



Objective Based Industrial Electrical Code

(OBIEC) Initiative
May-16-08





Topics - Agenda

- Traditional Electrical Code Systems
- What is the OBIEC
- Why is it needed
- Development process
- Users
- Regulators
- Safety
- Pilot Project
- Schedule for completion



Traditional North American Standards System

- Wiring Rules Linked Closely To Product Standards
 - One Set For All Installations
 - From The Residential Shed To Major Industrial Facility
- Canadian Electrical Code (CEC)
 - Users Range From Unqualified to Those Well Beyond The Limitations of a Code
- Process to Change CEC Rules Must Accommodate the Safety of All Users



Traditional Regulatory Approach To North American Electrical Systems

- Elements Of The System Operate Independently
 - Design (Restricted By CEC Prescriptive Requirements)
 - Construction (Often Left To Make Up For Incomplete Design)
 - Installer Qualifications (Government Certification Does Not Translate To Workers Qualified For Specific Tasks)
 - Government Electrical Inspections
 - Where Resources Are Often Inadequate (Except AB)
- Missing Element Of Continual Improvement
 - Inspections At Construction Phase Only
 - Maintenance And Operations Criteria Are Lacking



Traditional IEC Standards System

- Rules Less Prescriptive
- Recommended Practices
 - Selected Based on Application
 - Approach of Designers and Installers
- May Lack Consistency
 - Left to Interpretation by User
 - Justification of Approach Not Always Required
- Cultural Change For North America To Simply Adopt The IEC Approach Would Not Be Acceptable



What is the OBIEC "System"

- Objective Based Industrial Electrical Code
- Alternative To The Canadian Electrical Code
 - Intended For Use By A Specific User Group
- Contains Multiple Parts
 - Guidelines And Practices For
 - Design, Installation, Equipment, Operations And Maintenance
 - Safety Management Requirements
 - Regulatory Requirements
 - Auditing



What is the OBIEC “System” An Approach For Industrial Applications

- A “System” to Identify The Mandatory Electrical “Safety Objectives” That Must Be Met
- Identifies Various Industry Standards to Be Used As Guidelines
 - Requirements To Meet The Objectives Are Defined In The Design Documents
 - Allows Use Of Existing Codes
 - Canadian Electrical Code (CEC)
 - National Electrical Code (NEC)
 - International Electrotechnical Commission (IEC)
 - Existing Product Standards (ANSI, CSA, IEC, IEEE, UL, Etc.)



Why Is An Objective Based Code Needed

- Technology Changes Too Rapidly For Prescriptive Codes To Keep Up
 - Globalization (Access To New Technology)
- Desire For Greater Design Flexibility To Meet Project-specific Requirements
 - Cost Savings
 - Improved Safety



OBIEC Initiative - Background

- Industry Initiated – Informal OBIEC Stakeholder Advisory Committee Formed ~ 2001
- CSA & Industry Agree On Development Process – 2003
- Inaugural Meeting Of The CSA Technical Committee For The OBIEC – October 2003
- Initial Draft Documents – June 2006
 - Objective Based Industrial Electrical Code (OBIEC)
 - OBIEC Safety Management Systems Standard (SMS)



Benefits of OBIEC – Electrical Safety

- Better Control of Electrical Systems Safety (For The Life of the Facility) Through:
 - Management Systems Approach
 - Integration With Other Internal Management Systems
 - Personnel Management (Education & Training)
 - National Recognition
 - Mechanism For Continual Improvement
 - Leads to Better Design
 - Improved Access To Global Technologies
 - Focussed Spending on Real Safety Issues



Benefits of OBIEC – Typical Cost Savings

- **Estimated Savings Over Existing Codes**
 - Up to 16% Based on Current Knowledge
 - e.g. 16% Electrical Savings on \$100 Million Project (7 to 10 million electrical) = \$1.1 – \$1.6 Million Savings
 - With System Maturity & New Technology
 - Could Be 20-25%
- **Some Examples**
 - Use Equipment Certified to Non-CSA Std's
 - North American Sourcing of Cables
 - Cable Installation (Spacings, Volt Drop, Protection by Location, IEEE Ampacities, etc.)



Benefits of OBIEC – Other Benefits

- **General**
 - Industries More Competitive
 - More Projects, More Jobs
- **Regulators**
 - Stable Objectives
 - Puts Responsibility on Owners/Users
- **Manufacturers**
 - Opens Market For International Products
 - Lower Certification Costs/Time
- **CSA**
 - Strategic Positioning For The Development of Objective-based Codes/Standards



Creating the OBIEC

- **Developed By Canadian Standards Association**



- National Consensus Standard Of Canada
 - Meeting Standards Council of Canada (SCC) Criteria
- Covers – Design, Products, Installation, Operations, Maintenance, Reclamation/Demolition
- References “Recognized” Electrical Codes, Product Standards and Recommended Practices
- Objective Based Only
 - i.e. No Performance or Prescriptive Statements

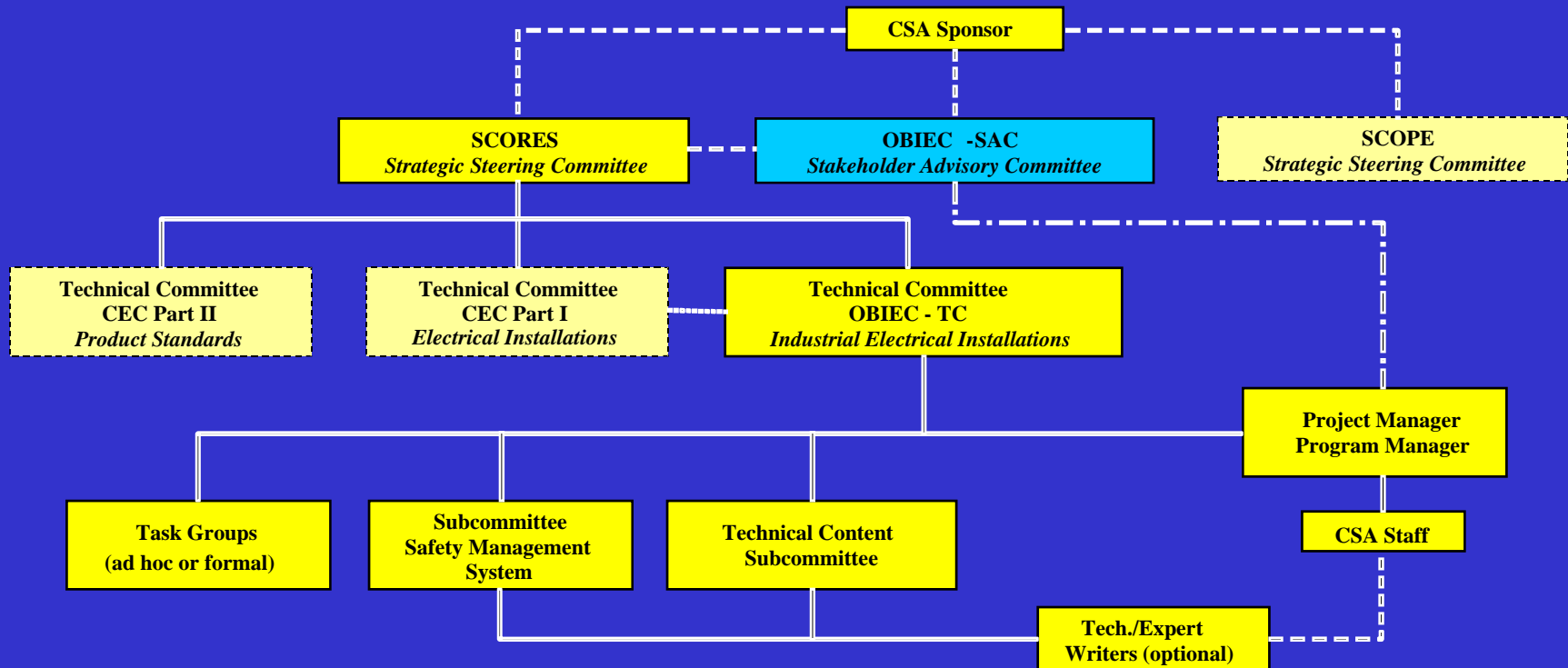


OBIEC Scope – (Components)

- Develop OBIEC Code (CSA Standard)
 - As a National Consensus Standard of Canada (meet Standards Council of Canada criteria)
 - Covers – Design, Products, Installation, Operations, Maintenance, Reclamation/Demolition
 - References “recognized” Codes, Standards and Recommended Practices
 - Objective Based only (i.e. no performance or prescriptive statements)
- Develop Qualification Guideline (CSA Standard)
 - Safety Management System – for Industrial Users to follow and for qualification by the Regulators
 - Intended as a guideline for Regulators
- Develop Handbook
 - Description of referenced Codes, Standards, Recommended Practices, and other Guidance documents



Development Structure of the OBIEC



- CSA persons or groups directly involved in the OBIEC development
- CSA groups that may be involved indirectly in the OBIEC development
- OBIEC Stakeholder Advisory Committee
- Direct lines of communication, e.g., reporting to or directing work
- Open lines of communication, e.g., providing information / recommendations
- Same as dashed line above, plus progress/financial reporting & billing
- Indirect communications, e.g., liaison between groups



OBIEC "System" Contents

- Objective Based Industrial Electrical Code
 - Based on IEC 60364 Chapter 13 – Fundamental Principles
- Safety Management System Standard
- Handbook
- Regulatory Components



Safety Management System (SMS)

- **Basic Concept And Requirements**
 - CSA Standard – Safety Management System
 - For Industrial Users To Follow To Develop Their System
 - SMS Is Company Specific
 - Unique To Each User
 - For Regulators To Qualify Users
 - Intended As A Guideline For Regulators
- **Based on an ISO 9000 Concept**
 - The SMS is a guide to develop a Company Specific Plan



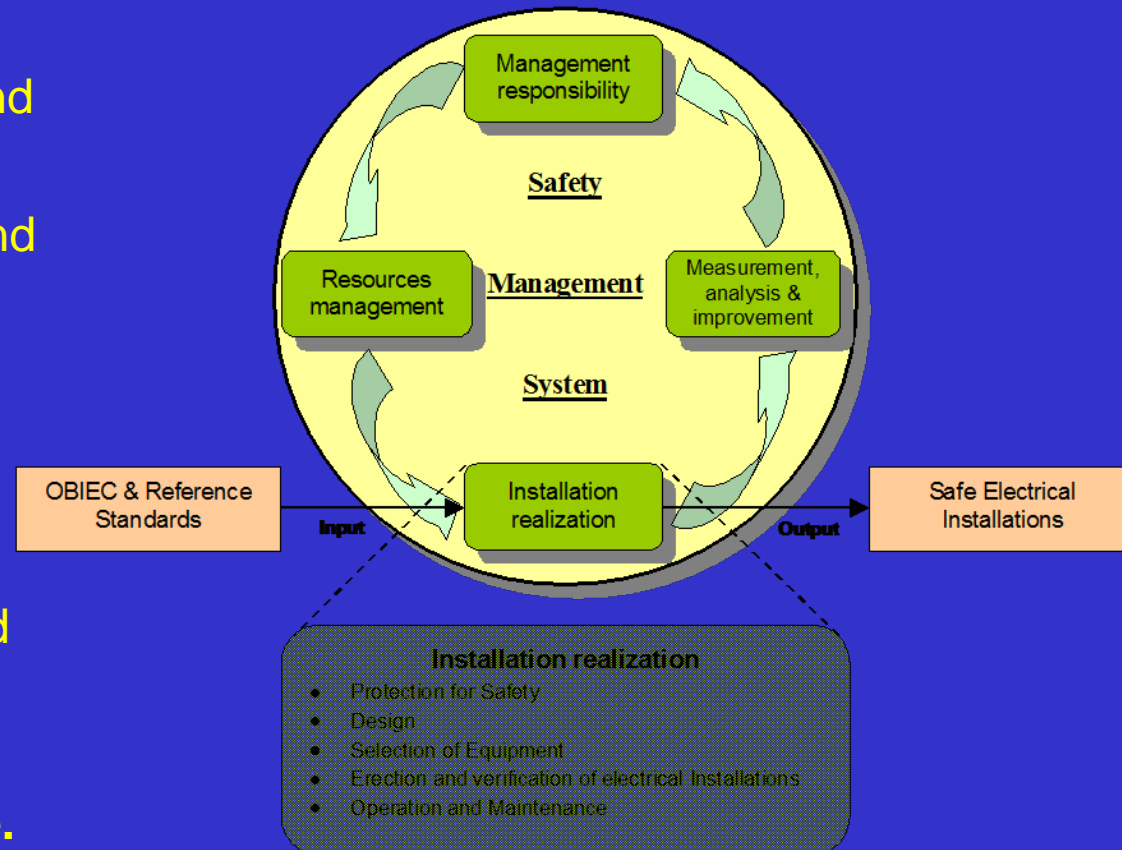
Safety Management System (SMS)

- User Creates Management Systems For The Effective Implementation Of The OBIEC In Their Organization To Ensure Electrical Installation Safety Objectives Are Met
 - Their Safety Management Manual Contains The Policies, Processes And Procedures Required To Meet The Minimum Requirements Of The OBIEC-SMS Standard
- Promotes Continual Improvement Similar To Other 9001 Systems.
- Continual Monitoring Of The Safety System And All Its Elements Is Performed And Improvements To The System Are Made Over Time



Objective-Based Approach Safety Management System

- **Plan:** establish the objectives and processes necessary to deliver results in accordance with customer (user) requirements and the organization's policies.
- **Do:** implement the processes
- **Check:** monitor and measure processes and product against policies, objectives and requirements for the product and report the results.
- **Act:** take actions to **continually improve process performance.**





Handbook Development

- References Guideline Documents
 - Electrical Codes
 - Product Standards
 - Recommended Installation Practices
 - Other Guidance Documents
- Essentially A Training Manual For New Engineers



Handbook Development

- Will define “sophisticated users”
 - further describes their qualifications or definition
- To be completed after OBIEC, SMS and pilot project
 - provides informal descriptions of the intent of the OBIEC
 - Offer examples and information to aide in the application of the OBIEC to an electrical installation.
- Uses the format of the Canadian Electrical Code Part I Handbook
 - where the code words and phrases are rewritten in a less restricted format and text.
- may contain acceptable solutions, case studies, practical guide on authorized user’s required organization and activities
- may contain informative linkages between the SMS and the OBIEC
- identify any linkage between the OBIEC and specific code clauses in the CEC, IEEE standards, or other documents recognized by the OBIEC.
- in the very early stages



Standards Maintenance

- CSA will provide Ongoing administration and maintenance of the OBIEC “System”
 - in accordance with requirements established under their accreditation as a Standards Development Organization.
 - it is expected that the majority of changes to the OBIEC will be in the References area, primarily adding new ones, and updating others that are already included.



Who are the intended users

- **Heavy Industry**
 - With The Necessary Engineering And Operations Sophistication
 - Must Be Able To Describe And Demonstrate Their Capability In A Safety Manual Developed In Accordance With The CSA Standard,
 - OBIEC Safety Management System — Requirements (SMS).
- **Safety Manual Is Intended To Be Registered With A Certification Body Of OBIEC Management Systems Accredited By A Notified Body**
 - Similar Process To ISO 9000



Regulators In Canada

- Individual Provinces And Territories Are The Authority Having Jurisdiction (Regulator) Over Electrical Installations
 - Adopt Or Adapt The Electrical Code (CEC)
 - Define Acceptable Product Certifications And Agencies
- Have The Right Under Law To Determine How and If The OBIEC Is Used Within Their Jurisdiction
 - Specific Requirements Cannot Be Dictated



Regulator

- **Based On Safety Management System - Requirements Document Regulators Will Develop**
 - Administrative Requirements Accepting The SMS As Is
 - They Have The Right To Modify It
 - Develop A Separate Version Of The SMS For Their Jurisdiction
- **The SMS Standard Is Being Developed Under A Consensus Process**
 - Most Regulators Are Involved
 - Most Will Accept In Their Jurisdictions With Little Or No Modifications
 - This Will Promote A Consistent, National Approach.



Safety

- **OBIEC Will Set A Higher Standard Of Safety**
 - Introduction Of Safety Objectives Instead Of Prescriptive Methods Allow User And Engineering Designer To Focus Their Efforts On Real Safety Issues.
- **Requires**
 - Documentation For All Design, Equipment Selection, Installation,
 - Documentation Of Key Design Decisions, Equipment Selection, And Inspection Requirements.
 - Commitment To Regular Safety Checks And Audits, Continuous Performance Improvement,
 - A Long-term Evaluation And Maintenance Schedule That Goes Far Beyond Today's System Of Occasional Regulator Inspections.
 - Uses CEC As Benchmark For Establishing Minimum Safety Levels

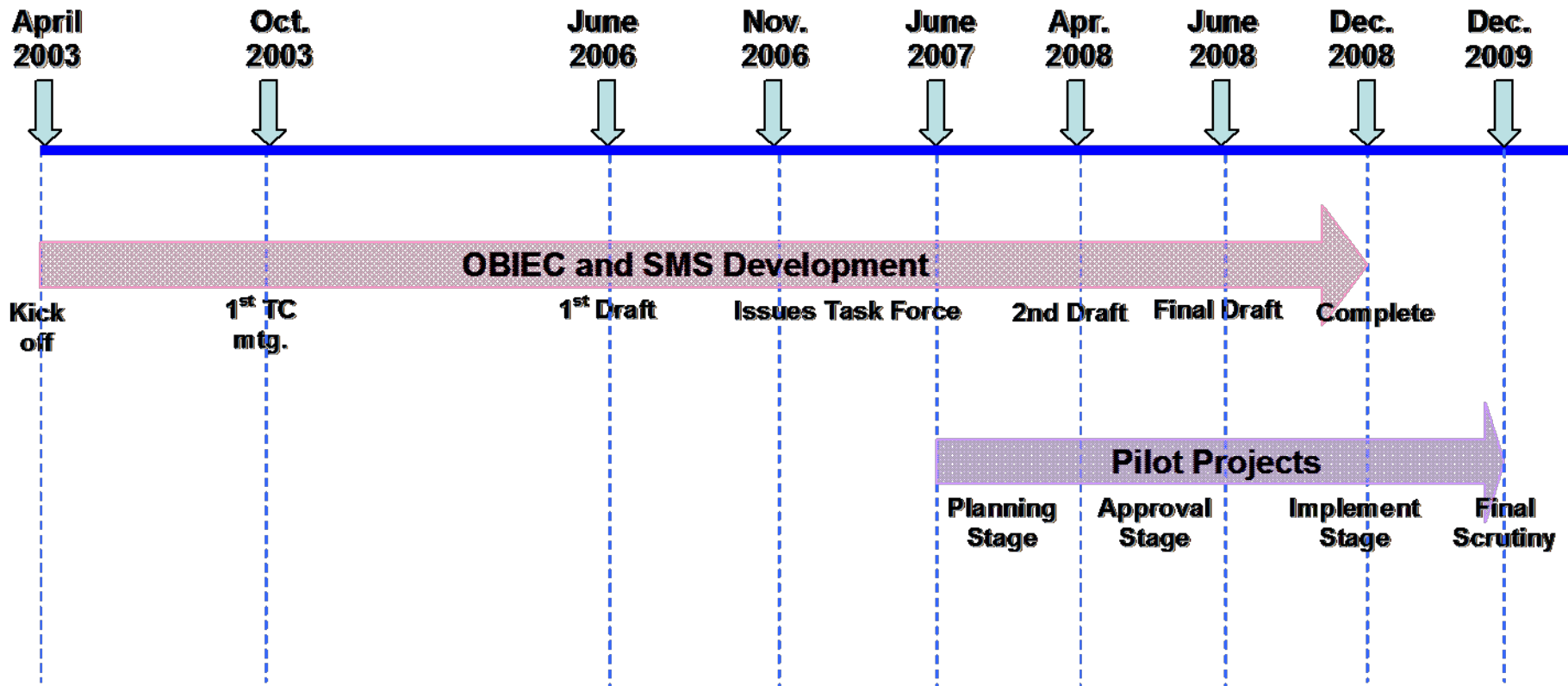


Pilot Projects

- Several OBIEC Pilot Projects Have Been Identified
- Presently Preparing Safety Management System Manuals
 - To Meet The Requirements Of The OBIEC Safety Management System And The Regulator Requirements
- Initiatives Will Provide Open Access To Audit Results, Planned Corrective Actions And Sharing Of Lessons Learned
 - Information Sharing Provides the Opportunity To Adjust The Standards And Provide All Stakeholders With Important Confidence-building



OBIEC Initiative - Status (Schedule)





Conclusion

- The OBIEC & SMS will provide industrial users with
 - Increased design flexibility
 - Access to global technologies
 - Innovative solutions
 - Increased safety
 - not only at time of construction but throughout the life of the facility (cradle-to-grave)
 - Cost savings
- CSA process provides for National Consensus Standards uniformly applied across Canada
 - Goal to have a single registry recognized by every province
- More funding is required to complete the OBIEC Initiative