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Subject: Risk Management and Control Guidelines for Asset Management Companies

The Securities and Exchange Commission of Pakistan ("the Commission") in exercise of powers conferred under section 282 B (3) of the Companies Ordinance, 1984 issues the attached guidelines for establishment of Risk Management Systems and Controls in the Asset Management companies (AMCs).

The purpose of these guidelines is to facilitate and guide the AMCs and provide a general framework of risk management from their perspective. These guidelines are flexible in the sense that AMCs can adapt them in line with the size and complexity of their business. Although, the risk management framework and sophistication of the process, and internal controls used to manage risks, depends on the size, nature and complexity of institutions activities. Nevertheless, there are some basic principles that apply to all institutions irrespective of their size and complexity of business and are reflective of the strength of an individual institution risk management practices. It is hoped that the guidelines will provide a useful reference for AMCs in developing and assessing their own risk management systems.

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Commissioner (SCD)

Enclosed: As above

Distribution:

1. Chief Executive Officers, Asset Management Companies
2. Mutual Funds Association of Pakistan
3. Trustees of Collective Investment Schemes

Risk Management and Controls

Guidelines for Asset Management Companies

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1 PREAMABLE

As per the clause (o) of sub regulation (1) of regulation 38 of NBFC and NE Regulations 2008, Asset Management Companies(AMCs) are required to establish and maintain sufficient Risk Management Systems and Controls to enable it to identify, assess, mitigate, control and monitor risks in the best interest of unit holders of the Collective Investment Schemes (CIS) under its management. In order to guide and facilitate the AMCs, the Securities and Exchange Commission of Pakistan (SECP) issues the following guidelines for establishment of Risk Management Systems and Controls in the AMCs.

The purpose of these guidelines is to provide a general framework of risk management from the Asset Management Companies perspective. These guidelines are flexible in the sense that AMCs can adapt them in line with the size and complexity of their business. Although, the risk management framework and sophistication of the process and internal controls used to manage risks depends on the size , nature and complexity of institutions activities. Nevertheless, there are some basic principles that apply to all institutions irrespective of their size and complexity of business and are reflective of the strength of an individual institutions risk management practices. It is hoped that the guidelines will provide a useful reference for AMCs in developing and assessing their own risk management systems. Since AMCs differs greatly one from another in terms of size, complexity, product mix and client type, however, what is appropriate for one AMC may not be appropriate for another however, the objective of the compliance with these guidelines should be to comply with the basic principles.

2 INTRODUCTION

Risk management is the process of identifying, assessing and monitoring both enterprise and portfolio risks in order to minimize unanticipated losses and uncompensated risks and optimizes the reward/risk ratio. A risk management system encompasses the scope of risks to be managed, the process/systems and procedures to manage risk alongwith the roles and responsibilities of individual involved in risk management function. The framework should be comprehensive enough to capture all risks a CIS is exposed to and have flexibility to accommodate any change in business activities. An effective risk management framework includes:-

- Risk Governance
- Risk Management Process and Procedures
- Portfolio Risk Measurement
- Operational Risk Management

3 RISK GOVERNANCE

One of the key to effective risk management is a risk governance structure that provides appropriate senior level oversight, segregation of functions, independent control groups and organizational checks and balances within a risk conscious culture.

Risk governance refers to the creation of checks and balances through organizational structure. Although risk governance structures will vary depending on the size and complexity of each organization, effective risk management generally requires:

- Definition of Roles and Responsibilities;
- Risk Management Policies;
- Establishment of organizational checks and balances including an appropriate segregation of front/back and/or middle office functions;
- Creation of a culture in which understanding and managing risk is everyone's responsibility;
- Independent control groups, including, where possible, a risk manager reporting and/or having access to, CEO, Board, Executive Committee or the like;and
- Senior management and board level understanding of risks, definition of risk tolerances, and setting of risk management and ethical tone.

3.1 Definition of Roles and Responsibilities

In order to fulfill the duty to identify, measure and manage the risks relevant to the Collective Investment Schemes, AMCs should define an organizational structure in which risk management roles and responsibilities are clearly defined including written policies and other procedures identifying the specific people within the organization who are authorized to approve various actions, make exceptions to various policies etc. Boards of Directors have a responsibility to understand the major risks applicable to their firms and approve and periodically review the firm-wide risk management framework including how risk is to be identified, assessed, monitored and controlled. Senior management is responsible for overseeing the establishment and implementation of a risk management framework, including policies, procedures, systems & methodologies and for assuring that they are complied with. A management that considers the risks attributable to new products and strategies before they are approved for first use and periodically thereafter, that sets risk tolerances and makes sure they are adhered to and receives information on an ongoing basis sufficient to enable it to anticipate problems and makes midcourse corrections is a

management that is less likely to encounter the types of problems including unanticipated losses, reputational and operational blow-ups, style drift and guideline breaches, that have caused losses to investors and buy-side firms in the past. Line managers should be responsible for complying with applicable policies and procedures and should be evaluated on how well they do so. Portfolio managers should be responsible for maintaining levels of portfolio risk consistent with representations made to clients and/or required by client guidelines. (Risk levels should be monitored with a view to preventing both insufficient and excessive risk-taking.) Operations personnel should be responsible for adhering to operational policies and procedures to control risk. Control groups should be responsible for measuring and monitoring risk and for conducting independent reviews of compliance with risk management and other policies.

3.2 Policies and Procedure

The risk management process should be appropriately documented, formalized and traceable in the procedures and organizational rules of the AMC. The corresponding documents should be referred to as "risk management policy". The risk management policy should be approved, reviewed on a regular basis and if necessary, adjusted by the Board of Directors. In particular, with respect to the organization and functioning of the process, the risk management policy should:

- identify the personnel and unit(s) that are in charge of the different parts of the risk management process;
- define the principles and methods for the periodic identification of the risks relevant to the Collective Investment Schemes;
- set out the terms of the interaction between the risk and the investment management processes in order to keep the Collective Investment Schemes risk profile under control and consistent with the Collective Investment Scheme investment strategy; and
- define the terms and frequency of risk management reporting to Senior Management and to the Board of Directors of the Company.

In addition to written policies and procedures, AMC must also adhere to investment guidelines disclosed in the Constitutive Documents of the Scheme.

3.3 The Risk Management Function

AMCs should specifically identify the relevant unit, department or personnel in charge of carrying out the risk management tasks (the risk management function). The risk management function should be hierarchically and functionally independent from the operating units where appropriate and proportionate in view of the nature, scale and complexity of the Company's business and of the CIS it manages. For the risk management function to operate successfully, a degree of separation from the Company's front-office functions is required. Where it is not appropriate or practical to have a separate risk management function, the AMC should nevertheless be able to demonstrate that specific safeguards guarantee that risk management function is carried out with an adequate level of independence.

The risk management function should implement the risk management policy & procedures and should report directly to the Senior Management and submit a periodic report to Board of Directors. It should operate in accordance with adequate standards of competence and efficiency. An efficient risk management function requires adequate means and organization. In particular, the risk management function should have the necessary personnel, with the skills, knowledge and expertise needed to be accountable for the responsibilities that are placed upon them. The risk management function should employ sound processes, professional expertise, adequate techniques and IT structures. The risk management function should be responsible for the identification, monitoring and measurement of risks and the implementation of the methods and procedures necessary for this purpose, including the drafting of the related documentation.

3.4 Risk Management Committee (RC)

It is generally a board level subcommittee constituted to supervise overall risk management functions of the AMC. The structure of the committee may vary in AMCs depending upon the size and volume of the business. Ideally, it should be headed by independent director and should constitutes at least three directors. The terms of reference of this committee may cover the following:-

- Developing and reviewing detailed risk management policies and guidelines specifying risk tolerance of the AMC;
- Ensuring that risk management system has the requisite tools to identify and manage all relevant risks including the credit, market, liquidity and operational risks;

- Ensuring that risk management function has the capacity to obtain timely information necessary to apply risk management policies and procedures which allow for the accurate and timely measurement and aggregation of risk exposures; and
- To submit its recommendations to the board of directors together with the explanation of their purpose and likely effects.

3.5 Reporting to the Board of Directors and the Senior Management

The Asset Management Companies should implement and maintain efficient internal reporting by the risk management function. The terms, contents and frequency of this reporting should be defined in the risk management policy. The risk management function should report regularly to the Senior Management and if necessary to the heads of the different operational departments, highlighting the current level of the risks relevant to the CIS and outlining any actual or expected breaches to their limits to ensure prompt and appropriate action is taken. Periodic written reports should be submitted to the Board of Directors, providing an in-depth analysis of the consistency between the actual risks and the risk profile of the CIS. The risk management function should periodically report to the senior management about the results of the controls regarding the risk profile of the CIS, the overall adequacy of the risk management and the measures taken to address any deficiencies.

3.6 Segregation of Functions

Asset management companies should be organized in a manner that provides appropriate checks and balances. This necessitates the segregation of control functions from line functions as well as the segregation of front office functions from middle/back office functions to ensure independent verification of trade details and valuations etc.

Depending on the size and complexity of the organization, as well as its culture, this may necessitate dividing responsibilities between a front, middle and back office or in the alternative, front and back office only. From control perspective, the existence or non-existence of a middle office is not particularly important. What is important is that the front office person responsible for bringing in new clients and/or entering into transactions, *i.e.*, the marketer, portfolio manager or trader, is not the person (or the subordinate or superior of the person) responsible for determining the acceptability of the client or counterparty from a credit perspective or for checking and entering full trade details, confirming, comparing and settling the trade, valuing the trade initially and on an ongoing basis,

monitoring the risks attributable to the transaction (consistent with the risk measurement system that has been established), and determining whether it is acceptable to exceed established limits without participation of various control groups.

Appropriate segregation of functions should require that trades be verified, confirmed, compared, valued, etc. by people other than traders and that independent checks and balances exist at every stage of the process to prevent intentional or unintentional misstatements and other errors to remain unresolved.

3.7 Understanding and Managing Risk is Everyone's Responsibility

While designated risk management professionals play a significant role in managing and controlling risk, risk management is much more than policing and enforcing limits. Viewed in the broadest sense risk management is the responsibility of all. Employees at every level should be cognizant of risks and willing to do their part to make sure those risks within their sphere of responsibility are managed in a manner that is consistent with the firm's policies and disclosures provided to clients. Even the most detailed and sophisticated risk management programs are likely to be not effective in the absence of a risk conscious culture.

3.8 Establishment of a Risk Conscious Culture

One of the most important risk controls an Asset Management Company can have is a risk conscious culture in which risks are well-understood, tolerances are clearly defined and risk/return tradeoffs are considered. Creating a risk conscious culture requires conscious effort by senior management. In addition to determining and communicating their risk tolerances, senior managers set the ethical and fiduciary tone for the organization. Whether or not this necessitates the adoption of a formal or a less formal ethics policy but equally rigorous articulation of values. Effective risk management involves having senior management define both the risk profile and values of the organization and communicating them to employees at the outset of the employment relationship and periodically thereafter and require that those values be adhered to at all times by themselves and their employees.

3.9 Internal Audit

An AMC should have a process (for example, an audit committee of the board) that approves the audit program. Internal audit should provide independent assurance to the board, its audit committee or an appropriate senior manager of the integrity and

effectiveness of the systems and controls in place for risk management and should make recommendations where appropriate. Internal audits should be conducted to review compliance with the overall risk management policies and procedures. AMCs should establish a system of independent ongoing assessment of its investment risk management processes and the results should be communicated directly to the board of directors, its audit committee, and/or senior management according to their materiality. Internal auditors should have the requisite level of training and expertise in investment risk management in order to be effective.

3.10 Compliance

The board of directors and senior management should ensure that a named individual is responsible for all compliance matters and that individual should be independent of the risk-taking units. The AMC should have a process for the dissemination of compliance information, ensuring that it has up-to-date staff trainings and that regular compliance reports are produced. Further, it should ensure that there is a procedure to ensure the monitoring of compliance with the overall investment strategy, policies and procedures, legal and regulatory compliance requirements, and the notification of compliance breaches and senior management response and follow up. Senior management and the board of directors should receive regular, timely reports on compliance. A proposed investment decision should have adequate documentation demonstrating that the decision is in compliance with the investment policies and the risk management framework.

4 RISK MANAGEMENT PROCESS AND PROCEDURES

The risk management procedures should ensure that the actual level of the risks incurred by the CIS remain consistent with its risk profile as defined by the Board of Directors in the Constitutive Documents. The risk profile of the CIS should reflect the level of the identified relevant risks that arise from its investment strategy, as well as their interaction and concentration at portfolio level. Risk management procedures can be understood as the set of actions aimed at:

- identifying and measuring the relevant risks;
- assessing their consistency with the CIS risk profile;
- fostering through the appropriate reporting channels the adoption of remedial measures in case of deficiencies; and
- monitoring the efficacy of the action taken.

4.1 Identification of Risks

The risk management process should assess and address all risks relevant to the CIS. Relevant risks should be identified among all possible risks incurred by the CIS, according to the methods and principles defined by the risk management policy of the AMC. The risk management process should regard as relevant the material risks that stem from the investment objective and strategy pursued by the CIS, the trading style adopted by the managers and the valuation process. The identification of risks relevant to the CIS should be conducted under the responsibility of the risk management function, whose advice should therefore help the Senior Management provide a meaningful description of the risk profile of the CIS. However, this identification process should not be a static exercise but, on the contrary, should be periodically revised to allow for possible changes to market conditions or the CIS investment strategy. The risk management function should carry out an appropriate identification of the material risks relevant to the CIS without being bound by the use of a specific risk management model (techniques, methods and technical instruments) within the AMC.

4.2 Risk limits

The risk management policy of the AMC should provide for each CIS a system of limits concerning the measures used to monitor and control the relevant risks. These limits should be approved by the Board of Directors, and be consistent with the risk profile of the CIS. The limit system should refer to the risk profile of the specific CIS and should set

appropriate limits for all potentially relevant risk factors. That is, it should cover all risks to which a limit can be applied and should take into account their interactions with one another. Without prejudice to the limits imposed by the regulations an AMC should define for each CIS the limits that should be complied with by the CIS to maintain consistency with the chosen risk profile. The risk limit system should be consistent with the CIS' investment strategy. The self-defined risk limit system provides for an appropriate way to manage and control risk and should be respected as part of the ongoing risk management process. The AMC should ensure that every transaction is immediately taken into account in the calculation of the corresponding limits. The limit system should be clearly documented and records should also be kept of cases in which the limits are exceeded and the action taken.

4.3 Exception Reporting

The risk management policy should define procedures that, in the event of breaches to the risk limit system of the CIS, result in a prompt correction of the portfolio and provides timing of this. In order to achieve this objective, the process should be designed to trigger a prompt reaction from fund managers if the CIS target risk limit is breached. In order to ensure an efficient rebalancing of the portfolio in these circumstances, the risk management process should employ risk management tools and measurement techniques which are able to provide precise information about the most relevant risk factors to which the CIS is exposed. The risk management process should allow warnings to be generated so that appropriate corrective measures may be taken on a timely basis to prevent breaches. While ongoing warnings should primarily relate to the imminent breach of the predetermined risk limits as set by the risk limit system of the CIS, exceptional warnings may result instead from specific risk assessments addressing possible forecast scenarios that result from a particular concern. In this context, stress tests may contribute to the generation of exceptional warnings which should be adequately taken into account within the investment decision-making process.

4.4 Monitoring of the Risk Management Process

The Board of Directors should receive on a periodic basis written reports from the risk management function concerning:

- the adequacy and effectiveness of the risk management process;
- any deficiencies in the process with an indication of proposals for improvement; and
- whether the appropriate remedial measures have been taken.

The risk management function should review the adequacy and effectiveness of measures taken to address any deficiencies in the risk management process. The risk management process should be subject to appropriate internal or external independent oversight. The risk management function should periodically assess, and consequently report to the Board of Directors, the adequacy and efficiency of the structures, procedures and techniques adopted for risk management.

5 INVESTMENT RISK MANAGEMENT

5.1 Market Risk

Market risk includes:

- interest rate risk: risk of losses resulting from movements in interest rates; to the extent that future cash flows from assets and liabilities are not well matched, movements in interest rates can have an adverse economic impact ;
- equity and real estate risks: risk of losses resulting from movements of market values of equities and other assets; and
- currency risk: risk of losses resulting from movements in exchange rates; to the extent that cash flows, assets and liabilities are denominated in different currencies, currency movements can have an adverse impact.

An AMC should be able to measure its market risk exposure across risk factors (i.e. interest rate, equity and currency) and across the entire portfolio. The AMC should set appropriate metrics to measure exposure to market risk factors.

5.2 Liquidity Risk

Liquidity risk is another key element of market risk that requires significant attention. There are two key components of liquidity risk:

- The liquidity of individual instruments and the implication of such liquidity for pricing; and
- Any mismatch between the liquidity of the portfolio versus the liquidity provisions offered to investors.

An AMC should establish liquidity risk management policies and procedures that form an integral part of their broader risk management framework. As part of these policies and procedures. AMC is expected to continuously monitor their CIS' liquidity profiles and ensure that appropriate levels of liquidity are maintained in the CIS taking into account the liquidity available in the underlying asset market(s), redemption flows or other liabilities. AMC should also make adequate contingency funding plan for meeting liquidity requirement in case of contingency. AMC should also put in place and periodically test contingency funding plans with an aim to ensure that any applicable liquidity management

tools can be used where necessary, and if being activated, can be exercised in a prompt and orderly manner.

5.3 Credit Risk

There are two types of credit risk that are relevant to asset management companies:

- Issuer credit risk is the credit risk attributable to individual securities; and
- Counterparty credit risk is the risk attributable to the downgrading and/or insolvency of a counterparty.

In dealing with issuer credit risk, asset managers typically rely on either rating agencies' assessments where available or their own internal rating systems based on a combination of internal and external analyses. The degree to which independent issuer credit analysis is appropriate differs from firm to firm, depending on the nature of the instruments traded, size, resources and other factors. AMC should conduct independent assessment of credit worthiness of the counter party while taking credit exposure.

Counterparty credit risk is the risk of loss attributable to changes in the ability of counterparties to meet their financial obligations. Exposure to individual counterparties may be present in many different parts of an organization. For example, an AMC may trade, do repos and securities lending with and buy debt and equity issued by a counterparty with whom it has outstanding derivatives transactions. AMC shall develop a comprehensive approach to manage counterparty credit riskand consideration should be given to tracking this risk on an aggregate basis.

5.4 Concentration Risk

The risk measurement process should allow adequate assessment of the concentration and interaction of relevant risks at the portfolio level. Concentration risk can affect a portfolio in several ways. A concentrated, undiversified portfolio has unique risks inherent in its structure. In addition, large concentrations in individual instruments can make liquidation at mark-to-market prices difficult if those mark-to-market prices are based on typical transaction size and do not reflect the size of the position. As a result, mark-to-market values can differ significantly from liquidation values.

In addition to concentration risk at the portfolio level, AMCs face concentration risk across portfolios with respect to both individual investments and strategies. Excessive

concentrations across portfolios and excessive exposure to particular factors (for example value vs. growth) have the potential to put a AMC at risk and need to be tracked and understood.

5.5 Leverage Risk

Leverage can be defined in a variety of ways. The most commonly used definitions involve borrowed money. However, instruments such as options have 'embedded leverage' and instruments such as futures create leverage due to the way they are margined. One common definition of leverage decomposes every instrument into its effective notional long and short components. The total value of the longs plus the total value of the shorts is then divided by the net asset value to compute leverage. Regardless how leverage is defined, it is important from a risk management perspective that the incremental risks to a portfolio attributable to leverage should be understood, tracked and controlled.

5.6 Investment Risk Should be Measured and Monitored

Regardless whether risk tolerances have been selected by the client or asset manager, various metrics should be considered to measure and monitor investment risk. Some common metrics include standard deviation, tracking error, expected shortfall, downside semi-standard deviation and value at risk (VaR). While each metric is useful, none tells the entire story. Thus it is useful to employ a combination of metrics. Measuring risk can be done on either an ex post or ex ante basis as both can be important to a robust approach. Where back-testing is used expected returns, risks and correlations should be updated and reassessed based on comparisons of risk and returns to what back-tests have forecast.

5.7 Performance Measurement and Monitoring

Performance analysis is an important facet of investment risk management. Every portfolio should have a defined benchmark or other objective and should be monitored against that benchmark or objective. Performance attribution should be undertaken to isolate the factors that have contributed to under or over performance.

5.8 Techniques and Tools of Risk Management

The risk management policy of AMC should specify the techniques and tools that are deemed suitable to measure the relevant risk factors attached to the investment strategies and management styles adopted for each CIS. Measurement techniques include both quantitative measures as regards quantifiable risks and qualitative methods. Ongoing risk

management operations involve the computation of a number of quantitative measures (the risk measurement framework), more or less sophisticated in terms of meaning and methodology, which generally aim to address the effects of market risk, credit risk (including issuer risk and counterparty risk) and liquidity risk. The computation of these (more or less sophisticated) measures is carried out by IT systems and tools, which may need to be integrated with one another or with the front-office and accounting applications. Consequently, while the choice of the risk measurement framework should depend primarily on the characteristics of the investment strategies of the CIS under management (higher-risk profile CIS may need more complex measures than plain low-risk profile ones), this may also partly reflect the diversity in size and complexity of the business and organisation of the AMCs. However, AMCs should employ sufficiently advanced risk measurement techniques, being expected to keep up to date with and consider the use of leading market solutions in the interests of investors. If CIS invest in structured products, their multiple risk components should be appropriately identified and managed. When quantitative measurement of the effects of some risk factors is not possible, or produces unreliable results, AMCs may consider integrating and adjusting their figures with elements drawn from a variety of sources, in order to obtain a comprehensive evaluation and appraisal of the risks incurred by the CIS. This approach is also likely to apply to the assessment of non-quantifiable risks, such as operational risk.

5.9 Stress Testing

Stress tests are usually meant to capture the possibility of rare and severe losses which could occur during market shocks and which are unlikely to be measured by the models as they tend to follow structural breaks in the functional relationships between market variables (sudden shifts of crucial model parameters). Stress tests should cover all quantifiable risks which affect to a material degree, the value of the CIS with particular attention given to those risks which are not represented with sufficient accuracy by the risk models used. Such risks might include, for example, unexpected changes to price correlations or to asset (or even market) liquidity. Stress tests may reflect subjective scenario hypotheses based on evidence concerning trading and market conditions (that may relate to either specific securities or an entire portfolio) during past periods of turmoil. However, such scenarios should not merely mirror historical conditions, but should elaborate on the assumption that similar dynamics could affect the risk factors arising from the CIS outstanding exposures. When the investment strategy of the CIS is based on specific

trading or portfolio models and algorithms the risk management function should be adequate to assess and control their use. AMC should conduct ongoing liquidity assessments in different scenarios, which could include fund level stress testing. Liquidity stress testing can be used by AMC to assess the liquidity characteristics of the CIS's assets relative to the CIS's anticipated redemption flows under stressed market conditions and to tailor the CIS's asset composition, liquidity risk management, and contingency planning accordingly.
The performance and oversight of stress testing should be sufficiently independent from the portfolio management function. AMC should maintain appropriate documentation of stress testing and should be able to provide the relevant information to authorities.

5.10 Risk measurement and Asset Valuation

Valuation risk is a subcomponent of investment risk that is key for asset managers because inaccurate valuations result in incorrect NAVs, potentially causing unfair treatment to one set of investors versus another, and possibly inflating manager incentive compensation. investors who buy in at inflated prices or redeem at deflated prices are unfairly disadvantaged. Fair and accurate valuations are essential.

The risk management function should provide appropriate support to the valuation process concerning exposures to illiquid assets, structured securities and complex derivatives. If robust market prices are available, the risk measures should be computed relying on a complete and adequate time series of marked-to-market values. However, when measuring risks of illiquid assets, risk managers should thoroughly check the robustness of their estimates, testing the data used for the computation against the valuations of actual comparable trades. Assumptions and models underlying pricing of illiquid, structured financial instruments (whether or not they embed derivatives) or complex derivatives should be consistent with the risk measurement framework used by the AMCs. These should be maintained and revised over time accordingly (using back-testing etc.).

A valuation committee can provide important supervisory oversight of the AMC's procedures for valuing portfolio instruments. A valuation committee is often responsible for;

(i) approving overrides of prices;

(ii) determining what valuation methodology is appropriate in the case of securities for which there are no readily available market quotations, or for

which special circumstances make the use of readily available market quotations inappropriate;

(iii) approving models and the assumptions to be used in connection therewith, and

(iv) determining fair value for securities for which none of the methods set forth above is deemed to be appropriate.

6 OPERATIONAL RISK MANAGEMENT

In addition to the risks attributable to an asset manager's governance and investment risk management, there are various types of operational risk that need to be addressed. Set forth below are various principles that apply to the management of operational risk.

6.1 Operational Risk Measurement and Monitoring.

Operational risk includes all aspects of errors and mistakes that can be made in the ordinary course of business and well as in a disaster. It is important to have adequate monitoring and tracking of all elements of back office operations that can go wrong. This includes fails, reconciliation differences, customer complaints, guideline breaches, systems issues etc. The key to effective operational risk management is to create a process that tracks the various elements of operational risk over time, identifies trends that could be an early warning sign of trouble and to implement an exception/escalation process that ensures that problems that are significant, large, aged or growing are dealt with at increasingly higher levels of management. Manual processes are generally more likely to cause operational problems than automated ones which have been thoroughly tested. Therefore, they should receive a heightened degree of scrutiny. Likewise, transactions that need to be forced fit into a system need extra scrutiny.

6.2 Availability of Adequate Systems, Processes and Resources

Advances in technology have resulted in the widespread availability of industry standard and proprietary systems for quantitative research, portfolio management, portfolio risk measurement, sales support, trading, settlement and record-keeping. The availability of such tools, while not a substitute for good risk management and oversight, enhances asset managers' ability to track and value positions, allocate trades among various clients measure and monitor risks, improve guideline compliance, control conflicts etc. Conversely, the lack of adequate systems and processes is often a flashing red light indicative of major risk issues. For this reason, it is appropriate for every AMC to review on a periodic basis the adequacy of its systems, processes and resources, taking into account the nature of its products and businesses, size, customer type and other relevant factors.

6.3 Management of Model Risk

Asset managers rely on models for investment decisions, portfolio valuations, measuring and/or guiding risk mitigation, tracking limits & guidelines, analyzing business strategies, etc. AMCs should deal appropriately with the possible vulnerability of their risk

measurement techniques and models (model risk). The quality of risk model-based forecasts should be demonstrably assessed. Essentially, the risk management function should run documented tests to verify that model-based forecasts and estimates correspond, with the appropriate confidence level, to the actual values of the relevant risk measures (back-testing). Back-testing should be carried out separately for every technique used in the risk measurement framework; tests should be run prior to inception (model calibration and internal validation) and, subsequently, on an ongoing basis to check how the model's viability and robustness hold up over time. AMCs should also assess in advance the validity range, market conditions and any inherent or assumed limits of their risk measurements, which generally result from the assumptions underlying the models or the estimation of their parameters. This assessment should be carried out, if needed, through additional diligences which include stress tests.

6.4 Back up , Disaster Recovery and Business Continuity Plan

AMCs should have in place contingency and business continuity plans to ensure their ability to operate as going concerns and minimize losses in the event of severe business disruption. This should cover:-

- Off site backup of key systems and information;
- Details of key suppliers and service providers in case of disaster;
- Details of availability of necessary redundancies including infrastmcture redundancies as well as operational , human capital and human-resource related issues, such as transportation, medical care, accommodating extended absences, law enforcement and insurance issues, among others.

6.5 Effective Records Management

More information and records are created and stored today than ever before. As a result, it is becoming increasingly important for AMCs to establish and maintain an effective records management program that addresses the creation, identification, retention, retrieval, and ultimate disposition of records. In creating and administering such programs, firms may want to consider mechanisms necessary to comply with any preservation obligations resulting from litigation or governmental examinations or inspections. Factors contributing to an effective records management program include:

- realistic and practical policies that are tailored to the particular organization;
- employees being aware of and trained regarding their responsibilities;

- periodic testing of the program to ensure that it is working as intended; and
- revising the program as necessary to adjust to changing circumstances and regulatory environment.

6.6 Effective System Security

AMCs typically are in possession of confidential client, employee and other sensitive information. In addition to having a fiduciary duty to maintain the confidentiality of such information, in many instances they are also subject to privacy and secrecy laws which require not only the safeguarding of such information, but also timely notification of breaches of security. In light of the business, legal and reputational risks associated with breaches of security, maintaining effective information security is critically important. Among other things, this includes:

- Physical Security - i.e. the focus on restricting access to building infrastructure & office space and the safety of personnel. General Controls include physical barriers (security guards, turnstiles etc.) and ensuring that proper background / reference checks are performed for all personnel and third-party service providers. Application controls include door locks, surveillance cameras and environmental monitoring.
- Network Security - i.e., protecting the corporate network from malicious software attacks, the mass loss of data, and unauthorized access by external parties. General controls include internet firewalls, proxy servers, content filters, anti virus, anti Spam, software patch management, remote access security and the continuous monitoring of the network perimeter. Application controls include multi-factor authentication and encryption.
- Information Security - i.e. preserving the confidentiality and integrity of information as it is collected / created, stored, transported, shared / distributed, and retained or destroyed. Where feasible information and systems should be classified and access should only be granted on a need to know basis. General controls include information security policy, awareness training, disposal procedures, access and identity management, and change, problem, and quality management. Application controls include encryption, event logging and the ongoing control testing of high risk information and systems.

6.7 Fiduciary Responsibilities

Fiduciaries have a legal obligation to act in the best interest of their clients, to treat all clients fairly and to meet a very high standard of care. For AMCs acting in a fiduciary capacity, it is important that the nature and extent of their fiduciary duties be clearly understood by employees and clients alike. To accomplish this, fiduciary obligations should be clearly spelled out in applicable investment or management agreements and other legal documentation, and understood by all relevant parties. Equally important, employees need to be cognizant of their fiduciary obligations and to consider those obligations in their ongoing decision-making. If a particular action or decision would benefit one investor or class of investors over another, or other conflicts of interest exist, such action, decision or conflict should be considered from a fiduciary risk perspective and appropriately disclosed and or resolved. The incorporation of a fiduciary mindset into a firm's culture is itself a risk control.

6.8 Risk Pertaining to Subadvisors, Custodians and Outsourced Service Providers

Asset management companies often rely on third parties including subadvisors, custodians and various types of outsourced service providers who perform operational, accounting, recordkeeping and other types of services. In utilizing the services of such third parties, it is important from a risk management perspective to keep in mind that asset managers have ongoing fiduciary obligations to their customers even though they have delegated certain of their responsibilities to others. It is therefore critical to perform careful reviews of the capabilities of third parties at inception of relationships and on an ongoing basis and to review information provided by third parties for completeness, balance and accuracy in order to be able to determine whether such third parties meet the risk management, credit, operational, legal and other relevant standards of the reviewing company with respect to the function they are performing. It is not sufficient to merely ascertain that a prospective subadvisor or provider of outsourced services has in place risk management controls; rather, a qualitative judgment as to their sufficiency needs to be made. Where feasible, on site visits to subadvisors, custodians and other key service providers should be part of the initial and ongoing due diligence.

6.9 New Products and Strategies Risk

The asset management industry is constantly evolving and new products are being developed. Written policies regarding new product development and launch can reduce risk. The approach that can be used is a new product committee/ Management Committee that

typically includes representatives of the front office, operations, systems, risk management, legal, and financial control. Each member is responsible for identifying issues raised by the product within his/her area of responsibility and making sure that these issues are satisfactorily resolved in advance of approval and first use of the product. The decision whether to trade a new product and how to address whatever risk, legal, systems, operations or other issues it raises should be considered and resolved prior to launch of the product.

6.10 Reputation Risk

In fiduciary businesses, reputation is critical. History has shown that the harm caused by reputational risk can be grossly disproportional to the injury caused to investors by matters giving rise to that risk. Sources of "reputational" exposures are present in virtually every facet of an AMC's business and every business/client relationship an AMC enters into. These issues must be evaluated on a continuing basis. To prevent problems from developing, senior management must articulate, adhere to (and require others to adhere to) clear ethical standards and create a risk conscious culture. Asset managers must always remember that they are fiduciaries. To the extent a written ethics statement is in place, it should address how key conflicts are handled so as to control conflicts between the interests of multiple clients and the interests of the firm and its employees.