

NRC-CNRC

From **Discovery**
to **Innovation...**

NBC Part 6 HVAC New Ventilation Requirements to Address IAQ Problems

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National Research
Council Canada

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de recherches Canada

Canada

Outline

New Ventilation Requirements to Address IAQ

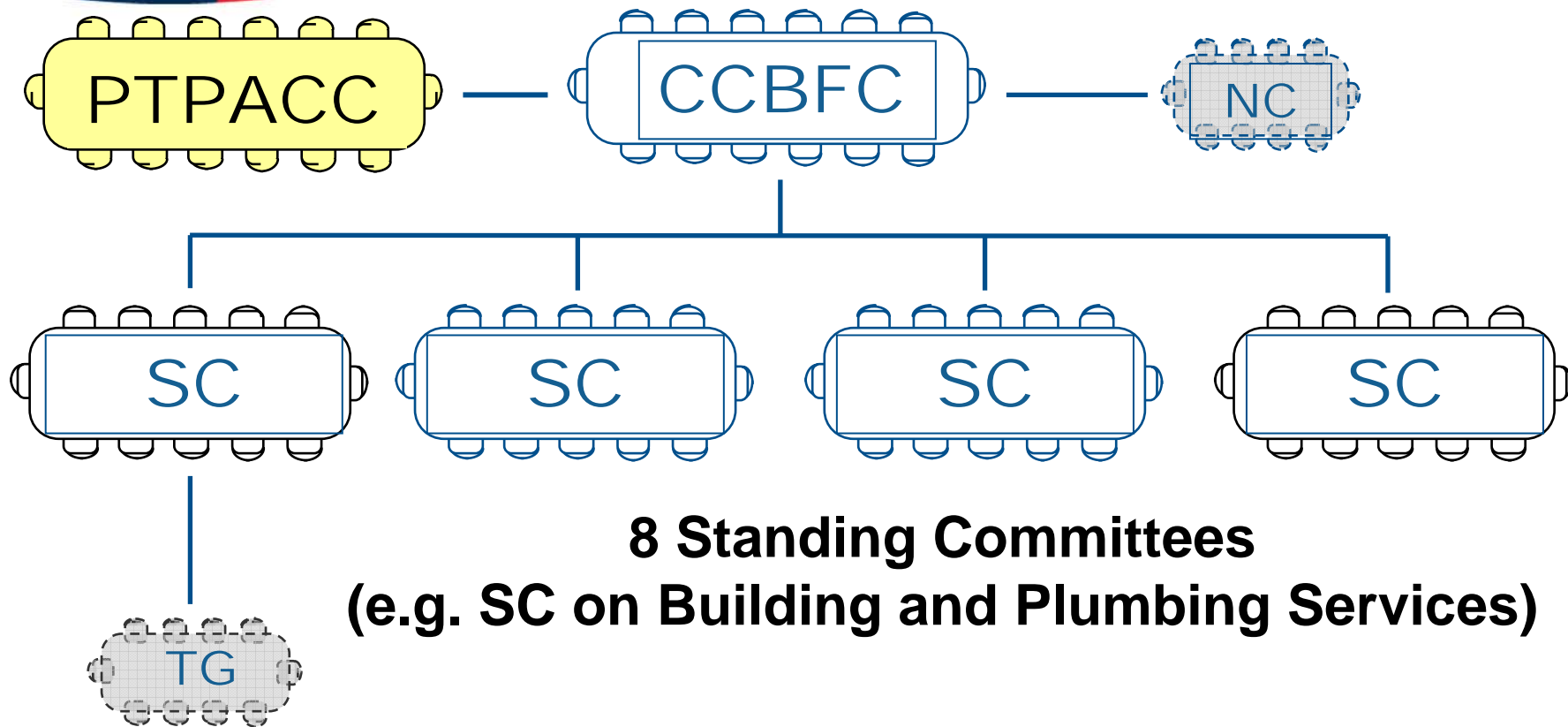
- Codes System Framework
- Codes Development Process
- NBC Part 6 HVAC and IAQ
- Next Steps

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Codes Committees



8 Standing Committees
(e.g. SC on Building and Plumbing Services)

Task Groups

**(e.g. TG on Ventilation
– NBC Part 6)**

Committee Membership

Membership on the Commission and its standing committees reflects a matrix:

- Balanced representation from major sectors
 - Provincial/territorial/municipal regulators
 - The construction industry
 - The general interest

Committee Membership

Membership on the Commission and its standing committees reflects a matrix:

- The regions of Canada
 - Atlantic Canada
 - Central Canada
 - The Prairies
 - The West Coast and the North

Standing Committee

Standing Committees:

- Established by the CCBFC
- Assigned responsibilities
- Technical assessments
- Recommends amendments to Code
- Continuous review of documents
- Considers new developments
- Establishes Task Groups and Working Groups

Outline

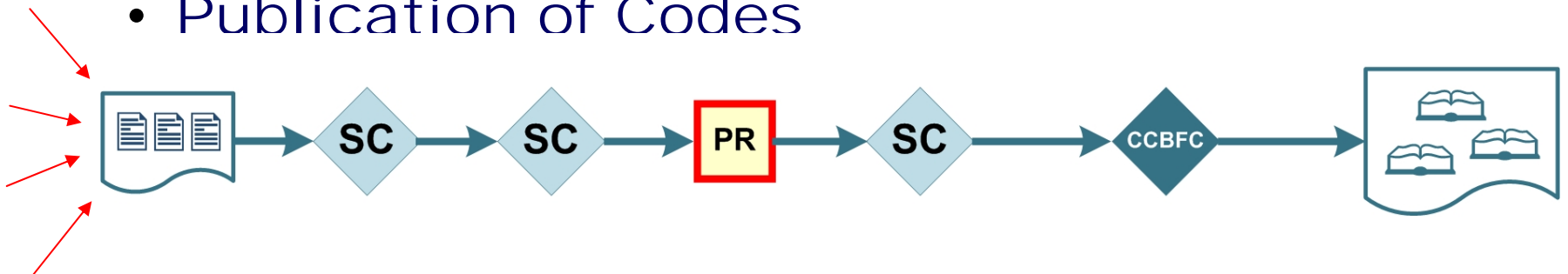
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The Process

From proposed changes to a code requirements:

- Change Request from Proponent (or SC)
- Standing Committee – Review
- Standing Committee – Development
- Public Review
- Standing Committee – Decision
- Commission Decision
- Publication of Codes



Code Change Requests

How Do Requirements Get Into the Code?

- By request
- Anyone can request
- Inclusion is not automatic
- Submit a Code Change Request form
- See guidelines at www.nationalcodes.ca

CCR Guidelines

Code Change Requests Should Include:

- Supporting documentation
- Cost/benefit analysis
- Information on enforcement implications
- Specifics of changes to the code
- Justification/explanation
- Statements demonstrating that the change addresses the objectives of the code

Code Requirements

Rules for Requirements

A requirement must:

- Identify the minimum level of performance
- Address the scope of the code (objectives)
- Be enforceable/measurable (at the time of construction)
- Address issues that need to be regulated
- Satisfy cost-benefit analysis

Objectives

An objective-based code doesn't care if the solutions are prescriptive or performance; they just need to satisfy the objectives.

The objectives of the National Building Code:

- Health (e.g. OH1 Indoor Conditions)
- Safety
- Fire and Structural Protection of Buildings
- Accessibility

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CCBFC Priority

Task Group on the Development of Explicit Ventilation Requirement – NBC Part 6

“The intent of the priority was regarding the minimum air quality when designing the ventilation systems for a building”

- EC May 2007

CCBFC Priority

Task Group on the Development of Explicit Ventilation Requirement – NBC Part 6

- Identify and define IAQ problems
- Are not explicitly addressed in Part 6 of the NBC
- Set minimum indoor air quality limits
- Are within the existing objective

NBC Part 6 - HVAC

Building Application

- Classified as post-disaster buildings,
- Used for major occupancies, or
- Exceeds 600 m² in building area or exceeds 3 storeys in building height

OH 1.1

Division A, Section 2.2 Objectives

OH – Health

OH 1 Indoor Conditions:

- OH 1.1 - inadequate indoor air quality
- OH 1.2 – inadequate thermal comfort
- OH 1.3 – contact with moisture

NBC Part 6 - HVAC

6.2.2.1. Required Ventilation

- All buildings shall be ventilated as per Part 6
- Except self-contained mechanical ventilation systems serving only one dwelling unit (Subsection 9.32.3.)
- The ventilation rates are as per ASHRAE 62 (except for storage garages)

Three preliminary problems identified:

#1 Venting of clothes dryers

#2 Outdoor air quality for ventilation

#3 Venting of products of combustion

Problem #1

Venting of Clothes Dryers

The identified problems are:

- Discharge of contaminated and moisture-laden air into the building
- Build-up of lint in collective venting
- Short-circuiting of air to non-operating appliances

Minimum IAQ Requirements #1

Venting of Clothes Dryers

The proposed code changes are:

- Exhaust directly to the outdoors
- Common exhaust duct vented by one fan
- Interlock to activate exhaust fan
- Provided with make-up air

Problem #2

Outdoor Air Quality for Ventilation

The identified problems are:

- Outdoor air assumed to be better quality than indoor air
- Some outdoor air not acceptable for ventilation
- Contaminated outdoor air may cause adverse health effects on occupants
- No code requirements to address quality of outdoor air used for ventilation

Minimum IAQ Requirements #2

Outdoor Air Quality for Ventilation

The proposed code changes are:

- Outdoor design conditions in HVAC design
- Set maximum levels of particles and gases
- Require devices to reduce particles and gases if above maximum levels
- Appendix provides guidance

Minimum IAQ Requirements #2

NBC 6.2.1.7. Outdoor Design Conditions

The outside conditions to be used in designing HVAC systems:

- Climatic
- Seismic
- Outdoor Air Quality

Minimum IAQ Requirements #2

Maximum levels of particles and gases

The outdoor air quality conditions to be equal to or less than:

- 70 $\mu\text{g}/\text{m}^3$ annually and 120 $\mu\text{g}/\text{m}^3$ daily for particulate matter
- 15 ppb annually and 25 ppb daily and 82 ppb hourly for ground-level ozone
- 13 ppm in eight hours and 31 ppm hourly for carbon monoxide

Minimum IAQ Requirements #2

HVAC designed to include devices:

- If particles and gases are above maximum levels
- To reduce particles and gases to acceptable levels
- Prior to introduction of outdoor air to indoor occupied spaces

Minimum IAQ Requirements #2

Appendix provides guidance on:

- The reasoning behind the new requirements
- The origins of the maximum levels
- Where to obtain information
- Description of the cognizant authority

Problem #3

Venting of Products of Combustion

The identified problems are:

- Discharge to outdoor occupied spaces
- Short circuiting with air intakes
- Contaminated air may cause adverse health effects
- No code requirements to address location of exhaust

Minimum IAQ Requirements #3

Venting of Products of Combustion

The proposed code changes are:

- *Currently under review by the Task Group*

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Next Steps

Task Group on Part 6 of the NBC

- Identify and define additional IAQ problems
- Recommend additional code changes that set minimum indoor air quality limits
- Request an expansion of scope to include the OH 1.2 and OH 1.3 objectives

Public Participation in the Codes Development Process

- Submit a Code Change Request
- Forward your comments during the Public Review
- Participate on Committees

For more information, visit our website at:

- www.nationalcodes.ca

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Questions?

