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Risk Management

Enterprise & Operational Risk Activities

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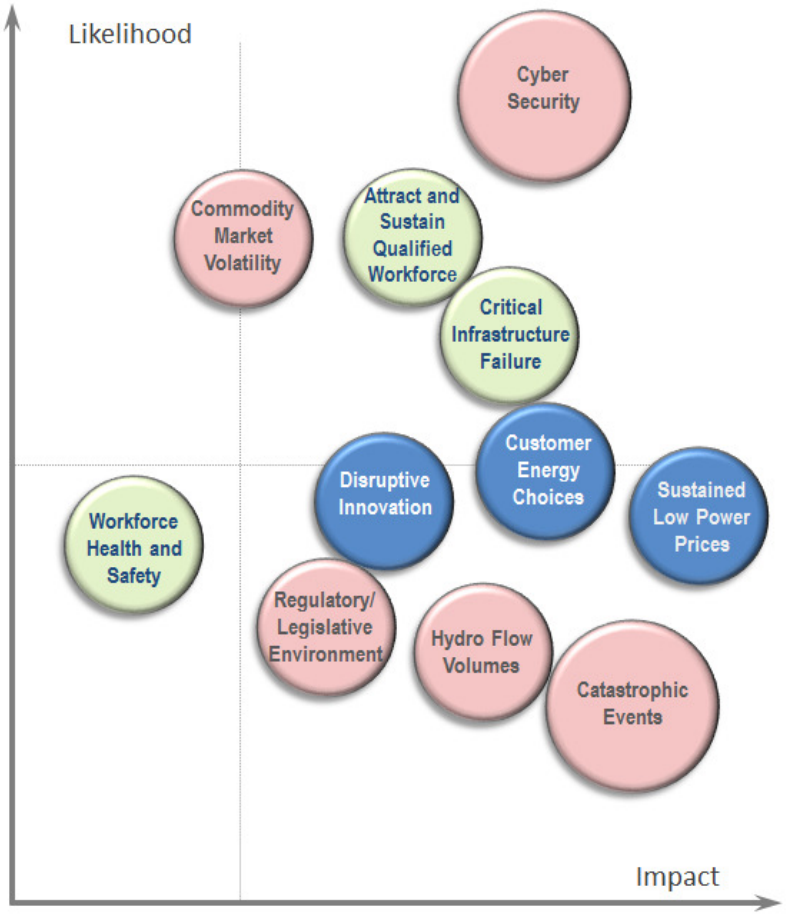
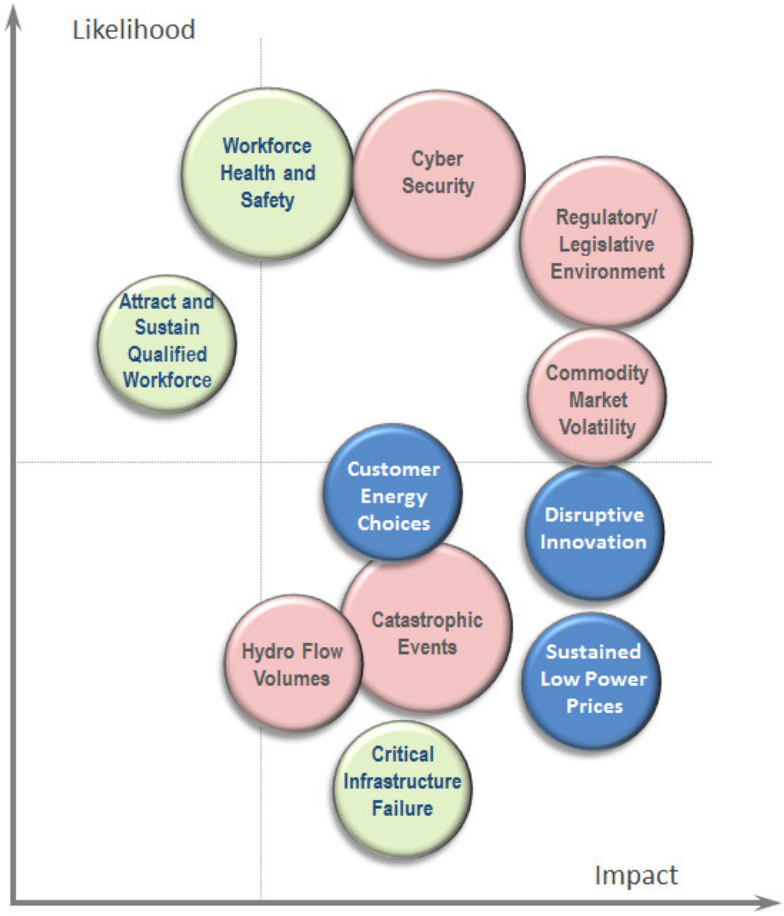
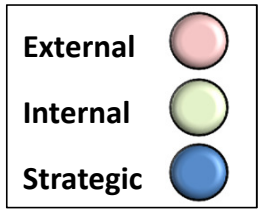
May 24, 2016

Overview of Top Risks Workshop Assessments

Top Enterprise Risks: *Previous to Current*







Marker color represents risk source and size indicates risk velocity

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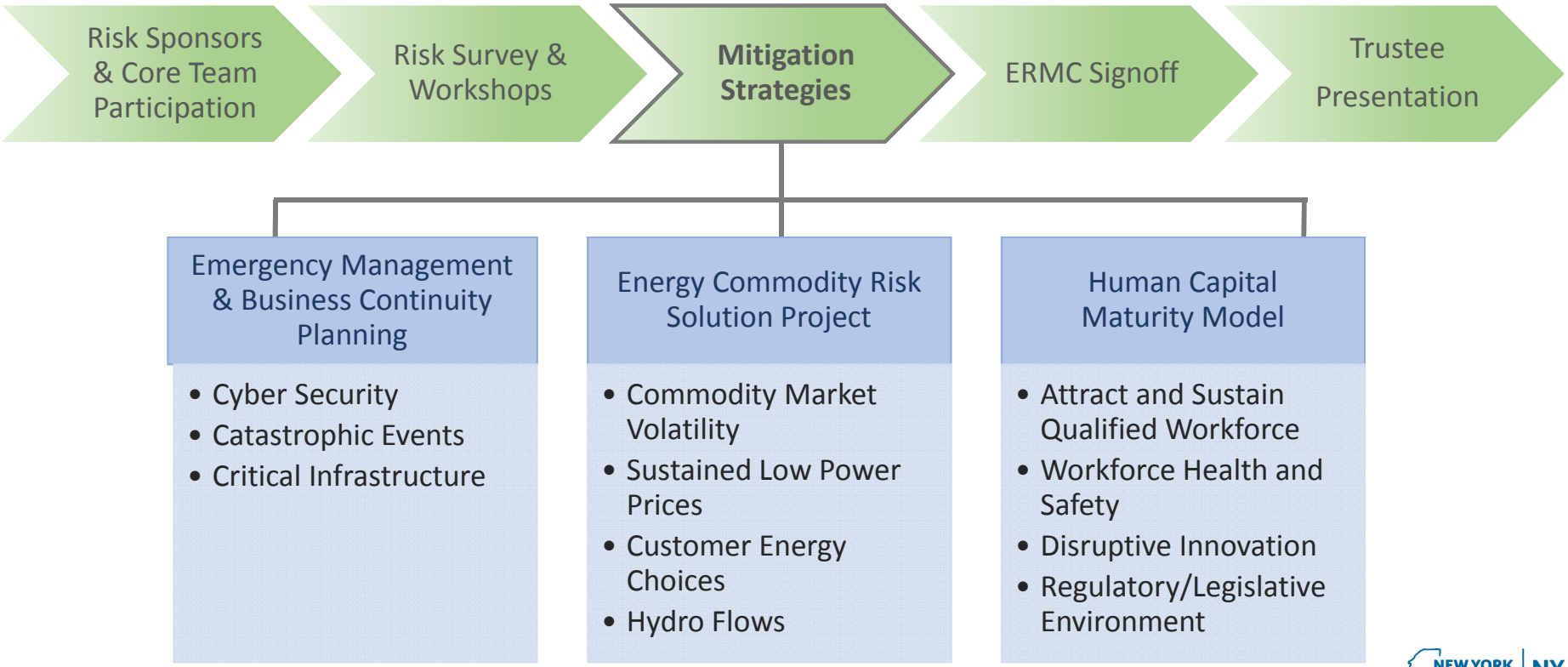
Risks Assessment Process

- **Key mitigation strategies are being implemented to demonstrate NYPA's strong commitment to a robust risk culture**
- **These efforts mitigate existing and potential risks across several fronts**



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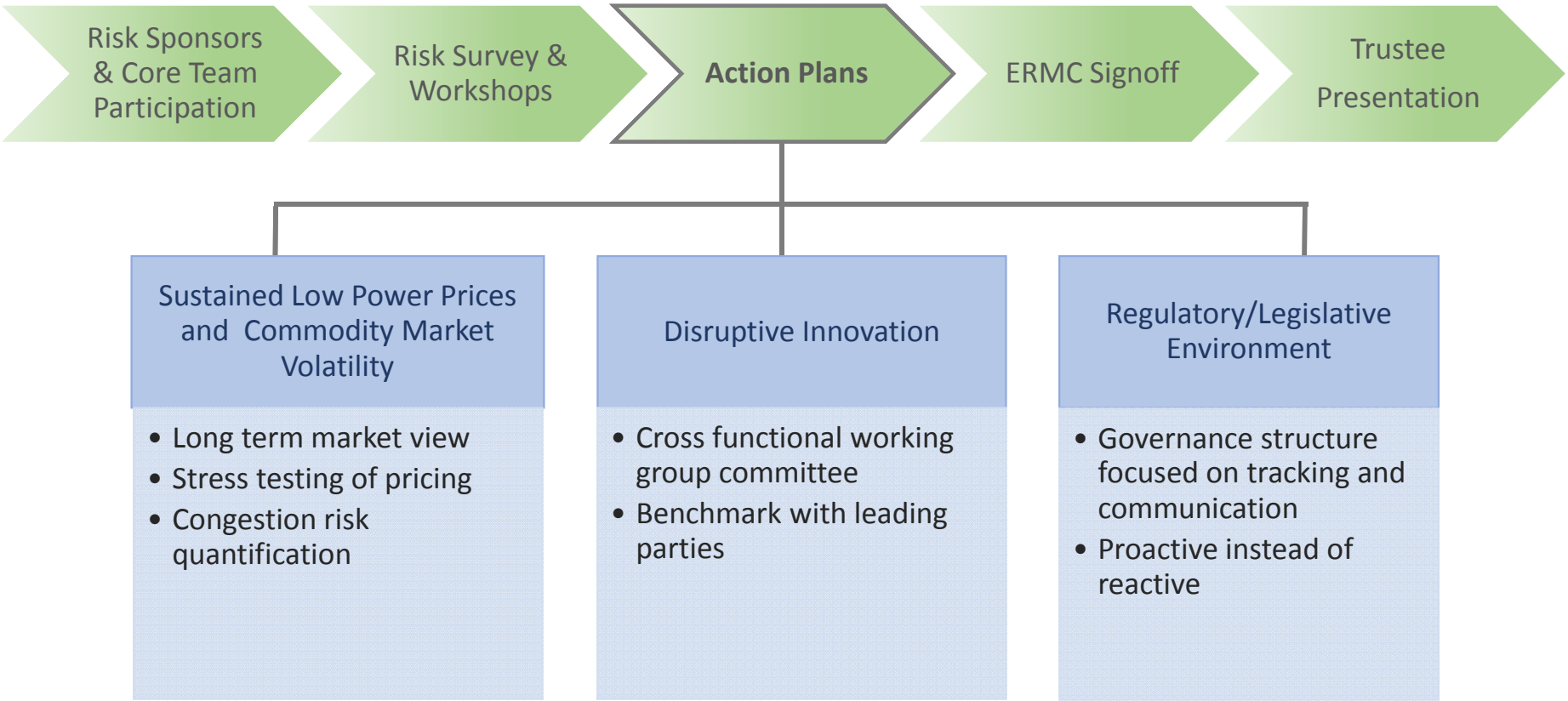
Top Risks Assessment Process

- **Key action plans identified addressing NYPA's Top Enterprise Risks**



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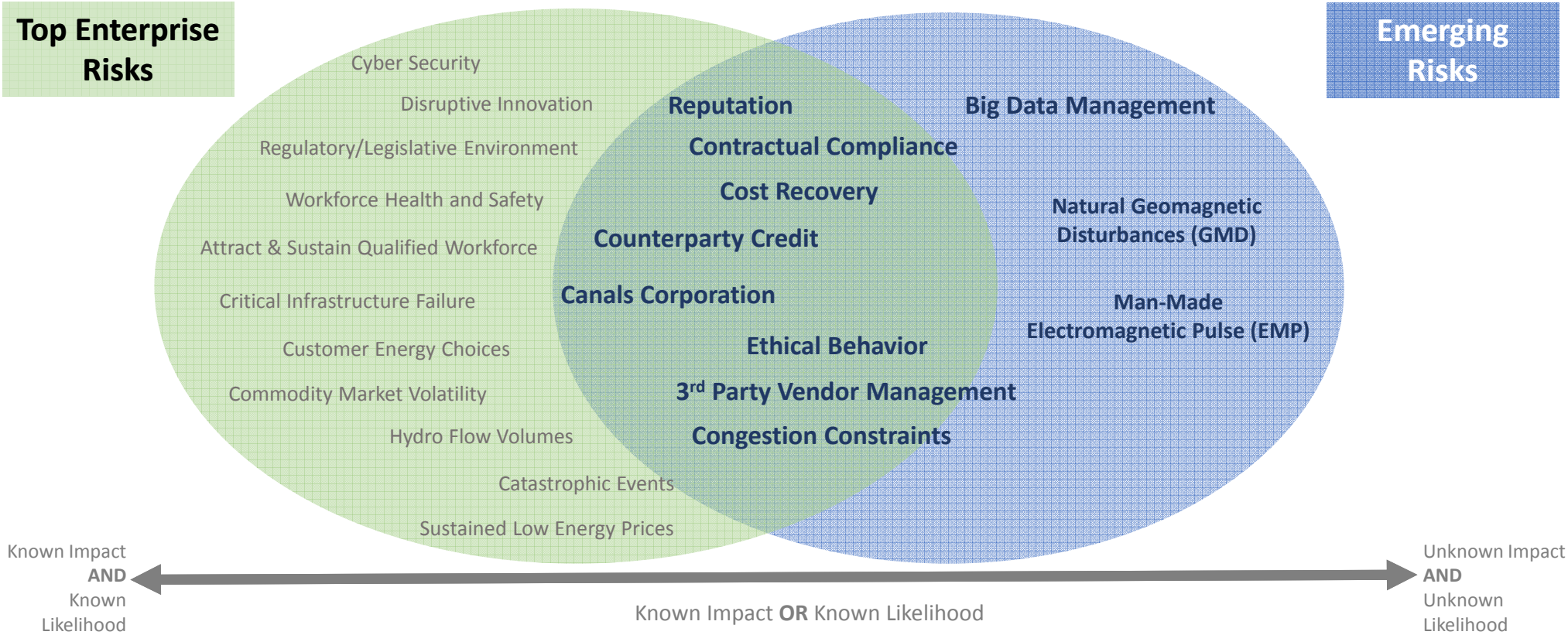
Key Risk Indicators

Top Enterprise Risks	Title
Cyber Security	• Viruses Detected • Cyber Prevention Protection
Workforce Health and Safety	• Safety Walk Downs • Near Miss Reporting
Regulatory/Legislative Environment	• Federal Regulation/Legislation Potentially Impacting NYPA
Commodity Market Volatility	• NYC Governmental Customer Cost-of-Service Variance
Hydro Flow Volumes	• Hydro Flow Probability • Hydro Forecast Variance
Attract and Sustain Qualified Workforce	• Salaried Voluntary Turnovers vs. Vacancy Rate
Critical Infrastructure Failure	• Lost Market Revenue Resulting from Forced Outages • Tracking Critical Corrective Maintenance Hours
Sustained Low Power Prices	• 2017 Energy Prices Indexed to 2012 Pricing • 2017 Capacity Prices Indexed to 2012 Pricing

Emerging Risks: 5-Year Horizon



- **Conditions, situations or trends whose impact and likelihood are unknown due to lack of data**
- **Strategy, financial strength, competitive position and reputation could be impacted**

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Cyber Security Risk

Requires Clearly Defined Roles and Responsibilities

Cyber related event or activity that has a major impact on NYPA, impairs grid reliability, erodes public trust and/or compromises safety	Operations	Information Technology	Cyber	Business Services	Legal	Corporate Affairs	Human Resources	Risk Management	Expected Outcome
Evaluate and improve recovery and public trust/reputation									
Public trust / reputation risk management framework	C	C	C	C	I	C	C	A/R	Development of a risk management framework to address reputational risk. Integration of business continuity and emergency management program with enterprise level business resiliency.
Enterprise level business resiliency integration	R	C	C	I	I	I	I	A	
Develop enterprise-wide cyber security governance and enhance foundational controls									
*Enterprise level technology architecture	R	R	C	C	I	I	C	C	Establishment of governance policies, procedures and controls related to security architecture, and third party protocol.
*Enterprise level security architecture	C	C	R	C	I	I	C	C	
Third-party protocol	R	C	R	C	C	I	R	A	
Enterprise data classification and security	A/R	A/R	R	C	C	I	I	I	
Key Risk and Performance Metrics									
External and internal indicators of performance (KPIs and KRIs)	A	I	R	C	I	I	I	R	Development and establishment of metrics used to measure leading and lagging indicators

Note: Cyber Organization is still under development, once completed an Accountable party will be assigned

Complete Outstanding

- **Responsible**: *Those who do the work to achieve the task*
- **Accountable:** *The one answerable for the correct and through completion of the deliverable or task*
- **Consulted:** *Those whose opinions, feedback and inputs are sought*
- **Informed:** *Those who are kept up-to-date on progress*

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Managing Cyber Security

- Ongoing talent acquisition

- Strengthened governance process by establishing policy and framework
- Enhanced alignment between IT/OT/Cyber and strategic initiatives
- Established Enterprise Architecture group within IT
  - Critical Infrastructure Protection – CIPv5 implementation to complete by July 1
- Developing cloud standards through engagement of multiple stakeholders

- Establishing a list of issues and corrective/mitigation actions to strengthen Cyber technology
  - Upgrade of Intrusion Detection/Prevention capability
  - Tools to detect, analyze and respond to cyber attacks
  - White Plains Office network redesign-improve resiliency, access control, network monitoring

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Reputational Risk

Reputational Risk

- **An event or activity that has a major impact on the value NYPA provides to New York State, stakeholder trust and perception of NYPA, and/or NYPA's ability to sustain and enhance its business viability**

Key Stakeholders	Insights	Next Steps
• Customers • Energy and Capital Markets • Media • NYPA • Policy Makers • Society	• Agreement on reputation as critical to how we deliver value to NY State • Confidence in its ability to respond to crises based on experienced professionals with key relationships • Desire to enhance already strong reputation • Commitment to a more proactive reputation management strategy	• Enhance enterprise level governance and program • Work plans to strengthen reputational resiliency • Clarify, roles, responsibilities and accountability • Operationalize Reputational Risk Management framework

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Appendix

Risk Assessment Highlights

- **Overall Engagement:**
  - Cross functional participation including Senior level Leadership
    - Multiple risk workshops held averaging 11 participants per workshop
    - Over 60 respondents to Top Risk Survey

- **Strategic:**
  - Sustained Low Energy Prices is a primary driver of net income whose impact and likelihood remained relatively unchanged
    - Current and/or pending mitigations/controls in place or being put in place to dampen negative impacts of this risk
  - The Disruptive Innovation change was driven by an increase in impact.
    - Emphasis placed on this risk through the formation of a Disruptive Innovation Working Group focusing on identification, tracking and impact assessment

- **External:**
  - Regulatory/Legislative risks are typically driven by external stakeholders
    - Canals Corporation demonstrates the magnitude of impact due to outside influences
  - Cyber Security is still classified as a high level risk
    - Downward shift was due to upgrades in skills, processes, and technology

- **Internal:**
  - Workforce Health & Safety continues to be a high priority for the Authority
    - Cross functional team input revealed greater insights

Key Risk Indicators

Cybersecurity

External

Risk Description	Risk Activity/Highlights
Cyber related event or activity that has a major impact on NYPA, impairs grid reliability, corrodes public trust and/or compromises safety	• Completed reputational risk assessment facilitated by Risk Management and Deloitte. • Integrating Emergency management across NYPA facilitated by Technical Compliance and Navigant.

Risk Indicator 1: Viruses Detected *Updated: March 2016*

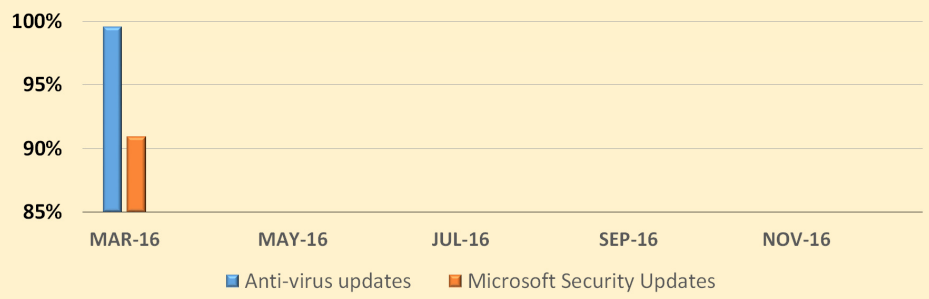
Viruses identified and addressed on NYPA networked PC

March-16	67
Average Month	67

Lower is Better

Risk Indicator 2: Cyber Prevention Protection

Description: Software updates to keep NYPA assets protected against future threats



Occupational Health and Workforce Safety

Internal

Risk Description	Risk Activity/Highlights
Failure to ensure a safe and secure work environment	• NYPA has a robust amount of controls, policies, job safety plans, training, protective equipment, programs and committees currently in place. • Currently updating Health and Safety policies, procedures and training to ensure regulatory compliance and consistency across sites. • Exploring opportunities to ensure contractor safety culture, fleet safety features and protecting/preventing workplace violence were identified as additional action plans.

Risk Indicator 1: Safety Walk Downs *Updated: March 2016*

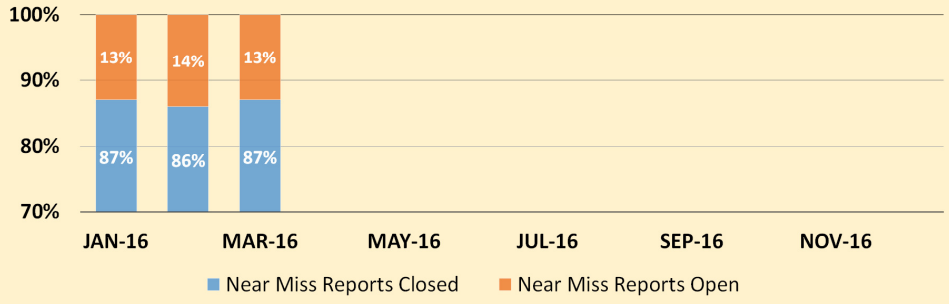
Safety walk downs is an indicator to capture NYPA's efforts at incident prevention

YTD	35%
YTD Goal	25%

Higher is Better

Risk Indicator 2: Near Miss Reporting

Description: An indicator to mitigate noted hazards to prevent them from escalating to more serious incidents



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Key Risk Indicators

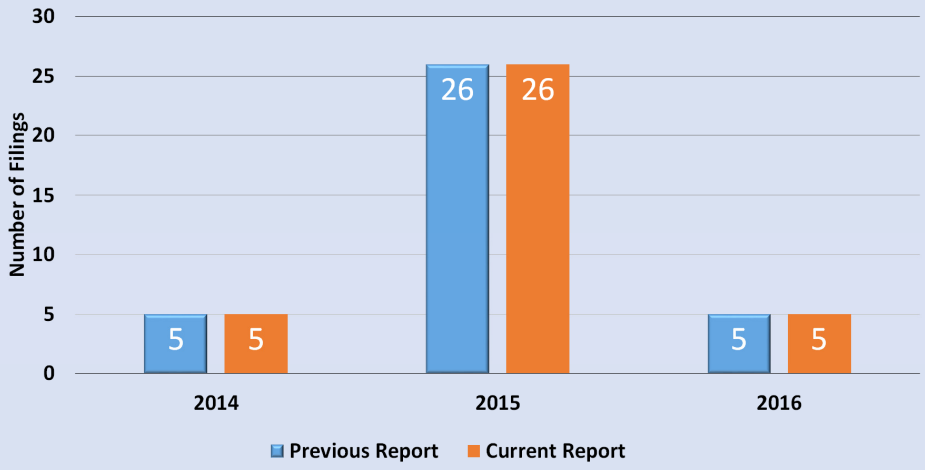
Regulatory/Legislative Environment

External

Risk Description	Risk Activity/Highlights
Failure to anticipate and adequately respond to the adoption of statutes, regulations, standards and market rules that may impact NYPA's ability to fulfill its mission	• A focal point of discussion was the significant impact of Regulatory/ Legislative environment as well as second order effects on NYPA (e.g. Canal Corp). • A governance structure will be established to track new laws and trends in an effort to improve the anticipation of future policy developments and, enhance internal communication.

Risk Indicator 1: Federal Regulation/Legislation Potentially Impacting NYPA *Updated: April 2016*

Description: Measure tracks pending regulation/legislation



Commodity Market Volatility

External

Risk Description	Risk Activity/Highlights
Inability to plan for, respond to and manage opportunities in energy market price volatility impacting the Authority's revenue and customers	• Short term dynamic hedging alternatives and establishment/refinement of thresholds to respond to price signals are currently being developed. • Long term hedging strategies and energy commodities risk solution is currently being facilitated by Risk Management and PWC.

Risk Indicator 1: New York City Government Customer Cost-of-Service Variance *Updated: April 2016*

Initial proposed Cost-of-Service compared to current projections

Initial Budget	$354
Current Projections	$337

Millions

Risk Indicator 2:

In-Development

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Key Risk Indicators

Catastrophic Events

External

Risk Description	Risk Activity/Highlights
Severe events potentially disrupting reliability and availability of generation, transmission assets and/or the workforce	• Multiple policies, procedures, plans, drills, training and monitoring systems including communication with vendors, other utilities and local/regional government are in place. • Revision and revitalization of the Emergency Management Program is in process and being facilitated by Technical Compliance and Navigant.

Risk Indicator 1:

In-Development

Risk Indicator 2:

In-Development

Hydro Flow Volumes

External

Risk Description	Risk Activity/Highlights
Variability of hydro flows versus budget forecast may result in significant fluctuations in revenue from hydro generation	• Improving probabilistic hydro forecasting model with the U.S. Army Corps of Engineers, Great Lakes Environmental Research Lab (GLERL) and Clarkson University. • Actively monitoring alternative water use proposals by Council of Great Lakes Governors.

Risk Indicator 1: Hydro Flow Probability *Updated: April 2016*

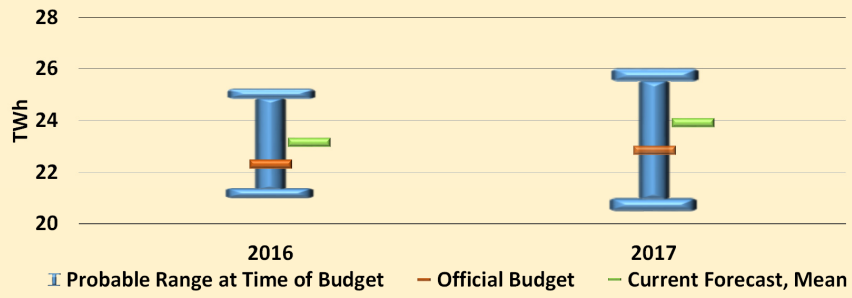
Probability the actual hydro generation will be less than projected budget

Budget 2016	11%
Budget 2017	17%

Lower is Better

Risk Indicator 2: Hydro Forecast Variance *Updated April 2016*

Description: Monitor changes of the hydro forecast from budget projections



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Key Risk Indicators

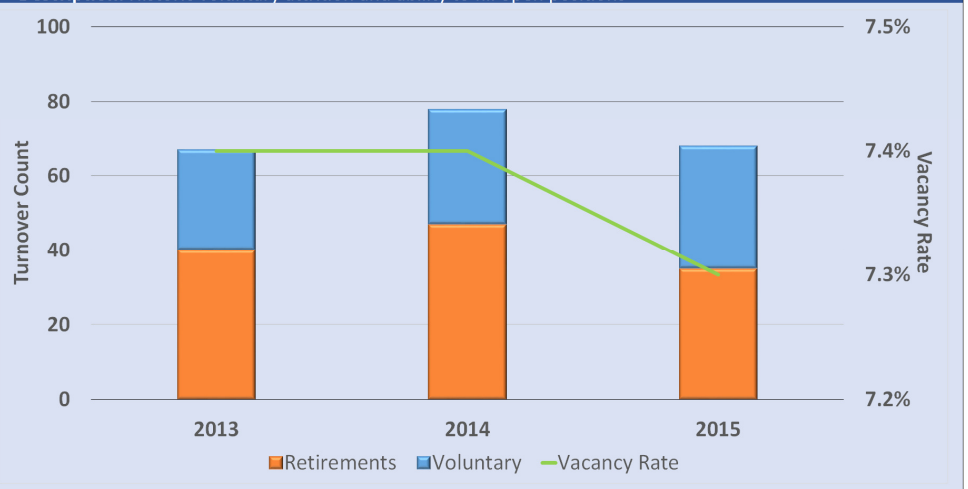
Attract and Sustain Qualified Workforce

Internal

Risk Description	Risk Activity/Highlights
Ability to attract and sustain a qualified and skilled workforce needed for core operations and strategic growth in a competitive market	• Human Resources is in the process of implementing a Human Capital Maturity Model which will drive to reshape the Authority into more high capacity, flexible, and effective organization.

Risk Indicator 1: Salaried Voluntary Turnovers vs. Vacancy Rate *Updated Annually*

Description: Historic voluntary attrition and ability to fill open positions



Critical infrastructure Failure

Internal

Risk Description	Risk Activity/Highlights
Failure of critical infrastructure leading to service disruption, injury, degradation of system reliability and/or significant loss of the Authority's revenue	• Redundancy of major equipment, incident reporting, inspection and maintenance tracking, asset hardening evaluation, ice management, insurance, vendor selection/diversification process, performance testing and condition monitoring are some of the robust controls already in place. • Strategic Asset Management Plan (SAMP) is in process and addresses asset life-cycle, reliability centered maintenance program and best practices.

Risk Indicator 1: Lost Market Revenue Resulting from Forced Outages *Updated March 2016*

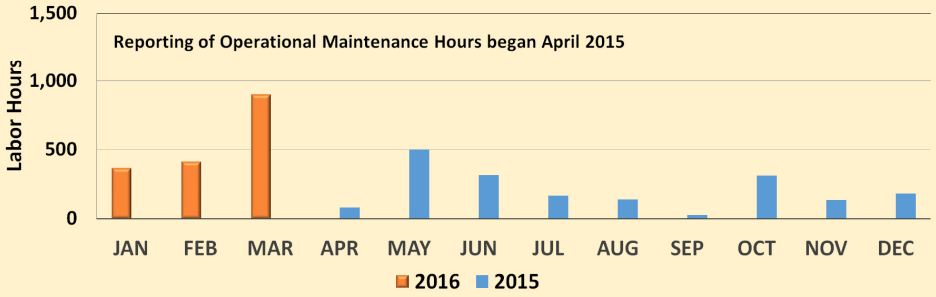
Financial market impact of forced outage events

YTD: Jan to Mar 2016	$0.4
Historical: Comparable 3-Year Average	$0.3

$ in Millions

Risk Indicator 2: Tracking Critical Corrective Maintenance Hours

Description: Critical maintenance repair hours compared to historical average (2013 - 2015)



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Key Risk Indicators

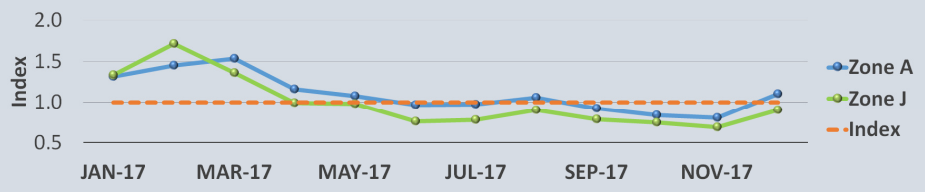
Sustained Low Power Prices

Strategic

Risk Description	Risk Activity/Highlights
Inability to respond to sustained low power prices and adapt to changing customer perception of the competitive value we provide	• Sustained low power prices is a key risk impacting long term strategy for operations, value of energy efficiency and our customer offerings. • Stress test potential impacts and our ability to respond.

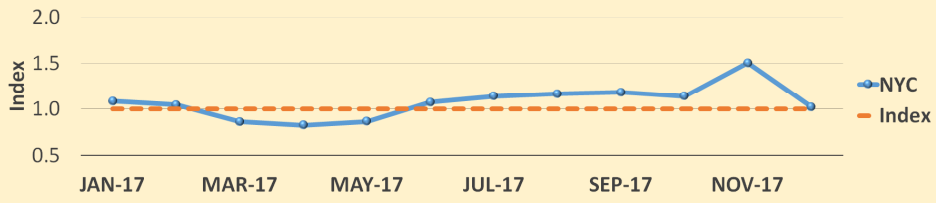
Risk Indicator 1: 2017 Energy Prices Indexed to 2012 pricing
Description: Values > 1.0 Indicate higher energy prices relative to 2012

Market as of 4/22/2016



Risk Indicator 2: 2017 Capacity Prices Indexed to 2012 pricing
Description: Values > 1.0 Indicate higher capacity prices relative to 2012

Capacity as of 4/7/2016



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