

BLACK START DIESEL GENERATOR

A Critical Backup Power Source for Blackout Conditions.

25. ब्लैक स्टार्ट डी जी सेट

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The background image shows a multi-story building with a light-colored facade. Several yellow signs with black text are visible. The signs in Hindi read 'उद्दिष्ट है डाइजल जनरेटर' (Purpose is Diesel Generator) and '26. ब्लैक स्टार्ट डी जी सेट' (26. Black Start Diesel Generator Set).

BSDG Set :

- BSDG stands for **Black Start Diesel Generator**.
- It is a self-starting generator used to bring the power plant back online in case of a total **blackout**.
- BSDG is set to start automatically when required.
- NTPC Faridabad BSDG Capacity : **3.3 MW**.

Key Purpose :-

- Acts as an emergency power source.
- Starts critical auxiliaries and systems when external or main power is lost.

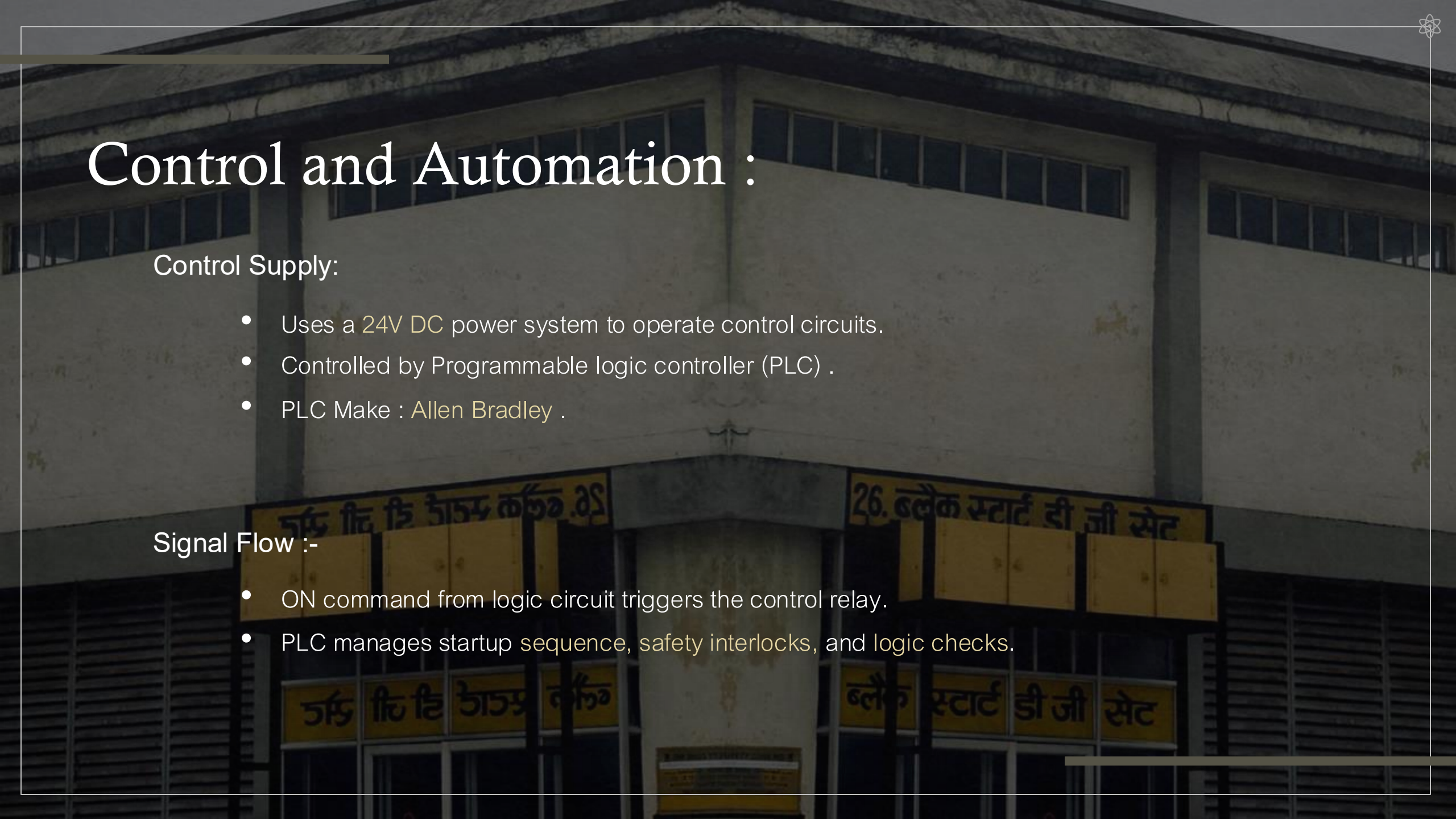
Fuel & Starting Mechanism :

Fuel Used :

- **Diesel**: Primary fuel source for combustion engine.
- **Compressed Air**: Used in the air torque motor for **cranking** (engine starting).

Starting Mechanism Logic :-

- Solenoid valves receive ON command from **PLC** (programmable logic controller) logic.
- Compressed air is released -> engine starts -> generator begins power supply.

The background of the slide is a photograph of a building. The building has a light-colored facade and a series of windows. Below the windows, there are yellow signs with text in Hindi and English. The signs are arranged in a row, and the text is in a bold, sans-serif font. The overall image is slightly dark and has a grainy texture.

Control and Automation :

Control Supply:

- Uses a 24V DC power system to operate control circuits.
- Controlled by Programmable logic controller (PLC) .
- PLC Make : Allen Bradley .

Signal Flow :-

- ON command from logic circuit triggers the control relay.
- PLC manages startup sequence, safety interlocks, and logic checks.



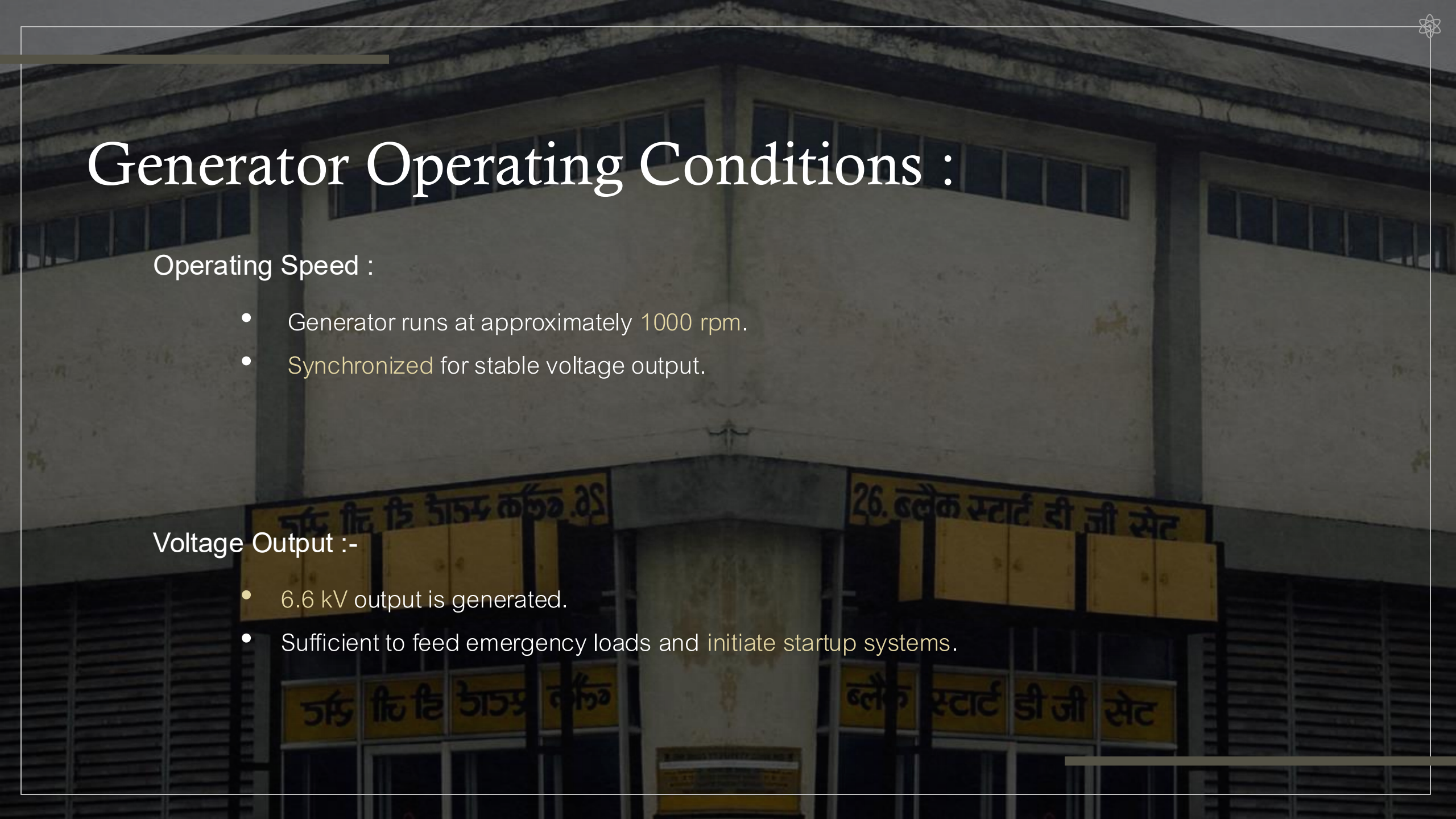
Battery and Charger System :

Battery System :

- 24V battery bank .
- 12 cells each of 2V.
- Battery Type: Dry cell.
- Make: Amara Raja.

Battery Charger :-

- Maintains charge for uninterrupted PLC and control supply.
- Critical for enabling starting command even when plant power is at zero.

The background of the slide is a photograph of a building, likely a government or institutional structure, with a curved facade and multiple windows. The building is covered with yellow signs featuring black text in Hindi. The signs are arranged in rows, with some signs partially obscured by the text overlay. The overall tone of the image is somewhat muted, with a dark overlay to make the text stand out.

Generator Operating Conditions :

Operating Speed :

- Generator runs at approximately 1000 rpm.
- Synchronized for stable voltage output.

Voltage Output :-

- 6.6 kV output is generated.
- Sufficient to feed emergency loads and initiate startup systems.

The background of the slide is a photograph of a building, likely a power station or industrial facility. The building has a curved facade with multiple windows. There are yellow signs with black text in Hindi on the building. One sign on the right says "26. ब्लैक स्टार्ट डी जी सेट" (26. Black Start D.G. Set). Another sign on the left says "उप हि हि डाउट कॉल" (Up Hi Hi Down Call).

Power Distribution and Role During Blackout :

Role of 6.6 kV Output :

- Feeds critical plant chargers and backup bays.
- Enables restarting of key auxiliaries (pumps, fans, control panels, etc).

During Blackout :-

- BSDG becomes the first power source.
- Initiates black start sequence to recover normal operations.



THANK YOU

Sincere thanks to :

AGM S.S Narula Sir

&

Sir Kaushal