Smart Contract Security Audit V1

Emergency Controller Smart Contract Audit

Jun 23, 2025



https://t.me/SFI_ANN

Table of Contents

Table of Contents

Background

Project Information

Smart Contract Information Executive Summary

File and Function Level Report

File in Scope:

Issues Checking Status

SWC Attack Analysis Severity Definitions Audit Findings

Automatic testing

Testing proves Inheritance graph Call graph

Source lines

Risk level

Source units in scope

Capabilities

Unified Modeling Language (UML)

Functions signature Automatic general report

Conclusion

Disclaimer

Background

The purpose of the audit was to achieve the following:

- Ensure that the smart contract functions as intended.
- Identify potential security issues with the smart contract.

The information in this report should be used to understand the risk exposure of the smart contract, and as a guide to improve the security posture of the smart contract by remediating the issues that were identified.

Project Information

• Platform: Binance Smart Chain

• Name: EmergencyController

• Language : Solidity

• **Contract Address**: 0xc12ecc8b2ad21c3ceada29ae8bbb707299fc83e5, 0xb4fe5047284dbd99eb78ca053c719b40c65dcc48

• Code Source: https://github.com/TerraDharitri/drt-pREWA/tree/main/contracts

What is EmergencyController?

Purpose: Centralizes emergency state management for integrated contracts alc

Functionality: Defines emergency levels, enables global pauses, and supports emergency withdrawals

Key Traii: Upgradeable contract with multi-appoval and innolt:r

Ofchestrates rapid, secure responses to security threets



Core Features



Emergency Levels

Supports Allevels (Normal, Caution Alert. Critical)



Global Pause

Halts system operations during emergencies



Emergency Withdrawals

AllowGusers to withdrow with configurable penaties



Timelock for **Critical Actions**

Notifies registered contracts of state-changes

Emergency Levels and Responses



Level 0: Normal

State, System fuly oprational.



Level t: Caution

Actions: Niors operations during emerge leles



Level 2: Alert

Actions: Significent threat with configurable penalties



Level 3: Critical

System paused, excalation for security

» Level 3 escalation requires upto 20 approvals (min 1 hour, max

Built for Security



ReentrancyGuard

Prevents reentrancy attacks (Via OponZedpelin)



AccessControl

Role-based permissions (Admin, Emergency, Pauser roles)



Timelock

Deleys critical actions for review



SafeERC20

Secure token transters



Function Restrictions

Limits function access based on

Governance and Access Control

् Roles

DEFAULT_ADMIN_ROLE_Manages approvals, (imelock duration, resovarmin

★ EMERGENCY_ROLE: Sets emergency levels, approves Level 2, reglisters

PAUSER_ROLE

Pauses)unpauses the system

EmergencyAware Contracts Nolities registered contracts of state changes

Function Restrictions. Limits function access basd on

Executive Summary

According to our assessment, the customer's solidity smart contract is Well-Secured.



Automated checks are with remix IDE. All issues were performed by the team, which included the analysis of code functionality, manual audit found during automated analysis were manually reviewed and applicable vulnerabilities are presented in the audit overview section. The general overview is presented in the Project Information section and all issues found are located in the audit overview section.

Team found 0 critical, 0 high, 0 medium, 1 low, 0 very low-level issues and 2 notes in all solidity files of the contract

The files:

EmergencyController.sol

Audit Score:

99% secure



File and Function Level Report

File in Scope:

Contract Name	SHA 256 hash	Contract Address
	8e73765eaa98f95db8f5e b7a40cd13b0dc845266	0xc12ecc8b2ad21c3ceada29ae8bbb707299fc83 e5, 0xb4fe5047284dbd99eb78ca053c719b40c65dc c48

• Contract: EmergencyController

• Inherit: Initializable, ReentrancyGuardUpgradeable, IEmergencyController

• Observation: All passed including security check

• Test Report: passed

• Score: passed

• Conclusion: passed

Function	Test Result	Type / Return Type	Score
accessControl	√	Read / public	Passed
contractProcessedEmerg ency	√	Read / public	Passed
currentApprovalCount	✓	Read / public	Passed
currentApprovers	√	Read / public	Passed
emergencyApprovalProp osalIds	√	Read / public	Passed
emergencyLevel	✓	Read / public	Passed
emergencyLevelNotified	√	Read / public	Passed
emergencyLevelTimesta mp	√	Read / public	Passed
emergencyWithdrawalE nabled	√	Read / public	Passed
emergencyWithdrawalP enalty	√	Read / public	Passed
getApprovalStatus	√	Read / public	Passed
getEmergencyAwareCo ntractsPaginated	√	Read / public	Passed

		_	
getEmergencyLevel	√	Read / public	Passed
getEmergencyWithdraw alSettings	√	Read / public	Passed
isFunctionRestricted	√	Read / public	Passed
isSystemPaused	√	Read / public	Passed
level3ApprovalTime	✓	Read / public	Passed
level3ProposalId	√	Read / public	Passed
level3TimelockDuration	√	Read / public	Passed
level3TimelockInProgre ss	✓	Read / public	Passed
MAX_REQUIRED_AP PROVALS	√	Read / public	Passed
recoveryAdminAddress	√	Read / public	Passed
requiredApprovals	√	Read / public	Passed
restrictedFunctions	√	Read / public	Passed
timelockController	√	Read / public	Passed
systemPaused	√	Read / public	Passed
approveLevel3Emergenc	√	Write / public	Passed
cancelLevel3Emergency	√	Write / public	Passed
enableEmergencyWithdr awal	√	Write / public	Passed
executeLevel3Emergenc y	√	Write / public	Passed
initialize	✓	Write / public	Passed
pauseSystem	√	Write / public	Passed
processEmergencyForC ontract	√	Write / public	Passed
recoverTokens	√	Write / public	Passed
registerEmergencyAwar eContract	√	Write / public	Passed
removeEmergencyAwar eContract	√	Write / public	Passed
setEmergencyLevel	√	Write / public	Passed

setLevel3TimelockDurat ion	√	Write / public	Passed
setRecoveryAdminAddr ess	✓	Write / public	Passed
setRequiredApprovals	✓	Write / public	Passed
unpauseSystem	√	Write / public	Passed
updateFunctionRestricti on	√	Write / public	Passed

Issues Checking Status

SWC Attack Analysis

The Smart Contract Weakness Classification Registry (SWC Registry) is an implementation of the weakness classification scheme proposed in EIP-1470. It is loosely aligned to the terminologies and structure used in the Common Weakness Enumeration (CWE) for more info check https://swcregistry.io/

No.	Issue Description	Checking Status
136	Unencrypted Private Data On-Chain	Passed
135	Code With No Effects	Passed
134	Message call with hardcoded gas amount	Passed
133	Hash Collisions With Multiple Variable Length Arguments	Passed
132	Unexpected Ether balance	Passed
131	Presence of unused variables	Passed
130	Right-To-Left-Override control character (U+202E)	Passed
129	Typographical Error	Passed
128	DoS with block gas limit.	Passed
127	Arbitrary Jump with Function Type Variable	Passed
126	Insufficient Gas Griefing	Passed
125	Incorrect Inheritance Order	Passed
124	Write to Arbitrary Storage Location	Passed
123	Requirement Violation	Passed
122	Lack of Proper Signature Verification	Passed
121	Missing Protection against Signature Replay Attacks	Passed
120	Weak Sources of Randomness from Chain Attributes	Passed
119	Shadowing State Variables	Passed

118	Incorrect Constructor Name	Passed
117	Signature Malleability	Passed
116	Block values as a proxy for time	Not Passed
115	Authorization through tx.origin	Passed
114	Transaction Order Dependence	Passed
113	DoS with Failed Call	Passed
112	Delegatecall to Untrusted Callee	Passed
111	Use of Deprecated Solidity Functions	Passed
110	Assert Violation	Passed
109	Uninitialized Storage Pointer	Passed
108	State Variable Default Visibility	Passed
107	Reentrancy	Passed
106	Unprotected SELFDESTRUCT Instruction	Passed
105	Unprotected Ether Withdrawal	Passed
104	Unchecked Call Return Value	Passed
103	Floating Pragma	Not Passed
102	Outdated Compiler Version	Passed
101	Integer Overflow and Underflow	Passed
100	Function Default Visibility	Passed

Severity Definitions

Risk Level	Description
Critical	Critical vulnerabilities are usually straightforward to exploit and can lead to tokens loss etc.
High	High-level vulnerabilities are difficult to exploit; however, they also have significant impact on smart contract execution, e.g. public access to crucial functions
Medium	Medium-level vulnerabilities are important to fix; however, they can't lead to tokens lose
Low	Low-level vulnerabilities are mostly related to outdated, unused etc. code snippets, that can't have significant impact on execution
Note	Lowest-level vulnerabilities, code style violations and info statements can't affect smart contract execution and can be ignored.

Audit Findings

Critical:

No Critical severity vulnerabilities were found.

High:

No High severity vulnerabilities were found.

Medium:

No Medium severity vulnerabilities were found.

Low:

#Unused NotificationFailure Event

Description

The NotificationFailure event is defined but is never emitted within the provided code. The processEmergencyForContract function reverts directly on failure, rather than emitting this event.

Recommendation

Either remove the NotificationFailure event if it's not intended for use, or adjust processEmergencyForContract to emit it before reverting, possibly with more granular error handling. However, reverting is generally a stronger signal. If the goal is to *always* revert on failure, the event is indeed unused, It is normal in these type of smart contracts.

Status: Acknowledged.

Very Low:

No Very Low severity vulnerabilities were found.

Notes:

#Pragam version not fixed

Description

It is a good practice to lock the solidity version for a live deployment (use 0.8.28 instead of ^0.8.28). contracts should be deployed with the same compiler version and flags that they have been tested the most with. Locking the pragma helps ensure that contracts do not accidentally get deployed using, for example, the latest compiler which may have higher risks of undiscovered bugs. Contracts may also be deployed by others and the pragma indicates the compiler version intended by the original authors. And avoid Solidity compiler Bugs check here

https://sepolia.etherscan.io/solcbuginfo

Remediation

Remove the ^ sign to lock the pragma version.

Use of block.timestamp for comparisons

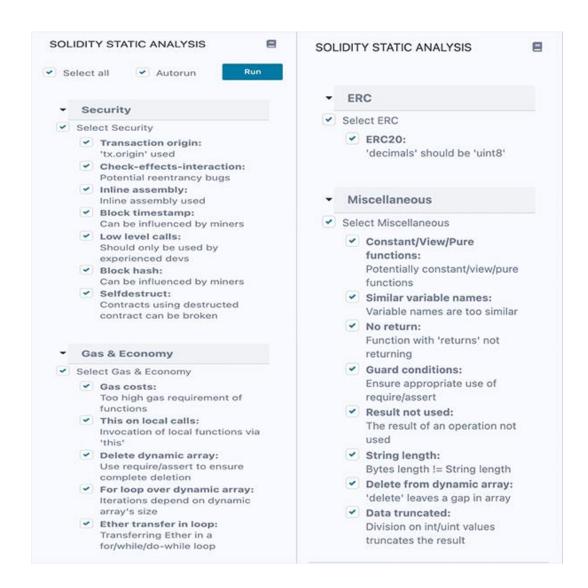
The value of block.timestamp can be manipulated by the miner. And conditions with strict equality is difficult to achieve - block.timestamp.

Recommendation

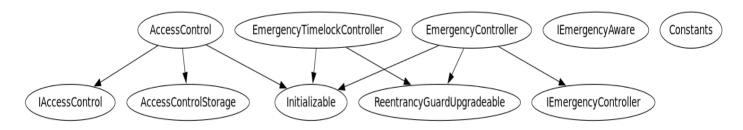
Avoid use of block.timestamp.

Automatic Testing

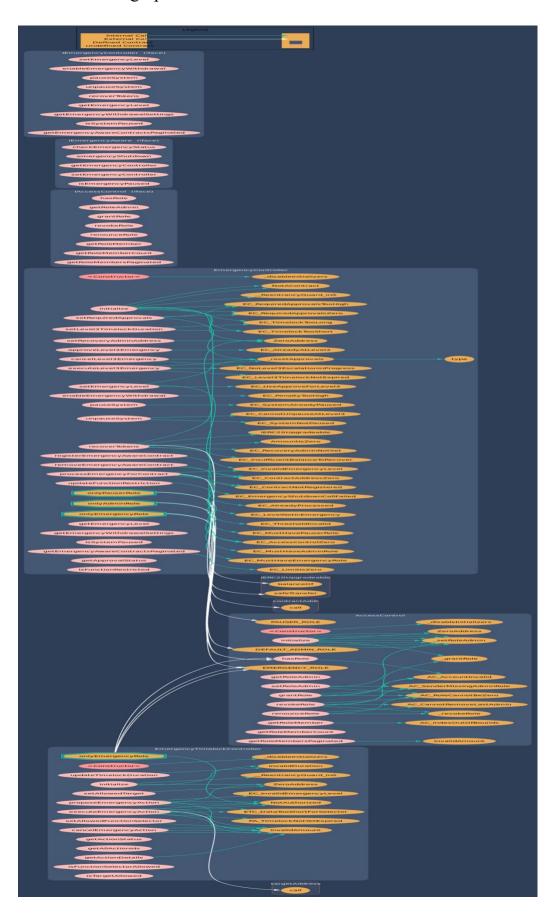
1- SOLIDITY STATIC ANALYSIS



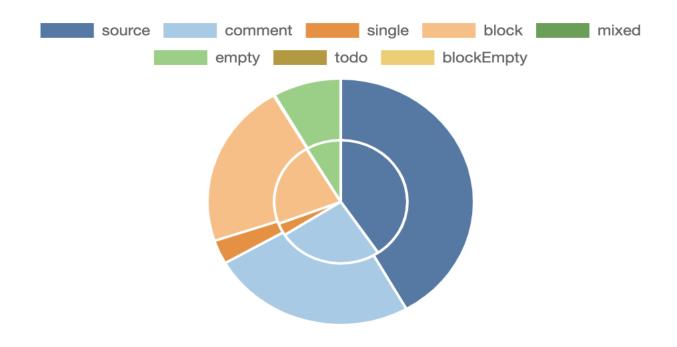
2- Inheritance graph



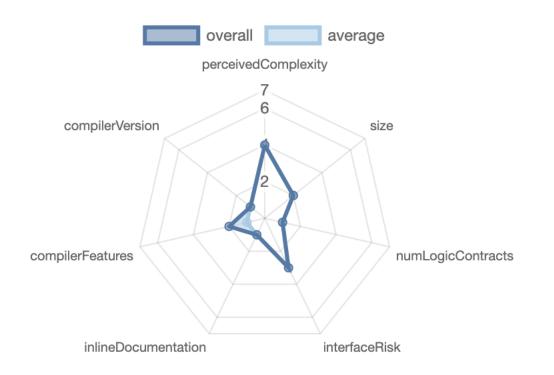
3- Call graph



Source lines



Risk level



Source units in scope

Source Units in Scope

Source Units Analyzed: 1 Source Units in Scope: 1 (100%)

Туре	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
>	contracts/controllers/EmergencyController.sol	1		686	666	363	228	337	
2	Totals	1		686	666	363	228	337	

Legend: [-]

- . Lines: total lines of the source unit
- nLines: normalized lines of the source unit (e.g. normalizes functions spanning multiple lines)
- nSLOC: normalized 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, ...)

Capabilities

Components



Exposed Functions

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



External	Internal	Private	Pure	View
22	19	0	0	6

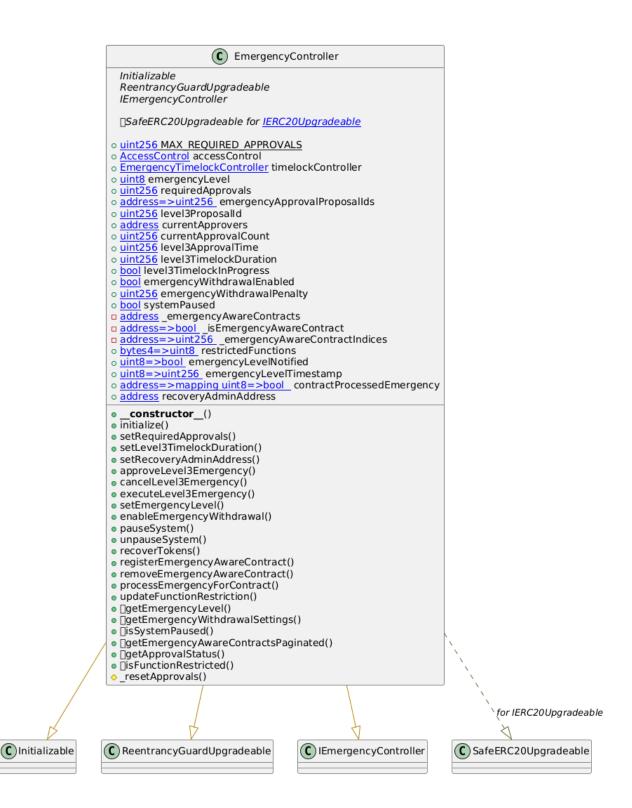
StateVariables



Capabilities



Unified Modeling Language (UML)



Functions signature

```
| Function Name | Sighash | Function Signature |
| ----- | ------ | ------- |
| initialize | 57fb25cc |
initialize(address, address, uint256, uint256, address) |
| setRequiredApprovals | 222a242e | setRequiredApprovals(uint256) |
| setLevel3TimelockDuration | e7d46932 |
setLevel3TimelockDuration(uint256)
| setRecoveryAdminAddress | 2c446a44 | setRecoveryAdminAddress(address)
| approveLevel3Emergency | 0a4fa332 | approveLevel3Emergency() |
| cancelLevel3Emergency | 6c48b99e | cancelLevel3Emergency() |
| executeLevel3Emergency | Od484100 | executeLevel3Emergency() |
| setEmergencyLevel | ac376ee7 | setEmergencyLevel(uint8) |
| enableEmergencyWithdrawal | 0eac6052 |
enableEmergencyWithdrawal(bool,uint256) |
| pauseSystem | dc1d4fb7 | pauseSystem() |
| unpauseSystem | 4c761240 | unpauseSystem() |
| recoverTokens | 069c9fae | recoverTokens(address,uint256) |
| registerEmergencyAwareContract | e2b5d8c4 |
registerEmergencyAwareContract(address) |
| removeEmergencyAwareContract | 55b1027e |
removeEmergencyAwareContract(address) |
| processEmergencyForContract | 0c08419a |
processEmergencyForContract(address, uint8) |
| updateFunctionRestriction | 93ca66d0 |
updateFunctionRestriction(bytes4,uint8) |
| getEmergencyLevel | e8793b20 | getEmergencyLevel() |
| getEmergencyWithdrawalSettings | 95bc252c |
getEmergencyWithdrawalSettings() |
| isSystemPaused | 7691c4ac | isSystemPaused() |
| getEmergencyAwareContractsPaginated | 36324533 |
getEmergencyAwareContractsPaginated(uint256, uint256) |
| getApprovalStatus | f2ebf6fc | getApprovalStatus(uint256, uint256) |
| isFunctionRestricted | 4d124887 | isFunctionRestricted(bytes4) |
```

Automatic general report

```
Files Description Table
| File Name | SHA-1 Hash
|----|
| /Users/macbook/Desktop/drt-
pREWA/contracts/controllers/EmergencyController.sol |
8e73765eaa98f95db8f5eb7a40cd13b0dc845266
| /Users/macbook/Desktop/drt-pREWA/contracts/access/AccessControl.sol |
40163fa249f10365c03cf1fa9ddd26e2f6eb1005
| /Users/macbook/Desktop/drt-
pREWA/contracts/access/storage/AccessControlStorage.sol |
2a1f4c3d6956a89011b090a62b15254b1d720d65
| /Users/macbook/Desktop/drt-
pREWA/contracts/access/interfaces/IAccessControl.sol |
540ec54eaade1c05a650af086ebf959654ec6322
| /Users/macbook/Desktop/drt-pREWA/contracts/libraries/Errors.sol |
0974f6f49e3b655fa93a2792154f1b506ec03c74 |
/Users/macbook/Desktop/drt-
pREWA/contracts/interfaces/IEmergencyAware.sol |
be6e0a371b0a5f62d5c7dc06e5c0c4121dcc7ca1 |
| /Users/macbook/Desktop/drt-
pREWA/contracts/interfaces/IEmergencyController.sol |
40bc149ec8a1da85c0e4c6170b06f3a0f3b77f3b |
| /Users/macbook/Desktop/drt-
pREWA/contracts/controllers/EmergencyTimelockController.sol |
94735e88ad7f750ead488b7ad618b1486cbdb483
Contracts Description Table
                   Type | Bases |
 Contract |
                -----:|:-----
L | **Function Name** | **Visibility** | **Mutability**
| **Modifiers** |
| **EmergencyController** | Implementation | Initializable,
ReentrancyGuardUpgradeable, IEmergencyController | | |
| Constructor> | Public | | NO | | |
 | initialize | External | | | initializer |
| L | setRequiredApprovals | External | | D | onlyAdminRole |
 | L | approveLevel3Emergency | External | | OnlyEmergencyRole
nonReentrant |
| L | executeLevel3Emergency | External | | D | onlyEmergencyRole
| L | setEmergencyLevel | External | | OnlyEmergencyRole
nonReentrant |
```

```
| L | enableEmergencyWithdrawal | External | | OnlyEmergencyRole
nonReentrant |
| L | pauseSystem | External | | OnlyPauserRole nonReentrant |
L | unpauseSystem | External | | onlyPauserRole nonReentrant | | l | recoverTokens | External | | onlyEmergencyRole nonReentrant
| L | registerEmergencyAwareContract | External ↓
onlyEmergencyRole |
| L | removeEmergencyAwareContract | External | | |
onlyEmergencyRole |
| L | getEmergencyWithdrawalSettings | External | | | NO| |
 | isSystemPaused | External | | NO |
| L | getEmergencyAwareContractsPaginated | External | NO | |
| L | isFunctionRestricted | External | | NO | |
| L | resetApprovals | Internal A | O | |
| **AccessControl** | Implementation | Initializable,
AccessControlStorage, IAccessControl | | |
└ | initialize | External │ | ● | initializer |
 | hasRole | External | | NO |
 L | getRoleAdmin | External | | | NO| |
 renounceRole | External | | NO | |
 L | setRoleAdmin | External | NO | |
 | getRoleMember | External | | | NO | |
 L | getRoleMemberCount | External | | | NO | |
 | getRoleMembersPaginated | External | | | NO | |
 L | grantRole | Internal 🖺 | 🔘 | |
 L | _revokeRole | Internal 🖺 | 🔘 | |
 L | setRoleAdmin | Internal 🖺 | 🔘 | |
**AccessControlStorage** | Implementation | |||
| **IAccessControl** | Interface | |||
 L | hasRole | External | | NO | |
 | getRoleAdmin | External | | | NO | |
 | grantRole | External | | | | NO | |
 L | revokeRole | External | | NO | |
| L | getRoleMember | External | | | NO | |
 L | getRoleMemberCount | External | | | NO | |
| L | getRoleMembersPaginated | External | NO | | |
| **IEmergencyAware** | Interface | |||
| L | checkEmergencyStatus | External | | NO| |
```

```
L | emergencyShutdown | External | | NO | |
L | getEmergencyController | External | | NO  | | L | setEmergencyController | External | | NO  | |
| L | isEmergencyPaused | External | | NO |
**IEmergencyController** | Interface | |||
| enableEmergencyWithdrawal | External | | | NO | |
      | pauseSystem | External | | | NO | |
      L | unpauseSystem | External [ | NO[ |
      L | recoverTokens | External | |
                                                                                                                    |NON |
     | L | getEmergencyWithdrawalSettings | External [ | NO[ |
      | isSystemPaused | External | | NO | |
  \mid \; \; \; \; \; \mid \; \; \; \; \mid \; \; \; \mid \; \; \; \mid 
| **EmergencyTimelockController** | Implementation | Initializable,
ReentrancyGuardUpgradeable | | |
| L | <Constructor> | Public | | | NO | |
| L | initialize | External | | | | initializer |
L | setAllowedTarget | External | | OnlyEmergencyRole |
| L | setAllowedFunctionSelector | External | | OnlyEmergencyRole
      nonReentrant |
| L | executeEmergencyAction | External | | OnlyEmergencyRole
nonReentrant |
| L | cancelEmergencyAction | External | | OnlyEmergencyRole
nonReentrant |
| L | updateTimelockDuration | External | | OnlyEmergencyRole | | | |
      | getActionStatus | External | | NO | |
| L | getAllActionIds | External | | NO| |
| L | getActionDetails | External | | NO | |
| L | isFunctionSelectorAllowed | External | | NO | |
| L | isTargetAllowed | External | | | | NO| |
| **Constants** | Library | |||
  Legend
| Symbol | Meaning |
 |:----|
               Function can modify state |
              Function is payable
```

Conclusion

The contracts are written systematically. Team found no critical issues. So, it is good to go for production.

Since possible test cases can be unlimited and developer level documentation (code flow diagram with function level description) not provided, for such an extensive smart contract protocol, we provide no such guarantee of future outcomes. We have used all the latest static tools and manual observations to cover maximum possible test cases to scan Everything.

Security state of the reviewed contract is "Well Secured".

- ✓ No volatile code.
- √ No high severity issues were found.

Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice as of the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against the team on the basis of what it says or doesn't say, or how team produced it, and it is important for you to conduct your own independent investigations before making any decisions. team go into more detail on this in the below disclaimer below – please make sure to read it in full.

By reading this report or any part of it, you agree to the terms of this disclaimer. If you do not agree to the terms, then please immediately cease reading this report, and delete and destroy any and all copies of this report downloaded and/or printed by you. This report is provided for information purposes only and on a non-reliance basis, and does not constitute investment advice. No one shall have any right to rely on the report or its contents, and Saferico and its affiliates (including holding companies, shareholders, subsidiaries, employees, directors, officers and other representatives) (Saferico s) owe no duty of care towards you or any other person, nor does Saferico make any warranty or representation to any person on the accuracy or completeness of the report. The report is provided "as is", without any conditions, warranties or other terms of any kind except as set out in this disclaimer, and Saferico hereby excludes all representations, warranties, conditions and other terms (including, without limitation, the warranties implied by law of satisfactory quality, fitness for purpose and the use of reasonable care and skill) which, but for this clause, might have effect in relation to the report. Except and only to the extent that it is prohibited by law, Saferico hereby excludes all liability and responsibility, and neither you nor any other person shall have any claim against Saferico, for any amount or kind of loss or damage that may result to you or any other person (including without limitation, any direct, indirect, special, punitive, consequential or pure economic loss or damages, or any loss of income, profits, goodwill, data, contracts, use of money, or business interruption, and whether in delict, tort (including without limitation negligence), contract, breach of statutory duty, misrepresentation (whether innocent or negligent) or otherwise under any claim of any nature whatsoever in any jurisdiction) in any way arising from or connected with this report and the use, inability to use or the results of use of this report, and any reliance on this report. The analysis of the security is purely based on the smart contracts alone. No applications or operations were reviewed for security. No product code has been reviewed