



July 24, 2014

NG-14-0187  
10 CFR 50.90

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Duane Arnold Energy Center  
Docket No. 50-331  
Renewed Op. License No. DPR-49

Response to Request for Additional Information, Application for Technical Specification Change Regarding Battery Terminal and Charger Voltage and Amperage

- References:
- 1) License Amendment Request (TSCR-145): Application for Technical Specification Change Regarding Battery Terminal and Charger Voltage and Amperage, NG-13-0297, dated August 29, 2013 (ML13247A275)
  - 2) Electronic Communication, Duane Arnold – LAR – TS Change regarding Battery Terminal and Charger Voltage and Amperage – Request for Additional Information – MF2763, dated April 24, 2014
  - 3) Response to Request for Additional Information, Application for Technical Specification Change Regarding Battery Terminal and Charger Voltage and Amperage, NG-14-0140, dated May 28, 2014 (ML

In the Reference 1 letter, NextEra Energy Duane Arnold, LLC (hereafter NextEra Energy Duane Arnold) submitted a License Amendment Request for the Duane Arnold Energy Center (DAEC) pursuant to 10 CFR 50.90. Subsequently, the NRC Staff requested, via Reference 2, additional information regarding that application. In Reference 3, NextEra Energy Duane Arnold committed to transmitting additional manufacturer information.

The Enclosure to this letter contains the requested information.

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This additional information does not impact the 10 CFR 50.92 evaluation of "No Significant Hazards Consideration" previously provided in the referenced application.

This letter does not make any new commitments or changes to existing commitments.

If you have any questions or require additional information, please contact J. Michael Davis at 319-851-7032.

I declare under penalty of perjury that the foregoing is true and correct.  
Executed on July 24, 2014

  
Richard L. Anderson  
Vice President, Duane Arnold Energy Center  
NextEra Energy Duane Arnold, LLC

Enclosure

cc: NRC Regional Administrator  
NRC Resident Inspector  
NRC Project Manager  
A. Leek (State of Iowa)

Enclosure 1 to NG-14-0187

Response to Request for Additional Information, Application for Technical Specification Change Regarding Battery Terminal and Charger Voltage and Amperage

1 page follows

**Response to Request for Additional Information,  
Application for Technical Specification Change Regarding Battery Terminal  
and Charger Voltage and Amperage**

As indicated in the attached letter from the Battery Cell Manufacturer, C&D Technologies, Inc., the impacts of equalizing the batteries at 137-137.5 volts are as follows:

- The time required for completing a recharge would be extended.

Since the DAEC only discharges the batteries during extended/refuel outages the equalization/recharge portion of the testing procedures and the equalization will continue until the batteries are properly charged.

- There would be limited mixing of the electrolyte.

As stated above the equalization/recharge portion of the testing procedures and the equalization will continue until the batteries are properly charged. All of the individual cell voltages and specific gravities are verified before the battery is placed back on float charge.

- If there are extended temperature excursions "well below" 77° F, a low equalizing charge can become just a standard recharge voltage with possible undercharge effects if the charge is not maintained long enough.

Again, as stated above the equalization/recharge portion of the testing procedures and the equalization will continue until the batteries are properly charged. In addition, the DAEC battery rooms are located in interior rooms of our control building, with no exterior walls such that a temperature excursion "well below" 77° F is not realistic.

The letter from the manufacturer does not indicate that the lower equalizing voltage will damage the cells in any way, only that the lower voltages will cause the equalization/recharge period to take longer. The DAEC therefore believes that the lower equalizing voltages will not damage nor have a detrimental effect on the batteries as long as we maintain the charge long enough to ensure full equalization.

Enclosure 2 to NG-14-0187

Manufacturer's Letter L. Carson to D. Pint, dated July 9, 2014

1 page follows

# **CD** TECHNOLOGIES, INC.

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P o w e r   S o l u t i o n s

1400 Union Meeting Road  
Blue Bell, PA 19422  
Phone: (215) 775-1314  
Fax: (215) 619-7887

Sent via Email to: [Dennis.Pint@NEE.com](mailto:Dennis.Pint@NEE.com)

July 9, 2014

Mr. Dennis Pint  
Duane Arnold Energy Center  
NextEra Energy Resources

Subject:        Battery Equalizing Voltages

Dear Dennis:

You advised us that you intend to add 2 cells your 58-cell station battery strings. You will be able to float the battery strings in the 132.5 to 133.5 V range (2.208 to 2.225 volts per cell). This will allow the cells to float within the low end of the recommended range of 2.20 to 2.25 volts per cell, based on an ambient temperature of 77°F.

For equalizing charge, you advised that the available range will be 137 to 137.5 volts (2.283 to 2.292 volts per cell). This is below the recommended equalizing charge voltage range of 2.33 to 2.38 volts per cell, so you requested if there would be any detrimental effects.

As we discussed, the time required for completing a recharge would be extended when the voltage is limited to 2.29 volts per cell. In addition, there would be limited mixing of the electrolyte, since gassing at that voltage is very light and it would take a long time for the specific gravity reading to be representative of the strength of the electrolyte.

Another concern is that if there are extended temperature excursions that are well below 77°F, a low equalize charge can become just a standard recharge voltage with possible undercharge effects if the charge is not maintained long enough.

Other than these issues, we would not expect the batteries to be damaged by this practice.

Regards,



Larry A. Carson  
Utility & Nuclear Product Manager