Shield Finance Yield Boost Mechanics Explained

Let

- V = Total assets in the shXRP vault (FXRP)

- S = Total circulating supply of shXRP shares

- L = Total amount of SHIELD currently locked in StakingBoost

- L_i = Amount of SHIELD locked by user i

- B_t = Amount of FXRP donated as boost during week t (sourced from protocol fee revenue)

The boost is distributed **strictly pro-rata** to locked SHIELD positions:

$$\text{Boost received by user } i \quad = \quad B_t \times \frac{L_i}{L} \qquad (1)$$

This FXRP amount is immediately becomes part of the vault's underlying assets and is credited exclusively to user i's position via `donateOnBehalf(i, B_t \times L_i / L)`.

The instantaneous vault price (share price) for user i after the boost becomes:

$$P_i = \frac{V + B_t}{S} \times \left(1 + \frac{L_i}{L} \times \frac{B_t}{V + B_t}\right) \quad \text{(approximate, for small boosts)}$$

More importantly, the **effective extra APY** that locked SHIELD earns from the boost program is:

$$\text{Boost APY}_i = \text{Base APY} \times \left(1 + \underbrace{\frac{L_i}{L} \times \frac{B_t}{V} \times 52}_{\text{boost multiplier}}\right) \quad \text{(annualized)}$$

Or, in its cleanest form (the one every auditor loves):

$$\text{Total APY}_i = \text{Flare Staking APY} + \left(\frac{B_{\text{annual}}}{V}\right) \times \frac{L_i}{L} \qquad (2)$$

Where B_{annual} is the total FXRP donated via the boost program over one year.

Example (real numbers you can quote)

Parameter	Value	Result
Vault TVL (V)	10,000,000 FXRP	
Weekly boost (B_t)	5,000 FXRP	→ 260,000 FXRP per year
User locks (L_i)	50,000 SHIELD	
Total locked (L)	1,000,000 SHIELD	
User's share of boost	5,000 × 50k/1M = 250 FXRP per week	
Annual boost yield added	(260,000 / 10,000,000) × (50,000/1,000,000) = **+13%**	
Total APY for this user	~10% (Flare base) + 13% boost = **~23% APY**	

One-liner for website and whitepaper

"Every week the protocol donates FXRP bought with real revenue. 100 % of that donation is distributed pro-rata to SHIELD lockers according to the formula

Boost APY = *Base APY + (Annual Protocol Revenue → FXRP) × (Your Locked SHIELD ÷ Total Locked SHIELD)*

No minting. No inflation. Pure revenue-share."