Forging a path to resiliency
Using CSA Z8002 to increase the capacity to respond to operational disturbances

Robert Barss CET, CCHFM, CHFM
Manager Environmental Stewardship
Nova Scotia Health Authority
Session Objectives

- This session will provide participants with:
  - overview of Canadian Standards Association (CSA Group)
  - background of Z8002 and where it fits in the health care standards universe;
  - updates in Z8002 that address current trends, advances, and needs in health care.
CSA Group
An overview on Standards Development
Value of Standards

Standards play an important role in safety, security, the environment and the global economy, by fostering wider acceptance of emerging technologies and helping to manage risk.
Members drive Standards for Social Good

- +9,000 Engaged and Dedicated Volunteer Members

- +1,300 Standards Technical Committees
CSA Standards Development Process

1. Request / Evaluation / Authorization
2. Assign to Committee
3. Notice of Intent
4. Meetings / Draft
5. Public Review
6. TC Reaches Consensus
7. Pre-approval Edit
8. Technical Content Approval
9. Procedural Approval
10. Final Edit / Publication
11. Dissemination
12. Maintenance
CSA Z8002
Introduction and Background
Introduction

- Proper operation and maintenance of a health care facility (HCF) is essential to the safe and effective delivery of services to patients and to the health and safety of staff and the general public.
Introduction

- Facilities must be resilient enough to absorb disturbances, ranging from infectious disease outbreaks to natural disasters.
Introduction

- O&M functions should be managed by trained and qualified personnel using a well-organized system, ensuring access to health care services after disasters.
Scope of CSA Z8002

- Part of the Z8000 Series of standards on health care facility design and construction

- Sets out a framework for O&M

- System requirements include:
  a) buildings and architectural systems;
  b) site elements related to the building and its functions, including on-site access routes;
  c) on-site utilities;
  d) the mechanical, electrical, and information technology, and security systems;
  e) life safety systems;
  f) airborne isolation rooms, operating rooms, and specialized medical procedure rooms;
  g) permanently installed equipment; and
  h) building services and interfaces for installed equipment, both medical and non-medical.
Who needs the Standard?

- Facility managers
- Maintenance managers
- IPC professionals and other health care professionals
- Architects
- Engineers
- Planning and project managers
- Contractors and builders
- Commissioning teams
First edition of CSA Z8002 - Accomplishments

- Addressed aspects of O&M including:
  - building & architectural systems
  - mechanical & electrical systems
  - building services
  - interfaces for clinical equipment

- Set requirements for O&M staff as well as trades people and contract workers

- Integration of fire life safety systems

- Included special requirements for the O&M of isolation rooms and operating rooms
The need for second edition of CSA Z8002?

- Advances in technology;
- Improve alignment with other standards;
- Incident management system and deployment of emergency communications;
- To provide alternate response and recovery planning;
- Organizational management and worker qualifications; and
- Construction management.
The Evolution of CSA Z8002-19

91 pages

112 pages
Development Timeline

First edition of Z8002 published
February 2014

Committee begins work on new edition
January 2018 – November 2018

Public Review
November 2018 to January 2019

Public Review comments resolved
January 2019 to February 2019

Ballot completed via TC recorded vote
February 2019
Introduction

General Requirements

Building and site maintenance plan

Systems operation manuals and maintenance and data manuals

Emergency and continuity response plans

Commissioning, recommissioning, monitoring, and optimization

Annual Reporting
What stayed the same?

• The core of this Standard is:

• the coordinated operation and maintenance program (COMP). The purpose of the COMP is to
  a) identify the HCF elements requiring O&M;
  b) responsibility for the operation;
  c) responsibility for maintenance;
  d) awareness of their responsibilities; and
  e) supporting and ongoing documentation.
New and Improved!

- Emergency and continuity planning
- HCF management qualifications
- Staff orientation checklist;
- Construction management;
- Contractor orientation program;
- New equipment-systems commissioning; and
- Data collection and systems integration.
New Reference Publications

- Z317.5-17 Illumination design in health care facilities
- Z317.14 Wayfinding for health care facilities
- Z10535.2-17 Lifts for the transfer of persons Installation, use, and maintenance
- National Association of Pharmacy Regulatory Authorities (NAPRA)
Operation and maintenance documentation overview

<table>
<thead>
<tr>
<th>Document</th>
<th>Scope / purpose</th>
<th>Examples of items covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality system</td>
<td>Control, monitor, and continually improve the COMP.</td>
<td>• Written procedures and policies for quality</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Staff training, qualifications, and responsibilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Process controls to ensure procedures are being followed</td>
</tr>
<tr>
<td>Risk assessment</td>
<td>Evaluate, and manage where possible, potential risks related to the responsibilities and activities of the O&amp;M service.</td>
<td>• Document areas posing potential risks to patients, staff, or visitors in the facility, along with the methods to mitigate the risk involved.</td>
</tr>
<tr>
<td>Coordinated operation and maintenance program (COMP)</td>
<td>Overall operation and maintenance program that applies to all activities and elements relating to O&amp;M.</td>
<td>• Identify HCF elements requiring O&amp;M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Assign responsibilities, training, and supporting documents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Means for ongoing monitoring and improvement</td>
</tr>
<tr>
<td>Systems operation manual</td>
<td>Ongoing operation of all systems.</td>
<td>• HVAC system (daily operation)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Boilers and hot-water systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pneumatic tube systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Safety and security systems</td>
</tr>
<tr>
<td>Maintenance and data manual</td>
<td>Maintenance of specific equipment and systems.</td>
<td>• HVAC system (e.g., filters, cooling towers, fans)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Plumbing systems (e.g., treatments and systems for infection prevention and control)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Electrical / lighting systems</td>
</tr>
<tr>
<td>Building and site maintenance plan</td>
<td>Maintenance of building and site elements that are not covered in the maintenance and data manual.</td>
<td>• Floors and other interior surfaces</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Building envelope and roof systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Architectural air seals in pressure-critical areas (e.g., operating rooms)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Site Elements – access, parking, grounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Outdoor signage</td>
</tr>
<tr>
<td>Emergency plans</td>
<td>Define expectations for the plant maintenance and service actions, responses, and responsibilities in relation to HCF emergency plans.</td>
<td>• Emergency evacuation plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Code response</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Hazardous materials management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Isolation of systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Essential service provision in emergency situations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Staff training</td>
</tr>
<tr>
<td>Ongoing commissioning</td>
<td>Process/program that monitors and documents the building’s performance, using the original commissioning documentation as a benchmark.</td>
<td>• Address all changes occurring in the facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ensure commissioning is carried out and documented</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Recommissioning at least every 5 years.</td>
</tr>
<tr>
<td>Standards and Reference Publications</td>
<td>Subsidiary standards and reference publications are included in Section 2 of Z8002, with further detail in Table B.1.</td>
<td>• Various related to operation and maintenance.</td>
</tr>
<tr>
<td>Codes and Regulations</td>
<td>Follow applicable codes and regulations and document compliance.</td>
<td>• Various related to operation and maintenance.</td>
</tr>
<tr>
<td>Documentation</td>
<td>Defined system for documentation (e.g., CMMS).</td>
<td>• Documentation required by elements of Z8002.</td>
</tr>
<tr>
<td>Annual Reporting</td>
<td>Report annually to HCF management on facility conditions and operation/maintenance needs.</td>
<td>• Issues and recommendations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Capital requirements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Financial, clinical, and operational aspects,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Infrastructure analysis</td>
</tr>
</tbody>
</table>
New Definitions

Drawings — a graphic representation of a building or system, and subdivided as follows:
a) design drawing — a drawing of a building or system as planned, with the design documents (drawings, specifications, etc.) sealed by the design professionals;
b) as-built drawing — a design drawing marked up, stamped, and signed by the contractor during construction or installation to show construction changes as compared to the design; and

Health Care Facility - Class C - updated to match that within Z8000

NEW! Emergency and continuity plans - documented collection of procedures and information that is developed, compiled, and maintained in readiness for use during an incident to enable an organization to continue to deliver its critical activities at an acceptable pre-defined level.

NEW! Multidisciplinary team (MDT) - a group comprising representatives from various disciplines in the health care facility that works with the project management team and others to ensure that the appropriate infection prevention and control measures are followed during construction activities.
New Requirements

- HCF Management Qualifications;
- Contractor Management;
- Construction Management;
- Emergency and continuity plans; and
- New-equipment systems training.
Annex Updates

- Annex I Personal Qualifications
- Annex J Maintenance management system
- NEW! Annex K Contractor’s Orientation Program
- NEW! Annex L Staff orientation list
Clause 4 General Requirement

- Management responsibility
- Coordinated operation and maintenance program (COMP)
- Operation and maintenance procedures
- Risk Management
- Management, staff qualifications
- Competent, qualified individuals
- Outsourcing of services
- Quality system
- Documentation and records
Clause 5 Building and site maintenance plan

- General
- Testing and inspections
- Building envelope
- Interior separation
Clause 6 Systems operation manuals and maintenance and data manuals

- General
- Systems operation manuals
- Maintenance and data manuals
Clause 7 Emergency and continuity plans

- Operation and maintenance of emergency and continuity plans
- Alternate planning requirements
- Incident command system requirements
- Departmental planning
- Contingency management
- Systematic review
- Decision-making levels
- Procedures for post-emergency and recovery of normal operations
Clause 8 Commissioning, recommissioning, monitoring, and optimization

- General
- Facility optimization
Clause 9 Annual Reporting

- Annual reporting

- Table 1 Testing frequency for medical procedure rooms and other areas requiring environmental controls (9 pages long):

| Operating room – testing personnel updated | Corridors — patient care areas |
| Airborne isolation room                     | Clinic areas — ambulatory care and pediatrics |
| Segregation room                             | Dietary — |
| Radiation bunker – reference to N288.3.4 added | kitchen and dishwashing |
| Post-anesthetic care                         | Labour, birthing, and |
| Intensive care                               | Caesarean delivery area |
| Neonatal intensive Care                      | Occupational therapy |
| Laboratory fume hood                        | Waiting rooms |
| Pharmacy – reference to NAPRA added          | Biomedical waste storage room |
| Air-handling systems                        | Washrooms and toilets |
| Dialysis                                    | Laundry rooms |
| Cardiology — cardiac catherization          | General storage, offices, locker rooms, conference rooms |
| Autopsy and morgue                           | Nursing stations and soiled utility rooms |
Annex A - Informative

- Sample table of O&M responsibilities
  - Building elements
  - Communication / security
  - Electrical
  - Emergency and continuity response planning
  - Environmental services / waste management
  - Equipment
  - Mechanical systems
  - Utilities – internal
  - Utilities – external
  - Integrated systems
  - Housekeeping
  - Statutory testing
Annex B - Informative

- HCF systems reference for standards and manuals
  - Table B.1 features HCF systems and related documentation
  - System types include:
    - Mechanical
    - Fuel
    - Miscellaneous
    - Electrical
    - Control
    - Communication
    - Transportation
    - Architectural / structural
    - Grounds, roads, and parking lots
Annex C - Informative

- Special monitoring and testing requirements
  - Table C.1 features HCF areas to be evaluated for special requirements
  - HCF areas include:
    - All clinical areas
    - Operating rooms
    - Airborne isolations rooms or areas
    - Charge areas / equipment
    - Decontamination entrance
    - Radiation bunkers
    - Post-anesthetic are units (PACUs)
    - Intensive care units (ICUs)
    - Neonatal care units (NICUs)
    - Laboratories
    - Morgue
    - Medical device reprocessing areas
    - Laundry
    - Fume hoods
    - Flammable storage units
    - Chemotherapy
    - Pharmacy
    - Kitchen
    - Continuing care
    - Other
Other Annexes

- Annex D – Informative: Quality Systems
- Annex E – Informative: Testing air change rates, relative pressurization, and directional flow in operating rooms, airborne isolation rooms, and post-anaesthetic recovery units
- Annex F – Informative: Testing air change rates, relative pressurization, and directional flow in special service areas
- Annex G – Informative: Testing airborne isolation rooms prior to patient occupancy
- Annex H – Informative: Testing for minimum outside air changes on mixed air handling systems.
Annex I - Informative

- *Personnel qualifications*
  - Classification of O&M personnel
  - Building operators
  - *Maintenance personnel*
  - Technicians or skilled trades
  - Users
  - NEW! Health care Facilities Manager Responsibilities and Qualifications
Annex J - Informative

- Maintenance management system
  - Purpose of a MMS
  - Opening a work order
  - MMS system options
  - MMS considerations for an O&M service
  - Closing a work order
  - Key features of a computerized MMS
  - NEW - Data collection and system integration for O&M
  - NEW – BIM / CMMS Integration
NEW! Annex K - Informative

- Contractor’s Orientation Program
  - Introduction
  - General guidelines and information
  - Responsibilities and requirements
  - Incident / near miss reporting
  - Fire safety
  - Chemical safety
  - Workplace violence prevention
  - Infection control
  - Security
  - Appendices
NEW! Annex L - Informative

- Staff Orientation List
  - Basic orientation
  - Department orientation
    - Introduction
    - Personnel Issues
  - Safety and security
  - Waste management
  - Miscellaneous
  - Plant and support services
Questions