CHAPTER 6
RIGHT WITH THE REGULATIONS

The NO_x emissions guidelines presented in Table 5-2 are from "The National Emission Guideline for Commercial/Industrial Boilers and Heaters" by the Canadian Council of Ministers of the Environment (CCME). The CCME is the major intergovernmental forum in Canada for discussion and joint action on environmental issues of major national, international and global concern. The guideline is part of a CCME plan to reduce ground-level ozone to 82 ppb (parts per billion) by the year 2005.

It should first be noted that the guideline is intended to apply to new boilers or heaters receiving approval for construction "on or after a date two years subsequent to the publication of this Guideline". The guideline is dated March 1998; the two-year time window allows provincial legislatures to give the guideline the effect of law, and to permit installations already under design and construction to proceed without interruption. Existing boilers and heaters are not required to meet the guideline, and what happens if they are overhauled is left to the implementing provinces. However, the guideline suggests that its requirements should apply if a) the cost of reconstruction work exceeds 50% of the current total erected cost, or b) the reconstruction work involves a burner change and the reconstruction costs exceed 12.5% of the current total erected costs.

Boilers and heaters having an input capacity of less than 10.5 GJ/h (10 million Btu/h) are excluded from the requirements of the guideline, even though this category accounts for an estimated 50% of capacity and 40% of nitrogen oxides (NO_x) emissions. However, enforcing an emissions guideline becomes impractical when dealing with a very large number of small units. Instead, the Standards Council of Canada is developing design standards with regard to emissions.

There are many exclusions in terms of size, age and type of equipment, and type of fuel. Emissions limits for boilers fired with wood or biomass are still under development, whereas several other fuels or applications are not subjected to the guideline simply because they probably could not comply, even when using the best technology presently available. These include various heaters in the petrochemical and refining sectors; coke ovens, blast furnace stoves and reheat furnaces in the steel sector; boilers fired with coal or by-product fuels; and chemical recovery boilers in the pulp-and-paper industry.

In summary, the guideline addresses new boilers and heaters firing natural gas, distillate oil and residual oil as primary fuel, at input rates of 10 million Btu/h or more. It does not apply to standby fuels. (Standby fuel is defined as a fuel that is fired less than 500 hours per year.) It sets emissions limits for NO_x, as presented in Table 5-2, and for carbon monoxide (CO), a uniform 125 g/GJ input. This converts to about 390 ppm for natural gas, 450 ppm for light and heavy oil (in all cases corrected to 3% O_2 in the flue gas). The emissions levels are intended to

be measured under normal operating conditions, at loads between 75% and 100% of rated capacity, and recommendations are made concerning the frequency of verification.

The guideline also acknowledges that reducing consumption reduces pollution, and accordingly provides emissions credits for energy efficiency. For boilers, the credit factor is derived by calculating the ratio of measured boiler efficiency to a reference efficiency for the fuel in question. This factor is then applied to increase the allowable emissions level presented in Table 5-2. Particularly for natural-gas-fired boilers, with their amenability to condensing heat recovery, maximizing efficiency may reduce the cost of meeting NO_x reduction requirements by modifications to the burner system. For air heaters, energy efficiency credits can be obtained by using the exhaust gas to preheat the combustion air. Tables of credit factors are presented in the guideline.

The formal guideline document (32 pages) can be purchased from the CCME at the following location:

CCME Documents
c/o Manitoba Statutory Publications
200 Vaughn Street
Winnipeg, Manitoba
Tel: (204) 945-4664
Fax: (204) 945-7172

The Province of Ontario is moving to make the CCME NO_x guideline part of its environmental legislation, probably as a policy requiring compliance in order to obtain a Certificate of Approval. It is also considering carbon monoxide concentrations in the context of a potential explosion hazard, as well as an air contaminant. However, the province already has a large body of environmental legislation in place, as well as a detailed process by which permits for new installations are approved. The most important of these are:

Environmental Protection Act ("EPA"), 1991
Regulation 346 under the EPA
Regulation 295: Air Contaminants from Ferrous Foundries
Regulation 338: Emissions from Boilers
Regulation 350: Lambton Industry Meteorological Alert
Regulation 355: Ontario Hydro
Regulation 361: Sulphur Content of Fuel

The Ministry of the Environment can be contacted at the various regional or district offices listed in the blue pages of local telephone directories, or at its head office in Toronto, by the following means:

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Ministry of the Environment World Wide Website: http://www.ene.gov.on.ca

Ontario Government Acts and Regulations World Wide Website:
http://www.gov.on. ca/MBS/english/publications/statregs/index.html