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**Blockchain Security | Smart Contract Audits | KYC
Development | Marketing**

MADE IN GERMANY

PolyKick Audit

**Security Assessment
24. February, 2023**

For



SolidProof_io



@solidproof_io

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Version	Date	Description
1.0	14. February 2023	<ul style="list-style-type: none">• Layout project• Automated- /Manual-Security Testing• Summary
1.1	24. February 2023	<ul style="list-style-type: none">• Reaudit

Network

Polygon

Website

<https://polykick.com>

Telegram

https://t.me/polykick_announcements

LinkedIn

<https://linkedin.com/company/polykick/>



Description

Our goal is to support web3 projects and drive successful adoption of innovative blockchain technology.

Our ILO model allows users to actively support new projects in a safe, ethical and fair manner.

Project Engagement

During the Date of 14 February 2023, **PolyKick Team** engaged Solidproof.io to audit smart contracts that they created. The engagement was technical in nature and focused on identifying security flaws in the design and implementation of the contracts. They provided Solidproof.io with access to their code repository and whitepaper.

Logo



Contract Link

v1.0

- <https://github.com/Meta-Identity/PolyKick-Smart-Contracts/tree/main/Contracts>
- **Commit:** 3207ab50ece4883ad60f0e8498779d1d39dc1556

v1.1

- <https://github.com/Meta-Identity/PolyKick-Smart-Contracts/tree/main/Contracts>
- **Commit:** fe52e891c0d77dc3641376de96ba24f697778709

Vulnerability & Risk Level

Risk represents the probability that a certain source-threat will exploit vulnerability, and the impact of that event on the organization or system. Risk Level is computed based on CVSS version 3.0.

Level	Value	Vulnerability	Risk (Required Action)
Critical	9 - 10	A vulnerability that can disrupt the contract functioning in a number of scenarios, or creates a risk that the contract may be broken.	Immediate action to reduce risk level.
High	7 – 8.9	A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.	Implementation of corrective actions as soon as possible.
Medium	4 – 6.9	A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.	Implementation of corrective actions in a certain period.
Low	2 – 3.9	A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.	Implementation of certain corrective actions or accepting the risk.
Informational	0 – 1.9	A vulnerability that have informational character but is not effecting any of the code.	An observation that does not determine a level of risk

Auditing Strategy and Techniques Applied

Throughout the review process, care was taken to evaluate the repository for security-related issues, code quality, and adherence to specification and best practices. To do so, reviewed line-by-line by our team of expert pentesters and smart contract developers, documenting any issues as there were discovered.

Methodology

The auditing process follows a routine series of steps:

1. Code review that includes the following:
 - i) Review of the specifications, sources, and instructions provided to SolidProof to make sure we understand the size, scope, and functionality of the smart contract.
 - ii) Manual review of code, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
 - iii) Comparison to specification, which is the process of checking whether the code does what the specifications, sources, and instructions provided to SolidProof describe.
2. Testing and automated analysis that includes the following:
 - i) Test coverage analysis, which is the process of determining whether the test cases are actually covering the code and how much code is exercised when we run those test cases.
 - ii) Symbolic execution, which is analysing a program to determine what inputs causes each part of a program to execute.
3. Best practices review, which is a review of the smart contracts to improve efficiency, effectiveness, clarify, maintainability, security, and control based on the established industry and academic practices, recommendations, and research.
4. Specific, itemized, actionable recommendations to help you take steps to secure your smart contracts.

Used Code from other Frameworks/Smart Contracts (direct imports)

Imported packages:

```
@openzeppelin/contracts/token/ERC20/IERC20.sol  
@openzeppelin/contracts/utils/math/SafeMath.sol  
./PolyKick_ILO.sol
```



Tested Contract Files

This audit covered the following files listed below with a SHA-1 Hash.

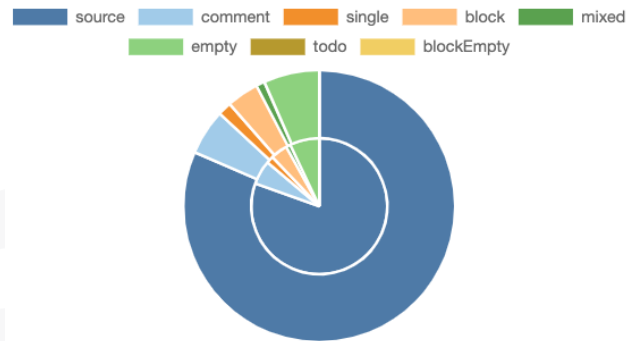
A file with a different Hash has been modified, intentionally or otherwise, after the security review. A different Hash could be (but not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of this review.

v1.0

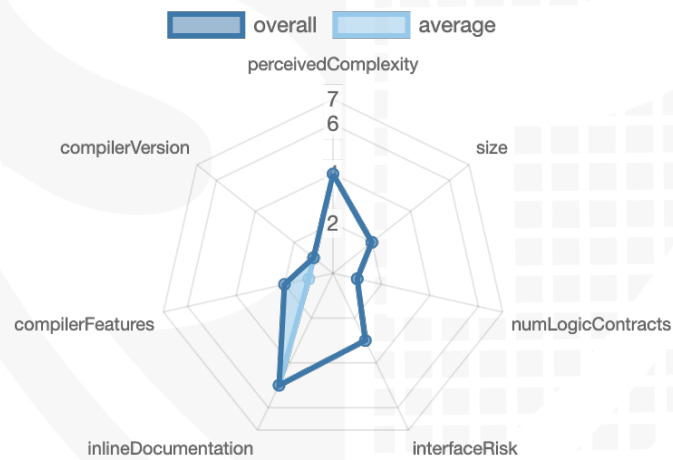
File Name	SHA-1 Hash
contracts/ PolyKick_Factory.sol	622d234d2619e5bfc233b02d5d2b393f43a ee82e
contracts/ PolyKick_ILO.sol	46fb6502b80f2ea97024b3169832ade7c5f 79b6e

Metrics

Source Lines v1.0



Risk Level v1.0



Capabilities

Components

 Contracts	 Libraries	 Interfaces	 Abstract
2	0	0	0

Exposed Functions

This section lists functions that are explicitly declared public or payable. Please note that getter methods for public stateVars are not included.







 Public	 Payable
25	2










External	Internal	Private	Pure	View
22	30	0	0	1

StateVariables

Total	 Public
48	38

Capabilities

Solidity Versions observed	 Experimental Features	 Can Receive Funds	 Uses Assembly	 Has Destroyable Contracts
 0.8.17		 yes		

 Transfers ETH	 Low-Level Calls	 DelegateCall	 Uses Hash Functions	 ECRRecover	 New/Create/Create2
 yes					 yes →  PolyKick_ILO

 TryCatch	 Unchecked

Inheritance Graph

v1.0



Scope of Work/Verify Claims

The above token Team provided us with the files that needs to be tested (Github, Bscscan, Etherscan, files, etc.). The scope of the audit is the main contract (usual the same name as team appended with .sol).

We will verify the following claims:

1. Is contract an upgradeable
2. Deployer cannot burn or lock user funds
3. Deployer cannot pause the contract
4. Deployer cannot set fees
5. Deployer cannot blacklist/antisnipe addresses
6. Overall checkup (Smart Contract Security)



Is contract an upgradeable

Name	
Is contract an upgradeable?	No



Write functions of contract v1.0

- transferOwnership
- addCurrency
- addProject
- projectNewRound
- startILO
- addAdmin
- removeAdmin
- setPolyDAO
- setCurrencyDecimals
- setDiscount
- addToWhiteListBulk
- addToWhiteList
- removeWhiteList
- extendILO
- buyTokens
- iloApproval
- setMinMax
- withdrawTokens
- returnFunds
- sellerWithdraw
- emergencyRefund
- receiveMoney 💰
- withdrawWrongTransaction

Deployer cannot burn or lock user funds

Name	Exist	Tested	Status
Deployer cannot lock	✓	✓	✓
Deployer cannot burn	✓	✓	✓

Comments:

v1.0

- The unsold Tokens will be burned after the approval of the ILO by the admin address, and the success of a sale.

Deployer cannot pause the contract

Name	Exist	Tested	Status
Deployer cannot pause	—	—	—



Deployer cannot set fees

Name	Exist	Tested	Status
Deployer cannot set fees over 25%	✓	✓	✓
Deployer cannot set fees to nearly 100% or to 100%	✓	✓	✓

Comments:

v1.0

- Fees cannot be set without any limitations

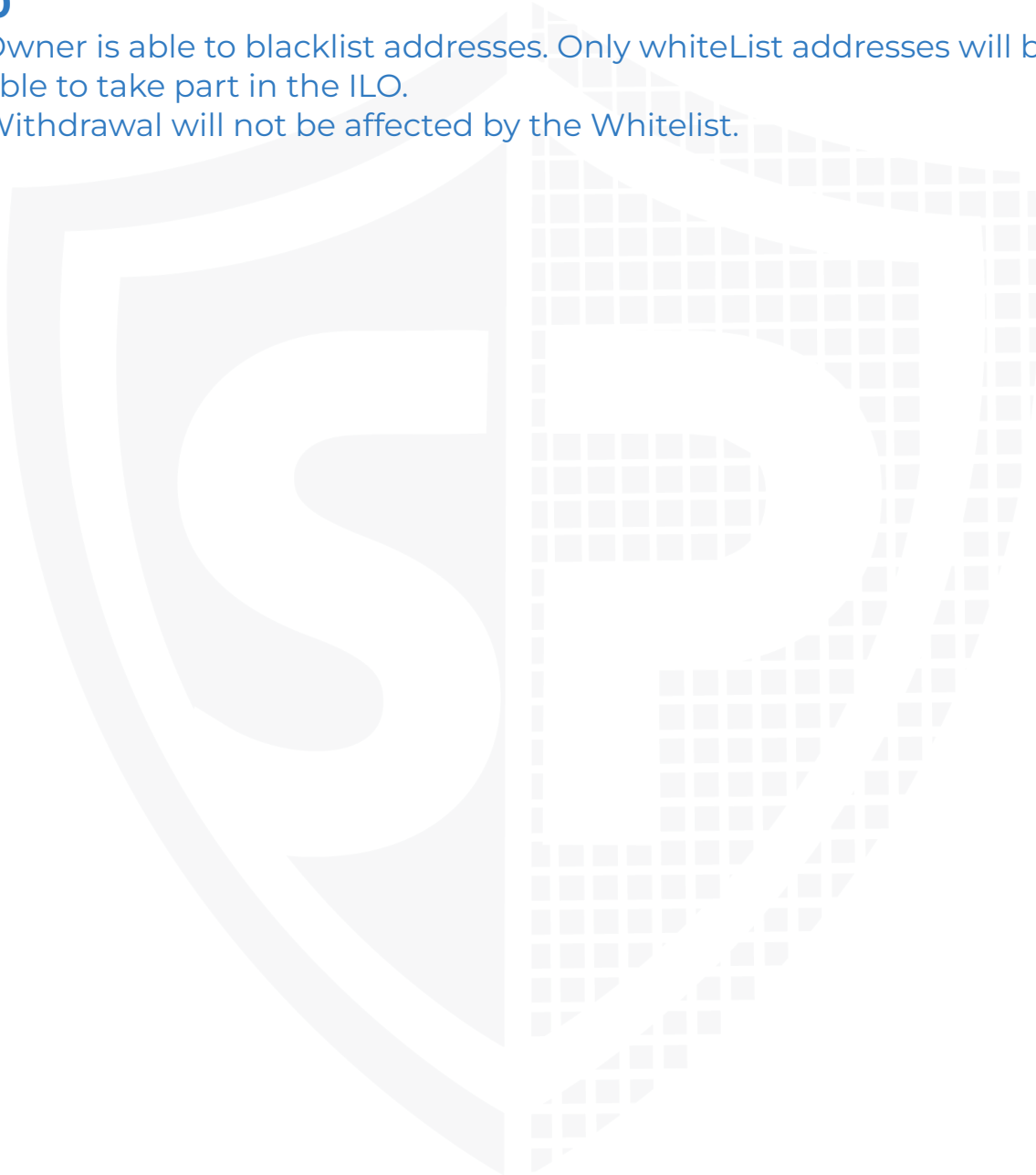
Deployer can blacklist/antisnipe addresses

Name	Exist	Tested	Status
Deployer can blacklist/antisnipe addresses	✓	✓	✓

Comments:

v1.0

- Owner is able to blacklist addresses. Only whiteList addresses will be able to take part in the ILO.
- Withdrawal will not be affected by the Whitelist.



Overall checkup (Smart Contract Security)

Tested	Verified
✓	✓

Legend

Attribute	Symbol
Verified / Checked	✓
Partly Verified	⚠
Unverified / Not checked	✗
Not available	—

Modifiers and public functions v1.0

◆ addAdmin	◆ transferOwnership
Ⓜ onlyOwner	Ⓜ onlyOwner
◆ removeAdmin	◆ addCurrency
Ⓜ onlyOwner	Ⓜ onlyOwner
◆ setPolyDAO	◆ addProject
Ⓜ onlyOwner	Ⓜ onlyOwner
◆ setCurrencyDecimals	◆ projectNewRound
Ⓜ onlyOwner	Ⓜ onlyOwner
◆ setDiscount	◆ startILO
Ⓜ onlyOwner	Ⓜ onlyOwner
◆ addToWhiteListBulk	
Ⓜ onlyAdmin	
◆ addToWhiteList	
Ⓜ onlyAdmin	
◆ removeWhiteList	
Ⓜ onlyAdmin	
◆ extendILO	
Ⓜ onlyAdmin	
◆ buyTokens	
Ⓜ nonReentrant	
◆ iloApproval	
Ⓜ onlyAdmin	
◆ setMinMax	
Ⓜ onlyAdmin	
◆ withdrawTokens	
Ⓜ nonReentrant	
◆ returnFunds	
Ⓜ nonReentrant	
◆ sellerWithdraw	
Ⓜ nonReentrant	
◆ emergencyRefund	
Ⓜ onlyAdmin	
◆ receiveMoney 💰	
◆ withdrawWrongTransaction	

Comments

- The ownership can never be renounced from the PolyKick_Factory and ILO contracts because there is no function to do so.
- The owner of all ILO contracts will be the owner of the Factory contract because in the startILO contract, instead of passing the project owners address, the function passes the address of the owner of the FactoryContract on Line138

S.No	File	Privileges
#1	PolyKick_Factory.sol	<ul style="list-style-type: none"> • Add Currency by adding token address, name and decimals. • Add project for the ILO. • Set the project owner to any address • Update the token, and currency address for an existing project. • The owner is also able to set the price of a token which will result in calculation of the final amount, the buyer will get after buying the tokens by the ILO contract.
#2	PolyKick_ILO.sol	<ul style="list-style-type: none"> • Add/Remove admin addresses of the project which is not recommended because the owner can set their own controlled address as the Project admin and remove the original one after the start of the ILO. Moreover, there can be more than one admin wallets for the ILO with the following privileges: <ul style="list-style-type: none"> - Extend the time of the ILO to any arbitrary time in the future only when the funds return value is true after ILO is approved because there is no maximum limit. Although, users will be able to claim their tokens in this phase. - Call the iloApproval function in order to set the success variable to be true if the target is reached, and if it is not called then withdrawal will not be possible even if the target is reached. - Set minimum and maximum amount to any number including zero which will result in lock of buyTokens function. • Set PolyDAO address to any arbitrary address. • The owner can set a discount on the token between 1 to 99 percent, and by default all tokens will be at 20% discount. • The admin can fail an ILO manually at any point in time even after the sale is successful, and the target is reached.

Please check if an OnlyOwner or similar restrictive modifier has been forgotten.

Source Units in Scope

v1.0

File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score
contracts/PolyKick_Factory.sol	1	=====	164	147	127	10	59
contracts/PolyKick_ILO.sol	1	=====	296	286	251	17	177
Totals	2	=====	460	433	378	27	236

Legend

Attribute	Description
Lines	total lines of the source unit
nLines	normalised lines of the source unit (e.g. normalises functions spanning multiple lines)
nSLOC	normalised source lines of code (only source-code lines; no comments, no blank lines)
Comment Lines	lines containing single or block comments
Complexity Score	a custom complexity score derived from code statements that are known to introduce code complexity (branches, loops, calls, external interfaces, ...)

Audit Results

Critical issues

No critical issues

High issues

No high issues

Medium issues

No medium issues

Low issues

No low issues

Informational issues

Issue	File	Type	Line	Description
#1	PolyKic k_ILO.s ol	Unused state variables	30, 31	Remove unused state variables
#2	All	NatSpec documentation missing	—	If you started to comment your code, also comment all other functions, variables etc.

Audit Comments

We recommend you to use the special form of comments (NatSpec Format, Follow link for more information <https://docs.soliditylang.org/en/latest/natspec-format.html>) for your contracts to provide rich documentation for functions, return variables and more. This helps investors to make clear what that variables, functions etc. do.

24. February 2023:

- There is still an owner (Owner can not be renounced)
- If the ILO admin address calls the emergencyRefund function then the token sale will fail and the users can manually withdraw their tokens.
- Read whole report and modifiers section for more information



SWC Attacks

ID	Title	Relationships	Status
SW C-1 36	Unencrypted Private Data On-Chain	CWE-767: Access to Critical Private Variable via Public Method	PASSED
SW C-1 35	Code With No Effects	CWE-1164: Irrelevant Code	PASSED
SW C-1 34	Message call with hardcoded gas amount	CWE-655: Improper Initialization	PASSED
SW C-1 33	Hash Collisions With Multiple Variable Length Arguments	CWE-294: Authentication Bypass by Capture-replay	PASSED
SW C-1 32	Unexpected Ether balance	CWE-667: Improper Locking	PASSED
SW C-1 31	Presence of unused variables	CWE-1164: Irrelevant Code	PASSED
SW C-1 30	Right-To-Left-Override control character (U+202E)	CWE-451: User Interface (UI) Misrepresentation of Critical Information	PASSED
SW C-1 29	Typographical Error	CWE-480: Use of Incorrect Operator	PASSED
SW C-1 28	DoS With Block Gas Limit	CWE-400: Uncontrolled Resource Consumption	PASSED

SW C-1 27	Arbitrary Jump with Function Type Variable	CWE-695: Use of Low-Level Functionality	PASSED
SW C-1 25	Incorrect Inheritance Order	CWE-696: Incorrect Behavior Order	PASSED
SW C-1 24	Write to Arbitrary Storage Location	CWE-123: Write-what-where Condition	PASSED
SW C-1 23	Requirement Violation	CWE-573: Improper Following of Specification by Caller	PASSED
SW C-1 22	Lack of Proper Signature Verification	CWE-345: Insufficient Verification of Data Authenticity	PASSED
SW C-1 21	Missing Protection against Signature Replay Attacks	CWE-347: Improper Verification of Cryptographic Signature	PASSED
SW C-1 20	Weak Sources of Randomness from Chain Attributes	CWE-330: Use of Insufficiently Random Values	PASSED
SW C-11 9	Shadowing State Variables	CWE-710: Improper Adherence to Coding Standards	PASSED
SW C-11 8	Incorrect Constructor Name	CWE-665: Improper Initialization	PASSED
SW C-11 7	Signature Malleability	CWE-347: Improper Verification of Cryptographic Signature	PASSED

SW C-11 6	Timestamp Dependence	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
SW C-11 5	Authorization through tx.origin	CWE-477: Use of Obsolete Function	PASSED
SW C-11 4	Transaction Order Dependence	CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')	PASSED
SW C-11 3	DoS with Failed Call	CWE-703: Improper Check or Handling of Exceptional Conditions	PASSED
SW C-11 2	Delegatecall to Untrusted Callee	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
SW C-11 1	Use of Deprecated Solidity Functions	CWE-477: Use of Obsolete Function	PASSED
SW C-11 0	Assert Violation	CWE-670: Always-Incorrect Control Flow Implementation	PASSED
SW C-1 09	Uninitialized Storage Pointer	CWE-824: Access of Uninitialized Pointer	PASSED
SW C-1 08	State Variable Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED
SW C-1 07	Reentrancy	CWE-841: Improper Enforcement of Behavioral Workflow	PASSED
SW C-1 06	Unprotected SELFDESTRUCT Instruction	CWE-284: Improper Access Control	PASSED

SW C-1 05	Unprotected Ether Withdrawal	CWE-284: Improper Access Control	PASSED
SW C-1 04	Unchecked Call Return Value	CWE-252: Unchecked Return Value	PASSED
SW C-1 03	Floating Pragma	CWE-664: Improper Control of a Resource Through its Lifetime	PASSED
SW C-1 02	Outdated Compiler Version	CWE-937: Using Components with Known Vulnerabilities	PASSED
SW C-1 01	Integer Overflow and Underflow	CWE-682: Incorrect Calculation	PASSED
SW C-1 00	Function Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED

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