Integrated Long Term Planning and Fleet Asset Management At Exelon

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Purpose of LTP and LTAM

- Ensure Comprehensive Identification of Issues Requiring Incremental Investment.
  - Short Term (0 to 5 Years)
  - Long Term (6 Years to End-of-Plant Life, i.e., 60 years)

- Ensure that Asset will perform intended function for life of the plant or Identify needed projects throughout the remaining life of the plant.

- Ensure Optimal Project Selection Over a 10-year Rolling Period (i.e. Project Management 10-year plan)

Key Attributes of LTP/LTAM

- Engineering Inputs/Sources:
  - *Plant System Long Term Plans*
  - *OPEX*
  - *EPRI (and Other Industry/Vender Information)*

- Integration of Both Site and Corporate Inputs.

- Maintaining A Living Pipeline for Project Planning, For the Life of the Plant (Projects > $500K 5 year out and >$1000K to 60 years) and For Project Management 10-Year Plan.

- Utilization of a Central Information Repository (Portfolio Director Database)

LTP and LTAM Process Flow

Exelon Nuclear

Industry Information

- EPRI Life Cycle and Aging Management Guides
- Obsolete Item Replacement (POMs)
- WOG Aging Assessment Field Guide
- INPO EPIX
- Internal OPEX
- Other

Corporate Strategies & Deliverables

- Long Term Asset Management Strategies
- PCM Templates

Project Approval and Prioritization

- PRC Threat Recommendation Package
- Site and Corporate PRC Review and Approval (Corporate for multi-site projects)
- Site and Corporate Checkbooks
- Exelon Nuclear Business Plan

System Long Term Planning

- System Long Term Improvement Plan (0-5 years & 6 years to End-of Plant Life)

Site Specific Long Term Issue Prioritization

- Site PHC Review and Approval
- Site "Top-10 Issues" Lists
- Site PRC Review and Approval
- Site MCIP Matrix
- Site Business Plans
- Site Checkbooks

Feedback:

- Site Obsolescence Concerns
- PCM Template Improvements
- LTAM Improvements
- Business Plan input
- Checkbook Input

Long Term Asset Management Strategies

Exelon Nuclear

- Overall Purpose: A *Strategic Evaluation* Performed Yearly, by Corporate Subject Matter Experts (SMEs) to Identify *Degradation or Aging Mechanisms*.
  - Identify Actions to Maintain or Upgrade Significant Assets to *Maximize Equipment Reliability*, *Plant Availability* & *Cost Optimization*.
  - Be An Input to Fleetwide or Site Plans to *Monitor, Mitigate or Correct Identified Vulnerabilities*

LTAM Strategies (cont'd)

- Evaluation Performed Yearly, typically in 1st Quarter.
  - Results reviewed by key stakeholders.
- LTAM Strategies Apply to Significant Plant Assets
  - *Steam Generators, Large Motors, Large Pumps, Main Condensers, Large Transformers, etc.*
- Currently Have Twenty-Seven (27) LTAM Strategies.

LTAM Format and Content

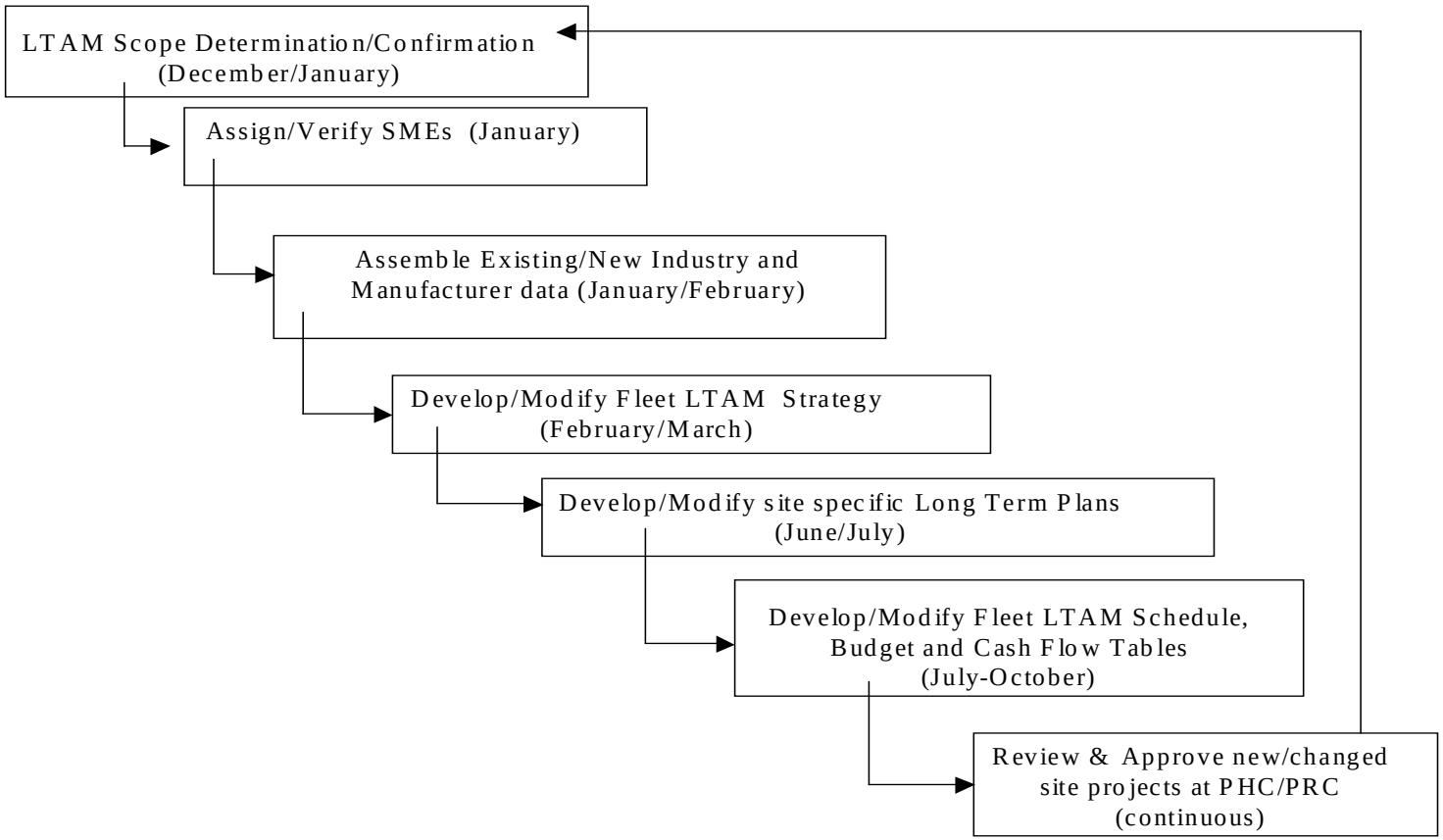
- *Scope Statement*
  - *Identifies applicable site*
  - *References PCM Templates*
  - *Clearly states that asset is good for life of plant or optimal replacement time*
- *Failure Mechanisms*
  - *Includes Aging and Obsolescence*
- *Mitigation Strategies*
  - *Provides Basis for 60-Year Life*
- *Issue Summary*
  - *Risk Mitigation*
  - *Long Term Recommendation*

2007 LTAM Strategies

Exelon Nuclear

- Buried Pipe
- BWR Reactor Internals
- Containment Liners
- Cooling Towers
- EHC Hydraulics
- Emergency Diesel Generators (Engine)
- Emergency Diesel Generators (Generator/Exciter)
- Feedwater Heaters
- Heat Exchangers
- Instrumentation & Controls
- Large Cranes
- Large Motors
- Large Pumps
- Large Transformers (Main, Aux, SU)
- Main Condensers
- Main Generators
- Main Generator (Exciters and VRs)
- Main Turbine Rotors & Casings
- Major Structures
- NSSS Piping
- PWR Inconel
- Raw Water Systems
- Reactor Recirc.MG Sets
- Refueling Equipment
- Spent Fuel Storage
- Steam Generators
- Torus & Suppression Pools

LTAM Strategy Process



LTAM Strategy Results

Corporate Engineering (Exelon Generation | Exelon Nuclear) - Microsoft Internet Explorer provided by Exelon BSC

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- Corporate Design
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- Asset Management
- Component Programs
- Equipment Reliability
- Fleet Wide Equipment Issues
- Non Component Programs

Corporate Engineering

News

- Please welcome Rich Ciemiewicz to Corporate Engineering
- Line Management Observation (LMO) Opportunities
- Please welcome summer intern Benjamin Young
- Please welcome summer interns Darrin McNew and Jason Ballengee
- Cantera All Hands Meeting Presentation Available

Our mission

To provide timely, cost effective, and high quality engineering services to all Exelon Nuclear plants in order to maximize plant and component reliability, minimize O&M costs, maintain plant configuration control, and to identify and resolve industry technical issues. This will be accomplished by a well trained and experienced engineering team that maintains close involvement and cooperation with the site engineering divisions while maintaining leadership in industry technical issue groups.

Our Management Team

Craig Lambert
Engineering Vice President

Roman Gesior

Engineering Links

- Engineering Duty Manager Resources
- Engineering Fundamentals
- Design Sharing
- Engineering Work Station
- Engineering Work Management
- Long Term Asset Management (LTAM) Strategies
- Engineering Yellow Pages
- Engineering Training
- Engineering Excellence Plan
- Engineering Improvement Plan

http://exelonwss.exeloncorp.com/nuclear/EquipRel/Long%20Term%20Planning/Forms/AllItems.aspx?RootFolder=http%3a%2f%2fexelonwss%2

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Engineering Long Term Planning (LTP)

Exelon Nuclear

- Source: Internal and External OPEX
- System Managers Prepare/Update System Health Overview Report (SHOR)
- Long Term Plans Identify Problems or Improvements for Plant Systems (and Major Components Within Those Systems).
- SHOR Includes a Long Term Improvement Plan Section.
  - *Short-Term: 0 to 5 Year Period*
  - *Long-Term: 6 Years to End-Of-Plant Life Period*

Engineering LTP (cont'd)

- Long Term Plans are Maintained in the SHIP Database (eSHIP) Accessible From the Exelon Nuclear Equipment Reliability Website.

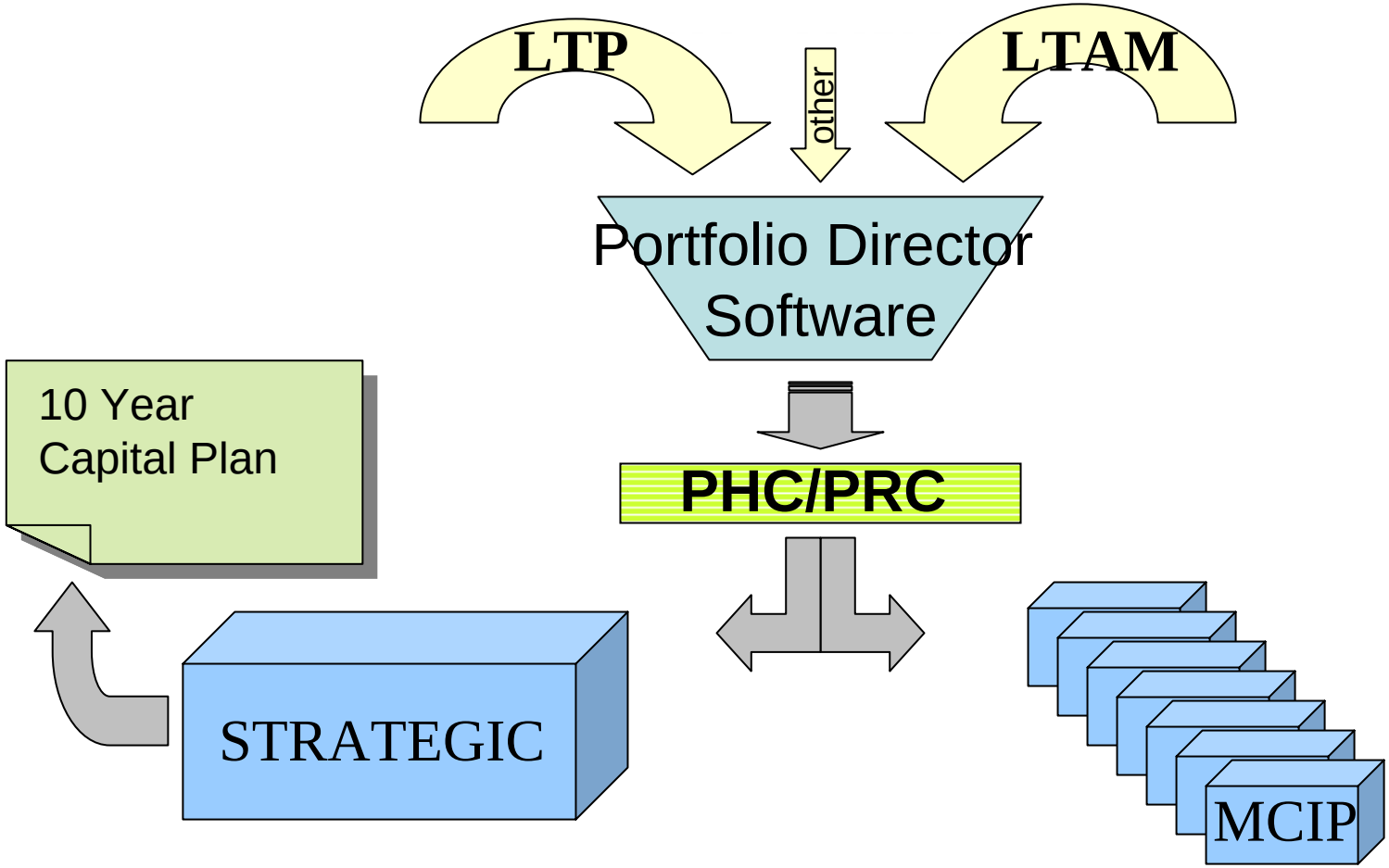
- Identified Long Term Plan Issues are Presented to Site *Plant Health Committee and Project Review Committee for Review and Approval*
  - *Issues Maintained in Portfolio Director Database*

LTP & LTAM Issue Prioritization

- LTAM Strategy Items and Long Term Plan Issues Are Integrated and Prioritized to Identify Those Items That Need Action *Over the Life of the Plant*

- Prioritization is Accomplished Through:
  - *PHC Plant Health Issue Priority Ranking Score*
  - *Project Prioritization Ranking Score*
  - *LTAM Consequence of Failure Rating*
  - *LTAM Probability of Failure Rating*

LTP/LTAM interface w/ Business Plan



- Fleet Prioritization
- Controlled by Corp Sr. Mgmt

- Nominal budget ~$9 -$18M/site
- Site Prioritization
- Controlled by Site VP

Benefits of Good Long Term Planning

Exelon Nuclear

- Identifies and Solves Problems In a Significant Period Before They Impact Plant Operation.
  - *Minimizes Emergent/Crisis Projects* by Executing Steps Before the Plant Is Impacted.
  - Provides Time for *Alternate Approaches or Contingency Actions*, When Necessary.
- Optimizes the Use of Site & Corporate Resources (Internal and External).
- Optimizes Outage Durations
- Supports Meeting *Budget and Generating Commitments* to the Corporation
- Overall, *Improves Equipment Reliability*.