

1 Q. **Asset Management**

2 Provide an electronic copy of Hydro's overall asset management philosophy and
3 strategy document.

4

5

6 A. Please see PUB-NLH-342 Attachment 1.

Asset Management and Project Execution at Nalcor Energy

2014.

Boundless Energy



Purpose of This Presentation

- To outline the drivers for an asset management system at Nalcor Energy
- To review Nalcor's desired state for asset management – what asset management excellence looks like
- To review Nalcor's asset management framework, and the key functions and elements within it
- To identify the respective mandates of business units; Project Execution and Technical Services; and the corporate office of asset management; and the roles and responsibilities of the key players in each area
- To review the organizational structures for business units in NLH and CFLCo which support LT asset planning; ST asset planning and scheduling; work execution; and operations.

Outline

- Asset management defined
- Drivers for an asset management framework at Nalcor
- Nalcor's asset management framework
- Asset management functions
- Asset management roles and responsibilities
- Supporting organizational structures
 - NLH, CFLCo
 - Office of Asset Management
 - Project Execution & Technical Services Division
- Next steps

Asset Management Defined

- What is Asset Management?
- Asset management functions
- Our stakeholders

What is Asset Management?

Asset management is the comprehensive management of asset requirements, planning, procurement, operations, maintenance, and evaluation in terms of life extension or rehabilitation, replacement or retirement to achieve maximum value for the stakeholders based on the required standard of service to current and future generations.

It is a holistic, cradle-to-grave lifecycle view on how we manage our assets.

Asset Management Functions

- Long term asset planning
- Short-term work planning and scheduling
- Critical spares management
- Work execution
- Operations

Our Stakeholders in Asset Management

- Our shareholder, the provincial government
- The general public and rate paying citizens of the province
- Industrial customers
- Regulatory agencies, including the Public Utilities Board
- Both current and prospective commercial partners
- Funding partners and rating agencies
- Our employees

Drivers for an Asset Management Framework

- Our corporate vision and goals
- Our corporate values
- Drivers for excellence in asset management
- Our vision and desired state for asset management

Nalcor's Corporate Vision and Goals

- Our Core Purpose

- ***“To build a strong economic future for successive generations of Newfoundlanders and Labradorians”***

- Our Corporate Goals

- Safety – to be a world class safety leader
- Environment – to be an environmental leader
- Business Excellence – through operational excellence, to provide exceptional value to all customers of our energy
- People – to ensure a highly skilled and motivated team of employees who are strongly committed to our success and future direction
- Community – to be a valued corporate citizen in Newfoundland and Labrador

Nalcor's Corporate Values

Nalcor Energy is a proud, diverse energy company, whose people are committed to building a bright future for Newfoundland and Labrador, unified by our core values of ...

- Open Communication – fostering an environment where information moves freely in a timely manner.
- Accountability – holding ourselves responsible for our actions and performance.
- Safety – relentless commitment to protecting ourselves, our colleagues, and our community
- Honesty and Trust – being sincere in everything we say and do.
- Teamwork – sharing our ideas in an open and supportive manner to achieve excellence.
- Respect and Dignity – appreciating the individuality of others by our words and actions.
- Leadership – empowering individuals to help guide and inspire others.

Drivers for Asset Management Excellence

- **Asset intensive** – Nalcor’s lines of business are asset intensive; managing these assets properly is critical to our success
- **Reliability and cost** -- ensuring we always provide a highly reliable and cost effective service in our base business – the generation and transmission of electrical power
- **Focus on business excellence** -- as a key enabler of our corporate vision and our future growth as a diversified and viable energy company
- **Best practice adoption** – the value of breeding operational excellence through innovation and the pro-active adoption of best practices in all lines of business
- **Safety** -- our goal of zero injuries and the need to ensure the safety of our employees, contractors, visitors, and the general public at all times
- **The environment** -- minimizing negative impacts on the environment caused by emissions, spills, and inefficiencies related to asset condition or energy use
- **Optimizing our people talent** – ensuring we are able to leverage available knowledge and skills across all business units, especially in highly specialized technical areas

Our Vision and Desired State

- Our Vision
 - A best practice, consistent approach to managing assets in all lines of business that drives excellence
- What Asset Management Excellence Looks Like
 - Process:
 - All aspects of service level determination; asset acquisition and renewal; asset operations; asset maintenance are seamlessly integrated across all Nalcor businesses through a standardized asset management system
 - We understand the standards of service expected from our assets. Our process is strongly grounded in the determination of necessary service levels and the basis of design, with strategic consideration given to asset objectives in the context of the company's vision, values and goals.
 - Supporting Organization
 - We are achieving significant organizational synergies through the use of a common, company-wide framework; consistent organizational structures; and common titling in all key positions
 - There is a clear delineation and understanding of asset management accountabilities between operations, corporate asset management functions, and engineering services

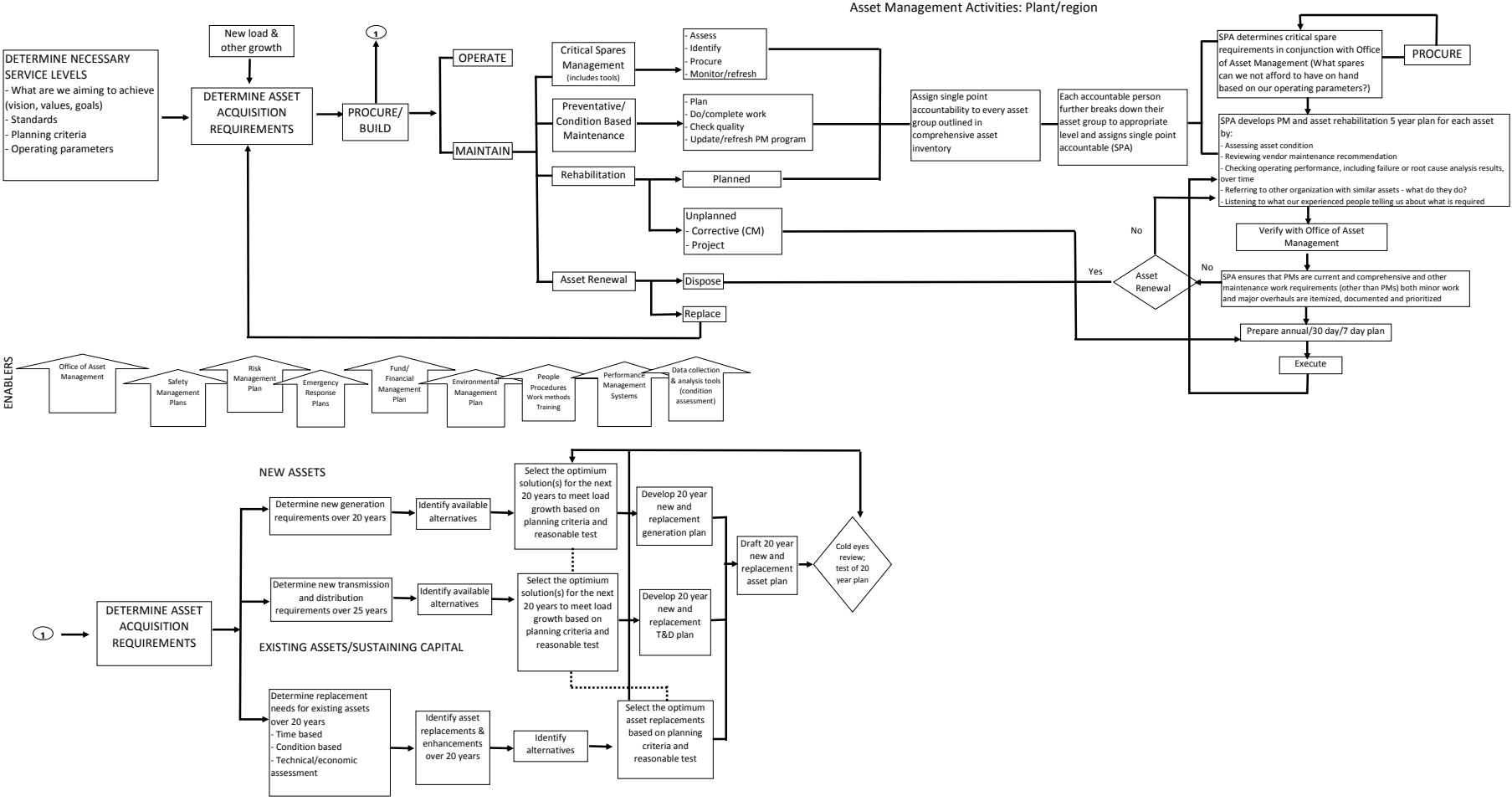
Our Vision and Desired State

- What Asset Management Excellence Looks Like (*con't*)
 - Supporting Organization
 - There is a clear and understood division of responsibilities in the areas of LT asset planning; ST planning and scheduling; work execution; operations; and support services
 - We know the condition of all key assets and how they are performing
 - Ideally, critical assets do not fail unexpectedly -- they are maintained, renewed or replaced before they fail; if assets are run to failure we know why that tactic was chosen and the necessary remedial action is taken
 - Critical spare parts are available
 - Key stakeholders understand and have confidence in the quality and integrity of our asset management approach and support/approve the investments required to meet service/customer expectations

Nalcor's Asset Management Framework

- Framework Elements
 - Basis of Design
 - Determination of Asset Acquisition Requirements
 - Operations, Maintenance and Asset Renewal
- Key Enablers
- Major Asset Classes

Asset Management Framework



Basis of Design

The standards, planning criteria and operating parameters which reflect the required level of quality and service our assets are expected to deliver -- documented and centrally maintained.

- **Standards**

- Outline the expected model for asset design
- Ensure consistency among similar projects
- Ensure that all legislative, safety, reliability and other design parameters are documented and available
- Internal standards (e.g., generation planning criteria)
- External standards (e.g., CSA standards, IEEE, ISO 14001, NERC)

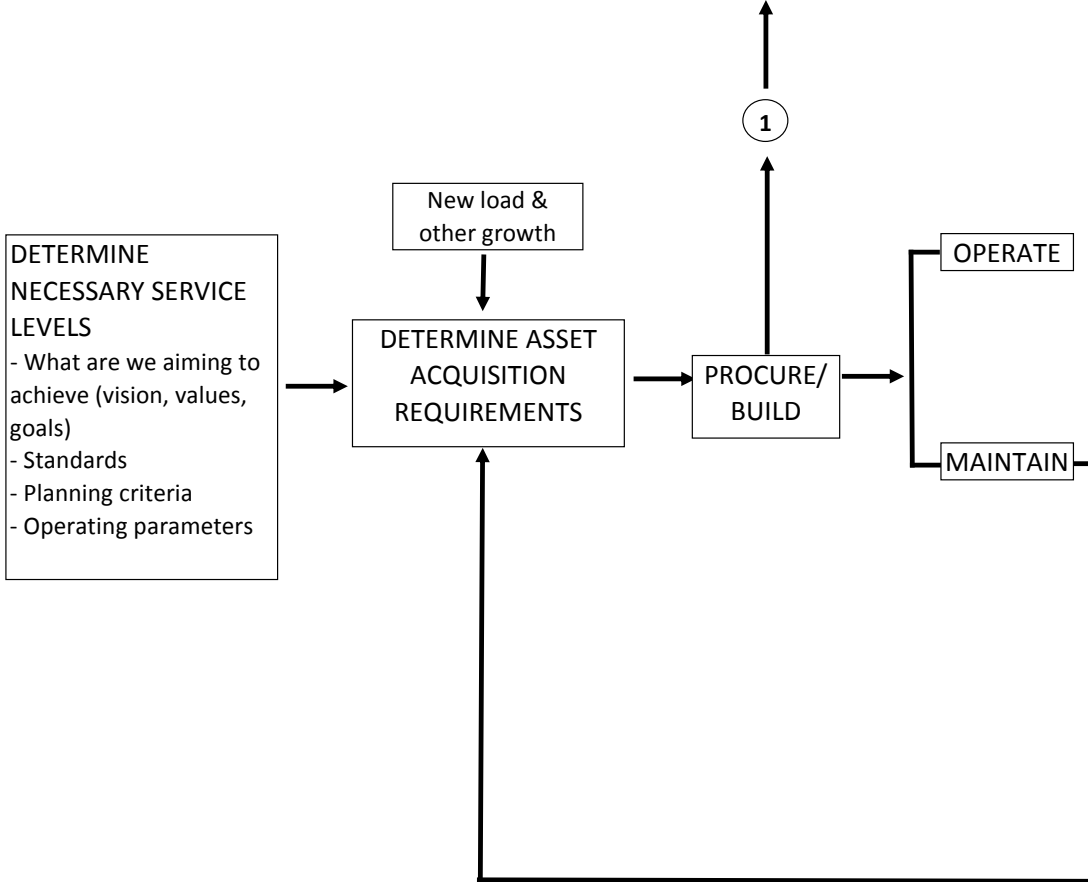
- **Planning Criteria**

- Guide the service levels required for new assets, provide an objective test for the asset/system
- Based on efficiency, reliability, and quality considerations, sometimes formal probabilistic analysis
- Will usually differ by asset group

- **Operating Parameters**

- Include the limits to which the asset can be run
- Primarily based on the technical specifications of assets, e.g., nameplate ratings
- Additional operating parameters may include established levels of reliability or efficiency

Basis of Design

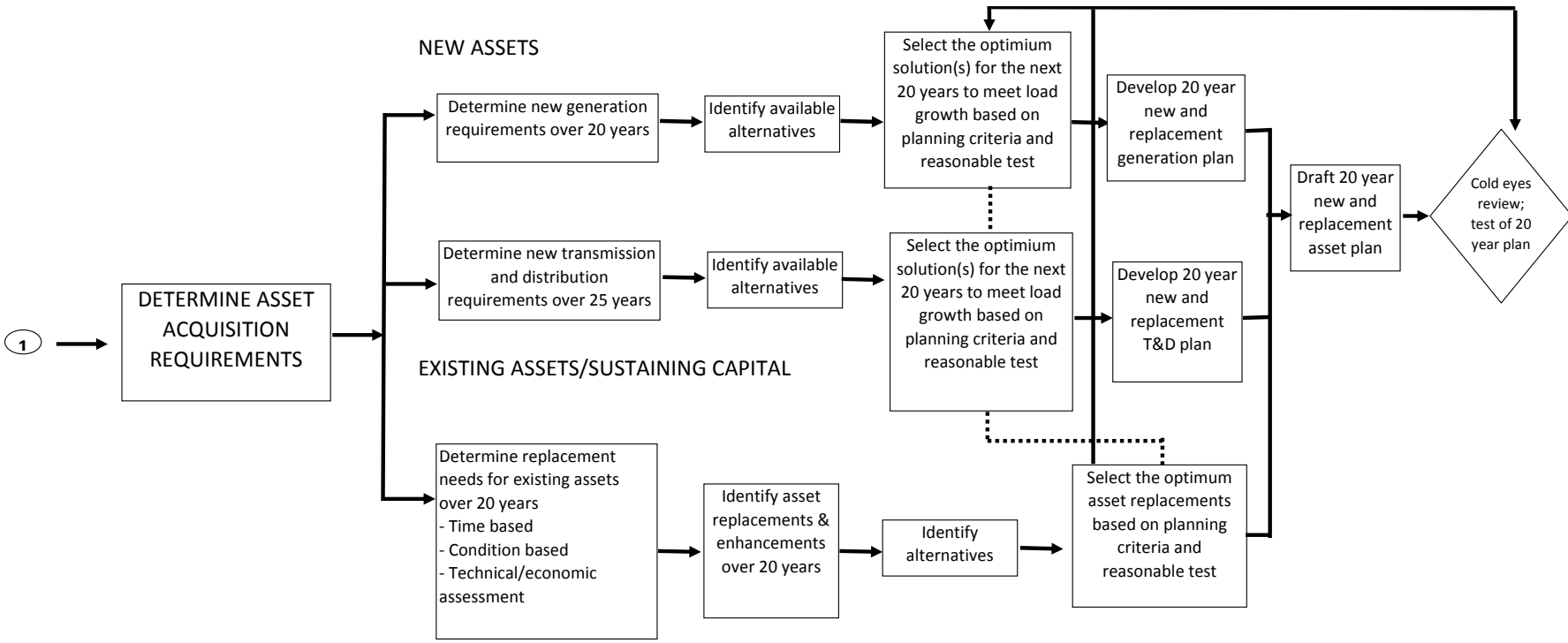


Asset Acquisition

How we determine what assets to invest in and the processes involved in procuring the assets, including replacement

- **New Assets**
 - Assets required to meet new demand or growth needs
- **Existing Assets/Sustaining Capital**
 - Regular review of existing assets to ensure that the 20 year plan continues to provide required service levels
 - Asset replacement or enhancement driven by one or more of the following:
 - Age and condition of asset
 - Condition only
 - Technical or economic assessment
 - Service expectations or standards for reliability or service duty may have changed
- **20 Year Planning Horizon**
 - 20 years plans for new/replacement assets and enhancements consolidated
 - Cold eyes review for completeness and quality

Determining Asset Acquisition Requirements



Operations, Maintenance, Asset Renewal

- Operate
 - Assets are operated safely in accordance with basis of design, operating parameters and regulations
- Maintain
 - Critical spares – identify, procure, monitor/refresh
 - Preventative maintenance
 - Long and short term planning
 - Do/complete – work execution
 - Check quality
 - Update/refresh PM program
 - Rehabilitation – work required to maintain performance at an acceptable service level
 - Planned – planned overhauls, maintenance resulting from planned inspection, asset condition
 - Unplanned – emergency and corrective maintenance
 - Safe, timely and environmentally responsible completions by skilled employees
- Asset Renewal
 - Monitoring of useful life
 - Life extension strategies are considered before asset replacement decisions are made

Operations, Maintenance, Asset Renewal

Ongoing operations, maintenance, critical spares management, rehabilitation and disposal of assets

- **Key Success Factors**

1. Comprehensive listing of all assets, constantly updated, document controlled
2. Single point accountable assigned re: operation & maintenance of each asset
3. All accountables understand their respective accountabilities in terms of:
 1. Understanding Nalcor's asset management approach
 2. Understanding the assets they are accountable for
 3. Ensuring each of these assets has a long and short term maintenance plan
 4. Ensuring these maintenance plans are excuted on time, on budget
 5. Ensuring each asset has an operating plan consistent with Nalcor's basis of design
4. Consistent organizational structure, including common titles
5. Line people understand they are accountable for all elements of full life cycle management, not corporate staff
6. Supporting processes (e.g. safety, environment, human resources)
7. An "Office of Asset management" to ensure consistency of approach and representing the CEO in the relentless drive for asset management excellence

Operations – Key Focus Areas

Assets are operated safely in accordance with their basis of design, operating parameters and regulations. Accomplished through people, processes, and reliable critical equipment. Includes procedures, inspections, maintenance programs, & qualified people to consistently execute.

- Procedures for operating, inspection and maintenance are available and consistently used:
 - Asset Maintenance Review
 - Work Methods
 - Work Protection Code
 - PM Inspection & Maintenance work orders
 - Job Planning & Standard Operating Procedures
 - KPI's & Metrics dashboard, Performance & Reliability Committee
 - Work Execution, Annual Work Plan & Project Execution process, Supply Chain & Spares
- Staff training, development and succession management
 - Operator/Technologist/Apprenticeship Programs, Holyrood ELAC
- Clear roles and accountabilities for key functions of Ops, WE, STWPS, LTAP & PE
- Planning and Scheduling, long and short term, monthly/weekly/daily management
- Root Cause and Repeat Failure Analysis and Improvement
- Management of Change

Key Enablers

- Safety Plans
- Asset Listings & Hierarchies, and Criticality/Health Rankings
- Risk Management Plan
- Emergency Response Plans
- Funding/Financial Management Plans
- Environmental Management Plan
- People, Procedures and Work Methods Training
- Performance Management Systems
- Performance Data – Collection, Quality Assurance, Analysis

Safety Excellence Pillars

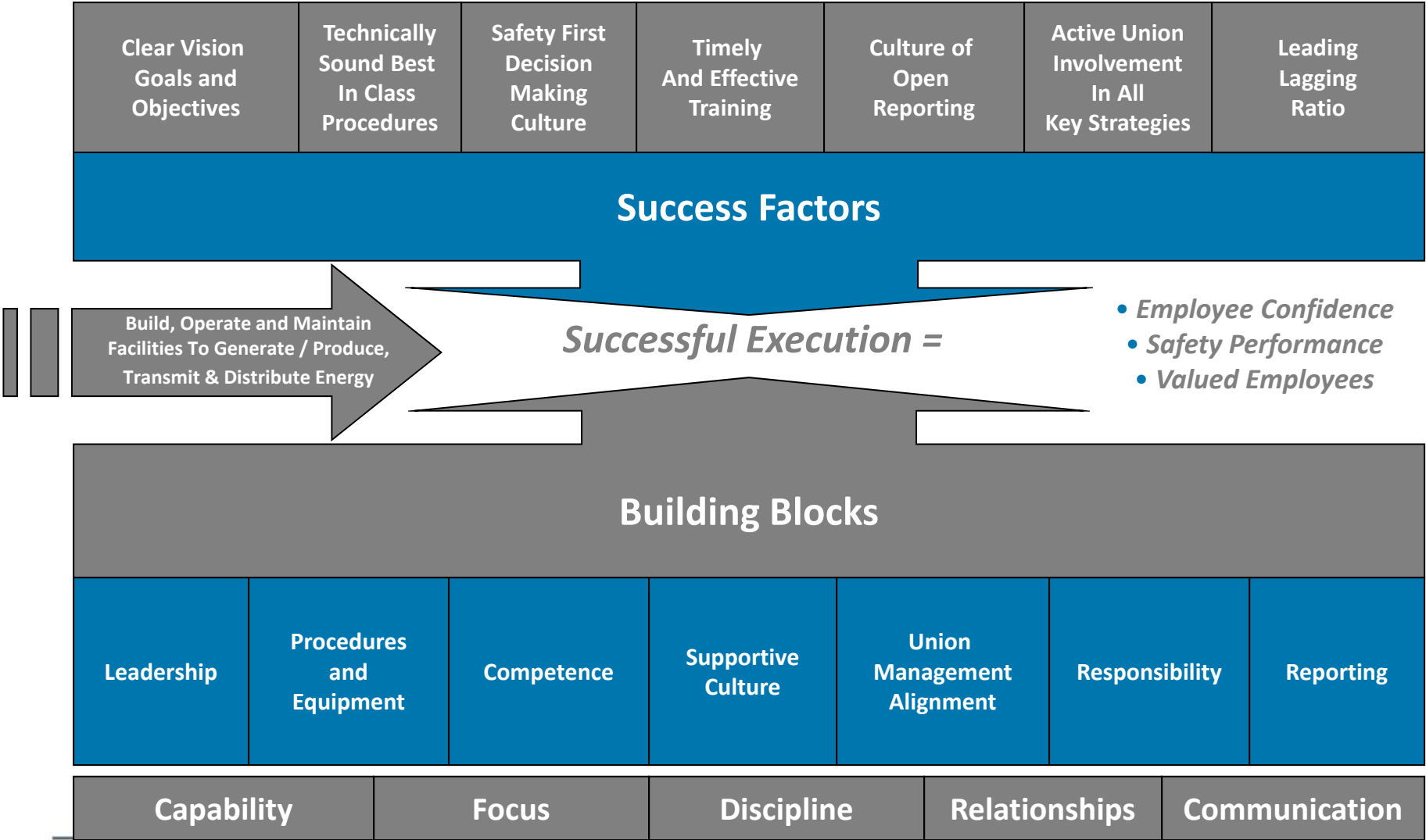


Reporting, Analysis, Action and Continuous Improvement

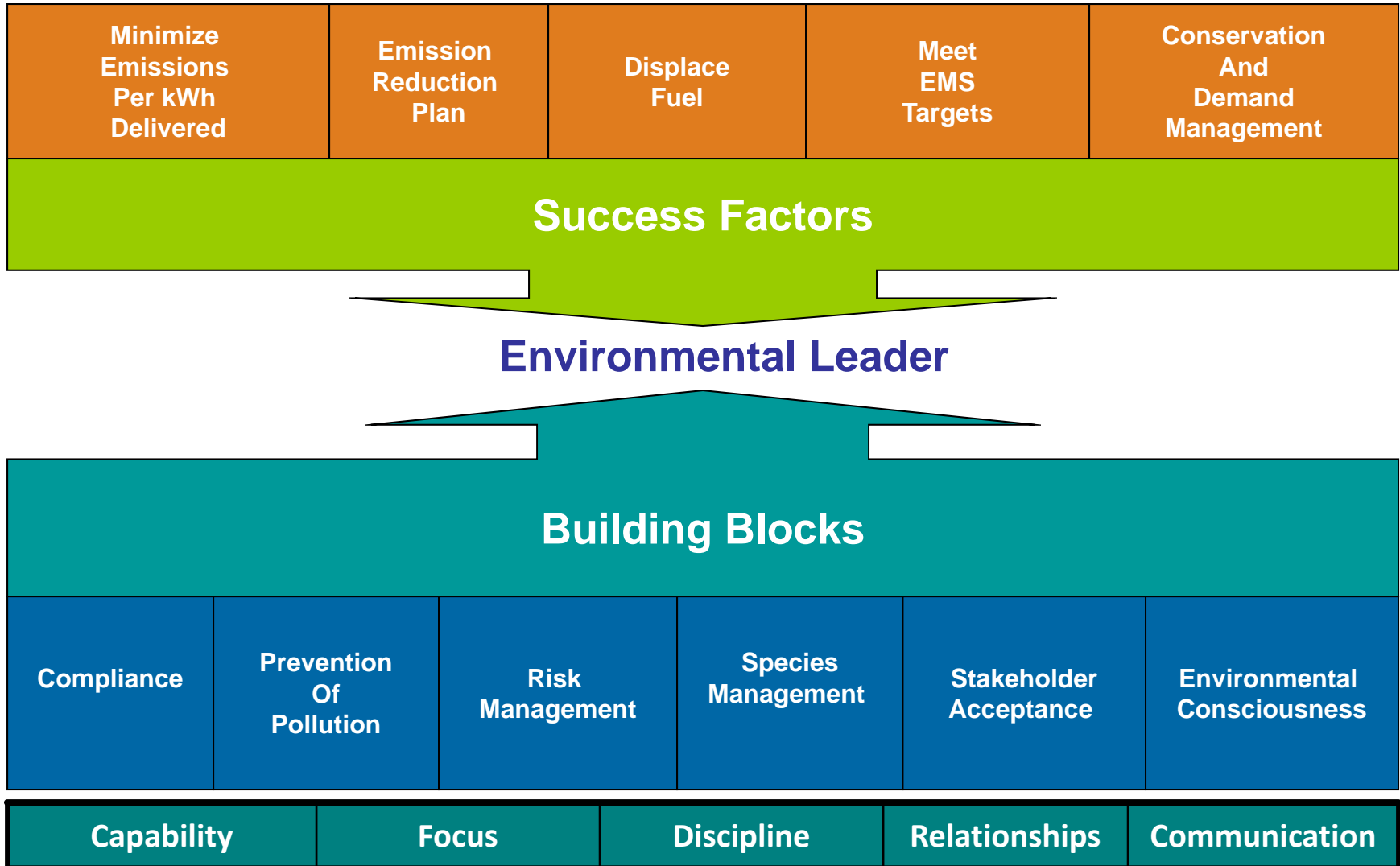
LEADING INDICATORS
Hazards, Near Misses, Safe and Unsafe Observations, First Aids, Inspections, Audits

LAGGING INDICATORS
Medical Treatments, Lost Time Injuries, Severity, analyzed by injury type, part of body, location, etc.

Safety Framework



Goal 2 Framework



Nalcor's Environmental Policy

Environmental Guiding Principles

PREVENTION OF POLLUTION

- Implement reasonable actions for prevention of pollution of air, water and soil and minimize the impact of any pollution which is accidental or unavoidable.
- Use the Province's natural resources in a wide and efficient manner.
- Use energy as efficiently as possible during the generation, transmission and distribution of electricity, and the operation of its facilities, and promote efficient use of electricity by stakeholders.
- Maintain an adequate level of emergency preparedness in order to respond quickly and effectively to environmental emergencies.
- Recover, reduce, reuse and recycle waste materials wherever possible.

IMPROVE CONTINUALLY

- Audit facilities to assess potential environmental risks and to identify opportunities for continual improvement of environmental performance.
- Establish environmental objectives and targets, and monitor environmental performance.
- Integrate environmental considerations into decision-making processes at all levels.
- Empower employees to be responsible for the environmental aspects of their jobs and ensure that they have the skills and knowledge necessary to conduct their work in an environmentally responsible manner.

COMPLY WITH LEGISLATION

- Comply with all applicable environmental laws and regulations, and participate in the Canadian Electricity Association's Sustainable Electricity Program.
- Periodically report to the Board of Directors, Leadership Team, employees, government agencies, and the general public on environmental performance, commitments and activities.
- Monitor compliance with environmental laws and regulations, and quantify predicted environmental impacts of selected activities on the environment.
- Respect the cultural heritage of the people of the Province and strive to minimize the potential impact of Corporate activities on heritage resources.

Annual Work Plans, Monthly & Weekly Schedules

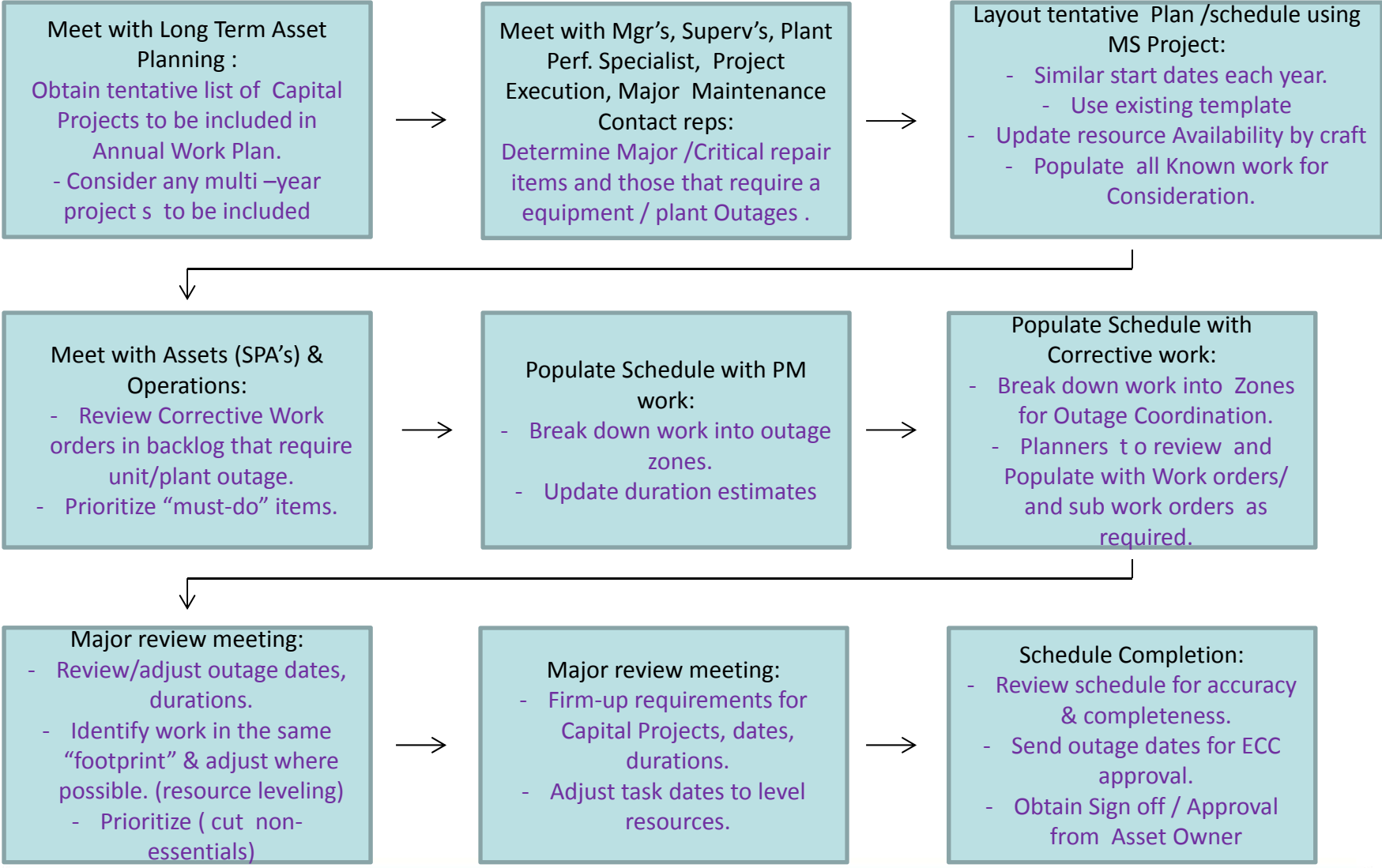
- Covers all the work we have to do next year in ensuring the safe, reliable and sustainable production and delivery of energy to customers.
 - Includes the work required to operate, maintain and upgrade our assets. Work load is sorted into 5 broad categories:
 - Corrective Maintenance (CM)
 - Preventative Maintenance (PM)
 - Non Maintenance (NM)
 - Staff Training & development
 - Safety Programs/Systems
 - Operating Projects (OP)
 - Capital Projects (CP)
 - Resource balanced, integrated plans
-

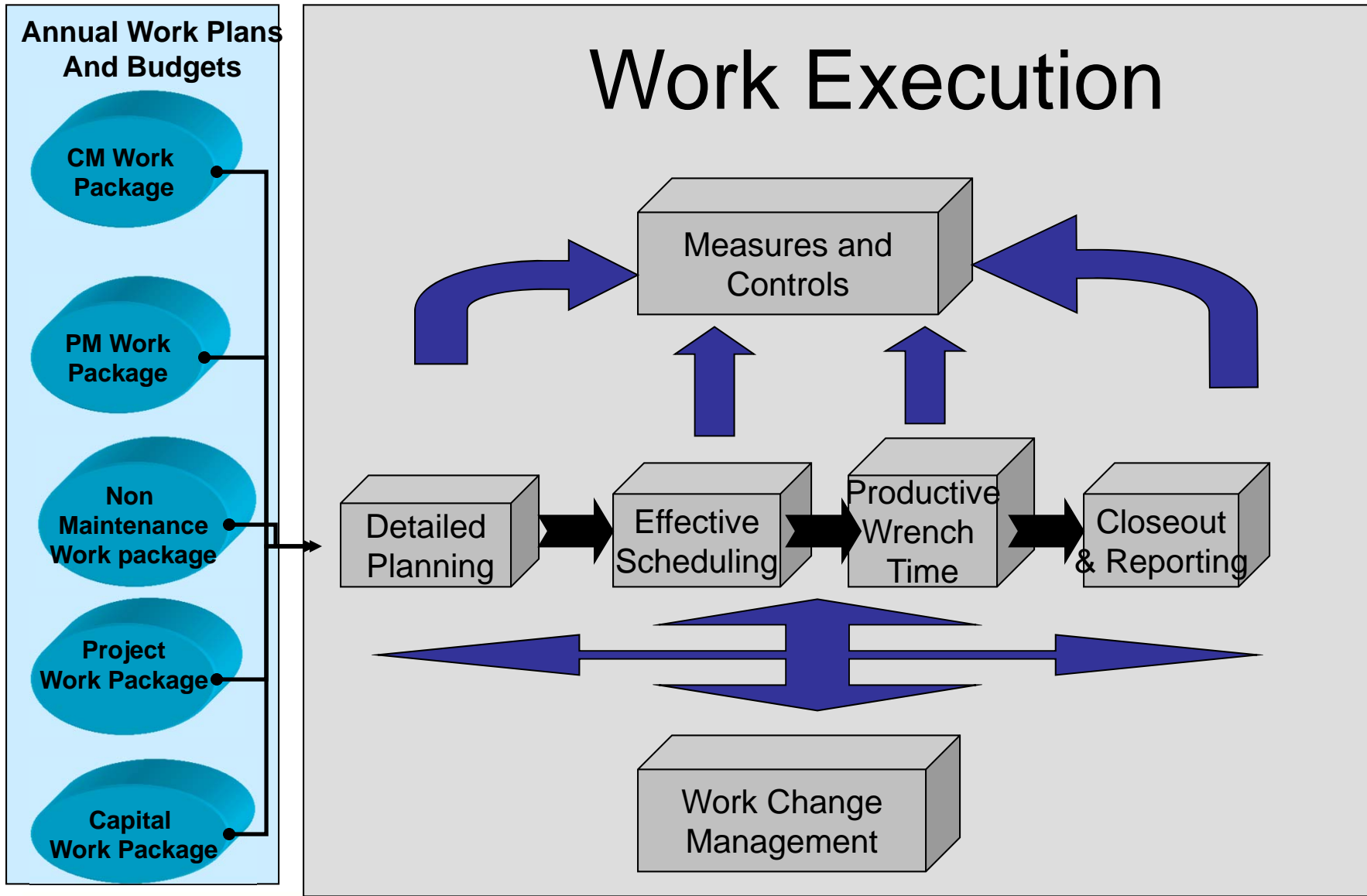
Annual Work Plan Development

The development process includes input from many stake holders such as:

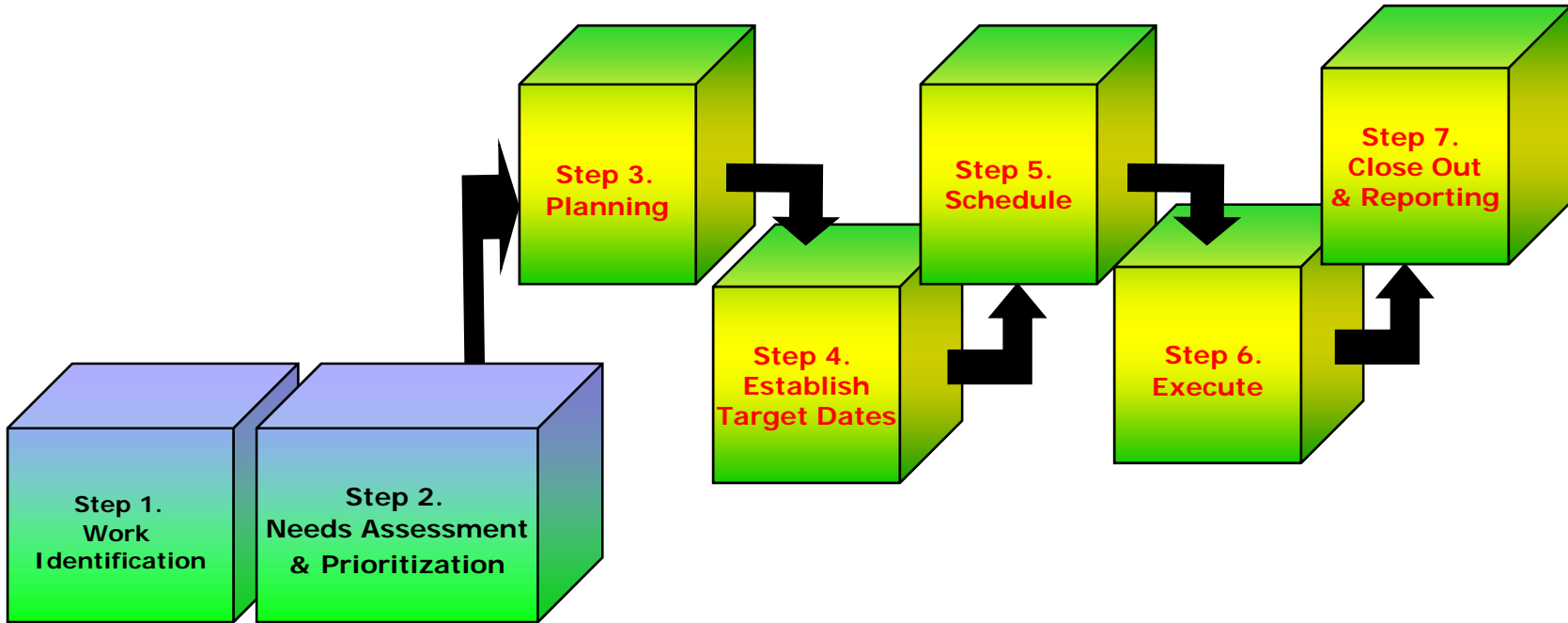
- Long Term Asset Planning Group
 - Maintenance tactics and PM Program
 - Asset replacements, rehabilitation and upgrades
- Operations Group
 - Corrective Maintenance Priorities/ Equipment operational Issues
 - Outage scheduling / maintenance opportunity or window
- Project Engineering Group & PETs
 - Capital / Operating Project Execution ; Schedule and Resource Requirements
- ECC Outage Coordination
- Contractor Representatives
 - Resource Availability and schedule
- The integrated schedule is developed, managed and championed by the STWPS Supervisor and approved by the Asset Owners who has the accountability for the assets.

Annual Work Plan Development Process

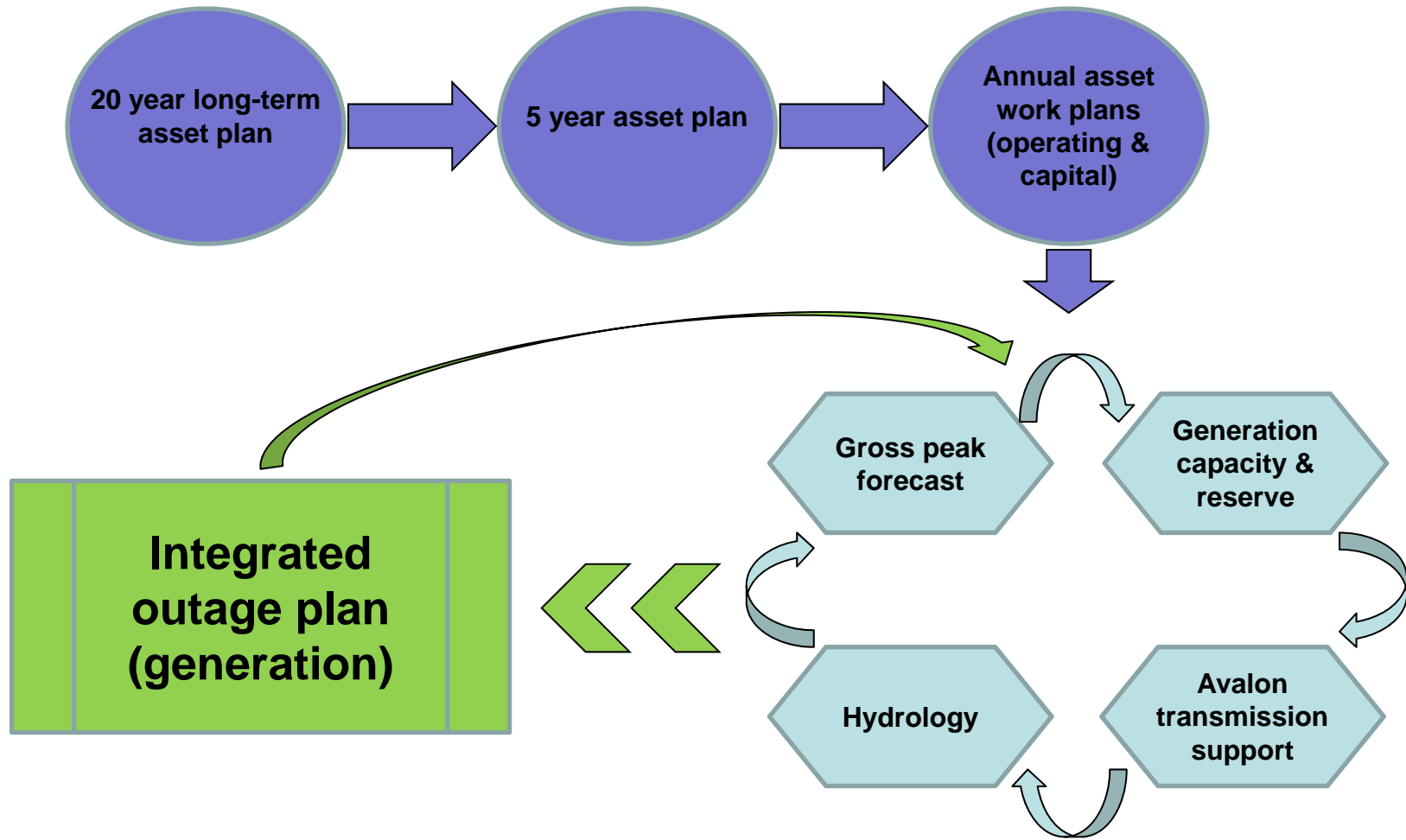




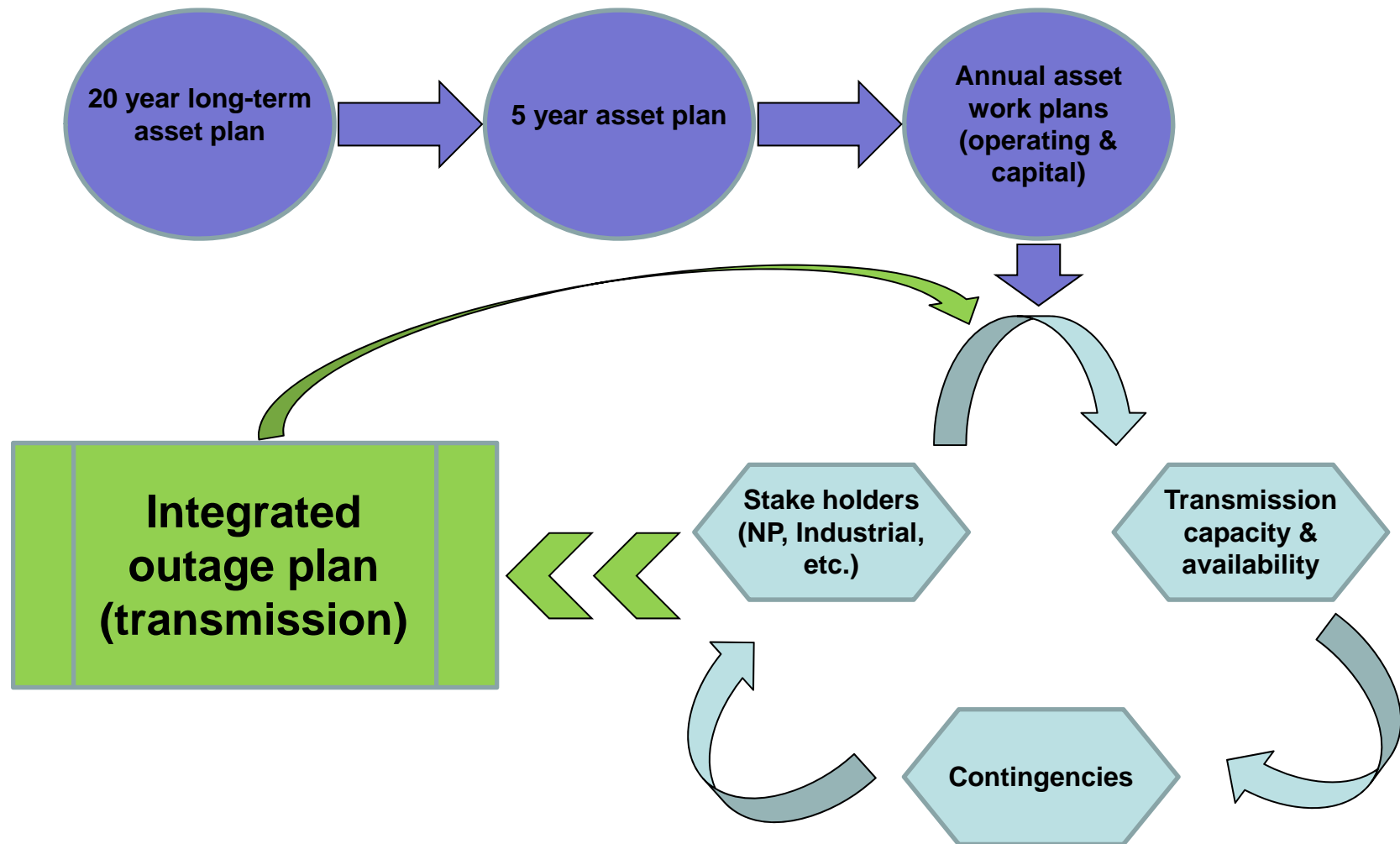
The Work Execution Process includes seven-steps



Integrated Outage Plan (Generation)



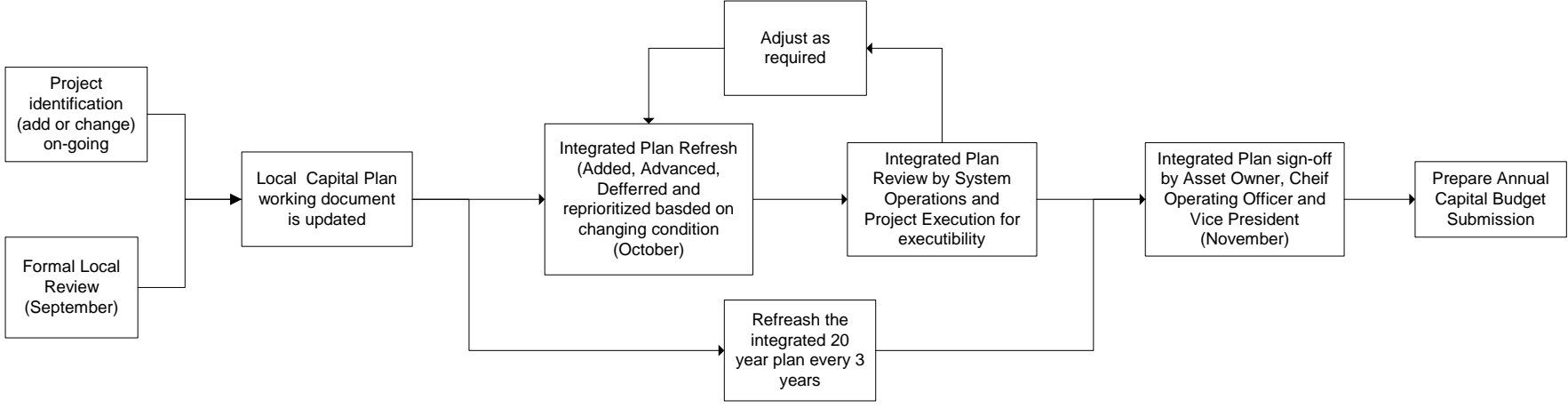
Integrated Outage Plan (Transmission)



Integrated Outage Plan

- Annual maintenance and capital plans, across all generation and transmission groups, are consolidated. Synergies in outage work to common equipment are noted
- Generation resource outages are planned, using the gross peak forecast, to meet system contingency reserve criterion (n-1)
- Avalon generation is scheduled to support transmission into the high demand regions, to maintain power system reliability
- Hydraulic resources are managed to optimize efficiency
- Transmission outages are planned with consideration to maintain sufficient transmission capacity and system reliability in the event of a contingency
- Consultation with stake holders occurs to ensure service continuity and customer relations

Long Term Capital Plan Refresh Cycle

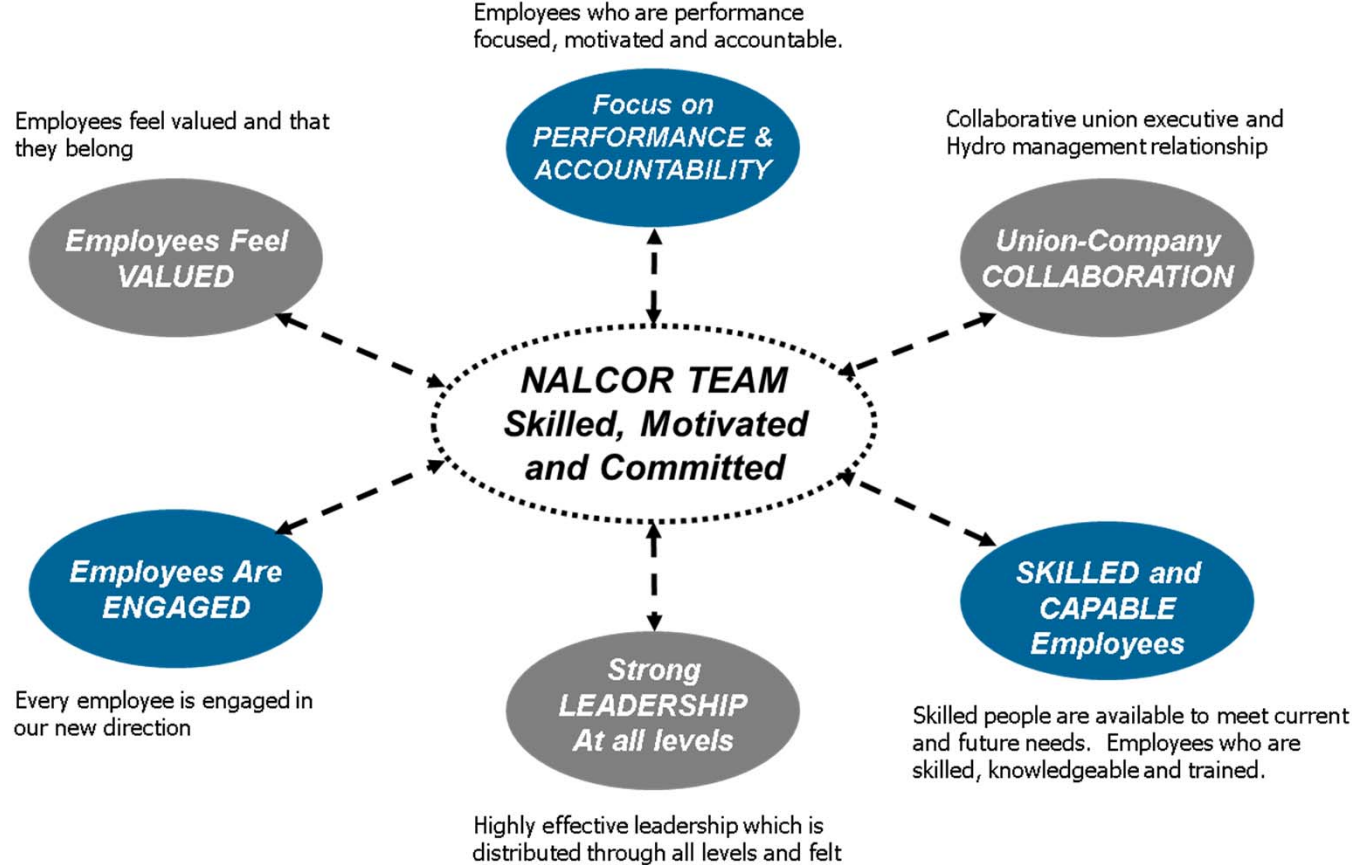


Long Term Capital Plan Refresh

- 20-year plans are formally refreshed on a 3 year cycle, with draft plans being adjusted on an ongoing basis to reflect new asset condition data from assessments, inspections and monitoring.
- Annually in September each area performs an internal review of the 5-year plan (a rolling window on the 20-year plan) with each of its functional areas, namely long term asset planning, operations, work execution, short term planning and scheduling, and asset owners. The plan is adjusted to address changes in need based on new condition data and failure history to ensure the right work is identified, on the right assets, at the right time, and that it can be successfully executed.
- In October of each year, the LTAP managers from each area meet to consolidate and prioritize the local plans into Hydro's integrated plan. The plan is adjusted to reflect the local required changes and prioritized using a standard prioritization calculator, qualified with expert review.
- The integrated Hydro plan is reviewed by the Project Execution, System Operations and System planning groups as well as Hydro's asset owners group to ensure that the project portfolio presented is achievable from project management and outage perspectives.
- COO / VP sign-off on the integrated Hydro plan is completed by the end of November.
- LTAP quality metrics focus on year over year change in the scope and cost of the 5 year plan.

Human Resource Strategy

NL Hydro's Framework for People Excellence

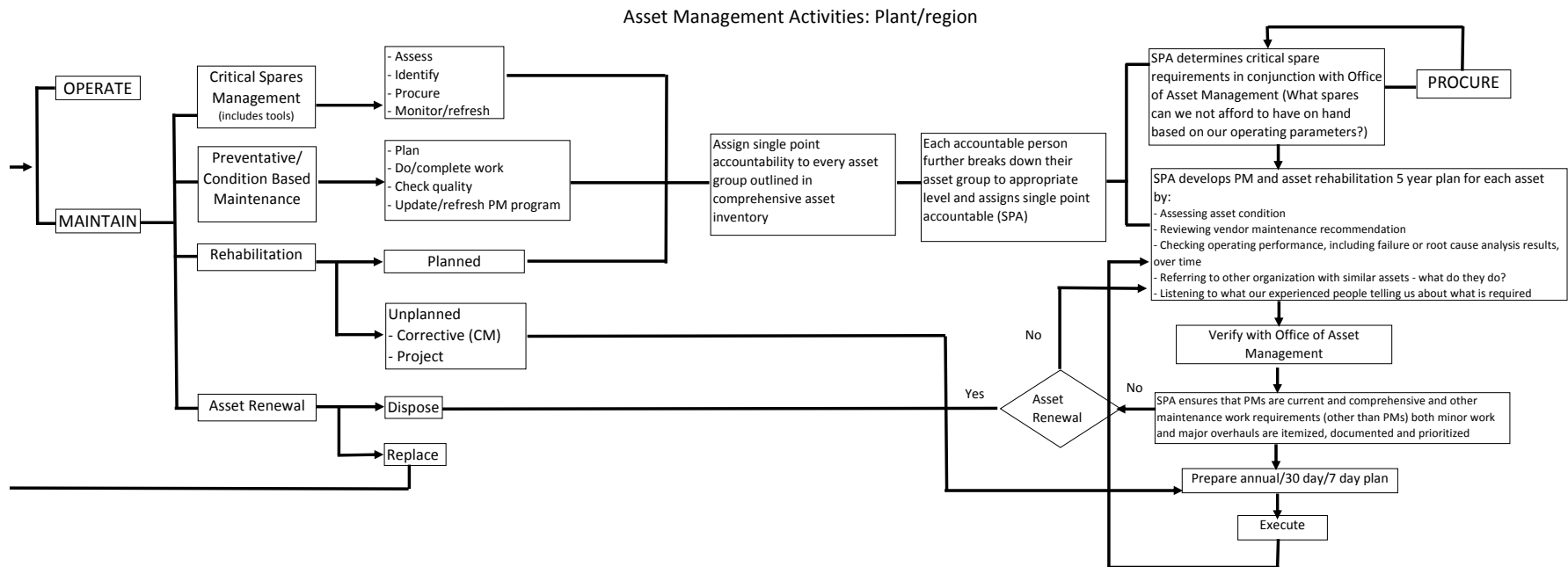


NL Hydro's HR Strategy

Hydro's 2007 HR strategy action plan (shown below) continues to be a key reference point in identifying priority HR initiatives during the company's annual corporate planning process



Operations, Maintenance, Asset Renewal



Asset Management Functions

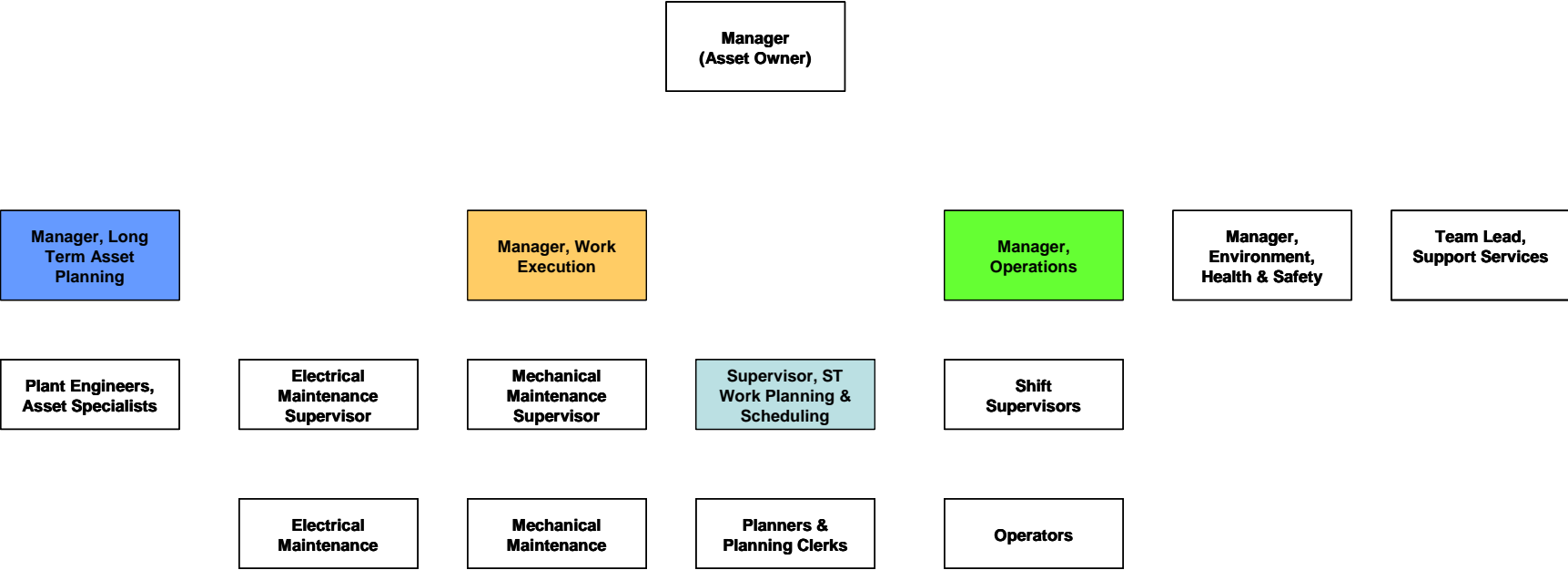
- Terms and Definitions
- Long Term Asset Planning
- Critical Spares Management
- Work Execution
- Short Term Planning and Work Scheduling
- Operations
- Support Services

Terms & Definitions

- **Long-term asset planning:** 20+ year for asset renewal (disposal, replacement), rehabilitation, preventative/ condition-based maintenance, critical spares. Includes identification of work for long-term capital plan.
- **Short-term planning:** 1 year view for assets (master work plan).
- **Scheduling:** Scheduling of work for 7-30 day period; considers all types of work, aimed at “full” use of available labour as well as work completion.
- **“Work” includes:** corrective maintenance (emergencies); preventative maintenance (including maintenance backlog); and projects (capital and operating).
- **Asset Owner:** The business unit leader who has custody and day-to-day control over asset work planning, work execution, and operations.
- **Critical Spare:** An asset or component that if unavailable, would prevent a plant or unit from operating at a required level of service, and for which there is no viable alternative.

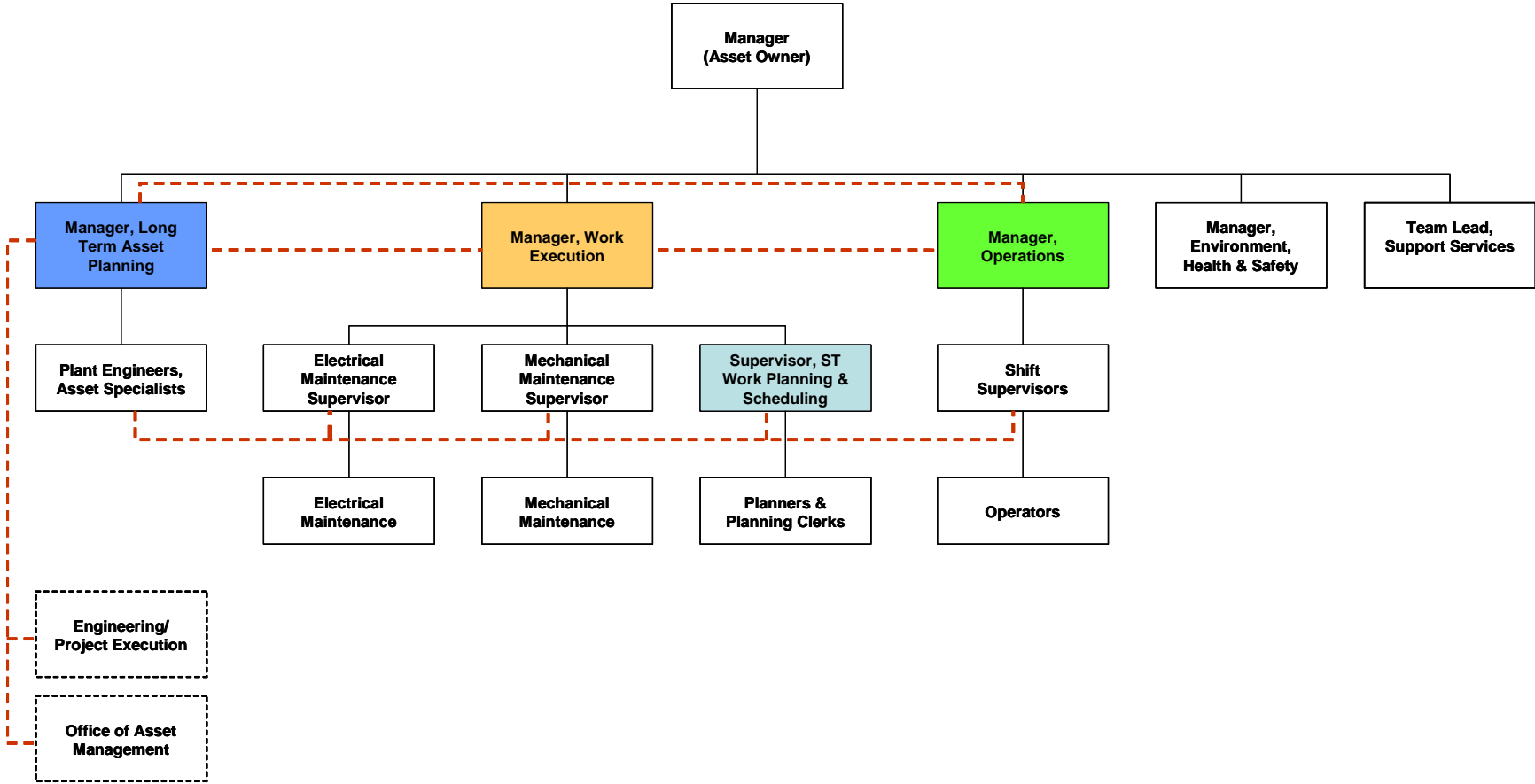
Asset Management

Sample Structure – Roles and White Space



Asset Management

Sample Structure - Formal and Informal Linkages



Asset Management

A dynamic system comprised of inter-related, moving parts



Change or movement in one area (e.g., operational demands, basis of design) will cause change or movement in other areas (e.g., the long term asset plan, work execution methods or priorities)

Asset Management Functions

FUNCTION	KEY ACTIVITIES
<p>Long-term Asset Planning</p>	<ul style="list-style-type: none"> • Focus on asset lifecycle – cradle to grave. • Develop and continually refresh 20+ year asset plan that reflects: asset rehabilitation/overhauls to major assets; asset renewal requirements – what needs to be replaced, when and with what. • Create and maintain accurate and complete asset listing/ hierarchies with supporting detail, location, history and financial information. • Translate 20 year asset plan into detailed 5-year and annual asset work plans; update as required. • Recognizing the dynamic nature of long and short-term asset work plans and the expertise of others, obtain input from work execution and operations functions when developing/refreshing long-term, 5-year and annual asset work plans. • Participate in technical councils and use technical councils to test long-term plans and promote their role in operational trouble-shooting. • Develop high-level implementation strategy including financial leveling, resource planning for each year of the long-term asset plan. • Drive development 20 year capital plan inputs for assets. • Check/ensure alignment with corporate long-term asset planning practices led by the office of asset management.

Asset Management Functions

FUNCTION	KEY ACTIVITIES
Long-term Asset Planning <i>(cont'd)</i>	<ul style="list-style-type: none">• Ensure project scope, estimates and quality are acceptable.• Identify and monitor asset reliability/service level requirements.• Develop and monitor asset performance metrics and develop/ execute actions to address performance issues.• Complete root cause failure analysis and remedial action plans.• Complete risk assessment and reliability monitoring.• Develop, monitor and continuously improve preventative and predictive maintenance programs.• Develop and implement condition assessment tools and monitoring techniques and incorporate results into planning activities.• Monitor and incorporate industry and technology trends impacting long-term asset plan.

Asset Management Functions

FUNCTION	KEY ACTIVITIES
Critical Spares Management	<ul style="list-style-type: none">• Use critical spares framework established by the Office of Asset management to identify critical equipment/tools spares based on criteria including: acceptable downtime/service levels; impact to reliability; delivery time; failure history; and repair duration.• Determine quantity, lead times, and optimum inventory levels.• Initiate the procurement of critical spares and ensures correct equipment is specified, ordered and received.• Develop necessary inspection/review/maintenance/ location requirements on critical equipment/tools spares to ensure readiness including monitoring OEM supplier support and equipment/tools availability.

Asset Management Functions

FUNCTION	KEY ACTIVITIES
<p>Work Execution <i>(includes corrective maintenance (emergencies); preventative maintenance (including maintenance backlog); and project (capital and operating))</i></p>	<ul style="list-style-type: none"> • Focus on safe, environmentally friendly and effective (quality, cost, schedule) execution of weekly, monthly and annual asset work plans. • Manage trades, tools and equipment resources required for work completion. • Integrate capital and operating project work including resource provisioning and associated commissioning coordination. • Prioritize work and monitor actual work completed against schedule; take action as necessary. • Supervise frontline workers. • Maintenance budget cost control. • Monitor maintenance execution productivity and effectiveness and monitor and report on work execution metrics. • Management and renewal of major contracts for equipment overhauls and minor service contracts. • Maintain effective record keeping (work order history and other work execution related documentation). • Recognizing the dynamic nature of long and short-term asset work plans and the expertise of others, provides input to long-term planning function (developing/refreshing long-term, 5-year and annual asset work plans).

Asset Management Functions

FUNCTION	KEY ACTIVITIES
<p>Short-term Planning</p>	<ul style="list-style-type: none"> • Manage and update detailed annual asset work plan. Scope includes preventative maintenance; predictive maintenance; quality assurance activities; asset overhauls; asset replacements and project work (capital and operating) based on long-term plan. • Recognizing the dynamic nature of long and short-term asset work plans and the expertise of others, provide input to long-term planning function (developing/refreshing long-term, 5-year and annual asset work plans). Determine resource, materials, tools and equipment requirements for the annual asset work plan. • Coordinate asset work plan timing to reflect outage schedule.
<p>Work Scheduling</p>	<ul style="list-style-type: none"> • Focus on development of 7 and 30 day work schedule. • Review resource allocation to ensure resources support completion of scheduled work. • Coordinate work execution schedule with Operations. • Prepare work orders that are ready to implement in terms of people, equipment/tools and materials. • Generate performance metrics to assess effectiveness of work planning.

Asset Management Functions

FUNCTION	KEY ACTIVITIES
<p>Operations</p>	<ul style="list-style-type: none"> • Focus on safe, environmentally friendly and efficient operation of the assets and utilization of the resource. • Monitor asset performance for proper operation to minimize potential for loss • Monitor asset efficiency and performance, adjust operations as required. • Lead/provide input for outage management with particular attention to customer requirements. • Administer Work Protection Code. • Collect and maintain appropriate operating (condition) data for technical analysis and other uses. • Maintain effective relationships with customers. • Develop/maintain operating procedures, drawings and other documentation • Recognizing the dynamic nature of long and short-term asset work plans and the expertise of others, provide input to long-term planning function (developing/refreshing long-term, 5-year and annual asset work plans).

Asset Management Functions

FUNCTION	KEY ACTIVITIES
Support Services	<ul style="list-style-type: none">• Provide functional expertise and support to operations management /staff in the following areas:<ul style="list-style-type: none">- Safety- Environment- Emergency Response- Human Resources- Security- Finance

Asset Management Roles and Responsibilities

- Manager, Long Term Asset Planning
- Manager, Work Execution
- Supervisor, Short Term Work Scheduling and Planning
- Manager, Operations

Roles and Responsibilities

MANAGER, LONG-TERM ASSET PLANNING

Summary of Job Function

Leads LT asset planning and critical spares management activities. Accountable for developing and refreshing the 20+ year asset plan addressing asset rehabilitation/overhaul, renewal and replacement. Drives development of annual asset work plan and provides oversight and input into effectiveness of asset maintenance activities including preventative & predictive maintenance.

Principal Activities, Duties and Responsibilities

- Develop and continually refresh 20+ year asset plan that reflects: asset rehabilitation/overhauls to major assets; asset renewal requirements – what needs to be replaced, when and with what.
- Create/maintain accurate & complete asset listing/ hierarchies with supporting detail, location, history, financial information.
- Translate 20 year asset plan into detailed 5-year and annual asset work plans; update as required.
- Recognizing the dynamic nature of long and short-term asset work plans and the expertise of others, obtain input from work execution and operations functions when developing/refreshing long-term, 5-year and annual asset work plans.
- Participate in technical councils and use councils to test long-term plans, promote their role in operational trouble-shooting.
- Develop high-level implementation strategy including financial leveling, resource planning for each year of the LT asset plan.
- Drive development 20 year capital plan inputs for assets.
- Check/ensure alignment with corporate long-term asset planning practices led by the office of asset management.
- Ensure project scope, estimates and quality are acceptable.
- Identify and monitor asset reliability/service level requirements.
- Develop and monitor asset performance metrics and develop/ execute actions to address performance issues.
- Complete root cause failure analysis and remedial action plans.
- Complete risk assessment and reliability monitoring.

Roles and Responsibilities

MANAGER, LONG-TERM ASSET PLANNING (cont'd)

Principal Activities, Duties and Responsibilities

- Develop, monitor and continuously improve preventative and predictive maintenance programs.
- Develop and implement condition assessment tools and monitoring techniques, incorporate results into planning activities.
- Monitor and incorporate industry and technology trends impacting long-term asset plan.
- Use critical spares framework established by the Office of Asset management to identify critical equipment/tools spares based on criteria including: acceptable downtime/service levels; impact to reliability; delivery time; failure history; and repair duration.
- Determine quantity, lead times, and optimum inventory levels.
- Initiate the procurement of critical spares and ensures correct equipment is specified, ordered and received.
- Develop necessary inspection/review/maintenance/ location requirements on critical equipment/tools spares to ensure readiness including monitoring OEM supplier support and equipment/tools availability.

Roles and Responsibilities

MANAGER, WORK EXECUTION
<p>Summary of Job Function</p> <p>Leads the planning and execution of work in annual work plan in a safe, environmentally friendly and effective manner.</p>
<p>Principal Activities, Duties and Responsibilities</p> <ul style="list-style-type: none">• Focus on safe, environmentally friendly and effective (quality, cost, schedule) execution of weekly, monthly and annual asset work plans.• Manage trades, tools and equipment resources required for work completion.• Integrate capital and operating project work including resource provisioning and associated commissioning coordination.• Prioritize work and monitor actual work completed against schedule; take action as necessary.• Supervise frontline workers.• Maintenance budget cost control.• Monitor maintenance execution productivity and effectiveness and monitor and report on work execution metrics.• Management and renewal of major contracts for equipment overhauls and minor service contracts.• Maintain effective record keeping (work order history and other work execution related documentation).• Recognizing the dynamic nature of long and short-term asset work plans and the expertise of others, provides input to long-term planning function (developing/refreshing long-term, 5-year and annual asset work plans).

Roles and Responsibilities

SUPERVISOR, SHORT-TERM WORK PLANNING AND SCHEDULING
<p>Summary of Job Function</p> <p>Leads the planning of work to deliver the work outlined annual work plan by developing 7 and 30 day work schedules.. Determines resource, materials, tools and equipment requirements to complete planned work and generates work orders and other documentation to support work execution.</p>
<p>Principal Activities, Duties and Responsibilities</p> <ul style="list-style-type: none">• Manage and update detailed annual asset work plan. Scope includes preventative maintenance; predictive maintenance; quality assurance activities; asset overhauls; asset replacements and project work (capital and operating) based on long-term plan.• Recognizing the dynamic nature of long and short-term asset work plans and the expertise of others, provide input to long-term planning function (developing/refreshing long-term, 5-year and annual asset work plans). Determine resource, materials, tools and equipment requirements for the annual asset work plan.• Coordinate asset work plan timing to reflect outage schedule.• Focus on development of 7 and 30 day work schedule.• Review resource allocation to ensure resources support completion of scheduled work.• Coordinate work execution schedule with Operations.• Prepare work orders that are ready to implement in terms of people, equipment/tools and materials.• Generate performance metrics to assess effectiveness of work planning.

Roles and Responsibilities

MANAGER, OPERATIONS
Summary of Job Function Leads the safe operation of assets in accordance with the basis of design and established operating parameters.
Principal Activities, Duties and Responsibilities <ul style="list-style-type: none">• Focus on safe, environmentally friendly and efficient operation of the assets and utilization of the resource.• Monitor asset performance for proper operation to minimize potential for loss• Monitor asset efficiency and performance, adjust operations as required.• Lead/provide input for outage management with particular attention to customer requirements.• Administer Work Protection Code.• Collect and maintain appropriate operating (condition) data for technical analysis and other uses.• Maintain effective relationships with customers.• Develop/maintain operating procedures, drawings and other documentation• Recognizing the dynamic nature of long and short-term asset work plans and the expertise of others, provide input to long-term planning function (developing/refreshing long-term, 5-year and annual asset work plans).

Supporting Organizational Structures

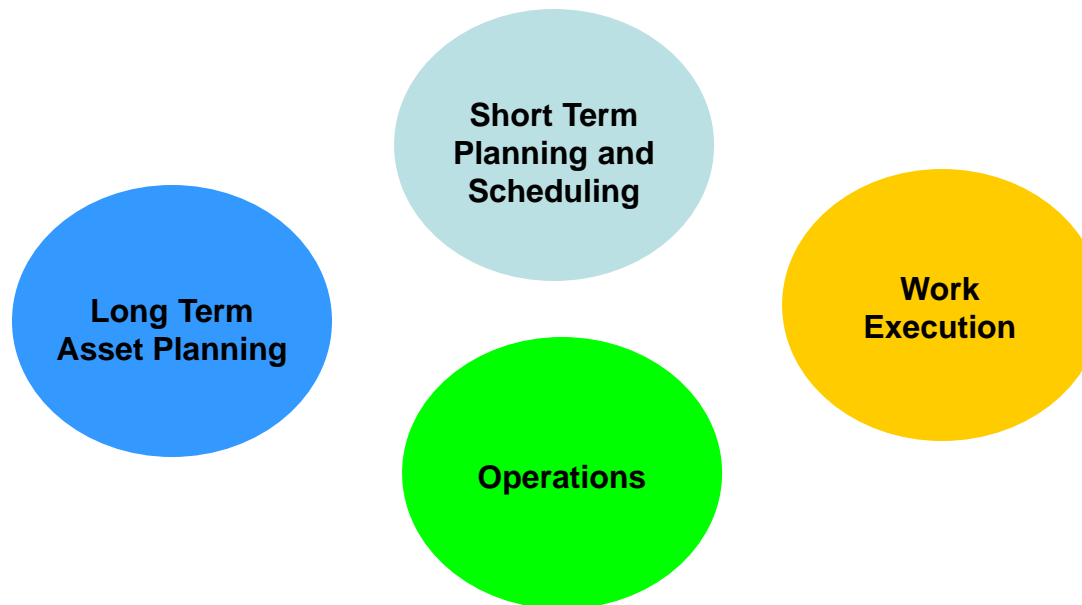
- Guiding Principles – Organization Design
- Thermal Operations, NLH
- Hydro Operations, NLH
- Transmission & Rural Operations, NLH
- System Operations and Customer Service, NLH
- Hydro Operations, CFLCo

Guiding Principles – Organizational Design

- Key asset groups must be apparent
- Clear delineation of accountabilities for key asset management functions
- Must facilitate assignment of clear single point accountabilities for both operation and maintenance of assets
- Span of control – the number of direct reports to the next level above matches the capacity of that role to provide high quality direction and leadership
- Unnecessary hierarchical levels are avoided in order to optimize team focus and operational line of sight
- Must recognize the operational challenges related to the geographic dispersion of people and assets within our system

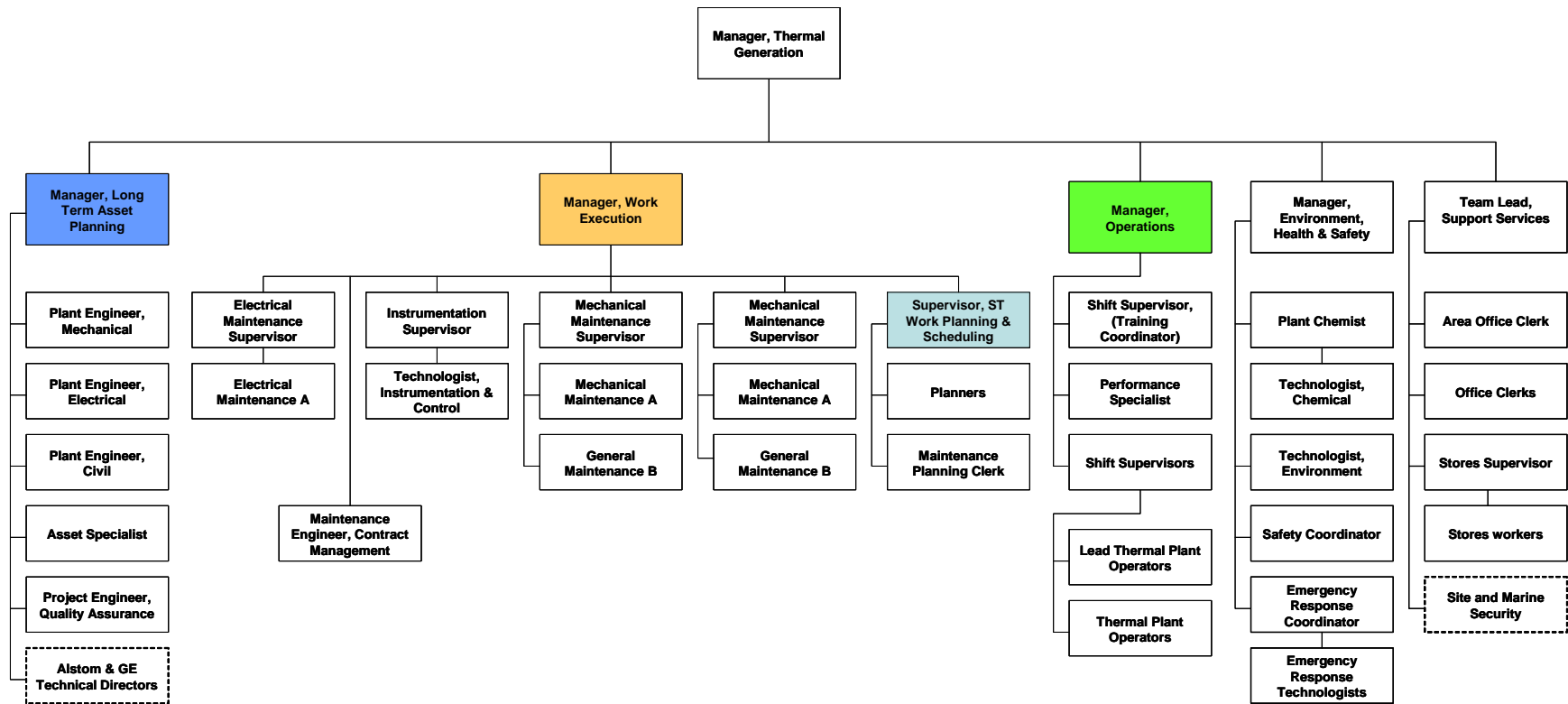
Guiding Principles – Organizational Design

- Consistency of organizational approach; similar areas of the business have similar organizational structures
- Consistent use of job titles, and job titles that reflect roles/asset management functions



Asset Management Organization Design

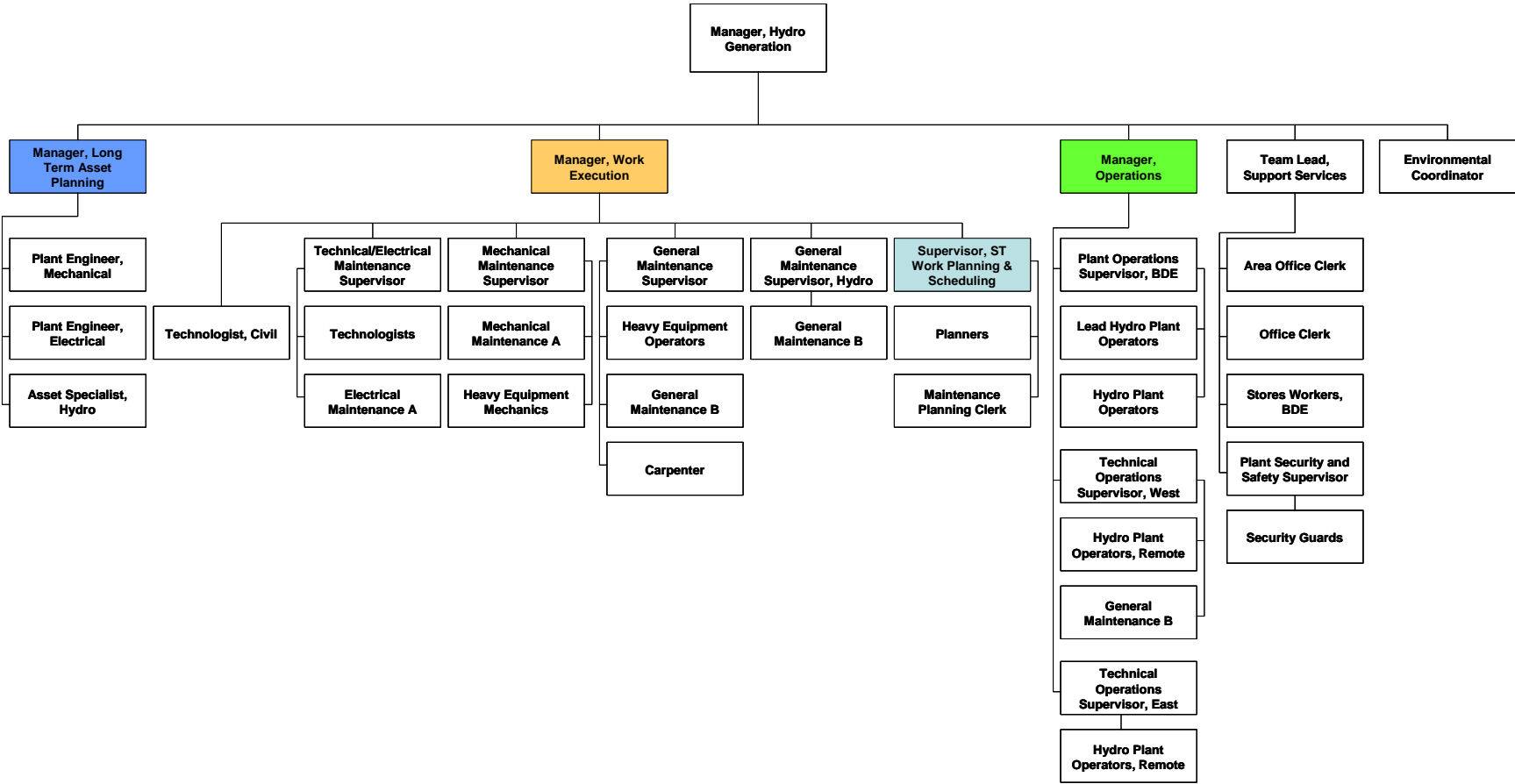
Thermal Operations - NLH



March 22, 2010

Asset Management Organization Design

Hydro Operations - NLH



March 22, 2010



Asset Management Organization Design

TRO, NLH – Chart 1 of 2

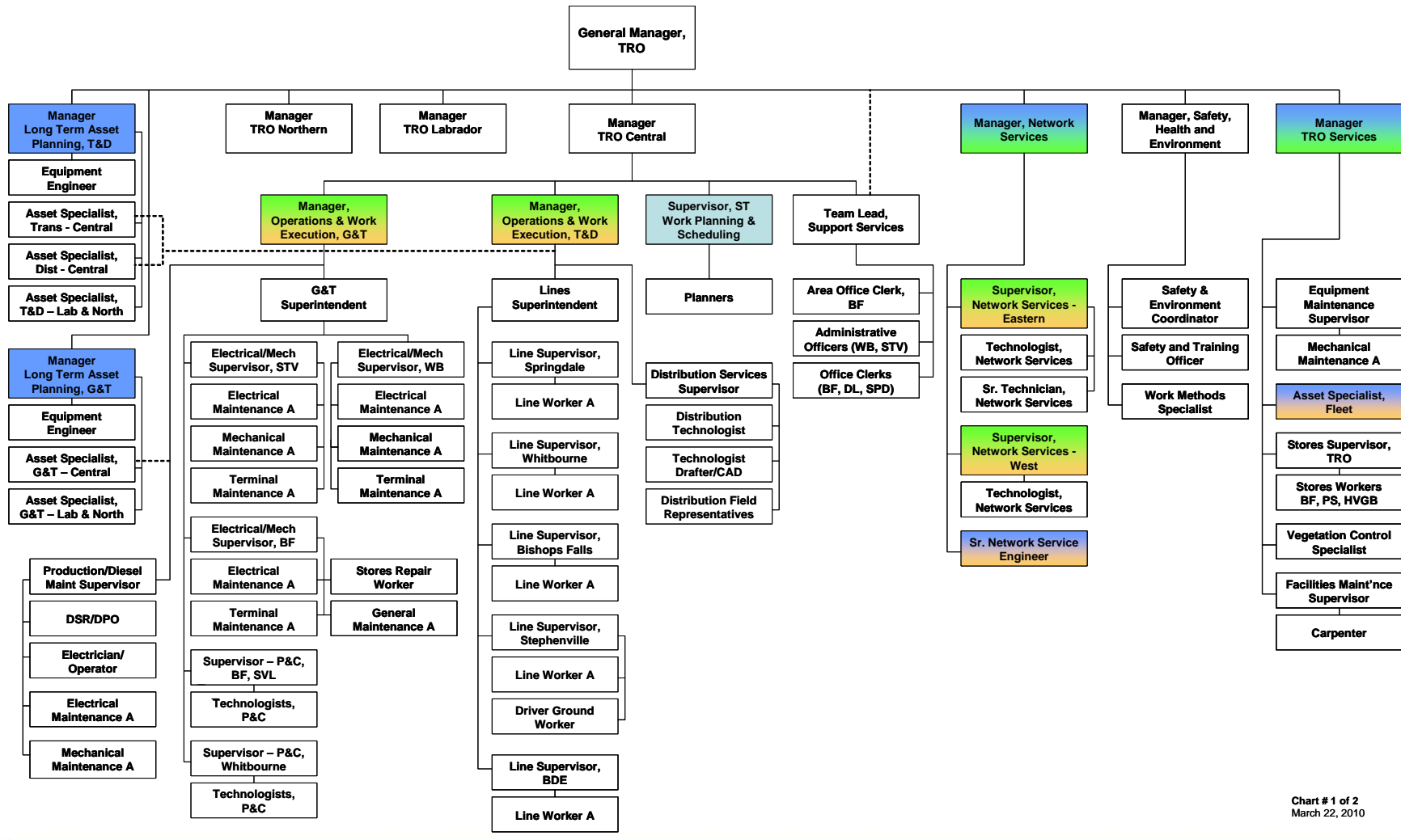


Chart # 1 of 2
 March 22, 2010

Asset Management Organization Design

TRO, NLH – Chart 2 of 2

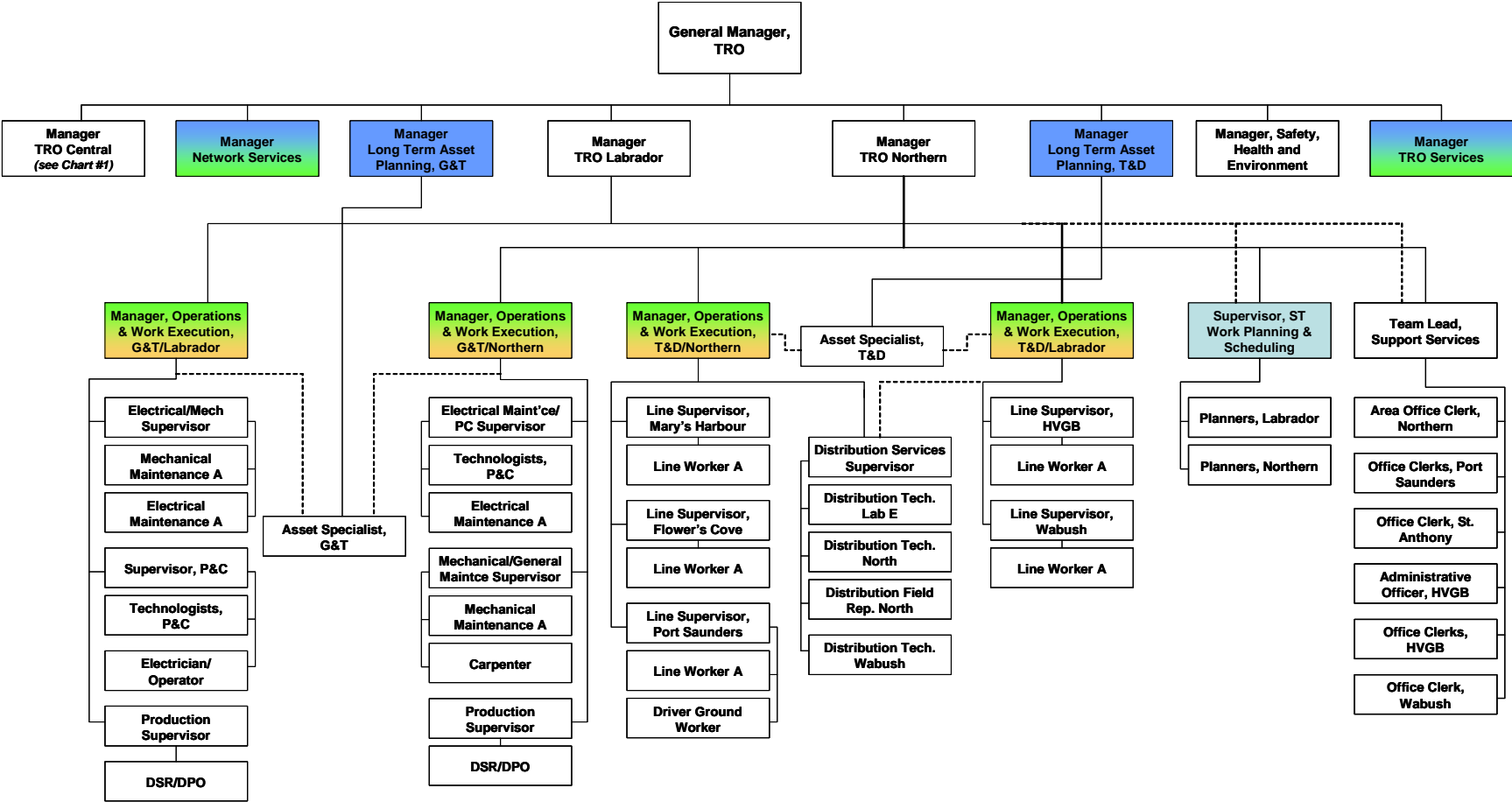
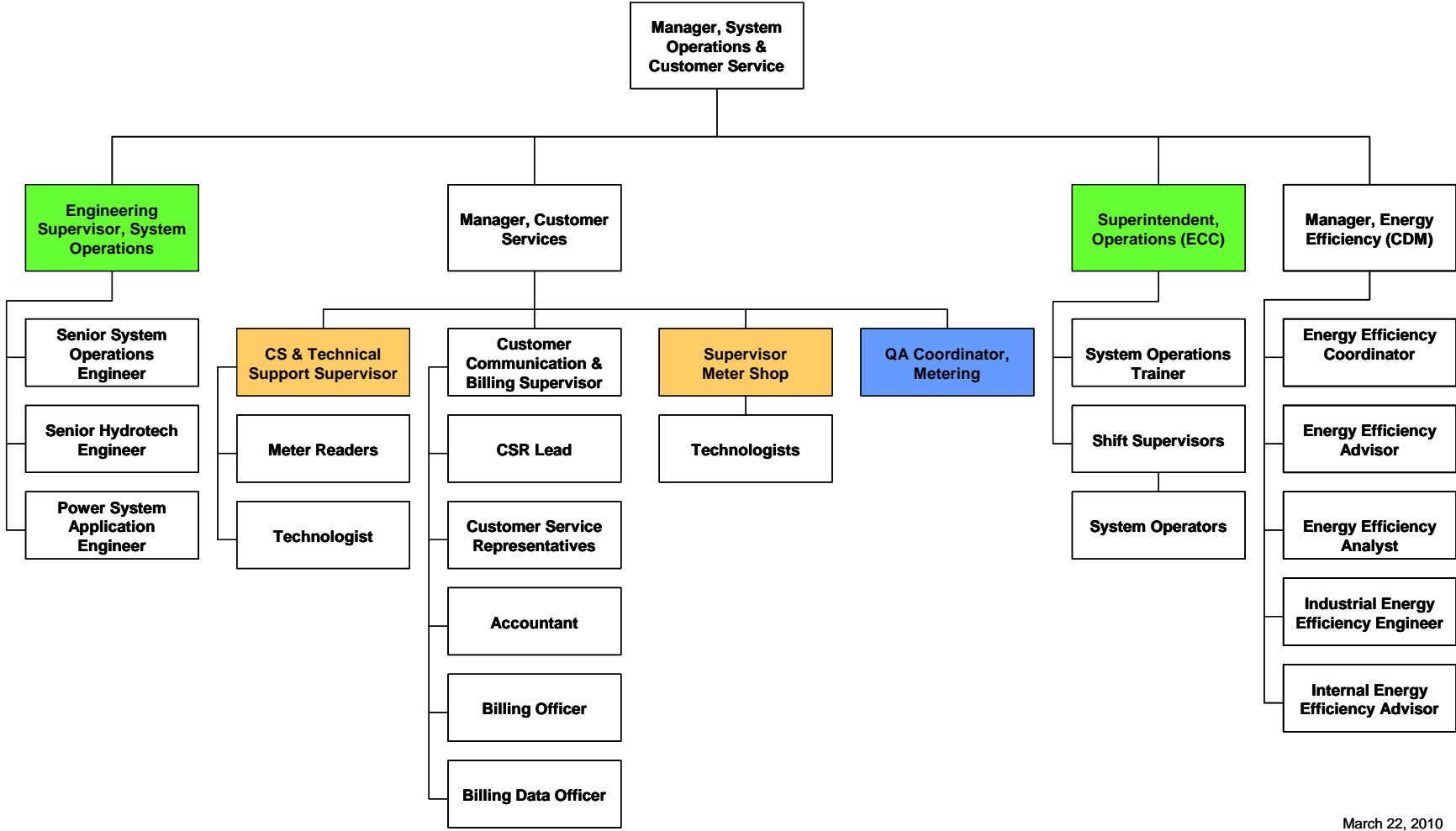


Chart #2 of 2
 March 22, 2010



Asset Management Organization Design

System Operations & Customer Service - NLH



March 22, 2010



Asset Management Organization Design

CFLCo – Production

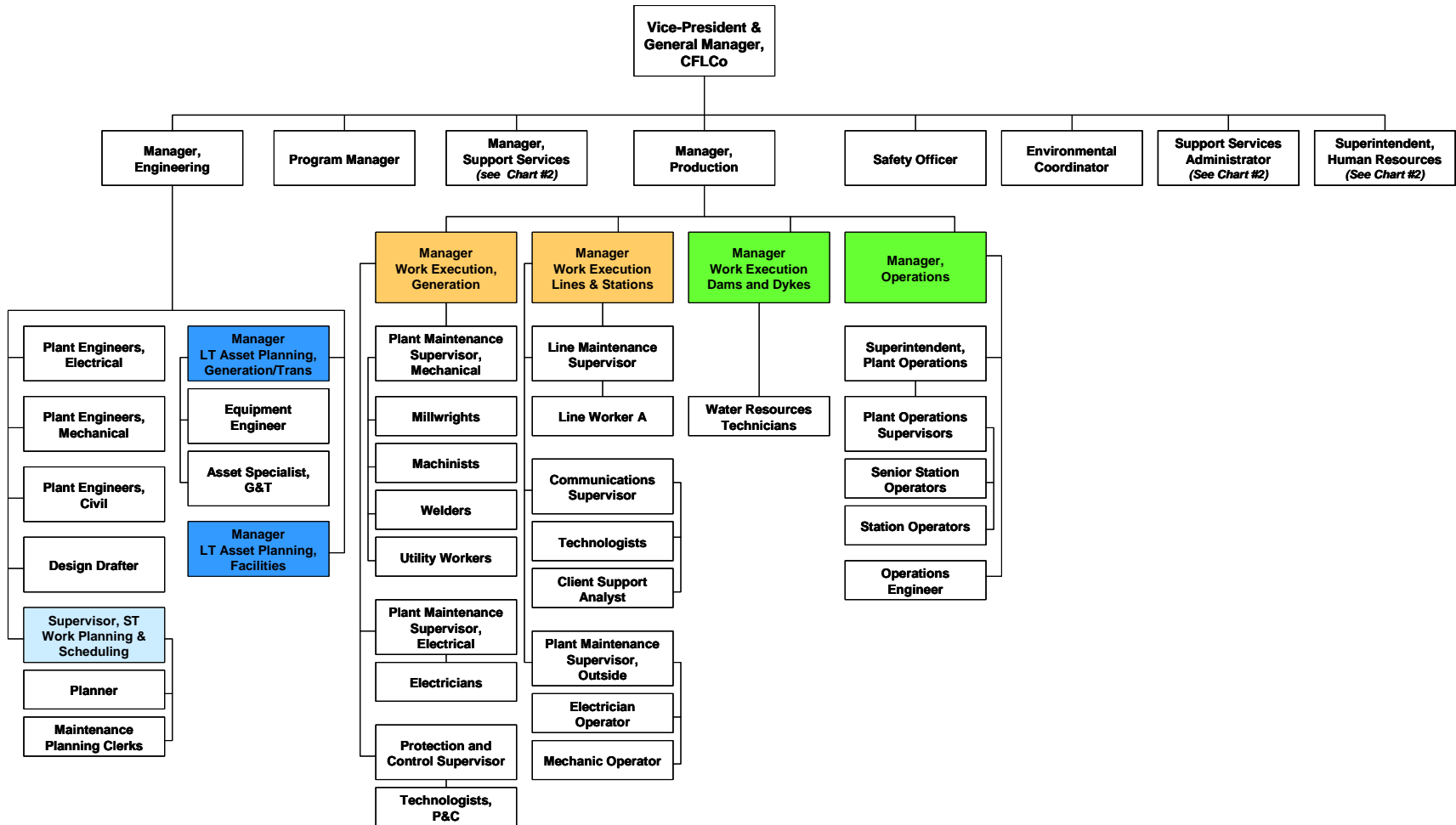


Chart #1 of 2
 March 22, 2010

Asset Management Organization Design

CFLCo – Support Services

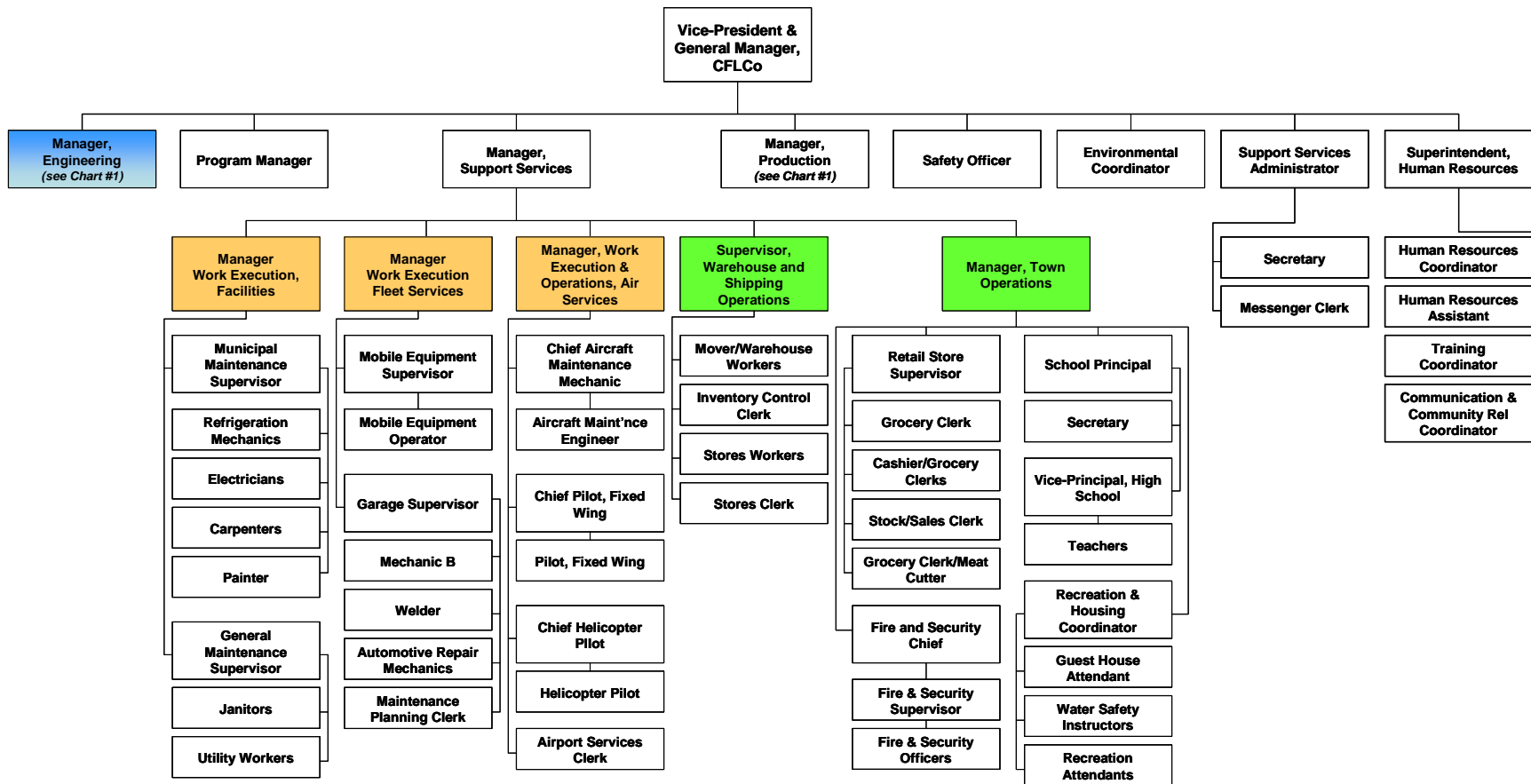


Chart #2 of 2
 March 22, 2010

Office of Asset Management

- Function/Mandate
- Roles and Responsibilities
- Organizational Structure

Office of Asset Management

- Function/Mandate
 - Develop/oversee asset management system framework
 - Lead introduction of AMS through all lines of business
 - Work with leadership and operations management to develop and staff the required organizational model
 - Manage alignment process in all areas through training and monitoring/audit processes
 - Test and adapt the supporting organizational model as needed
 - Coordinate internal and external skills/resources to address significant maintenance and operational issues
 - Coordinate/facilitate “councils” to share best practices
- Reporting to Vice-President, Project Execution and Technical Services
- Representing the CEO in the relentless drive for asset management excellence

Roles and Responsibilities

MANAGER, OFFICE OF ASSET MANAGEMENT

Summary of Job Function

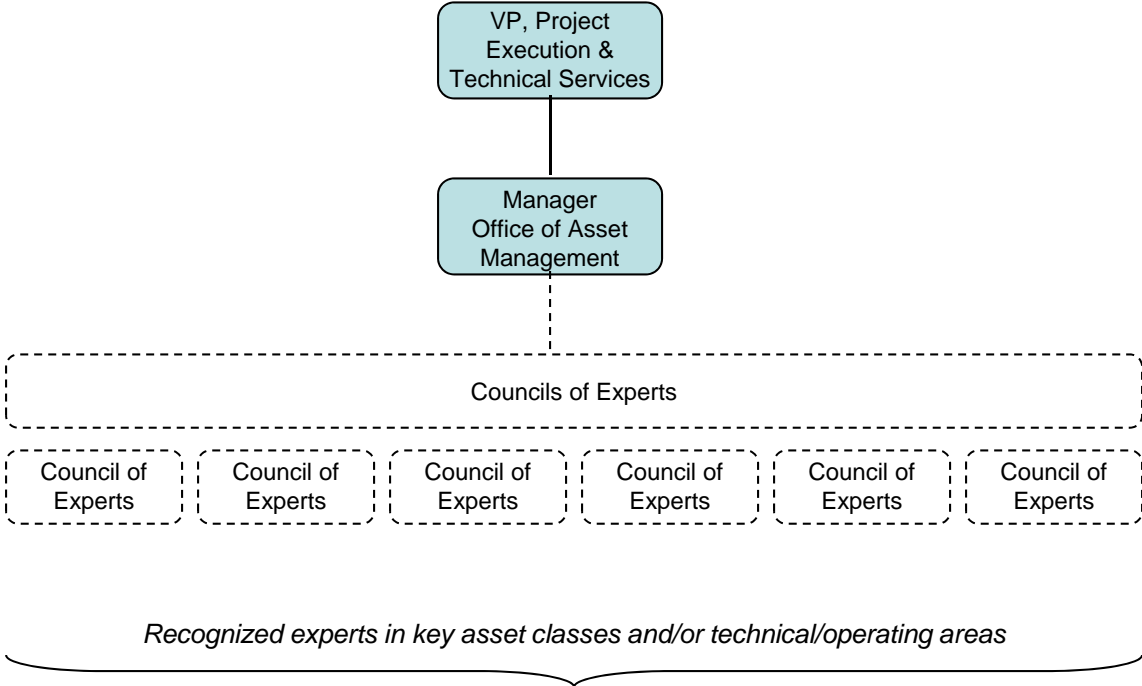
The Manager, Office of Asset Management is the champion of asset management excellence throughout the organization. This role leads the introduction of the asset management framework through all lines of business and facilitates, supports and coordinates the successful use of asset management principles and practices to realize Nalcor’s commitment to business excellence.

Principal Activities, Duties and Responsibilities

- Develop asset management system framework (content, standards, process, accountabilities, terminology/definitions, measurement).
- Work with leadership and operations management to develop and staff the supporting organizational model required to clarify accountabilities and implement the framework.
- Systematically manage the process of alignment in all areas through training, monitoring/audit to ensure company direction is translated into plans and actions of various asset groups.
- Test/adapt the framework and supporting organizational model.
- Coordinate organization-wide capital planning activities to ensure excellence and consistency.
- Work with leadership to establish service standards (reliability, etc) and operating parameters.
- Coordinate internal and external skills/resources to address significant maintenance and operational issues
- Maintain an “experts” list including internal subject matter experts, external consultants and company retirees.
- Coordinate/facilitate “councils” to share best practices within operational areas.
- Documentation: Collect and organize, in electronic format, the corporate documentation related to Asset Management; Maintain effective change management of process documentation.
- Drive consistent approaches to the implementation of asset management practices.
- Asset listing detail/breakdown - ensure consistent level of detail across asset areas and like system.

Organizational Structure

Office of Asset Management



Project Execution/Technical Services

- Scope and Mandate
- Organizational Structure
 - Organizational Considerations
 - Draft Organizational Structure
- Process For Annual Project Plan

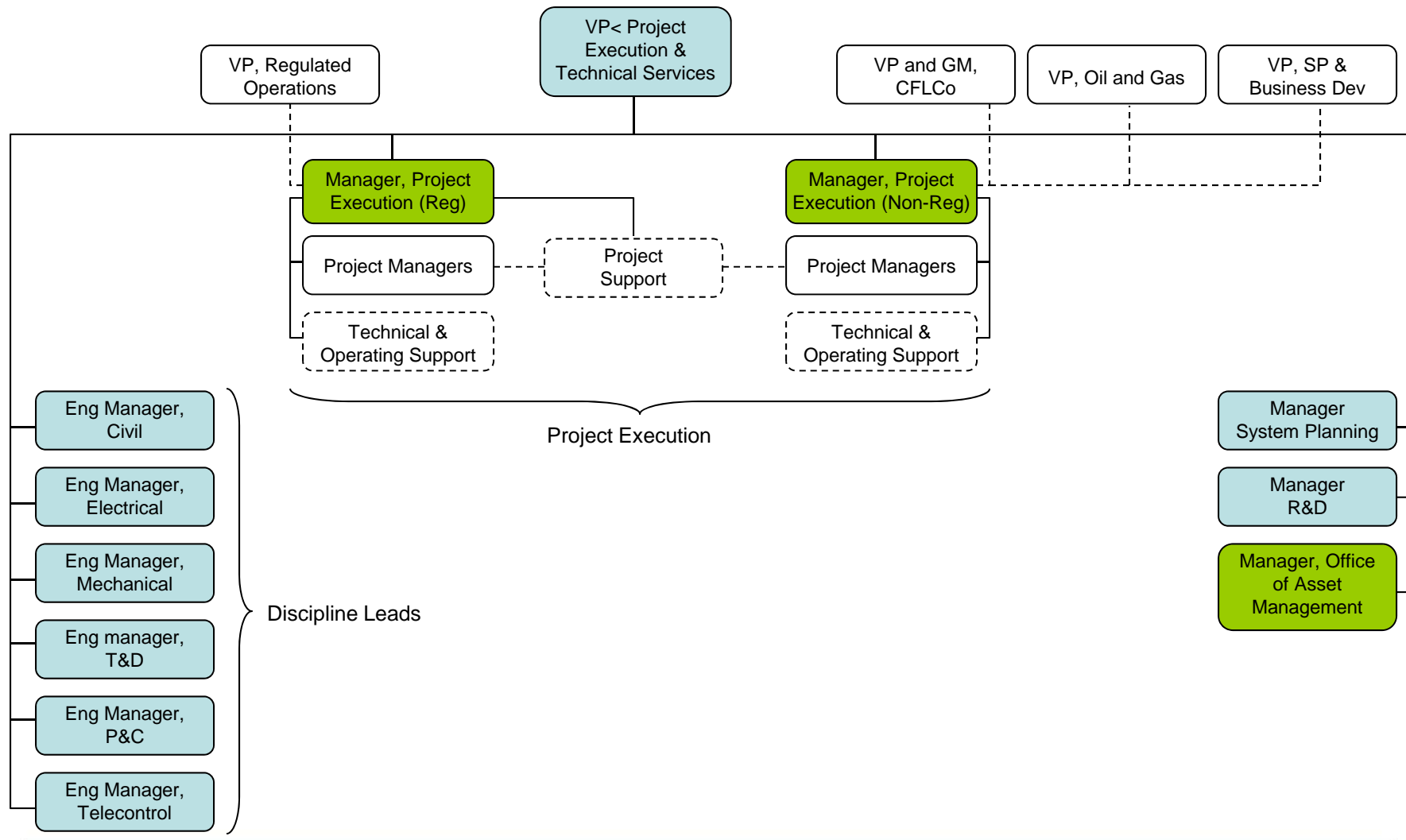
Project Execution/Technical Services

- Engineering Services transition to project execution group
 - Scope: Serving all Nalcor lines of business
 - Mandate:
 - Lead all aspects (project management and technical) of project delivery, both capital and operating (except those normally managed by the operations business units)
 - Participate in technical councils led by Office of Asset Management (role of councils will include operational support; standards; best practice sharing)
 - Effort focused to project delivery and operational support – 70%/30% split

Engineering Services/Project Execution

- Organizational considerations:
 - Engineering discipline teams to be maintained
 - Project execution department created
 - Managers, Project Execution
 - Project Managers
 - Project administration support
 - Organizational reporting will continue to be in Hydro
 - Mandatory time sheet process coupled with comprehensive work order system will ensure appropriate charge-outs for support provided to non-regulated businesses
 - Project Execution and Technical Services will provide directly or secure resources externally to fulfill their mandate

Engineering Services/Project Execution



Roles and Responsibilities

MANAGER, PROJECT EXECUTION

Summary of Job Function

The Program Manager is the key LOB interface between Engineering Services and Newfoundland and Labrador Hydro and CFLCo + Other LOBs respectively. This role supports the LOB in all elements of the planning, design and execution of projects and the supply of technical and operating assistance from the appropriate discipline experts when needed. The primary focus of this position is to ensure the timely and cost-effective completion of the LOB's annual project execution program, and the role oversees the coordination of project teams and work execution in consultation with discipline leads and their teams.

Principal Activities, Duties and Responsibilities

- Accountable for on-time, on-budget delivery of projects (capital and operating) that satisfy the requirements of the lines of business.
- Acts as single point of contact for lines of business requiring project execution and technical/operational support.
- Interacts closely with long-term asset planning function in the operations groups, other Program Managers, and Project Managers in translating long-term asset plans into consolidated 20, 5 and one year project plans.
- Identifies project teams to deliver projects comprised of relevant disciplines (with operational resources as required) in consultation with team leads of engineering discipline teams.
- Prepares or coordinates the development of project estimates as part of the annual budget preparation process.
- Oversees the activities of project managers for specific projects and may personally manage projects for lines of business as appropriate.
- Collects, consolidates and communicates project performance data to lines of business leads and others.
- Promotes the consistent use of best practice project management approaches.

Roles and Responsibilities

PROJECT MANAGER
<p>Summary of Job Function</p> <p>Project Managers are accountable to Program Managers for planning and coordinating people, resources, schedules and budgets to ensure the safe, timely, cost-effective and high quality execution of annual project plans on behalf of one or more Nalcor lines of business.</p>
<p>Principal Activities, Duties and Responsibilities</p> <ul style="list-style-type: none">• Accountable for the safe, timely, cost-effective and high quality execution of annual project plans on behalf of one or more Nalcor lines of business.• Communicates effectively with project sponsor/clients and continually seeks opportunities to increase satisfaction.• Creates and executes project work plans and revises as appropriate to meet changing needs and requirements.• Identifies resources needed, assigns individual responsibilities and oversees project team performance.• Manages day-to-day operational aspects of project and scope.• Reviews deliverables prepared by team before passing to project sponsor/client.• Effectively applies Nalcor project management methodology and enforces project standards.• Prepares for engagement reviews and quality assurance procedures.• Holds regular status meetings with project team and project sponsor/client.• Resolves and/or escalates issues in a timely fashion.• Manages project budget to ensure on-time, on-budget completion of agreed project scope.• Minimizes exposure and risk on project through sound risk management practices.• Keeps track of lessons learned, shares with team members and ensures they are available for future projects.• Ensures project documents are complete, current, and stored appropriately.

Roles and Responsibilities

MANAGER, (DISCIPLINE AREA)
<p>Summary of Job Function</p> <p>Discipline Team Leads are the functional experts in their respective areas of engineering expertise, and through their teams they provide project execution and technical/operating assistance support to Nalcor’s lines of business. This role collaborates closely with Program Managers and Project Managers in project design and in the planning and execution of an integrated project plan for the Division.</p>
<p>Principal Activities, Duties and Responsibilities</p> <ul style="list-style-type: none">• Provides leadership in the completion of activities related to engineering design and project management and operational support in his/her discipline area.• Supports Program and Project Managers in the prioritization of the integrated annual project plan; the coordination of project teams; the assignment and scheduling of resources from their area; developing recovery plans to address unplanned work and other contingencies; and generally optimizing the utilization of available resources in order to meet or exceed project delivery goals and targets.• Ensures that team members are provided with the ongoing training and development necessary to both maintain and enhance their technical knowledge and skills, and to ensure they perform in a safe and effective manner.• Provides senior technical leadership both within their teams and within the company generally through councils of experts and other means, and fosters the development of best practice processes and standards within the discipline area.• Supports the Office of Asset Management and long-term asset planning functions in the business units in the development of standards related to maintenance and long term life cycle asset management.• Leads or participates on one or more of the company’s Technical Councils, and is available to coordinate or provide specialized problem-solving support to operations when needed.

Roles and Responsibilities

PROGRAM MANAGER, CFLCo
<p>Summary of Job Function</p> <p>The Program Manager is the key interface between CFLCo and the Project Execution and Technical Services (PETS) division in ensuring the safe, timely and cost-effective completion of CFLCo’s multi-year project execution program. The Manager plans and manages the execution of the rehabilitation and asset renewal work streams identified within CFLCo’s Long Term Asset Management Program (CF-LTAMP). The Manager accepts this scope from CF-Engineering and the Managers of Long-Term Asset Planning; develops a strategy and integrated schedule for completing the necessary work; and oversees the field execution of the annual program.</p>
<p>Principal Activities, Duties and Responsibilities</p> <ul style="list-style-type: none">• Develops and implements the strategies/plans necessary in order to execute the rehabilitation and asset renewal scope as contained within CFLCo’s long-term asset plan, in a manner which achieves the maximum possible synergies and efficiencies.• Ensures that the CF-LTAMP is completed on-budget, on-time and to the required standards of quality.• Supports CF leadership in seeking and obtaining annual capital budget approvals, manages and stewards this budget on behalf of CFLCo, and allocates and oversees the allocation of funds to project managers.• Manages relationships and resource requirements with NE-Project Execution and Technical Services, NE- CF, and all other divisions within Nalcor in order to ensure CF-LTAMP projects are given the required priority.• Supports the Manager, Project Execution in defining the interfaces and interface reporting responsibilities between projects.• Optimizes program execution synergies and provides integration management in areas such project phasing; the scheduling of inter-dependent tasks; the synchronization of inter-project deliverables; and the optimization of resources across projects.• Accountable for overall contract management including contract negotiation, administration, and close-out.• Identifies, analyzes and manages program risks and identifies contingency and strategy reserves. Approves all scope, cost and schedule changes and obtains necessary senior approvals when required.

Roles and Responsibilities

PROGRAM MANAGER, CFLCo (continued)

Principal Activities, Duties and Responsibilities

- Works with Engineering Services to develop and implement Quality Assurance strategies and plans for the engineering, procurement and construction phases of all projects.
- Ensures that construction management expertise is provided to support the planning and execution of the CF-LTAMP.
- Ensures that expertise in the areas of estimating, planning, scheduling, cost control, expediting, quality assurance, interface management, change management coordination, and contract management is provided to support the planning and execution of the CF-LTAMP.
- Responsible for system acceptance from, and return to, Production Operations.

Project Execution/Technical Services

- Accountable for on-time, on-budget delivery of projects (capital and operating) that satisfy the requirements of the lines of business
- Structure creates single point of contact for lines of business
 - Role requires close interaction with long-term asset planning function in the operations groups in translating the long-term asset plans into a program/collection of projects
 - Engineering managers identify resources to complete project proposals in consultation with long-term asset planning managers and operations managers as required
 - Project Execution Managers and Engineering Managers will identify project teams to deliver projects comprised of relevant disciplines (with operational resources as required) led by a project manager (dictated by size/complexity of project)
- Defines project management standards, guidelines, and methods that can be used consistently throughout the organization
- Consolidates the project portfolio to identify annual project execution plan (reflecting financial resources, internal and external resource availability)

Project Execution/Technical Services

Project Team Examples

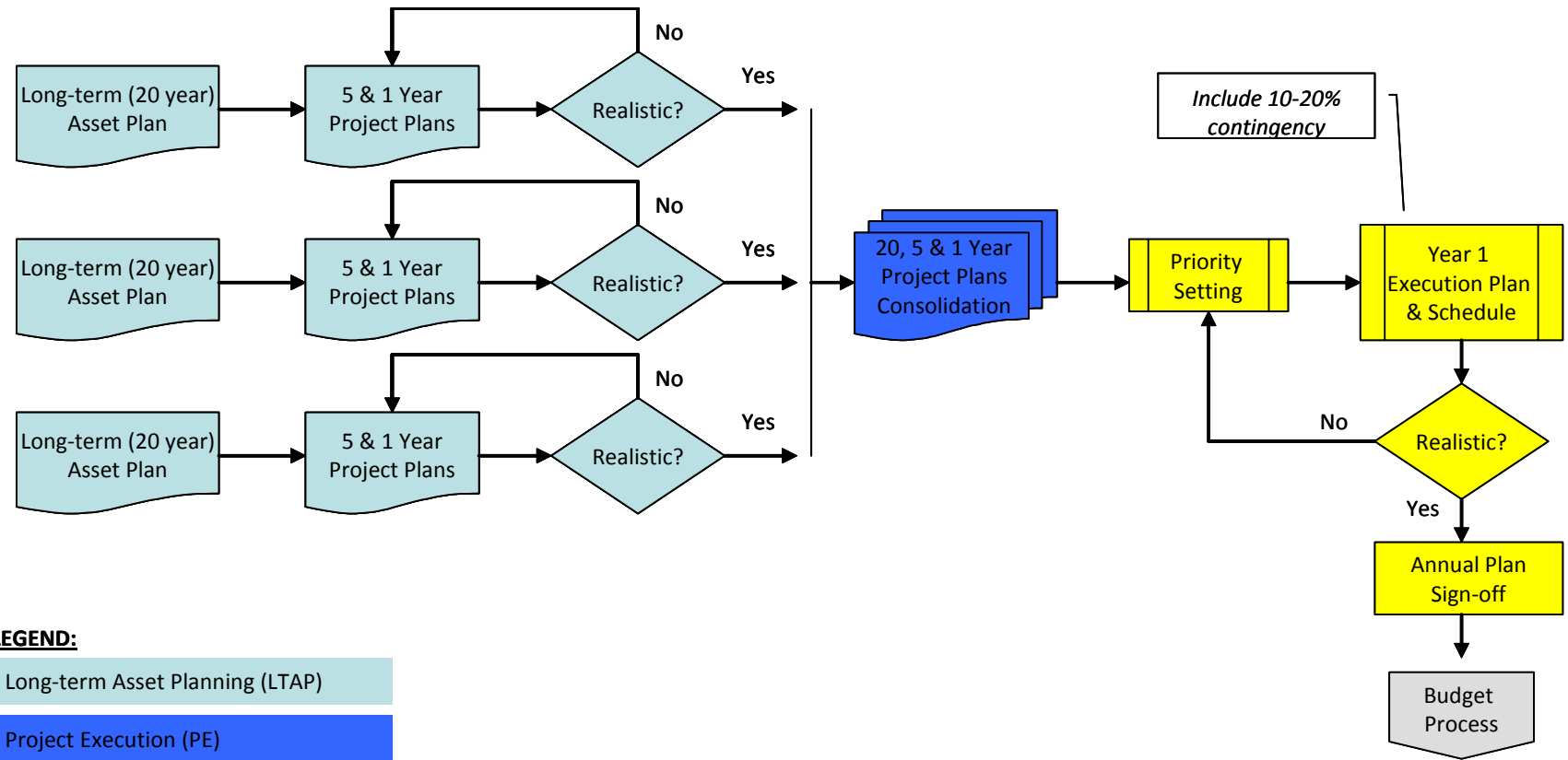
Project	Project Execution	Civil	Electrical	T&D	Mechanical	P&C	Telecontrol
HYDRO							
Project 1							
Project 2							
Project 3							
Project....							
CHURCHILL FALLS							
Project 1							
Project 2							
Project....							
OTHER LINES OF BUSINESS (Menihkek; Central NL; Business Development; Oil & Gas)							
Project 1							
Project							

Project Manager

Technical Resource



Process for Annual Project Plan



- LEGEND:**
- Long-term Asset Planning (LTAP)
 - Project Execution (PE)
 - Engineering Discipline (Eng. Dis.)
 - Joint LTAP/PE/Eng. Dis.



Next Steps *(as of March, 2010)*

- Near Term
 - Finalize all organization and staffing changes
 - Asset Management
 - Project Execution and Technical Services
 - Office of Asset Management
 - Internal communication
 - Employees affected by scope or title changes
 - Senior management group
 - All employees
 - Board of Directors
 - IBEW
 - External communication
 - Shareholder
 - PUB
 - Other stakeholders
- Balance of 2010
 - Establish Office of Asset Management processes
 - Supporting organizational models in other lines of business

A proud, diverse energy company, whose people are committed to building a bright future for Newfoundland and Labrador, unified by our core values.

Sharing our ideas in an open and supportive manner to achieve excellence.

Teamwork

Honesty and Trust

Being sincere in everything we say and do.

Open Communication

Fostering an environment where information moves freely in a timely manner.

Safety

Relentless commitment to protecting ourselves, our colleagues and our community.

Respect and Dignity

Appreciating the individuality of others by our words and actions.

Leadership

Empowering individuals to help, guide and inspire others

Accountability

Holding ourselves responsible for our actions and performance.