PUBLIC SAMPLE — REDACTED · client identity removed; ██ bars mark removed identifiers · methodology & findings intact

ECONOMIC MODELING ADDENDUM

ECONOMIC NOTE — STAKING

[redacted] · Track T4 — Validator-node staking & rewards

PROJECT	TRACK	DATE
[redacted]	T4	20 May 2026
TYPE	**SCOPE**	**CLASSIFICATION**
Structural modeling	Full-tier (in scope)	PUBLIC SAMPLE

00 SCOPE OF THIS NOTE

Staking is Standard-tier and its reward accounting is solvent-by-construction (per-stake divisions round down, leaving surplus dust; gross reward is pulled up front so principal, rewards and fees are jointly funded). No full economic addendum is warranted; two mechanism observations are worth recording.

01 OBSERVATIONS

Dust surplus is one-directional and unswept. Every per-stake reward and partial-power division rounds down, so a small, unrecoverable surplus of reward tokens accretes in the contract with no sweep function. Benign for solvency (the system stays over-collateralized) but it is dead value; consider an owner sweep of provable surplus, or accept it as a rounding buffer.

Validator liveness is coupled to rewards, not principal. A node pays its stakers only while the validator maintains the minimum stake; dropping below halts that node's rewards (and, per the pentest, can stall a whole distribution batch) without touching principal. This is an incentive/liveness coupling: model the validator's cost of maintaining the minimum against the fee they earn, and monitor validators approaching the threshold. The near-100% settable validator fee compounds this — a validator can economically starve their own stakers within one distribution's notice.

02 STANDOUT ACTION

Highest-leverage change: cap the validator-settable fee to a protocol maximum (e.g. 20–30%) and require notice on increases. This bounds the worst-case staker economics and, together with the createNode fee bound (PEN-T4-01), removes the two fee-driven ways a node can silently or permanently deny its stakers their yield.