

Power Grid System Analysis Report

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System Overview

System Specifications

Specification	Details
System Type	High-voltage transmission feeding low-voltage distribution network with distributed generation
Main Bus Voltages	132 kV (transmission), 11 kV (distribution), 400V (load)
Frequency	50 Hz, 3-phase system
Total Installed Load	2 MW (500 kW critical + 1.5 MW non-critical)

Generation Sources

Generator	Type	Nominal Power	Voltage	Frequency	Configuration	Type
Generator 1	Gas Turbine (Synchronous)	1 MW	11 kV	50 Hz	Yg	PV
Generator 2	Hydro (Synchronous)	2 MW	12 kV	50 Hz	Yg	PV
Generator 3	Diesel	4 MW	10 kV	50 Hz	Yg	PV
Total Capacity		7 MW				

Generator Power Contribution Analysis

Generator Output Characteristics for Different Load Scenarios

Load Scenario	Generator	Voltage (kV)	Current (A)	Active Power (MW)	Reactive Power (MVAR)	Power Factor	% Contribution
2 MW Load	Gen 1 (1MW)						
	Gen 2 (2MW)						
	Gen 3 (4MW)						
	Total	-	-	2.00			100%
5 MW Load	Gen 1 (1MW)						
	Gen 2 (2MW)						
	Gen 3 (4MW)						
	Total	-	-	5.00			100%
7 MW Load	Gen 1 (1MW)						
	Gen 2 (2MW)						
	Gen 3 (4MW)						
	Total	-	-	7.00			100%

