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NABCEP – What you need to know

- Understanding STC

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Learning Objectives

- A basic understanding of what Standard Test Conditions means
- What it is used for
- How it compares to other test conditions

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Standard Test Conditions:

1000 W/m2, AM 1.5, 25°C

- 1000 W/m2 [Irradiance – power / unit area]
- AM 1.5 [thickness or density of air that sun's rays travel through – modules are rarely flat (35°N lat.)]
- 25 degrees C (77 degrees F) [cell temp]

- Used to compare the performance characteristics of one mfg module to another

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- Various test conditions can be used to evaluate module performance and may produce different results.

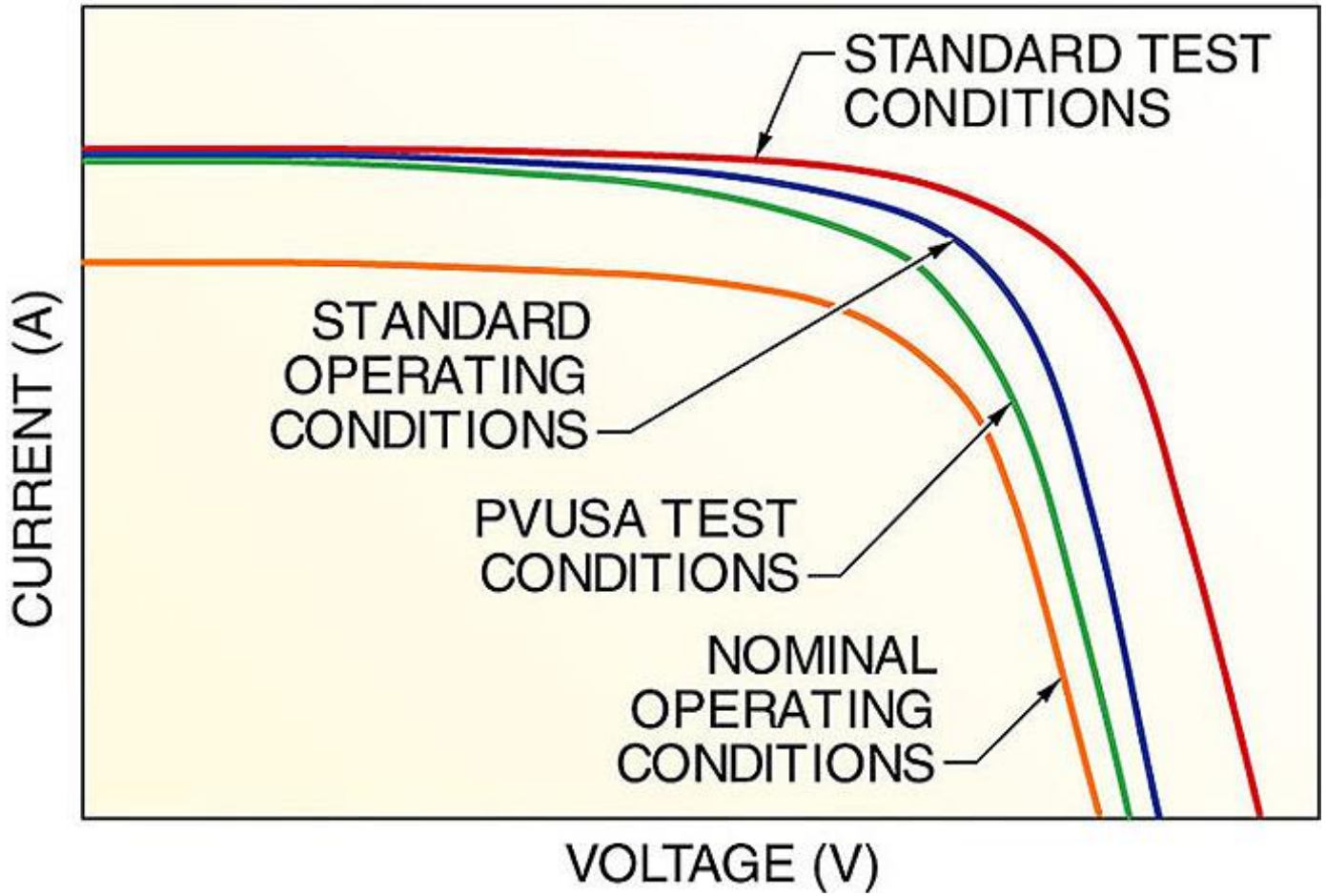

Image from Photovoltaic Systems 2nd Edition, by James Dunlop

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STC

- Standard Operating Conditions (SOC)
  - Irradiance: 1,000 W/m^2
  - Cell temperature: NOCT

- Nominal Operating Conditions (NOC)
  - Irradiance: 800 W/m^2
  - Cell temperature: NOCT

- Nominal Operating Cell Temperature (NOCT)
  - Irradiance: 800 W/m^2
  - Ambient Temp: 20°C
  - PV Array: open-circuit
  - Wind Speed: 1.0 m/s

- PVUSA Test Conditions (PTC):
  - 1000 W/m², 45°C, 1 m/s

Data from Photovoltaic Systems 3rd Edition, by James Dunlop

SAMPLE NABCEP TYPE QUESTION

Q: A reference meter is measuring 600 W/m2 and the module output is 200W. What would the expected output be at STC?

A: If STC is 1000 W/m2 then at 600 W/m2 the module is only producing 60% of it's nameplate power (600 / 1000 = .60), therefore it is losing 40%. The equation would be:

200W / .60 = 333W

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Thank You

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