

## POLICY REVIEW – RETURN CALCULATION LOGIC

(Developer Handoff Document)

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### **1 Purpose of This Module**

This module calculates **policy performance** for traditional / insurance-cum-investment plans.

It answers:

- How much money the policyholder has paid
  - How much they have received
  - What is the policy worth today or in future
  - What is the return (Absolute & XIRR)
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### **2 Outputs Required**

For each evaluation point, calculate:

- Total Premium Paid
- Total Payout Received
- Current Value (Policy Value on that date)
- Absolute Return (%)
- XIRR Return (%)

Evaluation points:

1. **Till Today (Review Date)**
  2. **Till Today + 3 Years**
  3. **Till Today + 6 Years**
  4. **Till Maturity**
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### **3 VERY IMPORTANT CONCEPT (Read First)**

#### **Everything is DATE-BASED**

- All values exist **only on policy event dates**
- We **never interpolate**
- We **always use the nearest earlier available policy date**

Think of this like a transaction ledger, not a continuous price chart.

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## Date Grid (Base Table)

### 4.1 How Dates Are Generated

Dates are generated from:

- **Policy Start Date**
- **Till Policy Maturity Date**
- **Based on Premium Frequency**

#### Frequency Date Increment

Yearly +12 months

Half-Yearly +6 months

Quarterly +3 months

Monthly +1 month

Example:

- Start: 21-01-2021
- Half-Yearly:
  - 21-01-2021
  - 21-07-2021
  - 21-01-2022
  - ... till maturity

This date grid is the **foundation** of all calculations.

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## Column Logic (Step-by-Step)

### 5.1 Policy Metadata (Constant)

Same on all rows:

- Sum Assured
  - Policy Term
  - Premium Amount (per frequency)
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## 5.2 Premium Tracking

### Premium Paid (Count)

- Increases by **1** on each premium date
- Stops increasing after **Premium Paying Term (PPT)** is completed
- After PPT, the value stays constant

### Total Premium Paid (₹)

- Cumulative sum of premium amounts
  - Increases only till PPT completion
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## 6 Paid-Up Value (Core Insurance Concept)

Paid-Up Value is **NOT surrender value**

It is an intermediate value used to calculate surrender value

### Formula

Paid-Up Value =

Sum Assured × (Number of Premiums Paid / Total Premiums Payable)

- ✓ Calculated on **every date**
  - ✓ No minimum year condition at this stage
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## 7 Bonus Logic

### How Bonus Works

- Bonus starts **after completion of 1 policy year**
- First bonus is credited at the **start of Year 2**
- Bonus accrues **every year till maturity**
- Total bonus count = **Policy Term**

### Calculations

Bonus Amount = Sum Assured × Bonus Rate

Total Bonus = Cumulative sum of Bonus Amount

Bonus rates are taken from a **separate reference sheet**.

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## 8 Interim Payouts (If Applicable)

Some policies give payouts during the policy term.

Payout Amount = Sum Assured  $\times$  Payout %

Total Payout = Cumulative payout till date

- ✓ Payouts are **positive cashflows**
- ✓ Payouts **reduce final surrender value**

Policy-specific payout details come from another sheet.

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## Total Paid-Up Value

Total Paid-Up Value = Paid-Up Value + Total Bonus

This value is used to calculate surrender value.

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## 1 0 Surrender Value Logic

### SSV Factor

- Comes from a **separate SSV factor table**
- Expressed as %
- Depends on policy year
- Minimum condition: **At least 2 premiums paid**

### Calculations

Surrender Value = Total Paid-Up Value  $\times$  SSV Factor

Net Surrender Value =

Surrender Value – Total Payout Received

## Net Surrender Value = Current Policy Value

This is the value used for:

- Till Today
  - Today + 3 Years
  - Today + 6 Years
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## 1 1 Maturity Logic (Only on Final Date)

Applied **only on maturity date row**:

Maturity Amount = Sum Assured × Maturity %

Other Benefits = Total Bonus + FAB + Loyalty Addition

Net Maturity Amount =

Maturity Amount + Other Benefits

### Important Rules

- FAB & Loyalty Addition apply **only at maturity**
  - They do **NOT** apply on surrender
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## 1 2 Evaluation Date Logic (CRITICAL)

### Review Date

- Review Date = **System Date (Today)**

### Target Dates

#### Scenario Target Date

Till Today Review Date

3 Years Review Date + 3 Years

6 Years Review Date + 6 Years

Maturity Policy Maturity Date

### Nearest Earlier Policy Date Rule

For each target date:

- Find the **latest policy date  $\leq$  target date**
  - Use values from that date
  - No interpolation
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### 1 3 Absolute Return Calculation

Absolute Return =

(Current Value + Total Payout – Total Premium Paid)

÷ Total Premium Paid

Current Value:

- Net Surrender Value (Before maturity)
  - Net Maturity Amount (At maturity)
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### 1 4 XIRR Calculation (Time-Weighted Return)

Cashflow Rules

- Premiums → **Negative**
- Interim payouts → **Positive**
- Final value → **Positive**

Final Cashflow

Scenario	Amount Used	Date Used
Till Today	Net Surrender Value	Review Date
Today + 3Y	Net Surrender Value	Review Date + 3Y
Today + 6Y	Net Surrender Value	Review Date + 6Y
Maturity	Net Maturity Amount	Maturity Date

✓ Value taken from nearest earlier policy date  
✓ Date used = evaluation target date  
Negative XIRR is **valid** and acceptable.

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### 1 5 External Reference Sheets (Mandatory)

Developer must use:

1. Bonus Rate Table
2. SSV Factor Table
3. Interim Payout Rules
4. Policy-specific conditions

These will be mapped via policy code / UIN.

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## 1 6 What NOT to Do (Very Important)

- ✗ Do NOT interpolate values
  - ✗ Do NOT assume daily compounding
  - ✗ Do NOT change dates
  - ✗ Do NOT add FAB / Loyalty on surrender
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## ✓ FINAL STATUS

- Business logic complete
- Date logic locked
- Edge cases covered
- Ready for backend implementation