BUSINESS RULES

1. Security & Access Control Rules

Authentication:

- All users (Admins, Officers, Consumers) must authenticate using a username and password.

- Successful authentication returns a JWT token for session management and secure API access.

Role-Based Access (RBAC):

Admins: Only admins can manage users, utility types, tariff plans, and billing cycles.

Billing Officers: Only billing officers can enter meter readings and generate bills.

Accounts Officers: Can view payments, outstanding dues, and financial reports.

Consumers: Can only view their own bills, payment history, and profile; they **cannot modify billing data**

2. Meter Reading Rules

- Sequential Integrity: The system must validate that the Current Reading is greater than or equal to the Previous Reading.

- Automatic Calculation: Consumption units must be automatically calculated as Current Reading - Previous Reading immediately upon entry.

- Frequency: Meter readings are recorded on a monthly basis.

3. Tariff & Billing Rules

- Bill Calculation Formula: The bill amount must be auto-generated using the formula: Total Bill = (Units Consumed x Tariff Slab Rate) + Fixed Charges + Taxes

- Lifecycle Management: A bill must strictly follow this status lifecycle: GENERATED -> DUE -> PAID -> OVERDUE.

- Tariff Slabs: The system must support tiered pricing (slabs) where different unit ranges have different costs (e.g., 0-100 units ₹5, 101+ units ₹10).

4. Payment & Dues Rules (Adapted for Billing Service)

- Outstanding Calculation: The system must track and calculate total outstanding dues by summing up all unpaid or partially paid bills for a specific consumer.

- Payment Recording: When a payment is recorded, the system must update the specific bill's status to PAID if the full amount is settled.

- History Tracking: The system must maintain a history of all past payments and associated bills for consumer viewing.

5. Connection & Consumer Rules

- One-to-Many Connections: A single consumer profile can have multiple utility connections (e.g., one Electric connection and one Water connection).

- Connection Identity: Each connection is uniquely identified by a combination of Utility Type, Meter Number, and Tariff Plan.

6. Reporting Rules

- Revenue Aggregation: The system must be able to aggregate total revenue collected on a monthly basis.

- Consumption Analysis: Reports must be capable of breaking down average consumption by utility type (e.g., Average Water usage vs. Average Electricity usage).