefits of impedance testing.

Sponsor: ComEd

Completion Date: Approx. 10/96

Expectations

Discussion/Action/Sponsor/Completion Date

6. Investigate performance and behavioral characteristics of high and low specific gravity Round Cells

Discussion: Recent problems and abnormalities of Round Cells have been limited to those with high specific gravity electrolyte. The effects of high specific gravity electrolyte on performance and behavioral characteristics are not fully understood.

Action: Investigate performance and behavioral characteristics of high and low specific gravity cells. Determine and document differences of each.

Sponsor: Wolf Creek

Completion Date: Approx. 4/97

Expectations

Discussion/Action/Sponsor/Completion Date

7. Establish communication between members and methods of data pooling

Discussion: With national participation, the User's Council member locations are such that frequent meetings are impractical. In order to share ideas and data, a more direct method of communication is needed.

Action: Develop a network between Council members using the Internet, that will provide convenient distribution of correspondence, information, and test data. Method should be fast, simple and convenient such that frequent correspondence and sharing of data is encouraged.

Sponsor: Duke Power

Completion Date: Approx. 6/96

Expectations

Discussion/Action/Sponsor/Completion Date

8. Investigate root cause(s) of Palo Verde and Braidwood battery capacity loss

Discussion: Recent Performance Tests of Round Cell batteries at Palo Verde Unit 2 and Braidwood Unit 1 have indicated unexpected and premature loss of capacity. Root cause evaluations at each station are ongoing. The results of these evaluations should be reviewed and shared such that lessons are learned and applied to develop a better understanding of Round Cell behavior.

Action: Investigate root cause(s) of capacity loss and evaluate results.

Sponsor: APS/ComEd

Completion Date: Approx. 9/96

ENCLOSURE 2

BATTERY

IN PLANT

SURVEILLANCE TEST DATA

SUMMARY

McGuire

Battery A

| | | |
|------------------|----------|--------|
| Service Test | 8/12/91 | Passed |
| Performance Test | 3/16/93 | 101% |
| Service Test | 6/22/93 | Passed |
| Service Test | 12/28/94 | Passed |

Battery B

| | | |
|------------------|----------|--------|
| Service Test | 6/2/92 | Passed |
| Service Test | 3/21/94 | Passed |
| Performance Test | 12/31/94 | 106% |
| Service Test | 10/18/95 | Passed |

Battery C

| | | |
|------------------|---------|--------|
| Service Test | 8/26/91 | Passed |
| Performance Test | 3/23/93 | 100% |
| Service Test | 7/7/93 | Passed |
| Service Test | 1/23/95 | Passed |

Battery D

| | | |
|------------------|----------|--------|
| Service Test | 6/16/92 | Passed |
| Service Test | 3/7/94 | Passed |
| Performance Test | 11/14/94 | 108% |
| Service Test | 12/11/95 | Passed |

Oyster Creek

Battery B

| | | |
|------------------|----------|--------|
| Service Test | 1/14/93 | Passed |
| Performance Test | 11/24/94 | 97.5% |
| Service Test | 11/24/94 | Passed |

Wolf Creek

No operational testing to date.

Braidwood Unit 1

Battery 111

| | | |
|---------------------------|-------|--------|
| Service Test | 3/94 | Passed |
| Modified Performance Test | 10/95 | 112% |

Battery 112

| | | |
|----------------------------------|-------|--------|
| Service Test | 4/94 | Passed |
| Modified Performance Test | 10/95 | 92% |
| Service Test | 11/95 | Passed |
| Single Cell Tests (3) | 3/96 | <65% |
| Service Test | 3/96 | Passed |
| Service Test (Replacement Cells) | 3/96 | Passed |

Braidwood Unit 2

Battery 211

| | | |
|---------------------------|-------|--------|
| Service Test | 10/94 | Passed |
| Modified Performance Test | 3/96 | 112.5% |

Battery 212

| | | |
|---------------------------|-------|--------|
| Service Test | 10/94 | Passed |
| Modified Performance Test | 4/96 | 112% |

Palo Verde Unit 1

Battery A

| | | |
|------------------|------|--------|
| Service Test | 3/92 | Passed |
| Performance Test | 9/93 | 108.6% |
| Service Test | 4/95 | Passed |

Battery B

| | | |
|------------------|-------|--------|
| Service Test | 4/92 | Passed |
| Performance Test | 10/93 | 105.4% |
| Service Test | 4/95 | Passed |

Battery C

| | | |
|------------------|------|--------|
| Service Test | 3/92 | Passed |
| Performance Test | 9/93 | 105.9% |
| Service Test | 4/95 | Passed |

Battery D

| | | |
|------------------|-------|--------|
| Service Test | 4/92 | Passed |
| Performance Test | 10/93 | 106.6% |
| Performance Test | 4/95 | 107.4% |

Palo Verde Unit 2

Battery A

| | | |
|---|------|--------|
| Service Test | 5/93 | Passed |
| Performance Test | 9/94 | 91.6% |
| Performance Test (Replacement Cells) | 3/96 | 106.7% |

Battery B

| | | |
|------------------|------|--------|
| Service Test | 5/93 | Passed |
| Performance Test | 1/94 | 100.0% |
| Performance Test | 9/94 | 89.0% |

Battery C

| | | |
|---|------|--------|
| Service Test | 5/93 | Passed |
| Performance Test | 9/94 | 90.6% |
| Performance Test (Replacement Cells) | 3/96 | 88.6% |

Battery D

| | | |
|------------------|------|--------|
| Service Test | 5/93 | Passed |
| Performance Test | 1/94 | 100.0% |
| Performance Test | 9/94 | 88.3% |

Palo Verde Unit 3

Battery A

| | | |
|------------------|-------|--------|
| Service Test | 10/92 | Passed |
| Performance Test | 4/94 | 105.6% |
| Service Test | 10/95 | Passed |

Battery B

| | | |
|------------------|-------|--------|
| Service Test | 10/92 | Passed |
| Performance Test | 3/94 | 110.0% |
| Service Test | 10/95 | Passed |

Battery C

| | | |
|------------------|-------|--------|
| Service Test | 10/92 | Passed |
| Performance Test | 4/94 | 109.2% |
| Service Test | 10/95 | Passed |

Battery D

| | | |
|------------------|-------|--------|
| Service Test | 10/92 | Passed |
| Performance Test | 3/94 | 112.9% |
| Service Test | 10/95 | Passed |