GDF GLOBAL DIGITAL FINANCE

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THE SMART CONTRACT PRIMER

Eight Principles of Best Practice for Smart Contract Implementation

1

DEVELOPMENT AND GROWTH OF INTERNAL RISK AND CONTROL OR COMPLIANCE FUNCTION WITH APPROPRIATE RESOURCING

Firms will need to consider how to develop and scale their internal operational risk and/or compliance departments to oversee, support and advise business lines with sufficient personnel to audit, maintain and upgrade any necessary coding issues. This will vary based on a firm's size, business model, and activities, proportionate to its business needs.

2

HAVE A CLEAR AND PROPORTIONATE INCIDENT RESPONSE MECHANISM/POLICY

These policies should include how and what should be done once an incident starts, and firms should have a clear business continuity plan ("BCP") as well as an information and communication technology ("ICT") plan to minimize the damage, as well as appropriate steps in place to maintain the continuity of any smart contract supporting important business services.

3

STANDARDIZED REQUIREMENTS FOR SMART CONTRACT AUDITS, WHILE WORKING TOWARDS A TEMPLATE-BASED APPROACH FOR BROADER SMART CONTRACT STANDARDIZATION

These policies should include requirements for completeness and robustness. Such requirements should also incorporate best practices that exist for smart contract auditing, and should promote transparency between regulators and market participants with respect to audit processes and outcomes.

4

ENSURE SMART CONTRACTS ARE WRITTEN IN CLEAR, WELL-DOCUMENTED CODE THAT IS EASY TO UNDERSTAND AND AUDIT

Best practices in documentation should describe, for example: intended functionality of the application, what properties and invariants should be maintained under execution, controls, and cross-contract dependencies. A smart contract should have a clear scope and use regular naming conventions and in-line comments. This should also be captured in product documentation.

5

EXTENSIVELY TEST SMART CONTRACTS BEFORE DEPLOYMENT USING VARIOUS SCENARIOS AND STRESS TESTS

This testing should include verifiable test coverage. Smart contract tests should methodically cover maximum existing use cases and functionalities to minimize unexpected and untested edge cases. Test coverage should also be transparent for both regulators and market participants.

6

IMPLEMENT STRONG ACCESS CONTROLS TO RESTRICT WHO CAN MODIFY OR INTERACT WITH THE SMART CONTRACT

This should also include Privileged Access Management and firms should ensure that there are strong access controls for any privileged access or admin activity. This should also be captured in product documentation.

7

INTEGRATE SMART CONTRACTS WITH EXISTING WORKFLOWS WITH HUMAN INTERVENTION AT CRITICAL POINTS FOR ADDED SECURITY

This risk mitigation should also be streamlined with the test coverage principle noted above. Ideally, human intervention should be required whenever there is activity outside the test coverage. This should also include ledger security monitoring and alerting capabilities as well as a key management solution with appropriate cybersecurity and enforcement controls.

8

AGREEMENT OF CONTRACTUAL OBLIGATIONS BETWEEN RELEVANT PARTIES

Firms should also consider how, particularly in respect of smart contracts that are used in the context of legal agreements between counterparties, to mitigate risks in smart contract integration through incorporation of certain provisions in legal contracts between the parties, to avoid legal ambiguities

CALLS TO ACTION

Recommendation #1: Prioritize Key Drivers of Smart Contract Interoperability Through Technical Standards and Developing a Template-Based Approach to Smart Contract Standardization

Recommendation #2: Support for Utilization of Existing Technology and Operational Risk Frameworks to Regulate Smart Contract Implementation

Recommendation #3: Look to Future-Proof Legal and Regulatory Regimes by Providing Clarity and Support for Responsible Innovation, Addressing Where Unique Risks Arise Without Creating Special New Regimes for Smart Contracts