BlockSwap suggestions for Rules

Described in pseudo code

Contracts : savETHRegistry.sol , SlotSettlementRegistry.sol

1. A member can reside in only one Knot. member[i] != member[j] => Knot[member[i]] != Knot[member[j]]
2. Zero DETH implies member is not member of any StakeHouse or any Knot
3. Zero savETH implies member not belong to the Open Index
4. Zero totalSupply(DETH) implies Withdraw was not yet called AND there is no member that is not belong to Open Index or StakeHouse
5. Zero totalColleteral implies number of members in indexes[i] == 0
6. DETH > 24 for Knot[i] implies mintDETHReserves() was called .
7. ETH.balanceOf(member) decreases implies DETH.balanceOf(user) increases AND number of SLOTs increases
8. In function _slashOwners , the sum of collateral slots of all owners is decreased by exactly “amount”
9. Invariant currentSlashedAmountOfSLOTForKnot[_memberId] <= 4
10. stakeHouseCurrentSLOTSlashed[_stakeHouse] >= currentSlashedAmountOfSLOTForKnot[_memberId]
11. If savETH.balanceOf(user) > 0 implies user is in Open Index

Additional rules:

12. Invariant : currentSlashedAmountOfSLOTForKnot > 3.9 => member has been kicked
13. Invariant : knotSlotSharesMinted == false => member is in a openIndex
14. Invariant : dETHRewardsMintedForKnot <= dETHManagementMetadata[dETHInCirculation]
15. Invariant : dETHManagementMetadata[dETHUnderManagementInOpenIndex] >= 32 * numOfMembersInOpenIndex
16. Invariant “: knotDETHBalanceInIndex == 24 + dETHRewardsMintedForKnot
17. indexIdToOwner[_indexId] != approvedIndexSpender[_indexId]
18. totalDETHMintedWithinHouse == 24 => there is only one member in the stakeHouse
19. Decrease in dETH in stakeHouse is at least of amount of 24
20. Decrease in dETH in stakeHouse => Increase in savETH
21. After deposit and then withdraw the user should end up with the same amount or tokens
22. If stakeHouse ends up with zero members then he should hold zero funds
23. After calling mintDETHReserves successfully the second call, immediately after, should fail
24. mintDETHReserves capped by 5% (fixed annual interest rate) (if rewards distributed at least once a year)
25. Knot marked as withdrawn implies currentSlashedAmountOfSLOTForKnot == 0