Reading the Grid

Interpret technical terms to understand a battery plant's decisions.

11.RI.2.B "Analyze and interpret the key terms (e.g., content-specific words and phrases, technical terminology) and ideas of historical, scientific, technical, and employment texts to clarify concepts."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline technical terms, then circle or number the nearby words that explain each term or show how it affects an operating decision. Mark at least six terms.

A Battery Plant and the Evening Ramp

1 On a windy April afternoon, operators at the Mesa Vista battery plant watched a graph called the net load. Net load is the electricity demand remaining after output from wind and solar generators is subtracted. As solar production rose near noon, the net load fell sharply. That drop did not mean people had stopped using electricity. Instead, panels were supplying much of the demand. The plant charged its lithium-ion batteries during this low-net-load period, taking electricity from the grid and storing it for later. This process helped prevent an oversupply of power, which can strain grid operations.

2 After sunset, solar output declined while households turned on lights, cooked dinner, and used appliances. The net load then climbed, creating a steep evening ramp. In grid planning, a ramp is the rate at which the system's required supply changes over time, not a physical slope. Mesa Vista began discharging its batteries, sending stored electricity back to the grid. This dispatch reduced the amount of power that other generators had to increase quickly. The batteries could respond within seconds, but their energy capacity limited how long they could discharge. Fast response and long duration are related, yet they are not the same capability.

3 Plant managers also considered the battery's state of charge, a measure of how much energy remains available compared with its usable maximum. A battery at 90 percent state of charge cannot necessarily deliver that energy all at once. Its power rating sets the maximum rate at which it can send electricity, while its energy rating describes the total amount it can store or deliver. These terms guided an operating decision: save some stored energy for the evening ramp rather than release all of it in late afternoon. By matching charging and dispatch to changing net load, the plant supported reliability without producing electricity itself.

2 ANSWER WITH EVIDENCE

Use the passage

1. What does net load measure, and why did it fall near noon?

2. What does ramp mean in this text? Explain how that meaning supports the decision to dispatch the batteries.

3. How do energy capacity and power rating differ? What limitation does each term describe?

4. How does the phrase "without producing electricity itself" clarify the battery plant's role in grid reliability?

3 YOUR TURN

Your own words

Write a 55 to 70 word operations note for a new grid operator. Use net load and either state of charge or power rating correctly, explain one operating decision, and show how the two terms differ.

ANSWER KEY

Reading the Grid

GRADE 11 · 11.RI.2.B

PART 1 · READ AND MARK

Underline technical terms, then circle or number the nearby words that explain each term or show how it affects an operating decision. Mark at least six terms. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What does net load measure, and why did it fall near noon?	**Net load is electricity demand remaining after wind and solar output is subtracted. It fell because solar panels were supplying much of the demand.**
2	What does ramp mean in this text? Explain how that meaning supports the decision to dispatch the batteries.	**A ramp is the rate at which required electricity supply changes over time. During the evening ramp, the batteries discharged so other generators would not need to increase power as quickly.**
3	How do energy capacity and power rating differ? What limitation does each term describe?	**Energy capacity limits how long a battery can discharge because it refers to available stored energy. Power rating limits the maximum rate at which the battery can send electricity.**
4	How does the phrase "without producing electricity itself" clarify the battery plant's role in grid reliability?	**The plant does not generate new electricity. It stores electricity from the grid and later returns it when changing net load makes it useful.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

At noon, watch net load, not just total customer demand. If solar output lowers net load, charge the battery when its state of charge leaves usable space. Later, discharge during the evening ramp, but do not assume a high state of charge means unlimited output. State of charge shows stored energy, whereas power rating limits the rate of delivery.

Accept equivalent explanations that accurately interpret the technical terms through their context and connect them to the plant's decisions. In the open response, check that the student distinguishes net load from the selected second term and stays within 55 to 70 words.