

Deferred Maintenance Liability or Opportunity

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Design Principles

Our goal: To replace old and inefficient equipment with new sustainable equipment and technologies.

- **Energy Efficient**
- **Environmentally Sensitive**
- **Improve Learning Environment**
- **Reduce Operational Maintenance**
- **Reuse Materials**
- **Increase/Prolong Life Cycle**

Central Plant

Liability:

- **40 year old equipment and technology**
- **Harmful chlorofluorocarbon (CFC 11)**
- **Undersized equipment**
- **Insufficient Heating and Cooling**
- **Not code compliant**
- **Not energy efficient**

Projects

Replacement of:

- **Boilers**
- **Chillers**
- **Emergency Generator**

Case Study - Generator

Old:

175kW 40 year old natural gas fired generator that supported:

- **Emergency lights and fire systems**

Case Study - Generator

New:

600kW dual fuel generator that supports:

- **Business continuity plans for IT business systems**
- **Heating pumps for potential extended power outages**
- **Demand response capabilities to reduce hydro loads during peak periods**

Case Study - Chillers

Old:

40 year old 900 and 750 ton solid state centrifugal chillers

- **Running cfc 11 refrigerant**
- **Increased breakdown**
- **Inefficient Energy Use of 1.1 kW/ton**
- **No chilling in May or October (energy)**

Case Study - Chillers

New:

Three variable speed drive 550 ton centrifugal chillers with state of the art control system (Hartman Loop)

- **Control strategy that optimizes equipment and minimizes energy consumption**
- **Provide chilling during shoulder periods**
- **Energy Efficiency of less than .058kW per ton**
- **Annual savings of \$104,000**
- **Efficiency payback of 6 years**

Case Study - Boiler

Old:

Four 300 BHP boilers with average NOx emissions of 70ppm and 77% efficiency

- **Deteriorating insulation**
- **Excessive breakdowns**
- **Extremely large footprint**

Case Study - Boiler

New:

Three 450 BHP boilers with average NOx emissions of 39ppm and 85% efficiency

- **Variable speed drive blower motors and reduced HP on pump motors**
- **Increased capacity for new buildings**
- **Reduced Hydro/Gas consumption \$56,000 annually**
- **Efficiency payback of 2 years**

Opportunities - Lighting

Humber has been working on lighting for the past 17 years.

- **1990 – 4 lamp T12 2x4 fixtures to 2 lamp T12 with reflectors**
- **1993 – installed motion sensors in every space**
- **1998 – T12 to T8 ballasts and removal of all PCB's**
- **2000 to present continue to reduce wattage, employ dimmable ballasts and explore new lighting technology**
- **Use low mercury lamps, recycle old lamps and do not use incandescent lighting.**

Seize the opportunity

Don't settle for old Technology

Make it new and make it Sustainable