Risk Management Policy

North Eastern Electric Power Corporation

February 2016

To,

Executive Director (Corporate Planning)
North Eastern Electric Power Corporation Limited
Brookland Compound, Lower New Colony
Shillong-793 003

27 Feb, 2016

Reference: Letter of Award for providing "Consultancy Services for Preparation of Risk Management Policy of North Eastern Electric Power Corporation Limited dated 24.09.2014 (NEEPCO/ED (CP)/T-07/2014-15/205)

Dear Sir,

Subject: Risk Management Policy for NEEPCO

With reference to our engagement please find below the risk management policy for North Eastern Electric Power Corporation. The policy has been prepared utilizing the best practices in the industry while keeping policies of comparable organizations in mind for recommendations. Annexures provide the detailed risk compilation from site visits and interactions with various departments of NEEPCO.

The policy also includes inputs received from risk rating workshop, subsequent presentations with Directors as well as inputs from Audit Committee and NEEPCO's Board. Responsibilities and ratings for each risk have been undertaken collaboratively in the workshop.

Look forward to hear from you.

With Regards,

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1. Introduction

1.1. About organization

North Eastern Electric Power Corporation Limited (NEEPCO), a Miniratna Schedule "A" Government of India Enterprise under the Ministry of Power was set up on the 2nd of April, 1976 to plan, investigate, design, construct, generate, operate and maintain power stations in the North Eastern Region of the country. NEEPCO has an installed capacity of 1287 MW which is 36% of the total installed capacity of the N.E Region

MISSION OF ORGANIZATION

- To harness the vast hydro & thermal power potential
- To produce pollution free and inexhaustible power through planned development of power generation projects.
- To play a significant role in the integration and development of hydroelectric and thermal power in the Central Sector covering all aspects such as investigation, planning, designs, construction, operation and maintenance of hydroelectric and thermal projects which in turn would effectively promote the development of the nation as a whole.

1.2. Need for policy

In today's dynamic business environment risk landscape is evolving very rapidly, and it has become imperative for NEEPCO to take a structured approach for risk management to ensure that all the risks are managed effectively. In the alternative, these risks have the potential to disrupt achievement of NEEPCO's strategic and operational objectives.

Enterprise risk management helps organizations to identify events and measure, prioritize and respond to the risks challenging its most critical objectives and related projects, initiatives and day-to-day operating practices. The objective is to protect stakeholders' value through the establishment of an integrated Enterprise Risk Management Framework to provide clear and strong basis for informed decision making at all levels of the organization. In addition to this, regulatory requirements such as DPE guidelines on Corporate Governance and Companies Act 2013 have been imposed on the organization to have a robust enterprise risk management framework which shall be reviewed periodically, and in lieu of these requirements NEEPCO has decided to formulate Risk Management Policy within the organization.

This policy is a formal acknowledgement of the commitment of the organization to risk management. The aim of the policy is not to have risk eliminated completely from NEEPCO's activities, but rather to ensure that every effort is made by the organization to manage risk appropriately to maximize potential opportunities and minimize the adverse effects of risk. The organization aims to use risk management to take better informed decisions and improve the probability of achieving its strategic and operational objectives.

1.3. Risk management policy statement

NEEPCO recognizes that it is exposed to a number of uncertainties, which is inherent for the power sector that it operates in. The volatility of the power sector affects the financial and non-financial results of the business. To increase confidence in the achievement of organization's objectives, NEEPCO has developed Risk

Management Policy to remain a competitive and sustainable organization and enhance its operational effectiveness.

The policy statement is as given below:

1. To ensure protection of shareholder value through the establishment of an integrated Risk Management Framework for identifying, assessing, mitigating, monitoring, evaluating and reporting of all risks.
2. To provide clear and strong basis for informed decision making at all levels of the organization.
3. To continually strive towards strengthening the Risk Management System through continuous learning and improvement and to achieve the objectives of this policy through proper implementation and monitoring.
4. To ensure that new emerging risks are identified and managed effectively.
5. To put in place systems for effective implementation for achievement of policy objectives through systematic monitoring and effecting course corrections from time to time.

1.4. Objectives of policy

The main objective of this policy is to ensure sustainable business growth with stability and to promote a pro-active approach in identifying, evaluating, reporting and managing risks associated with the business. In order to achieve the key business objectives, the policy establishes a structured and disciplined approach to Risk Management, including the development of the Risk Register, in order to guide decisions on risk related issues. The specific objectives of the Risk Management Policy are:

1. To identify business objectives which reflect the interests of all beneficiaries and stakeholders
2. To identify the threats to the achievement of business objectives
3. To regularly review the risk landscape as a result of business activities and of the business and economic climate in which the Company is operating
4. To regularly review exposure to all forms of risk and reduce it as far as reasonably practicable or achievable
5. To identify and regularly measure key risk indicators and take appropriate action to reduce the risk exposure
6. To regularly review the key risk controls to ensure that they remain relevant, robust and effective
7. To control and manage risk by appropriate risk reduction and mitigation actions

To achieve these objectives, NEEPCO shall adhere to the following core principles:

1. Effective Accountability: The Board has the overall responsibility to ensure effective risk management process within the company.
2. Team's commitment: Every function/ department/ project site/ office in the organization shall work in coordination to ensure effective implementation of this enterprise risk management policy.
3. Proactive Leadership: Risk identification (including identification of the risk of lost opportunities), risk assessment and risk monitoring are ongoing activities and shall form an integral part of the company's operations, management and decision making process. All the identified risks shall be updated in the central repository.

4. Risk Culture: Informed and consistent risk related decisions shall be taken, non-compliant behaviors shall not be tolerated and risk management shall be dealt professionally.

5. Transparency and Compliance: The risk management activities along with the most significant risks shall be reported and the material failures in mitigation measures shall be escalated through reporting line to the relevant levels of organization structure.

1.5. Scope and applicability

The policy guidelines are devised in context of the organization's growth objectives, business profile envisaged and new business endeavors including new projects that may be necessary to achieve these goals and the emerging global standards and leading practices amongst comparable organizations.

Scope of the Policy shall cover:-

- All functions and departments of NEEPCO across all offices and locations
- All Projects (Under Construction and Investigation) of NEEPCO within and outside the country
- All Operational Power Stations of NEEPCO
- All events, both external and internal which shall have an impact on the business objectives of the organization

Applicability of the Policy: -The Risk Management Policy is applicable to the Corporate Office, Regional offices & Liaison offices, Power Stations and all the Project Sites of NEEPCO.

2. Risk governance

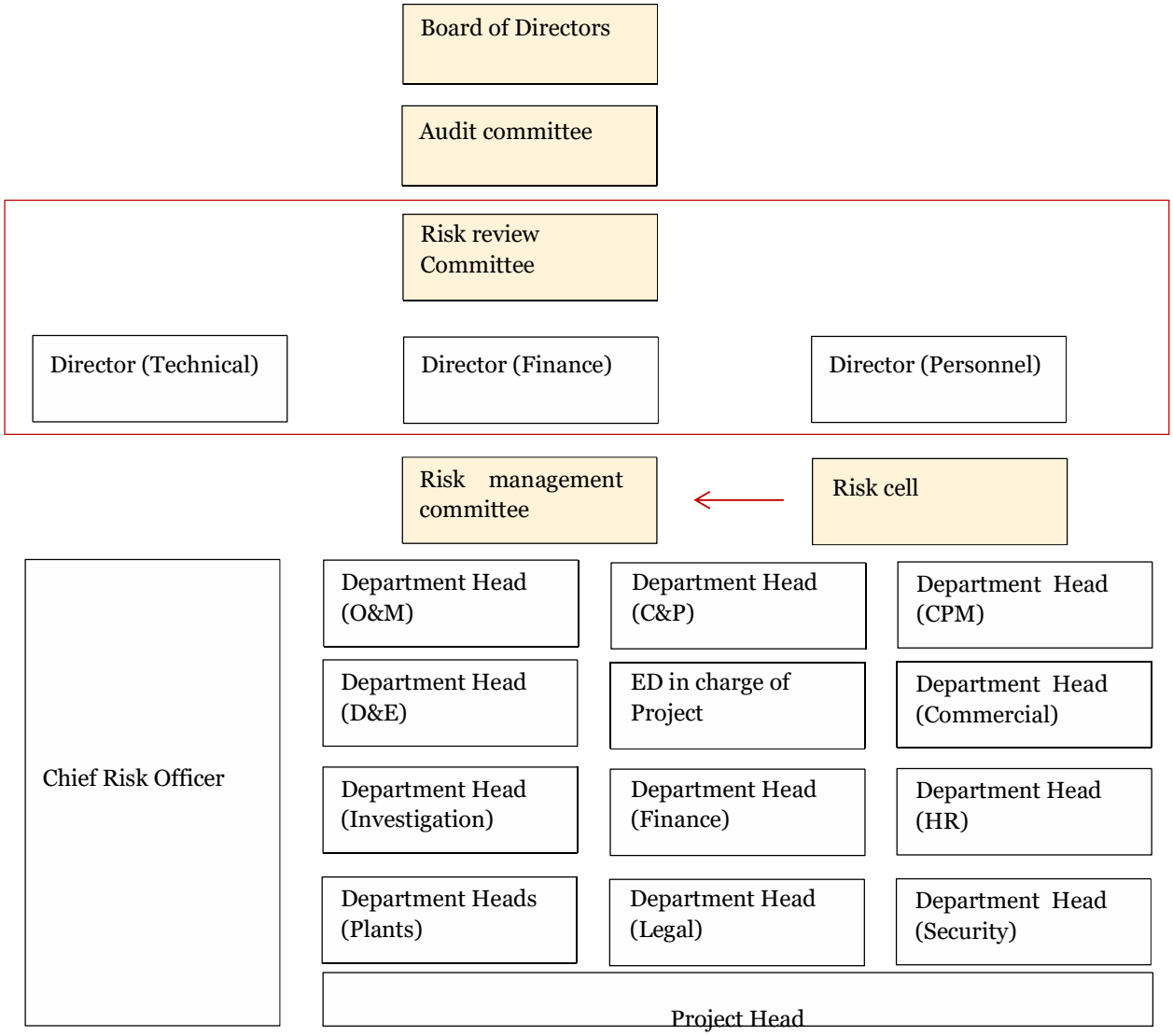
2.1. Risk governance structure

A well-defined risk governance structure serves to communicate the approach of risk management throughout the organization by establishing clear allocation of roles and responsibilities for the management of risks on a day to day basis. In order to develop and implement an Enterprise Risk Management framework, NEEPCO shall constitute a Risk Management Committee to be supported by Risk Cell.

Risk Management Committee shall identify the key risks and report them to the Risk Review Committee which shall ensure that risk management activities are undertaken as per this policy. The main objective of the Risk Management Committee shall be to provide an enterprise wide view of key risks within the organization to the Risk Review Committee.

The Risk Management Committee shall comprise of Chief Risk Officer (CRO) and heads of departments/ projects. The Risk Review Committee shall comprise of Chairman & Managing Director, Director - Technical, Director - Personnel and Director - Finance and shall appraise key risks to the Board.

The diagram below outlines the governance structure for NEEPCO: -



2.1.1. Audit committee

Constitution of Audit Committee

1. Director -Technical
2. Independent Directors - 2

Role and Responsibilities of the Audit committee:

The audit committee has the key role of review an evaluation of Company's financial and risk management policies and systems. The committee will review the risks presented by Risk review committee and present the relevant findings to the Board of Directors.

2.1.2. Risk review committee

Constitution of Risk Review Committee

1. Director - Technical
2. Director - Personnel
3. Director - Finance

The Risk Review Committee has the key role of aligning the strategic objectives with the organization's operations in order to achieve intended outcomes. The senior most Director would be the Chairman of the committee. Chief Risk Officer (CRO) would act as a convener for the meeting.

Role and Responsibilities of the Risk Review Committee:

- Aligning the strategic objectives with the organization's operation in order to achieve intended outcome
  and report to Audit Committee for further review and evaluate.
- Overall responsibility to oversee the process of Risk Management, as well as for forming its own opinion on the effectiveness of the Risk Management framework and the efficiency of the Risk Management process by engaging in substantive dialogue around key risks.
- Discuss key risks affecting the ability of NEEPCO to achieve its strategic purpose and objectives.
- Ensure that appropriate systems are in place to manage the identified risks, so that the company's
  assets and reputation are suitably protected.
- Ensure that responsibility and authorities are clearly defined and adequate resources are assigned to implement the Risk Management Policy.
- Review the minutes and reports from the Risk Management Committee and take remedial action.

2.1.3. Risk Management Committee

Constitution of Risk Management Committee:

1. The Chief Risk Officer (CRO)
2. Department Heads ((O&M, C&P, CPM, CP, D&E, ED in charge of Projects, Commercial, Investigation, Finance, HR, Legal, Security, HOD (IT), HOD (Environment Cell), HOD (QSHE), HOD (M&HS), CS & LA)
3. Head of Projects

Role and Responsibilities of Risk Management Committee:

The Risk Management Committee shall have the key role of identifying the key risks, suggest mitigation measures, monitoring and supervising the implementation of the Risk Management Policy and maintain enterprise wide view of the key risks faced by the organization.

- Identify the key risks anticipated for the organization and suggest mitigation measures to the concerned departments/project sites on bi-annual basis.
- Ensure that effective risk mitigation plans are in place and the results are evaluated and acted upon.
- Report the key risks faced by the organization and the mitigation plans to the Risk Review Committee on bi-annual basis.
- Ensure that the Risk Review Committee is informed about any new/emerging risks faced by the organization in case of exigencies/emergent conditions.
- Assist the Risk Review Committee in overseeing and monitoring the development and implementation of the Risk Management Policy.
- Assist the Risk Review Committee in decision making for risk management responses for identified key risks.
- Map the risks reported according to their ratings on a regular basis.

2.1.3.1. Chief Risk Officer

The Chief Risk Officer (CRO) shall be appointed to work with the departments/project site/power station heads in establishing and implementing the risk management process effectively in their areas of responsibilities.

Roles and Responsibilities of the CRO:

- Communicating and managing the establishment and ongoing maintenance of risk management policy pursuant to the organization's risk management vision.
- Designing and reviewing processes for risk management.
- Communicating with the Risk Review Committee regarding the status of risk management and reporting the key risks faced by the organization.
- Facilitating discussions among the Risk Management Committee to fulfill its responsibilities.
- Validating that the risk management policy is implemented in each department/ project site/ power station and that all significant risks are being recognized and effectively managed in a timely manner and conduct reassessment of the same, if required.
- Risks identified shall be widely circulated within the organization.

2.1.4. Risk cell

The Risk Cell shall be a team of dedicated members who shall report directly to the CRO.

Roles and Responsibilities of the Risk Cell:

- Assist the CRO in organizing Risk Management Committee and Risk Review Committee meetings.
- Record the key risks and their mitigation plans in the risk register as agreed by the Risk Management Committee and put up for the perusal of CRO on regular basis who shall report it to the Risk Review Committee.

2.2. Risk reporting structure

The following risk reporting structure shall be followed by the organization:

First Line of Reporting:-

- The department/project site/power station heads shall identify the key risks of their respective departments.
- The department/project site/power station heads shall ensure the implementation of risk mitigation plan within their respective departments/ power stations/ project sites.
- The department/project site/power station heads shall send the report on status of risks and mitigation measures taken on quarterly basis to the CRO for reporting in the Risk Management Committee.

Second Line of Reporting: -

- The Chief Risk Officer along with the other members of the Risk Management Committee shall bi - annually identify the risks and decide upon the key risks which shall be reported to the Risk Review Committee.
- After the Risk Management Committee decides the mitigation plan, Risk Cell shall record it in the risk register and handover the key risks with their mitigation plans to the CRO who in turn shall inform the concerned department/project site/power station heads for the implementation of the mitigation plans.
- Upon deciding and implementing the mitigation plan the Risk Management Committee through the CRO shall present it to the Risk Review Committee. The risk register shall contain:
  - Function/ department wise record of top risks
  - Risk category wise record of top risks
  - Treatment plans for the top risks

Third Line of Reporting:-

- The Risk Review Committee shall annually apprise the audit committee board on the key risks faced by the organization and the mitigation measures taken.
- The Risk Review Committee shall also apprise the audit committee for decision on any new/emerging risks faced by the organization in case of exigencies/emergent conditions.
- The Audit committee will present the relevant findings to the Board of Directors for approvals/actions.

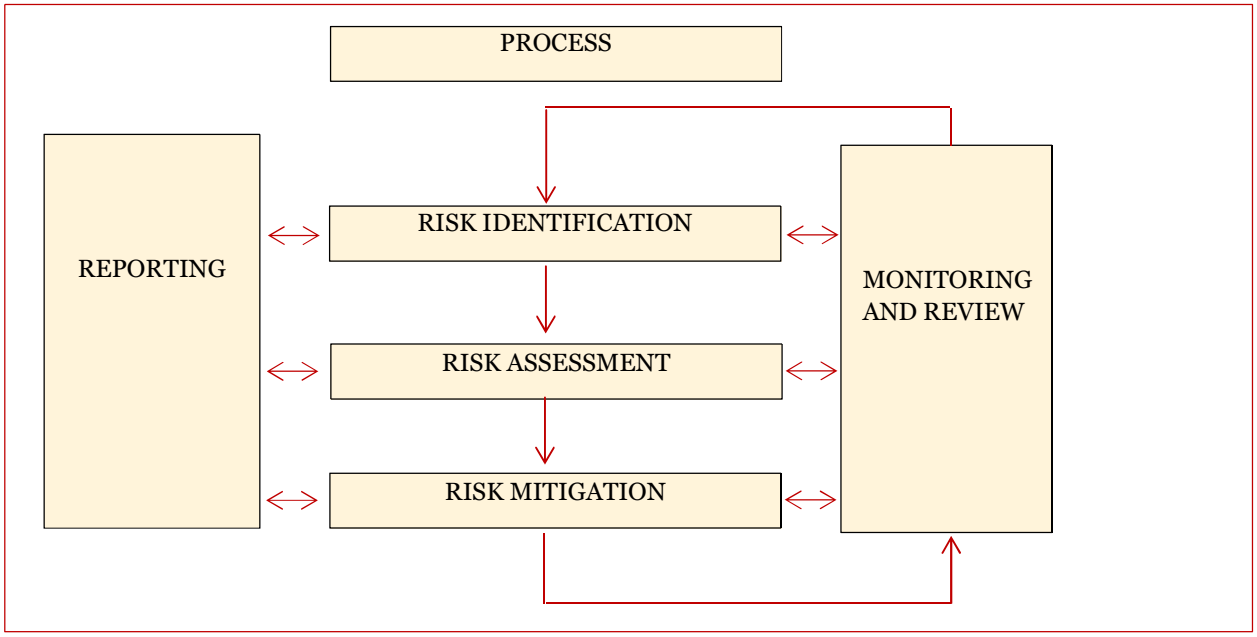
3. Risk management approach

Risk Management is the process which shall enable the organization to identify, assess and treat risks. It is the responsibility of everyone in the organization viz. Board, Management Team and all NEEPCO personnel. Risk Management applies to all functions, departments and operations within the organization.

The primary objective(s) of establishing a Risk Management Process is to ensure that:

- Risks faced by the organization shall be identified and collected in a central repository, enabling the top management to take a comprehensive view of the same
- Risks identified shall be assessed, mitigated, monitored and reviewed on an ongoing basis.

The Risk Management Process is depicted below:



3.1. Risk identification

Risk identification sets out to identify an organization's exposure to uncertainty. This requires an in-depth knowledge of the organization, the market in which it operates, the economic, legal, regulatory, social, political, technological and cultural environment in which it exists, as well as the development of a sound understanding of its strategic and operational objectives, including factors critical to its success and the threats and opportunities related to the achievement of these objectives.

Risk identification shall be approached in a methodical way to ensure that all significant activities within the organization have been identified and all the risks flowing from these activities defined.

The following methodologies can be used to identify risks:

- Brainstorming
- Surveys /Interviews/Working groups
- Experiential or Documented Knowledge

- Risk Lists - Lessons Learned
- Historical risk event information

3.1.1. Risk categorization

All the risks that have been identified shall be classified under the following risk categories - Strategic, Financial, Operational and Compliance risk.

- **Strategic Risk** - Risk of loss resulting from business factors. These risks adversely affect the achievement of strategic objectives and may impair overall enterprise value.
- **Financial Risk** - Risk directly impacting the balance sheet and access to capital.
- **Operational Risk** - Risk of loss resulting from inadequate or failed processes, people and information systems.
- **Compliance Risk** - Risk of loss resulting from legal and regulatory factors, such as strict privacy legislation, compliance laws, and intellectual property enforcement.

From the point of view of tracking, risks have further been divided on the business units handling the risk mitigation.

- **Corporate Level Risk**-These risks will be handled by the corporate team and would require mitigation for the entire organization. For e.g. financing, strategy, design risks etc. would need mitigation from corporate offices.
- **Projects - Hydro Risks**- These risks deal with hydro projects specific risks and need mitigation at the plant head level. For e.g. operations, R&R, land acquisition would need mitigation from each hydro project. This category would cover both under construction as well as completed project risks.
- **Projects -Thermal Risks**- These risks deal with thermal projects specific risks and need mitigation at the plant head level. For e.g. operations, fuel procurement etc. would need mitigation from each thermal project. This category would cover both under construction as well as completed project risks.
- **Projects - Renewable Risks**- These risks deal with Renewable projects specific risks and need mitigation at the plant head level. For e.g. implementation of JVs for renewable projects, project management, operations of the plant would need mitigation from each hydro project. This category would cover both under construction as well as completed project risks.

3.2. Risk assessment

Risk assessment allows an entity to consider the extent to which potential events have an impact on achievement of objectives. The events are assessed from two perspectives likelihood and impact. The positive and negative impacts of potential events are to be examined, individually or by category, across the entity.

Risk Rating is the result of the product of impact and likelihood of occurrence of a risk with the consideration of controls in place.

The risks identified shall be evaluated by their likelihood and impact parameters as per the following methodology:

Impact Rating : Determination of Financial, Operations, Legal & Regulatory impact due to risk occurrence				
Risk Category	Impact Parameters	Measurement Reference		
		Low (Rating 1)	Medium (Rating 2)	High (Rating 3)
Financial	Impact on key company financials such as operating revenue	Insignificant impact on company financials - operating revenue (Cost of impact is likely to be less than Rs. 1 Crores p.a.- Less than 0.1% of revenue)	Moderate impact on company financials - operating revenue (Cost of impact is likely to be between Rs. 1-10 Crores p.a.- Between 0.1%-1% of revenue)	Significant impact on company financials - operating revenue (Cost of impact is likely to exceed Rs. 10 Crores p.a.- 1% of revenue)
Strategic	Impact on key strategies for organization such as customers, employees and vendors	Minimum impact on stakeholders	Moderate impact on stakeholders	Significant impact on stakeholders
Operations	Impact on service availability, productivity, third party relationships, brand value and reputation	Minimal impact on operations	Moderate impact on operations	Significant impact on operations
Compliance	Legal and Regulatory breach and its consequences due to non-compliance to legal and regulatory requirements	Minimal or No Impact	Moderate compliance failures detected, limited penalties	Significant compliance failures detected, show cause notice or Significant penalties

Estimate impact of event:

Process of impact of risk quantification for the company has to be qualitative, supported by quantitative impact analysis. To apply this approach, the chain of adverse consequences, which may occur in case the identified risk materializes, shall be enlisted. For each of the chains of adverse consequences, the cost impact needs to be calculated and attributed to the particular risk. In such an exercise, actual cost impacts (like claims by contractor, loss of equipment value, etc.) as well as opportunity costs (like loss in realization of revenue, delay in commission of project etc.) must be captured to arrive at the total cost impact of materialization of the risk. This has been based on OHSAS, QMS guidelines as well as industry standards.

In case, the rating based on different parameters are different, higher of the two or more ratings shall be considered as the final risk rating.

E.g. For a particular risk, Impact rating is 3 based on the Financial parameter and 2 based on the Operations parameter, the final impact rating shall be taken to be as 3.

Estimate Likelihood of occurrence:

Process of likelihood of risk quantification for the company has to be qualitative based on Stakeholder discussions and supported by data on the occurrence .To assess the likelihood, the following classification matrix shall be considered as below. This has been based on OHSAS, QMS guidelines as well as industry standards:-

Likelihood Rating: **Determination of Risk occurrence**		
Risk Measurement Score (Likelihood)	**Classification**	**Supplement information to determine the score of Likelihood.**
1	Unlikely	Rare Occurrence based on History
2	Likely	Annual occurrence
3	Very Likely	More than once in a year

The Following table shall be used to analyse and calculate the Risk exposure:

Sl no	Risk Description	Risk Impact			Likelihood Rating	Risk Exposure	Mitigation Plan	Mitigation Status	Remarks
		A			B	C = A x B			
		Risk Category	Rating	Final impact rating(Highest of impact ratings)	Based on Stakeholder views				
		Financial							
		Strategic							
		Operational							
		Compliance							

Risk Exposure:

The risk assessment methodology adopted defines risk exposure as a product of Impact (rating) of the risk and the Likelihood of occurrence (rating) of the risk.

Impact	x	Likelihood	=	Exposure
(Rating from 1 to 3)		(Rating from 1 to 3)		(Rating from 1 to 9)

The ratings of risk exposure are as follows**:-**

Risk Exposure Rating	
Risk Exposure Score	Classification
<=3	Low
>3 &<=6	Medium
>6 &<=9	High

3.3. Risk mitigation

There are four common strategies for treating risk. There is no single "best" response strategy, and each risk must be considered on its own merits. Some risks may require a combination of strategies and multiple responses, whereas others may need only one strategy with a single response.

- **Risk avoidance/ termination:** This involves doing things differently and thus removing the risk (i.e. divestments). This is particularly important in terms of project risk, market risk or customer risk but often wishful thinking in terms of the strategic risks.
- **Risk reduction/ treatment:** Reduce or Treat the risk. This is the most widely used approach. The purpose of treating a risk is to continue with the activity which gives rise to the risk but to bring the risk to an acceptable level by taking action to control it in some way through either:
  - Containment actions (lessen the likelihood or consequences and applied before the risk materializes) or;
  - Contingent actions (put into action after the risk has happened, i.e. reducing the impact. Must be pre-planned)
- **Risk acceptance/ retention:** Accept and tolerate the risk. Risk Management doesn't necessarily mean risk reduction and there could be certain risks within the organization that it might be willing to accept and continue with its operational activities. NEEPCO shall tolerate such risks that are Considered to be acceptable, for example:
  - a risk that cannot be mitigated cost effectively;
  - a risk that opens up greater benefits than loss
  - uncontrollable risks

  It's the role of Risk Management committees to decide to tolerate a risk, and when such a decisionis taken, the rationale behind it shall be fully documented. In addition, the risk shall continue to be monitored and contingency plans shall be in place in the event of the risk occurring.

- **Risktransfer:** Transfer some aspects of the risk to a third party. Examples of risk transfer include insurance and hedging. This option is particularly good for mitigating financial risks or risks to assets.

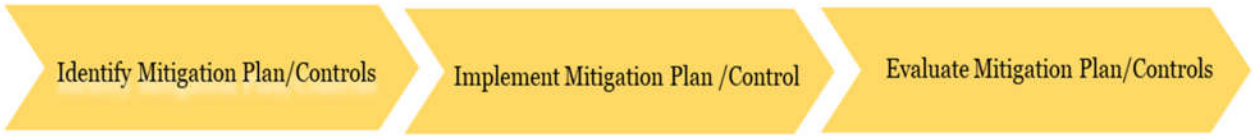
a) The following aspects shall be considered for the transfer of identified risks to the transferring party:
   - Internalprocesses ofNEEPCO for managingand mitigating the identified risks.
   - Cost benefit of transferring the risk to the third party.

b) Insurance can be used as one of the instrument for transferring risk.

Risk Reduction/ Mitigation Process

The risks are identified and the risk mitigation mechanism selected is risk treatment or risk transfer. The next step shall be to review and revise existing controls to mitigate the risks falling beyond the risk appetite and also identify new and improved controls.

Risk Mitigation Process:



Identify controls

New control activities are designed in addition to existing controls post assessment of risk exposure at current level to ensure that the risks are within the accepted risk appetite.

Control activities are categorized into Preventive or Detective on the basis of their nature and timing:

- Preventive controls - focus on preventing an error or irregularity
- Detective controls - focus on identifying when an error or irregularity has occurred. It also focuses on recovering from, repairing the damage from, or minimizing the cost of an error or irregularity.

Evaluate Controls

The controls identified for each risk event shall be evaluated to assess their effectiveness in mitigating the risks falling beyond the risk appetite.

Implement Controls

It is the responsibility of the Risk Management Committee to ensure that the risk mitigation plan for each function/department/power station/project site is in place and is reviewed regularly.

3.4. Risk management and review

The Risk Management Committee is the key group which shall work on an ongoing basis within the risk management framework outlined in this policy to mitigate the risks to the Organization's business as it may evolve over time.

3.4.1. Risk Monitoring

As the risk exposure of any business may undergo change from time to time due to continuously changing environment, the risks with their mitigation measures shall be updated on a regular basis.

The following process shall be followed:

Quarterly

1. The departments/ project sites/ power stations head shall review the status of risks and treatment actions.
2. Any new or changed risks shall be identified and escalated, if deemed necessary to the Chief Risk Officer (CRO).

Bi - Annually

1. The CRO along with the other members of the Risk Management Committee shall identify the key risks to be put up in the Risk Review Committee meet.
2. The Risk Management Committee shall monitor and supervise the development and implementation of the Risk Management Policy and maintain enterprise wide view of the key risks and their mitigation measures faced by the organization.
3. The Risk Management Committee shall report the key risks and their mitigation plans to the Risk Review Committee on bi-annual basis.

Annually

1. The Risk Review Committee shall annually apprise the Audit Committee on the key risks faced by the Organization and the mitigation measures taken. The Audit Committee will present the relevant findings to the Board of Directors for approval /actions.

3.4.2. Risk Review

Effective risk management requires a reporting and review structure to ensure that risks are effectively identified and assessed and that appropriate controls and responses are in place. Regular audits of policy and standards compliance shall be carried out and standards performance reviewed to identify opportunities for improvement. It shall be remembered that organization is dynamic and operate in dynamic environment. Changes in the organization and the environment in which it operates must be identified and appropriate modifications made to risk management practices. The monitoring process shall provide assurance that there are appropriate controls in place for the organization's activities and that the procedures are properly understood and followed.

Any monitoring and review process shall also determine whether:

- The measures adopted resulted in what was intended.
- The procedures adopted and information gathered for undertaking the assessment was appropriate.
- The acceptability of each identified risk and their mitigation plan shall be assessed and risks shall then be ranked to identify key risks for the organization.
- Proposed actions to eliminate, reduce or manage each material risk shall be considered and agreed.
- Responsibilities for the mitigation measures for key risks management of each risk shall be assigned to appropriate department/power station/project site heads.

The head of departments/head of projects shall review progress on the actions agreed to mitigate the risk and make an assessment of the current level of risk including:

- Establishing whether actions have been completed or are on target for completion.
- Report the status of implementation of mitigation plans to the Risk Management Committee.

4. Operation of risk management policy

4.1. Approval of the Policy

The Board shall be the approving authority for the company's overall Risk Management Policy. The Board shall, therefore, monitor the compliance and approve the Risk Management Policy and any amendments thereto from time to time.

4.2. Review of the Policy

The risk management policy shall be reviewed as and when required but not later than 5 (Five) years based on changes in the business environment/ regulations/ standards/ best practices in the industry by an outside consultant/ organization or in-house that would present their recommendations to the Chief Risk Officer.

4.3. Maintenance of Risk Register

- Centralized Risk register with their mitigation plan shall be maintained by CRO/ Risk Cell and shall be reviewed and updated as per the policy guidelines.
- Manual reporting would be undertaken by each business unit which will be upgraded to tool based reporting post enterprise risk management implementation.

Appendix 1 A - Appendices

Reporting formats

S.No.	Risk Description	Risk Category	Impact	Likelihood	Rating	Responsibility	Risk Mitigation Measure

Key definitions

Risk

Risk is the effect of uncertainty on objectives. It is expressed as a combination of the probability of an event over a given period of time and its consequence. Events with a negative impact represent risks, which can prevent value creation or erode existing value.

Risk Management

Risk management is a set of coordinated activities to direct and control an organization with regard to risk. Risk management includes risk identification, risk assessment, risk mitigation, risk acceptance and risk communication.

Risk Identification

Risk identification is the process of identifying the organization's exposure to uncertainty.

Risk Assessment

Risk assessment is the overall process of risk analysis and risk evaluation. It allows an entity to consider the extent to which potential risk events have an impact on achievement of objectives.

Risk Mitigation

Risk mitigation determines the way to deal with risk. Various mechanisms to mitigate risk are:

I. Risk avoidance/ termination - decision not to become involved in, or action to withdraw from, a risk situation.

II. Risk transfer - sharing with another party the burden of loss or benefit or gain, for a risk.

III. Risk reduction/ treatment - actions taken to lessen the probability, negative consequence, or both, associated with a risk.

IV. Risk acceptance/ retention - the acceptance of the burden of loss or benefit or gain, for a risk.

Risk Appetite

Risk Appetite is the broad-based amount of risk a company or other entity is willing to accept in pursuit of its business objectives and goals.

Risk Register

A 'Risk Register' is a document for recording the risks in a standardized format.

Tools for quantification and prioritization of risks

Every company in varying sectors have different approaches for quantification of risks. Some of the practices are illustrated below for reference:-

1. Economic Capital

Management must understand the organization's overall risk and whether taking that risk provides an adequate return. Capital frameworks measure exposure across quantifiable risks. Economic capital models can align with the organization's specific risks and objectives, provide a consistent view on the capital required to support those risks, and help inform management about risk and return trade-offs.

Economic capital is commonly understood to utilize a value-at risk measure on the potential loss of market value balance sheet surplus. Regardless of the precise methodology, any economic capital framework seeks to determine how much capital should be held to support the actual risks the company faces. The capital definition should be aligned to a company's risk appetite definition and its unique objectives.

Some key related methodologies are as below-

(a) **Valuation framework**: Commonly economic capital frameworks utilize observable market variables to value assets and liabilities. Alternatively, an economic balance sheet can be defined with a discounted cash flow approach using current, but not necessarily market-consistent, assumptions. Because of their book value principles, GAAP and statutory balance sheets do not capture risk if required capital is quantified in terms of short-term losses.

(b) **Time horizon**: Most commonly economic capital is defined by the potential loss over a one-year horizon, where the market value at each point in time reflects the full tail of the liabilities and the applicable risk margins. A run-off approach is sometimes used that could focus on how cash flow or surplus emerges over a long-term projection, but companies typically prefer the simplicity of a short-term approach. The time horizon should be linked to the valuation framework. For example, a market-consistent valuation framework is commonly used with a short-term horizon, where a statutory-based framework may be utilized with a long-term run-off approach.

(c) **Risk measure and confidence level**: Regardless of the balance sheet and time horizon, a company must decide to what part of the tail it plans to measure exposure. While 99.5% value at risk is common, different confidence levels and risk measures (e.g., CTE98) could also be considered, depending on the valuation framework. Ultimately, the risk metric and confidence level should align to the unique objectives of each organization.

2. Stress Testing

Stress testing is a powerful tool to supplement a company's internal capital model due to its conceptual simplicity. Stress-testing results are easy to explain to senior management and can drive home an understanding of a company's most material risk exposures. The approach does not attempt to capture all quantifiable risks, but instead illustrates the future financial impact over several periods of adverse, yet plausible, scenarios involving one or more risk factors. Executives hesitate to act on measures they do not fully comprehend — like a diversified 99.5% value-at-risk measure on an economic balance sheet, for example. Conversely, "If this economic scenario unfolds over the next several years, here's how our balance sheet will look" can be powerful enough to drive management actions. A forward-looking stress test projects a balance sheet for a given adverse deterministic scenario. Consider the following in such an approach:

(a) Balance sheet: Any balance sheet definition that is important to the organization (e.g., GAAP, statutory, economic) should be considered.

(b) Income statement: For companies utilizing a GAAP-based stress-testing approach, the balance sheet and income statement respond differently to market changes (e.g., unrealized gains flow through other comprehensive income rather than net income). Typically a projected balance sheet is the test's focal point, but management also values understanding the income impacts.

(c)Scenario types: The risk materiality should drive the scenarios selected. This will vary by company, though commonly market risk is the most material and scenarios are hence focused on market events. • Scenario quantity: No absolute rules exist for the number of scenarios. Companies should use enough scenarios to cover the most material risks, but not so many that the message gets lost.

(d) Projection length: The emerging consensus is to project the balance sheet for the business planning period (typically three to five years) since the purpose of the exercise is to inform management decisions.

Presently, in industry multiple IT based tools are present which can be used by NEEPCO in effective implementation as well as quantification of risk.

Top risks identified (Post inputs from workshop, site visits and subsequent presentations

S no	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
1	Strategic	Corporate/ Projects- Hydro/ Projects- Thermal/ Projects- Renewable	Land Risk	Delays in acquisition of land for various locations of the project such as dam, power house, switching yard etc leading to project execution challenges	High	High	1. Liaison with State Government departments through the Relationship Management Committee to develop a provision for land acquisition. 2. Apart from direct compensation for assets lost to land acquisition, benefit sharing programs should be designed to sensitize the indirect benefits of development projects to the impacted stakeholders. 3. Create large pool of locally available skilled and employable people to ascertain less resistance from local people for land acquisition, as they will get employment from the project. 4. Monitor the effectiveness of compensation, relocation, and assistance programs provided at the time of Rehabilitation & Resettlement.	ED in charge of the project/HOP/Land acquisition Cell
2	Operations	Projects- Hydro	Geological Risk	1. Land Slide during construction stage leading to stopping of work in the following area: a. Approach Road b. Excavated Area in Dam, Adits, Surge	High	High	1. Landslide hazard zonation mapping of the project 2. Assess their impact on the project and make necessary provisions 3. Build a Knowledge Management System which will be the repository of all projects related information. This System can be used to understand the	ED(Projects)-Hydro/ED(S&I)/ HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
				Shaft, Valve House, Surface Penstock, Vertical Shaft and Power House 2. Land slide in reservoir area in O&M stage			reasons for cost and time overruns on account of uncertain geological conditions. Estimation for new projects should take these learning into account. 4. Ensure detailed surveys / studies are carried out by competent personnel / consultants during the detailed Investigation (DPR) stage to address geological challenges anticipated in the feasibility stage. 5. Ensure effective implementation of project design in line with the DPR prepared during the detailed Investigation stage of the project. 6. Ensure a comprehensive analysis is performed to ascertain the causes of adverse events with regard to geological aspects. 7. Ensure that standards defined at the project conception are strictly adhered to in project implementation	
3	Strategic	Corporate	People Risk	Shortage of skilled manpower resources at supervisory and mid management level-Lack of skilled manpower resources at supervisory and mid management levels due to reduced recruitment and aging workforce and lack of	High	High	1. Manpower planning/assessment and Succession Planning shall be performed annually to establish staffing levels and a systematic process shall be followed for identification of required human capital resources, adequate competencies and the development of strategies necessary to meet these requirements.	Head of HR

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
				adequate quality of outsourced resource at workman/labour level			2. Key demographic employment data and characteristics (e.g. sex, average age, occupational groups, skills/competency profiles, etc.), internal workforce trends (e.g. retirement eligibility, vacancy rates, turnover, etc.) and inputs from various departments are important factors which should be considered when conducting a comprehensive manpower analysis. 3. Adopt HR tools like employee satisfaction survey, exit interviews and external benchmark study to frame and implement a companywide retention policy to prevent loss of business skills and check attrition.	
4	Strategic	Corporate	Competition Risk	Process of decision making leading to opportunity loss for NEEPCO	High	High	1. Design a system workflow for the approval of files or procedures to improve coordination between various departments and enable quick response and prompt decision. 2. The estimated turnaround time for these decision and the responsibility centres for decision making shall be clearly identified. Notification mails and alerts shall be inbuilt in the workflow which will send alerts to the personnel as the deadline for decision making approaches. 3. Undertake tendering to empanel agencies for bidding for projects.	ED(CP)/CGM(QSHE)

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
5	Financial	Corporate	Recovery Risk	Non recovery of tariffs from state governments leading to cash flow and growth restrictions on the organisation- Around 1500 Crores pending with State governments (As on Mar, 2014)	High	High	1. Appropriate payment security mechanisms needs to be enforced in case of utility default in payment. Renewable sources are expected to have maximum priority in payment by utilities. Hence stringent payment security mechanisms can be enforced. 2. In case of state utilities defaulting, liaison with state and central government for clearance of dues. 3. Create alternate modes/plan for power sale in case utility defaults.	ED(Commercial)
6	Operations	Projects-Hydro/ Projects-Thermal/ Projects0 Renewable	Project Risk	Law and Order issues along with lack of infrastructure at sites leading to project time and cost overruns	High	High	1. Proactively liaison with Government departments and maintain healthy relations. 2. Updation of CSR policy in line with major industry standards 3. Collaborate with the State Ministry to set up cells with the objective to sensitize the people and create awareness regarding the benefits and inherent advantages of hydropower projects. 4. Take up the matter of Law and order due to local agitation with the concerned administration highlighting the importance of such projects for the development of State or region. 5. Constitute a Social Responsibility Cell to actively engage with local administration as part of local area development committee to discuss the	ED(Security) / HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
							modalities of the company's social. 6. Social Responsibility Cell shall factor in the social costs as part of its CSR/R&R activities to create employment opportunities	
7	Strategic	Projects-Renewable	Capability Risk	Lack of expertise in new areas of growth like renewables/ JVs.	High	High	1. A dedicated team shall be assigned to gain thorough knowledge of the Thermal, Solar & Wind Power sector. 2. The team shall be adequately trained to develop competency in these sectors. 3. Knowledge repository shall be built in NEEPCO for supporting creation, capture, storage and dissemination of information related to Thermal, Solar & Wind Power sector. This will enable employees to have ready access to the organization's documented base of facts, sources of information, and solutions. 4. Engagement with technical and management consultants with the perspective of capacity building in the domain	ED(RE) / ED(CP)
8	Operations	Projects-Hydro/ Projects-Thermal/ Projects-Renewable	Disaster Risk	Lack of sensitization on disaster management policies at corporate and plant level	High	High	1. Disaster management policy for the organization incorporating the best in industry as well as taking into account the local conditions and the technology under implementation for NEEPCO 2. Training workshops on disaster management at the plant with	HOPs/ HODs

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
							quarterly drills for implementation of learnings from the workshops	
9	Operations	Projects-Hydro/ Projects-Thermal/ Projects-Renewable	Project Risk	Non availability of contractors in case of breakdown at site	High	High	1. Identify Contractors having specialized capabilities to attend major breakdown of the machines. 2. Empanel the contractors that would be available at short notice for attending breakdowns at project sites in remote areas. 3. Develop Contractors development programme to encourage and train contractors in execution of specialized maintenance requirements.	ED in charge of the project/HOP
10	Strategic	Projects-Hydro/ Projects-Thermal	Project Risk/ Performance Risk	Lack of performance and technical audit for power plants leading to sub optimal performance	High	High	1. Plant performance audits have not been conducted for plants which have been in operation for years 2. Technical reviews and performance audits can optimize the plant performance- Can also reduce any penalties that the organization is paying for reduction in plant performance with age of the plant 3. Technical/ Plant performance audits can improve the PLF of the plant along with enhanced preventive maintenance of equipments thereby increasing the life of the plant	ED(O&M) / HOP
11	Strategic/ Financial	Corporate	Compliance Risk/ Claim Risk	Lack of standard processes to handle claims/ litigations	Medium	Medium	1. Prepare a claim management manual for use uniformly across the organization.	ED(C&P)

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
				leading to possible liabilities for organisation			2. Empanel reputed firms for providing case as well as expert witnesses for taking up in case of national/ international arbitrations 3. Encourage plant heads to prepare delay files for documenting all delays from contractors/ suppliers in case of claims at the time of plant commissioning	
12	Strategic	Corporate	Project Risk/ Time Risk	Empowering Project Management division to avoid delays in Project execution	High	High	1. Develop an internal mechanism for proper monitoring of project execution (Integrated Scheduling, regular updation and corrective actions, cost components). Review the effectiveness of procedures in case project is delayed by 5% of the project time schedule to improve the planning and execution to avoid time or cost overruns. 2. Ensure adequate resource allocation and efficient mobilization to overcome manpower shortage through effective project monitoring. 3. Implement a system to regularly review costs and fix appropriate responsibility centers for managing costs of the project. 4. Continuous monitoring of the controllable delays to protect the company from adverse effects of time and cost overruns. Uncontrollable delays to be recorded and passed onto the beneficiaries via tariff as per CERC	ED in charge of the project

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
							guidelines. 5. Implement Management information systems (MIS) that would improve coordination between various departments and enable quick response and prompt decision making as well as bring to attention areas of short-fall impeding the projects.	
13	Strategic	Projects-Hydro	Feasibility Risk	Lack of adequate social, environmental and technical feasibility assessment before taking up projects	High	High	1. Create a framework for taking up new projects. Only projects passing the filter should be taken up. 2. Before taking up projects, rapid study on preliminary feasibility to be carried out. The study should encompass the following aspects: • Displacement and social appreciation • Probability of obtaining and status of various statutory clearances • Engineering and Geology 3. Taking into account the following select parameters in feasibility assessment • Dam Height • HRT tunnel length • Maximum tunnel height • Tariff • Geological conditions of Dam, • Tunnel • Construction Material	ED (S&I)/ ED(CP)

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
							• Diversion Design Flood • Sediment Risk and Management • Power evacuation and construction power availability	

Additional risks

S No	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
1	Strategic	Corporate	People Risk	Lack of Succession Planning, Manpower attrition and non -development of core competency.	High	High	1. Manpower planning/assessment and Succession Planning shall be performed annually to establish staffing levels 2. Adopt various mechanisms via Financial/Non-financial reward & recognition systems including Performance related incentive based on individual/ group performance which would lead to an increased organizational productivity, 3. Adopt HR tools like employee satisfaction survey, exit interviews and external benchmark study to frame and implement a companywide retention policy to prevent loss of business skills and check attrition.	Head of HR
2	Strategic	Corporate	People Risk	Inadequate process to manage knowledge within the organization due to frequent transfer of personnel from one department/ project to another.	High	High	1. Knowledge repository shall be built in NEEPCO for supporting creation, capture, storage and dissemination of information. This will enable easy transfer of knowledge between employees who will have ready access to the organization's documented base of facts, sources of information, and solutions. 2. Knowledge sharing, proper and elaborate handholding of records should be ensured at the time of relieving/ transfer of personnel.	HR Department

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
3	Strategic	Corporate	Competition Risk	Lack of experience in competitive bidding and increased competition from private and government non hydro power companies entering into hydro power sector may result in the loss of projects	High	High	1. Identify skill gap and seek assistance from external consultants/ hire resources with adequate knowledge/experience in competitive bidding. 2. Adequate training/exposure to be provided to the existing resources to build competencies in competitive bidding. 3. Plan to build capabilities for participating in competitive bids, by creating a Knowledge Management System which will have repository of all project bids by NEEPCO or by its competitors in order to identify areas where NEEPCO can improve (such as cost and time reduction).	ED(CP)
4	Strategic	Projects-Thermal	Information Risk	Information flow is not organized; plant team doesn't have copy of PPAs. Difficulty in resolving technical issues in a timely manner due to communication barriers, lack of familiarity with SEC equipment and absence of local support from SEC	High	High	1. Knowledge Management System shall be built in NEEPCO for supporting creation, capture, storage and dissemination of information. 2. The organization's documented base of facts, sources of information, and solutions will enable quick decision making in case the same uncontrollable event has occurred in past. 3. Regular workshops shall be conducted to discuss learnings from past experiences on how delays in decision making have impacted time and cost and how Knowledge Management System can enable them to promote quicker decision	ED(O&M)/ ED(Commercial)

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
							making. 4. Develop an internal monitoring mechanism for the approval of files or procedures. Identify the key decision points, the delays which will be detrimental to the overall project. The estimated turnaround time for these decision and the responsibility centers for decision making shall be clearly identified. 5. Management information systems (MIS) shall be implemented that shall improve coordination between various departments and enable quick response and prompt decision making as well as bring to attention areas of short-fall.	
5	Strategic	Projects-Thermal	Inventory Risk	High cost of spares/inventory due to sticking with OEM for most of the spares under the threat of revoking of warranty by OEM if indigenous spares are used.	Medium	High	1. Follow VFD/ ABC level inventory management system for decreasing lead time in procurement 2. At the time of design look for decreasing the lead time of procurement via preference for domestic equipment 3. Keep high lead time items above normative limits to prevent such equipment leading to plant operation constraints.	HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
6	Strategic	Corporate	Political Risk	Abandoning of projects midway due to: (i) Change in Government regulations. (ii) Change in Government policies. (iii) Change in Government directives.	Low	High	1. Do proactive liaising with State Government departments via Relationship Management Committee to maintain healthy relations where discussions can take place prior to regulatory/ policy changes. 2. Closely monitor future policy/ regulatory developments and adopt advocacy to facilitate that framing of any changes in policy/ regulations take note of the NEEPCO's concerns.	ED(In Charge of the Project)
7	Strategic	Projects-Renewable	Technology Risk	Maturity of the technology used for the plant can lead to issues in performance in medium term	Low	High	1. Use stringent norms as prescribed by MNRE for taking up the project. Put the norms as prerequisite for bidding. 2. Empanel reputed agencies for partnership in project implementation selected via tendering processes.	ED(RE)
8	Strategic	Corporate	People Risk	Lack of training to keep employees abreast with the industry's latest technologies or with evolving industry demands/international standards	High	Medium	1. NEEPCO shall define mandatory training hours per employee and shall review and revise the training curriculum periodically to develop employees' core competencies. 2. Perform Training Need Analysis exercise to design the training curriculum for all the organizational roles. 3. All parameters shall be considered while drafting of training calendar including appraisal forms of employees, special request from Department Heads, request from employee, new business line, new system implementation etc. 4. The record of training conducted during the year shall be compared with the	Head of HR

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
							approved training calendar. Identify whether there were any delays in imparting the training vis-à-vis the approved plan.	
9	Strategic	Corporate	Client Concentration Risk	Client concentration risk - Lack of diversified portfolio of clients.	High	Medium	1. NEEPCO may consider participation in tariff based bidding to get the projects from State government and other agencies in addition to the allocation from the Central government. - NEEPCO may also consider taking projects from the neighboring countries.	ED(CP)
10	Strategic	Corporate	Market Risk	Allocation of difficult projects to NEEPCO and easier projects to private players	High	Medium	1. Do proactive liaising with the Government departments via Relationship Management Committee to maintain healthy relations where discussions can take place prior to award of projects. 2. Ensure timely completion of approval process with Government support and enter into PPAs to reduce offtake risk.	ED(CP)

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
11	Strategic	Projects-Hydro	Operations	Non - availability of defined operational strategy for power stations working in cascade causing generation loss.	Medium	Medium	1. NEEPCO shall create a joint monitoring and remote control center in consultation with other stakeholders for joint operations for the cascaded plants. This would entail real time monitoring of reservoir head for optimized generation besides facilitating regulation of flow in downstream areas of dams which will also ensure the safety measures to avoid downstream mishaps. 2. NEEPCO shall use supervisory control and data acquisition system (SCADA) for real time monitoring. 3. NEEPCO through proactive liaisoning should ensure that such projects which may be detrimental to operation of company's projects do not get sanctioned. 4. NEEPCO shall form a relationship team at the Power stations which will proactively liaison with other company's power projects in case of dependency on them to mitigate the risk of loss generation.	ED(O&M)/ HOP
12	Strategic	Corporate	Political Risk	Unanticipated changes in the regulations/ policies on river water release by State/ Central government could affect the operations of the Power stations	Medium	Medium	1. Keep a provision in the MoU with State Governments for ensuring minimum guaranteed discharge of water in river. 2. In the eventualities of such reduction in water discharge in river, appropriate authority i.e. CEA/CWC etc. shall be approached for review of designated parameters of hydro generating stations i.e. capacity, design energy etc.	ED(CP)

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
13	Strategic	Projects-Renewable	People Risk	Lack of technical skills in project implementation amongst employees	Medium	Medium	1. Encourage employees to learn the renewable skills via deputation in JV projects. Such employees can work on NEEPCO's pay roll and can learn from private sector in renewable project implementation on design, implementation and O&M side. 2. Tie up with industrial training houses like NPTI etc. for training in project implementation for interested /deputed employees	Head of HR
14	Strategic	Projects-Thermal	Strategy Risk	Choosing in-house O&M can lead to issues in cost management for the project	Medium	Medium	1. NEEPCO's strategy to undertake O&M internally can lead to issues in cost management in medium/long term. This can be prevented by partly outsourcing O&M in areas where NEEPCO has developed expertise - Hydro and Thermal 2. Can improve management of the plant as well as improve bottom line for the company. NEEPCO personnel involved in O&M currently can be moved to supervisor role for O&M contracts	ED(O&M)/ HOP
15	Operational	Corporate	Political Risk	Time and cost overrun due to lack of adequate/ timely clearances/ approvals from the respective Ministries	High	High	1. Identify the various State Government departments such as Environment and Forests which contribute mainly towards the delays and sensitize them about the various issues relating to the project. 2. Analyze the procedures involved in various clearances and interactions with the Government and suggest improvement opportunities.	ED(CP)/ HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
16	Operational	Projects-Thermal	Power Generation and Offtake	Inability to supply power under existing PPA due to transmission capacity constraints leading to under recovery of capacity charges For e.g.:- 1. Power evacuation may be a challenge in near future For E.g. 2: . Island mode operation during grid disturbances reduces power generation	High	High	1. Medium term solution: Look for alternate methods for power evacuation For e.g. Bangladesh line (100 MW) work is under progress and might help in this situation 2. Contractually look to safeguard the organization via clauses leading to recovery of part/full fixed charges in case of transmission constraints. This is prevalent in new DBFOO framework for power sale.	ED(CP)/ HOP
17	Operational	Corporate	Regulatory Risk	Time and cost overrun due to unanticipated regulatory changes by State/Central government	Medium	High	1. Proactive liaisoning with Central/ State Government to maintain healthy relations and to ensure that discussions take place prior to such regulatory changes. 2. Ensure that such issues are timely taken up with regulator so that costs due to such regulatory changes are passed on to the beneficiaries	ED(Commercial)

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
18	Operational	Projects-Hydro	Environmental Risk	Risk of flooding of power house, dam breakage due to floods and unprecedented rains.	Medium	High	1. Indemnify the company against possible losses by insuring the projects /power plants under natural calamity risk insurance policy. 2. Develop Disaster Management plan for each power plant / project with delegation of responsibility and set up nodal disaster Management committee to provide guidance at the corporate office to prevent any such loss. 3. Ensure that the company's disaster Management plan is captured in the State's Master disaster Management Plan. 4. Establish Gauge and Discharge sites at upstream of barrage to have prior information of flow sufficiently before flood reaches the barrage sites. 5. Complete shutdown of power house shall be ensured whenever the ppm of inflow water of river increases beyond the permissible level. 6. Pre and post monsoon inspections by Dam Safety Team shall be carried out regarding the health status of Dam and their remedial measures shall be implemented.	ED in charge of the project/ED(O&M)/HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
19	Operational	Projects-Hydro	Project Risk	Risk of damage to underground structures and vital installations due to fire.	Medium	High	For safety against fire, a fire protection program (FPP) shall be in place which consists of the following: 1. Staff positions responsible for management and implementation of the FPP. 2. Administrative policy, procedures, and practices for training of general plant personnel. 3. Adequate firefighting and smoke masks shall be stored at the power stations. 4. Periodic inspection, testing and maintenance of fire protection systems shall be conducted to ensure the fire equipment readiness at all times. 5. Installation of automatic fire detection, alarm, and suppression systems, including fire water supply and distribution systems • Manual suppression capability including portable fire extinguishers, standpipes, fire hydrants, hose stations. • Regular fire mock drills shall be conducted to the train the personnel. • Alternate escape routes especially near transformer gallery and proper ventilation to minimize risk to human lives. • Emergency response measures such as immediate medical aid and ambulance facilities shall be made available at project sites/power stations.	ED in charge of the project/HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
20	Operational	Corporate	Contracting Risk	Delays due to lack in contractor's/ JV partners anticipated performance - may be due to his own reasons or local/ forced conditions.	Medium	High	1. Upon signing the agreement with the vendor, define Service Level agreement (SLAs) against key performance indicators along with intermediate milestone penalty matrix which shall form part of agreement and shall be continuously monitored to evaluate vendor performance. 2. There shall be a provision in the contract that shall ensure the waiver of intermediate milestone penalties if the contractor meets the final deadline. 3. Stringent binding penalty clauses shall be included in the contract with the JV partners/ contractors to ensure their optimal performance.	ED(C&P) For JVs - ED(CP)/ ED(RE)

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
21	Operational	Projects-Hydro	Project Risk	Lack of adequate monitoring controls/studies regarding collection of silt data which may lead to decreasing capacity of the reservoir/ damage to the turbines.	Medium	High	1. Silt Level at Operating power stations shall be continuously monitored and Silt flushing shall be carried out as preventive measure. 2. Silt to be measured preferably at the confluence points of tributary/ nallah and quantum of Silt should be monitored in the reservoir and to take remedial measures as warranted. 3. Checking of Silt content should be carried out in Site laboratory by taking water sample from time to time so that machine can be stopped if Silt content goes beyond permissible limit. 4. Anti-corrosion compound coating of underwater components for reduction of damage due to silt. 5. Reservoir Capacity of power stations shall be monitored regularly and corrective actions such as excavation; dredging, siphoning, draining, flushing, flood sluicing etc. shall be taken, wherever required. 6. Periodic flushing shall be carried out on monthly basis during monsoon season for de-silting of reservoir as per reservoir flushing guidelines.	ED(O&M)/ HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
22	Operational	Projects-Hydro	People Risk	Lack of adequate safety measures at project sites/stations may cause injuries to personnel.	Medium	High	1. For safety measures at project sites/ stations, all persons on at sites must comply with Personal Protective Equipment (PPE). 2. Mandatory PPE requirements for project sites/ stations shall include: - Hard hat - Safety glasses - High visibility clothing (long sleeves and long pants) - Safety boots - Hearing protection and gloves carried and used where required 3. Safety Officer or Dedicated personnel in charge of safety measures shall be posted at the power station/project that will ensure compliance to the PPE requirements.	HOP
23	Operational	Projects-Thermal	Contracting Risk	Delay in commencement of construction due to disagreement between EPC and NEEPCO due to further subcontracting of work by EPC contractor.	Medium	High	1. Delays in project execution can be prevented via adequate contractual protection of the organization. Impose stringent LD penalties for the contractor in case of delays in mobilization. Keep milestone wise payments. 2. Additional clauses seeking approval from NEEPCO in case of further sub-contracting of work on the engagement.	ED(C&P)

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
24	Operational	Projects-Thermal	Disaster Management Risk	Lack of adequate safety procedures in under construction and operational plants leading to dangers to property and life.	Medium	High	1. Prepare checklists based on field quality manuals for field staff in under construction/implemented projects. 2. Sensitize contractor staff via quarterly workshops on relevance safety for the organization and project. 3. Engage with sub-contractors/ agencies with proper disaster management plan and with skilled resources for the job.	HOP
25	Operational	Projects-Thermal	Project Risk	Commissioning activities - Lack of Punch list awareness can lead to ad hoc commissioning in thermal units which in turn can lead to constraints in project operations	Medium	High	1. Create a list of commissioning activities for effective tracking. 2. Use tools for commissioning activities tracking in MS projects.	HOP
26	Operational	Projects-Thermal	Regulatory Risk	Quantitative & qualitative variation of fuel which may adversely affect Plant Output.	Medium	High	1. Look for inclusion of adequate protection clauses in Gas Supply Agreement which will can prevent supplier to undertake quality reduction in gas 2. Look for alternate solutions (Plan B) in case the gas supply from one source is of lower quality to prevent stranded assets	ED(O&M)/ HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
27	Operational	Projects-Hydro	Project Risk	Inadequate/lack of timely equipment and civil maintenance exercise which may result in loss of power generation due to frequent equipment breakdowns.	Medium	High	1. Annual preventive maintenance and minimum inventory plan for spares to be adhered to minimize breakdown losses in power generation. 2. Conduct an analysis of past data to check if maintenance schedules and norms are effective. 3. Link individual incentives for reducing failures which can be avoided by high quality maintenance.	HOP
28	Operational	Projects-Renewable	Technology Risk	Changes in weather conditions at project location can lead to lower units getting generated than envisaged at the bidding stage	Medium	High	1. Adequate due diligence via reputed third parties need to be undertaken before implementation starts on ground. 2. Protection in PPAs for recovery of fixed charges in case of 15% reduction in units generated due to weather constraints. 3. Use for higher grade technology with reflectors and tracking devices for maximum power generation from the plant. 4. Cost Benefit analysis would be needed for ensuring that the project remains viable and technology change leads to return enhancement.	ED(RE)

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
29	Operational	Projects-Hydro	Project Risk	Time and cost overrun due to risk of militant attack on vital installation of Power Stations.	Low	High	1. Adequate Safety measures like installation of CCTVs, Reinforced Barbed Tape (RBT) fencing at the vital installations, physical security at the power stations, personal security guards for employees of certain designation etc. shall be taken for power stations to mitigate the terrorist attacks and provide a safe Environment to the persons working at the sites. 2. A warning system shall be in place which shall get triggered by pressing a button. These buttons shall be installed at various locations in the powerhouse. In an event of emergency warning signals can be triggered in the security control room. The security control room can thereby notify the police or emergency services. 3. All the vulnerable/ sensitive areas shall be provided with high mast lights to keep adequate illumination level. 4. Inspection/ patrolling at night to be carried out to avoid any mishap at the power station. 5. Emergency response measures such as immediate medical aid and ambulance facilities shall be made available at project sites/power stations. 6. The power station shall be indemnified for such kind of risk under Industrial risk policy.	ED(Security)/ HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
30	Operational	Projects-Hydro	People Risk	Loss of human and animal life, material, machinery etc. due to release of water in downstream/due to flood	Low	High	1. NEEPCO shall ensure following steps for information regarding release of water in downstream: · Establish a siren with an appropriate blow range. · Notice boards to be erected in the downstream area. · Additional communication systems like calls, letters, circulars to local authorities, announcements on speakers etc. to be used during monsoon period and reservoir flushing. In addition NEEPCO can also look at :- (a) Development of Flood early warning system (b) Development of inundation simulation for flood plain zonation as mitigation measure of Dam Break analysis	HOP
31	Operational	Projects-Renewable	Project Risk	Delay in grid connection even when project is fully completed and ready for commissioning	Low	High	1. Provide notice and applications (CEA) to authorities 3-4 months before the project expected commissioning date 2. Liaison with local authorities in getting final approval for grid connectivity 1 month in advance of actual commissioning of the project.	HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
32	Operational	Projects-Renewable	Technology Risk	Selection of improper construction equipment/ technology especially for panels/Inverters	Low	High	1. Selection of contractor/EPC player with substantial experience in the area of project installation through Quality based selection process in tendering 2. Ability of the contractor to handle local constraints in technology implementation to also be an input in contractor selection by the project team	ED(RE)
33	Operational	Corporate	Project Risk	Time and cost overrun due to award of contracts without ensuring availability of land and clearances.	High	Medium	1. The Contracts division shall ensure all legal documents related to clearances and land acquisitions are approved by the authority and are in place before awarding the contract. 2. Land acquisition can be started as a parallel activity to clearances thus allowing for issues related with land acquisition to settle in due course of time.	ED(C&P)/ Land acquisition Cell
34	Operational	Corporate	Contracting Risk	Non settlement of claims of various contractors leading to disputes resulting into arbitration and legal complications besides delay in projects.	High	Medium	1. Resolve delays in contractor payment and cost escalation, if any on account of force majeure event immediately to prevent project delays and cost implications. 2. A dedicated dispute resolution committee shall be constituted for every project by corporate Contracts division to Ensure early settlement of claims. 3. The committee shall work on an ongoing basis throughout the project with adequate financial powers for early detection and settlement of the contractual dispute.	ED(C&P)/ HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
35	Operational	Corporate	Technology Risk	Insecure IT and Communication systems may result in its exposure to cyber threats.	High	Medium	1. Information security Management System (ISMS) shall be implemented in order to eliminate or minimize the impact that various security related threats and vulnerabilities might have on NEEPCO. 2. IT security policy should be developed/ reviewed and implemented to minimize disruption of IT services due to malware attacks and also pilferage of information. 3. The organization shall determine its requirements for the continuity of IT infrastructure in adverse situations, e.g. during a crisis or disaster. A disaster Recovery Site as part of business continuity plan shall be developed at an alternate location.	CGM(IT)
36	Operational	Projects-Renewable	Contracting Risk	Award of Turn Key contracts can lead to higher capital costs and lead to return reduction for NEEPCO	High	Medium	1. NEEPCO can look to award turnkey contracts in the initial stages of portfolio development 2. When 2-3 projects have been implemented through this route, NEEPCO can look to award specific element wise contracts for return optimization. NEEPCO can also use existing JVs with WAAREE for bidding in new projects via separate SPV	ED(RE)

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
37	Operational	Projects-Renewable	Project Risk	Availability of transmission constraints can lead to issues in power sale and thereby lead to penalties in PPA	High	Medium	1. Plan renewable projects by keeping into account availability of transmission for evacuation 2. Add additional clauses in the PPA with utilities for getting part of fixed charge recovery in case of transmission constraints. This is the prevalent practice in new DBFOO power sale bids in conventional energy. Can also be implemented in solar/wind projects. SECI standard PPA can be used for adequate clauses protection.	ED(RE)
38	Financial	Projects-Renewable	Financing Risk	Renewable projects with local constraints can have financing risk associated with them leading to higher cost of raising funds for the organization	High	Medium	1. Create separate SPVs for effective handling of the renewable project portfolio. 2. Undertake joint projects with reputed private companies E.g. JVs undertaken by NEEPCO in Wind and Solar space.	ED(RE)
39	Operational	Projects-Renewable	Environmental Risk	Delays due to :- (a) Emissions / Pollution / Contaminations (b) Disaster (c) Destruction / Damage (force majeure) (d) Objections by third parties	High	Medium	1. Use appropriate testing for the technology to be used. Permits /Clearances needs to be assessed beforehand to provision for environmental clearances at the bidding stage. 2. Environmental Audit - Post project implementation, undertaken environmental audit for assessing the impact of the project. Follow appropriate measures as per R&R policy of the organization.	ED (CP)/ CGM (Env.)

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
40	Operational	Projects-Thermal	Procurement Risks	High lead time of ODC components due to transportation challenges in North eastern states For E.g. in TGBPP:- ODC comes to Kolkata from Hyderabad through sea route then from Kolkata to Badarpur through river route and then from Badarpur to TGBPP through road.	High	Medium	1. Prepare procurement plan for each quarter based on inputs from the project management team which in turn would be based on actual progress of the project on ground. 2. Based on the information provided in procurement plan, resources on ground plan actual execution of logistics in case of ODC components in advance. 3. When ODC components are available at nearest point of delivery as per contract, hire suitable third parties for transportation to the plant location 4. Engage with suitable insurers for taking up transportation risks. File claims on a priority in case of damage to equipments.	ED in charge of the project/HOP
41	Operational	Projects-Thermal	Procurement Risks	Transportation is dependent on seasons, river transportation is not possible in winter and road transportation is not possible in monsoon due to land slide and other conditions.	High	Medium	1. Customize project plan taking into account delays in equipment transportation. 2. Engage with reputed third parties to transportation - These third parties can be empanelled via tendering.	ED(Projects)/ HOP
42	Operational	Projects-Thermal	Project Risk	Burn and Trauma Centers are not present in some units. For e.g. Burn unit and Trauma center is not there in Agartala, people are rushed to Kolkata in case of any eventuality	High	Medium	1. Follow guidelines for setting up burn and trauma center for the project. 2. Integrate the centers in safety policy of the organization. 3. Undertake burn and trauma insurance for employees via reputed agencies	Head of Medical & Health Service/HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
43	Operational	Projects-Thermal	People Risk	Lack of skilled laborers/contractors: The laborers and contractors who are carrying out the construction work at the project site are local to Arunachal and may not have required skills for the activities they are assigned. Key activities like welding require highly specialized worker, bringing them to the project site would involve higher cost. They are also not aware of the safe operating procedures for the activities.	High	Medium	1. It is necessitated by the state government to employ workers from local place; it also helps maintain relationship with the local people for smooth construction operations 2. It may not be easy to substitute the working staff from outside the local area. However, skill development training for livelihood would be imparted to suitable local people.	HOP/ CSR Department

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
44	Operational	Projects-Thermal	Quality Risks	Dependence on the contractors for completion of the job, lack of monitoring/supervision of the activities: Activities like construction of tunnel requires round the clock work. Construction site has many activities going on simultaneously; NEEPCO staff may not be sufficient/available at the site for monitoring the same. There are no early triggers, poor construction work may face up during the life of the project	High	Medium	1. There is higher number of senior staff in the project site, whereas there is shortage of junior staff in the project site. 2. In most of companies the ratio of junior staff is significantly higher than the senior staff. 3. Recruitment should be carried out in order to fill the vacancies of the officers. Junior staff can also be transferred from other completed/under construction site. Higher number of qualified people would ensure that standard of work being carried out is maintained at good level.	Head of HR
45	Operational	Projects-Hydro	Environmental Risk	Uncertain working environment due to extreme weather conditions/ difficult access to site may lead to subsequent delays in the project.	Medium	Medium	1. Estimate project timelines taking into consideration the past weather conditions data. Continuously monitor weather forecast by recording weather patterns via weather maps	ED(In charge of projects)/ HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
46	Operational	Corporate	Contracting Risk	Time and cost overrun due to stoppage of work due to labor problems of Contractor.	Medium	Medium	1. Develop a mechanism to ensure payment from contractor to sub-contract and from sub-contractor to labors is happening on a timely basis. 2. The Engineer in charge at the power stations/ project sites shall ensure minimum wages are being paid to the labors on a timely basis.	HOP
47	Operational	Projects-Renewable	Contracting Risk	Weather constraints leads to disruptions in generation from the plant - Events of Force Majeure	Medium	Medium	1. In case of weather constraints impacting the project progress/output, relevant clauses in force majeure can be activated. 2. Such clauses would need to be activated within 7 days of the event in case the event qualifies as force majeure. 3. Delay file needs to be prepared for the project schedule delays by the organization. This is needed at the project level.	ED(RE)/HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
48	Operational	Corporate	Project Risk	Non-maintenance of proper records, notes and documents leading to claims by contractors.	Medium	Medium	1. Implement an electronic Record Management System which shall digitize and store all documents/records at a Central location using a VSAT network at all project sites/power stations. 2. The documents/records at the Central location can then be duplicated onto tapes and kept at a storage location. 3. The head of each department shall ensure that all the data and documentation with their relevant correspondence shall be updated in the system. 4. The HOD's shall ensure that the correspondence/ claims by contractors shall be replied promptly with appropriate response/ counter claims wherever applicable.	HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
49	Operational	Projects-Hydro	Project Risk	Selection of improper construction equipment/ technology especially for underground works.	Medium	Medium	1. A technical advisory committee shall be formed comprising of personnel from relevant field and experience to review and advise the selection of the construction equipment/ technology. 2. Build a Knowledge Management System which will be the repository of all project related information. This repository shall be regularly updated with all minute details of the kind of terrain of a project, kind of machinery used, equipment failures encountered etc. This information shall be used as a base to understand the reasons for equipment failures and the new projects shall take those factors into account.	ED(CP)
50	Operational	Projects-Hydro	Project Risk	Inadequate process/ monitoring mechanism to ensure that trials and tests during commissioning of a Project site are performed mandatorily.	Medium	Medium	1. All tests and trials (Charging of water conductor System and checking for any abnormal seepage of water, sealing of surge shaft and draft tube gates, etc.) shall be performed as per the defined guidelines/ procedures before the commencement of the project. 2. Projects shall be commissioned after proper analysis of the reports. 3. Tests and trial reports shall be reviewed and audited annually. 4. Required Manpower shall be posted well in advance for round the clock operation of power house, Dam/barrage etc. and shall be adequately trained.	HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
51	Operational	Corporate	Project Risk	Delays in power equipment supply which may lead to delays in commissioning of the project.	Medium	Medium	1. Introduce appropriate penalty clause in the power equipment purchase agreement for delay in delivery of project critical power equipment. 2. Consider suppliers with proven technologies for supply of power equipment to reduce dependence on its existing source of power equipment. 3. Liaison with Ministry of power, Government of India for timely delivery of power equipment by the Public Sector Undertaking (PSU) supplier in case the delay is hampering the on-time completion of its project.	ED(C&P)
52	Operational	Projects-Thermal	Contracting Risk	Lack of adequate protection clauses in GSA protecting NEEPCO from delays in gas supply by contractors.	Medium	Medium	1. File petition seeking compensation to be filed with APTEL/ Consumer Court on the legality of GSA. 2. If criticality arises in contract agreement, the same may be examined by the Contract & Procurement Wing/ Legal Wing.	ED(CP)/ HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
53	Operational	Projects-Thermal	Project Risk	Acquiring land for laying of raw water line from river to plant for under construction projects can lead to project delays For E.g.:-In TGBPP, 16-17 families were affected but due to support for NEEPCO matters have been resolved amicably.	Medium	Medium	1. Follow GoI land acquisition guideline (FY 2015) to recalculate compensation under new scheme- Land acquisition 2. Take adequate provisioning at the time of design of the plant. 3. File additional petitions on “Change in Law" for tariff revision of the plant.	Land Acquisition Cell/ HOP
54	Operational	Projects-Thermal	Project Risk	Inadequate lighting maintenance in critical areas	High	Low	1. Ensuring safety procedures are followed 2. Regular maintaince of lighting of critical areas in line with safety procedures	HOP
55	Operational	Corporate	Project Risk	Delays in award of contracts/ retendering.	High	Low	1. Develop a uniform tender approval procedure for avoiding contract litigations that arise due to issues raised on tendering procedures. 2. All Contracts shall cover the scope of work in details clearly defining roles and responsibilities of the contractor to avoid litigations due to difference of understanding of scope. 3. Feedback mechanism shall be developed wherein learnings from various Contracts shall be updated and carried forward to other Contracts to make them more robust.	ED(C&P)/ HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
56	Operational	Projects-Hydro	Technology Risk	Non availability of reliable communication link with RLDC for telemetry of data shall lead to deduction of 1% ROE for the period of deficiency.	Medium	Low	1. Review/ Augmentation of existing communication system between Power Stations and RLDCs to ensure 100% availability of link for continuous data transfer to RLDCs. 2. The Power Stations shall continuously keep in touch with the RLDC to ensure there is no breakdown in their communication link and the data is being transferred diligently.	HOP
57	Operational	Projects-Thermal	Project Risk	Inadequate fire hydrant pressure due to usage of hydrant water for other purposes leading to insufficient water pressure during fire hazard / eventuality	Medium	Low	1. Design the plant to ensure availability of fire hydrant pressure. This can be done via booster compressor at appropriate plant locations. 2. Cover fire security as a part of disaster management policy of the organization and undertake trainings of the same on a quarterly basis for employees. 3. Ensure proper illumination to GT rooms /GT cabin for ensuring proper fire system to be operational in case of disasters. 4. Maintain water availability for fire systems to work properly at the plant location. Proper warnings should be displayed at the control room in case of fire system not working at the site.	HOP
58	Operational	Corporate	Contracting Risk	Risk of warranty lapses on account of delays in project commissioning subsequently leading to cost overruns.	Medium	Low	1. The contract shall include suitable amendment for critical power equipment, so that warranty remains valid from the date of commissioning of the project. 2. Have an Integrated plan for each project execution so that issues do not arise due to	ED(C&P)/ HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
							project Management loop holes.	
59	Financial	Projects-Thermal	Contracting Risk	Lack of proper insurance policies can lead to ad hoc decisions in risk transference leading to constraints in project returns over medium term	High	High	1. Renegotiate the contract with consulting company that is assisting corporate team in selection of right insurance cover and insurance companies. 2. Float tender for engagement of international consultants in the area - Run reverse bidding for engagement of reputed companies providing insurance policies	ED(C&P)
60	Financial	Projects-Thermal	Contracting Risk	Contracting and Procurement division has not been consulted in signing various contracts by the organization exposing firm to contractual risks in future as well as contractor claims	High	High	1. If criticality arises in contract agreement, the same may be examined by the Contract & Procurement Wing/Legal Wing. 2. Standard guidelines may be issued by Contracts and Procurement Cell to ease the signing of contracts by various divisions across the organization	ED in charge of the project/ED(C&P)

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
61	Financial	Corporate	Credit Risks	Non - realization of outstanding dues from the beneficiaries.	Medium	High	1. NEEPCO shall involve the Central Ministry of power and form a policy on realizing outstanding dues from the beneficiaries through Central plan Assistance which will help them in getting the pending payments. 2. Ensure that there are adequate penalty clauses in the ensuing PPAs for the beneficiary if they delay the payment. 3. Create an early warning system to the defaulting entity based on the recovery of dues in the last six months.	ED(Commercial)
62	Financial	Corporate	Financial Risks	Non - utilization of approved additional capital expenditures and its capitalization (For power stations).	Medium	High	1. Develop an internal mechanism for effecting proper plan to fully utilize the approved capital expenditure. 2. Regular monitoring of capex budget shall be done to improve the execution to avoid penalties. 3. Regular review of expenditure shall be done and if deviations are found, the issues concerning deviations shall be attended promptly. - Implement a system for regular review of costs and fix responsibility for delays in decision making. 4. Mails and alerts shall be sent to the personnel as the deadline for decision making approaches. The system shall be	ED(O&M)/ HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
							enabled to escalate it to higher authority once the decision making deadline has not been met.	
63	Financial	Projects-Thermal	Regulatory Risk	Risk of under recovery of fuel charges in case plant is not able to meet minimum standards for operation (SHR variations)	Medium	High	1. Look for technology up gradation of the plant to meet conditions as per PPA and CERC tariff regulations for the control period. 2. In cases of PPA under MoU route file petitions for allowance of 100% energy charges on actuals. 3. In case of PPA with state government on concessional rates, ensure that PPA includes minimal penalty clauses for not meeting design conditions over time. 4. File petitions with relevant authority seeking relevant rebates in meeting technical conditions based on design of the plant/year of commissioning	ED(O&M), ED(Commercial)
64	Financial	Projects-Thermal	Commercial Risk	No mechanism of tracking under/over recovery from tariff leading to issues in financial progress tracking for the organization	Medium	High	1. Development of internal matrix for tracking over/under recovery of fuel charges in PPAs 2. File appropriate petitions in case of under recovery of fuel charges and look for true up in the next control period of the plant	ED(Commercial)

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
65	Financial	Corporate	Liquidity Risks	Lack of Investments for financing projects due to high gestation period of projects and lower returns.	High	Medium	1. Encourage the availability of longer term finance at low cost from international sources, including ECAs, and through the use of credit enhancement mechanisms such as the World Bank Partial Risk and Partial Credit Guarantees. 2. Ensure that projects offered for funding have been adequately prepared in advance, based upon detailed technical studies and site investigation, with a clear contractual framework and security package already in place.	ED (F)
66	Financial	Projects-Hydro	Project Risk	Delays in projects due to problems of cash flow with the working contractors.	Medium	Medium	1. Establish appropriate governance structure at the project level to help the working contractors resolve their cash flow problems by providing support in day-to-day supplier management activities such as contract management and financial management. 2. A dedicated dispute resolution committee shall be constituted for every project by corporate contracts division to ensure early settlement of claims.	ED(Finance)

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
67	Financial	Corporate	Market Risk	Ineffective management of foreign currency fluctuation.	Medium	Medium	1. Develop a foreign exchange exposure management policy that will minimize the effects of adverse exchange rate fluctuations on the financial position of the company. 2. Report the details of foreign exchange exposures and the steps taken by management to limit the risks of adverse exchange rate movement to the board on quarterly basis.	ED(Finance)
68	Financial	Projects-Renewable	Project Risk	O&M costs can escalate at a higher rate than anticipated in the project feasibility studies	Medium	Medium	1. Take conservative scenarios in bidding for new field projects like renewable 2. Look at long term scenarios via hiring of employees for cost reduction provisioning 3. Look at long term fixed rate contracts for O&M. This would ensure sustainability of rates.	ED(RE)
69	Compliance	Corporate	Payment Security mechanism	Adverse regulatory policy development, Loss of securitization mechanism by 2016	High	High	1. Closely monitor future policy/ regulatory developments and adopt advocacy to facilitate that framing of any changes in policy/ regulations take note of the NEEPCO's concerns. 2. Get credit rating of the beneficiary assessed prior to signing the PPA so that the company can take a balanced view about the financial status of State utilities	ED(Commercial)

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
							and State Government and their ability to pay accrued dues. 3. Adopt Escrow mechanism, if the situation so warrants, for power sale realization beyond 2016. 4. Possibilities to be explored to make an amendment in PPAs with procurers to ensure that the lien on escrow post 2016 would be based upon the pair passu basis. 5. PPAs with State Governments to have a clause entitling the company to stop supply of power in case of payment default.	
70	Compliance	Corporate	Regulatory Risk	Lack of adequate process to ensure that all State and Central laws and regulations are tracked and complied.	High	High	1. Compliance Management Process shall be in place to identify/review periodically all national/state laws and regulations which NEEPCO shall comply to avoid the risk of any legal proceeding and being non-compliant.	Head of Legal Department
71	Compliance	Corporate	Socio-Political Risk	Inadequate monitoring of Rehabilitation & Resettlement (R&R) may lead to ineffective implementation of R&R program and may result in agitations in the local area leading to delays in commencement of the project.	Low	High	1. Follow the R&R policy for preventing delays on account of R&R issues. 2. To liaise with State Government's R&R department/directorate and with District collector/ administration through the Relationship Management Committee. 3. Constitute a Community Relationship Cell which shall actively engage with local administration as part of local area development committee to discuss the modalities of the company's social responsibility.	ED(CP)/ CGM(Environment)/HOP

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
							4. Carry out proactive CSR activities in key areas including communicating benefits of projects to the public at large in the project area to ensure public buy-in for land acquisition and R&R activities.	
72	Compliance	Projects-Renewable	Regulatory Risk	Tariff Changes post project commissioning via regulatory changes can lead to return reduction for renewable projects	Low	High	1. Regulatory commissions can look to reduce/predetermine renewable tariffs provided in the PPA in case of drastic changes/fall in PV panels globally. E.g. Gujarat utilities have filed for redetermination of renewable tariffs in projects. 2. Although this has not been quashed by APTEL currently, however risk exists for the renewable projects. 3. In such cases, NEEPCO can look to file petitions with APTEL in case any utility looks for redetermination of tariffs by PPA opening. 4. A case can also be made for change in law in case of tariff redetermination. However the scenario will vary case by case.	ED(RE)/ED (Commercial)

S No.	Classification	Category	Sub-Category	Description	Probability	Impact	Risk mitigation	Responsibility
73	Compliance	Projects-Renewable	Regulatory Risk	Changes in regulatory benefits like AD, GBI, Tax benefits etc. provided at the time of bidding provided for renewable projects can lead to return reduction for the project	Medium	Medium	1. File a petition with relevant authorities under "Change in Law" consideration in the PPA for recovery in case PPA tariffs are reduced	ED(Commercial)
74	Compliance	Corporate	Market Risk	Absence of security mechanism for Unscheduled Interchange (UI) Charges.	Low	Medium	1. Pursue the Regional Power Committees who is finalizing and verifying the UI charges and adhere to CERC norms being issued from time to time in respect of security mechanism of UI charges. 2. The generating station, as far as possible, shall generate electricity as per the day-ahead generation schedule finalized by the Regional Load Dispatch Centre in accordance with Grid Code.	ED(O&M)/ED(Commercial)/HOP
75	Compliance	Corporate	Regulatory Risk	Non adherence to CERC guidelines for tariff petition may lead to financial implications.	Low	Medium	1. The commercial Team shall ensure that the tariff petitions are as per the CERC guidelines. 2. The tariffs, before getting finalized, shall be internally reviewed at different levels between the commercial departments to ensure that they are in line with the CERC guidelines.	ED(Commercial)

Thank You