



Role: Rooftop Solar Grid Engineer



This document provides a comprehensive set of technical and practical questions for the role of Rooftop Solar Grid Engineer, covering design, installation, grid compliance, maintenance, and troubleshooting.

1. Role-Specific Questions

Q: What are the primary responsibilities of a Rooftop Solar Grid Engineer?

A: The main responsibilities include designing and installing rooftop solar systems, conducting site assessments, ensuring compliance with grid connection standards, performing system testing, and maintaining solar installations.

Q: How do you ensure the safety of rooftop solar installations?

A: Safety is ensured by following industry standards, using proper personal protective equipment (PPE), conducting structural assessments of rooftops, ensuring proper grounding and wiring, and adhering to electrical safety codes.

Q: What factors do you consider when designing a rooftop solar system?

A: Key factors include roof orientation, tilt angle, shading analysis, load-bearing capacity, local weather conditions, energy consumption patterns, and grid connection requirements.

2. Technical Knowledge

Q: What is the difference between on-grid and off-grid solar systems?

A: On-grid systems are connected to the utility grid and rely on it for backup power, while off-grid systems operate independently using batteries for energy storage.

Q: How do you calculate the size of a rooftop solar system?

A: The size is calculated based on the customer's energy consumption, available roof area, panel efficiency, and local solar irradiance. For example, if a household consumes 500 kWh/month and the location receives 5 peak sun hours/day, a system of approximately 3.3 kW is needed.

Q: What is the role of an inverter in a solar PV system?

A: The inverter converts the direct current (DC) generated by solar panels into alternating current (AC), which is used by most household and commercial appliances.

Q: What are the common challenges in rooftop solar installations?

A: Challenges include limited roof space, shading from nearby structures, structural integrity of the roof, compliance with local regulations, and ensuring proper grid synchronization.

3. Grid Connection & Compliance

Q: What are the key steps for connecting a rooftop solar system to the grid?

A: The steps include obtaining necessary permits, installing the system, conducting inspections, ensuring compliance with grid standards, and coordinating with the utility provider for net metering setup.

Q: How do you ensure compliance with local electrical codes and standards?

A: Compliance is ensured by staying updated on local regulations, using certified equipment, following installation guidelines, and conducting thorough inspections before commissioning the system.

Q: What is anti-islanding, and why is it important in grid-connected systems?

A: Anti-islanding is a safety feature that shuts down the solar inverter when the grid power is lost. It prevents the solar system from feeding electricity into the grid during outages, protecting utility workers and equipment.

4. Maintenance & Troubleshooting

Q: How do you identify and resolve issues in a rooftop solar system?

A: Issues are identified through regular inspections, performance monitoring, and diagnostic tools. Common problems like wiring faults, inverter errors, or panel degradation are resolved by replacing faulty components or recalibrating the system.

Q: What is the importance of cleaning and maintaining solar panels?

A: Regular cleaning removes dirt, dust, and debris that reduce panel efficiency. Maintenance ensures optimal performance, extends the system's lifespan, and prevents potential safety hazards.

Q: How do you handle a situation where the solar system is underperforming?

A: I would analyze system performance data, check for shading or dirt on panels, inspect wiring and connections, and ensure the inverter is functioning correctly. Necessary adjustments or repairs would then be made.

5. Solar Domain Knowledge

Q: What is the typical lifespan of a solar panel, and how does its efficiency degrade over time?

A: Solar panels typically last 25–30 years. Their efficiency degrades by about 0.5–1% per year, meaning they retain around 80–85% of their original efficiency after 25 years.

Q: How does temperature affect the performance of solar panels?

A: High temperatures reduce panel efficiency due to increased resistance in the photovoltaic cells. This is measured by the temperature coefficient, which indicates the percentage loss in efficiency per degree Celsius rise above standard test conditions.