

Refrigeration now has its competency profile!

Engineers who practise in the field know it all too well: refrigeration is a specialized field that evolves quickly and, surprisingly enough, for which Québec engineering schools offer very little training. These engineers can now use a new tool specifically designed for them and produced by the Ordre, a tool that could become their reference par excellence: the refrigeration competency profile!

LACK OF TRAINING IN A BROAD FIELD

Ordinary citizens don't realize it but refrigeration takes a big place in their lives: air conditioning units in homes, businesses and workplaces, freezers, cold rooms, refrigerated warehouses, refrigerated display cases, laboratories, arenas... Refrigeration is widely used in a number of areas.

Trained as mechanical engineers, refrigeration engineers are called upon to specialize. Whether they are consultants, plant engineers, contractors, manufacturers or users of refrigeration systems, these engineers must possess skills as specific as they are diverse. Forced to deal with a lack of available training in Québec, they must take online courses or training offered by our neighbours south of the border, learn from seasoned colleagues, ask contractors and manufacturers for advice... At the end of the day, they sometimes have difficulty seeing the complete picture and their practice can suffer as a result.

We must also consider that refrigeration is an ever changing field and engineers must be able to keep track of its many advances. Incidentally, many refrigeration engineers now have to face a daunting task, since the Québec government launched a vast modernization programme for refrigeration systems in arenas and curling facilities.

In fact, in order to comply with the Montréal Protocol, Québec has undertaken to replace the refrigeration systems for interior ice and skating rinks that still use Freon 22 by the year 2020. Refrigeration engineers must fully control new technology using ammonia or carbon dioxide based natural refrigerants, which have little impact on the environment but whose use may present certain risks.

A COMMITTEE WITH VARIED EXPERTISE

It is in this context laced with a certain sense of urgency that the Ordre des ingénieurs du Québec decided to prepare a refrigeration competency profile. There already are several competency profiles covering other fields of practice in engineering: the Ordre produced these profiles to allow engineers to pinpoint their shortcomings and weaknesses themselves, with a view to foster continued professional training and ensure the public's protection.

The committee put in place to prepare the refrigeration competency profile brought together various authorities in the matter, engineers whose expertise includes all aspects of the field namely design, manufacturing, installation, customer service and even, "the client's point of view. Together, the five members of the drafting committee have listed all of the skills that refrigeration engineers must possess.

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"I am convinced that this competency profile will really help engineers who will refer to it based on their needs," states André Delisle, Eng., expert consultant in refrigeration and member of the Professional Inspection Committee (PIC).

"Clients can also consult the document to help them spell out their needs or requirements in a call to tender as well as judge the quality of the work. Already, the Ordre's PIC considers it a valuable tool: inspectors use the competency profile to assess the skills of engineers with whom they meet and recommend it to these engineers."

Costas Labos, Eng., mechanical engineer for the City of Montréal, agrees: "This competency profile is a complete success, a very useful tool for refrigeration engineering. Engineers, employers, manufacturers and even representatives will benefit from it."

Both members of the drafting committee, Mr. Delisle and Mr. Labos hope that this new tool will be known and used. They explained its main features.

WHAT CAN THE COMPETENCY PROFILE TEACH US?

With the competency profile, the work of refrigeration engineers has never been more detailed, nor its required skills so clearly spelled out. First and foremost, this profile breaks new ground compared to previous profiles in that it provides a list of laws, regulations, codes, standards and other reference documents that refrigeration engineers

must be familiar and comply with in order to work in accordance with trade practices.

The competency profile then presents technical and general skills. Technical skills are divided into seven areas. According to engineer André Delisle, “the first area, namely design, lists a series of essential competencies that are necessary in order to avoid making mistakes seen too often.”

For example, refrigeration engineers will steer clear of many legal proceedings and claims if they “choose the technology that is appropriate for each specific project as well as their clients’ needs” (competency A3). This means that they should know how to:

- Determine technologies applicable to the project;
- Analyze the technical aspect of the applicable technologies;
- Analyze the economic aspect of the applicable technologies;
- Recommend the most appropriate technology.

Engineers who rely on nominal values to assess the thermal load will refer to competency “A5 – Size all elements, tubing and pipes”. They will get a complete view of the skills they have to acquire to carry out exact calculations.

“Thus, systems are designed with the proper dimensions and are less expensive to operate”, explains Mr. Delisle.

Again, with respect to design, section “A10 – Drafting the system’s specifications” lists all of the skills required to draft complete specifications, including all ancillary works.

The six fields of competency that follow the design competency cover each step involved in the completion of a refrigeration project, from manufacturing to upgrading a systems and all its components.

Engineer André Delisle points out that some projects neglect to justify the choice of materials. “Competency B2 refers to the competencies one must master in order to choose the materials for a system’s elements and components to use or manufacture.”

Finally, the refrigeration competency profile spells out general competencies that all engineers must possess in order to provide services that meet the clients’ needs and demands.

“Engineers must be able to stimulate the discussion, identify needs and inform the client as to what decisions must be made,” adds Costas Labos.

“For example, they must keep in mind that the clients’ needs might change and ask them the right questions: will there be an expansion of the premises in a few years? For this reason, they must demonstrate communicating abilities and personal skills such as analytical insight and good judgement.”

AFTER THE PROFILE...

Engineer Costas Labos knows industrial and recreational refrigeration well. For more than three years, he has helped

the City of Montréal in bringing arenas up to standards in accordance with the Québec programme. Before 2020, the City will have to replace the refrigeration system of more than 40 ice and skating rinks. Mr. Labos designs some of these systems according to the City’s standardized plans, and improves these systems using new technologies. He also assists external professionals in designing systems that meet the specific requirements of municipal facilities.

“A well informed and experienced engineer is an asset for any client, stated Mr. Labos. The competency profile shows that refrigeration engineering deals with more than simply choosing a refrigeration unit. The engineer must also be able to design a complete system based on actual and future needs, at the best possible cost and safely for all involved.”

Consequently, the refrigeration competency profile will help engineers to pinpoint their shortcomings and weaknesses themselves, allowing them to undergo the training that will improve their practice.

MEMBERS OF THE DRAFTING COMMITTEE REFRIGERATION COMPETENCY PROFILE

André Delisle, Eng.
Expert consultant in refrigeration

Costas Labos, Eng.
Mechanical engineer
City of Montréal

Mario Lamoureux, Eng.
President and CEO
Docal Ltd.

Patrice Morel, Eng.
Head of Engineering
Cimco Réfrigération

Claude Laforest, Eng.
Inspector and ad hoc secretary of the PIC Ordre
des ingénieurs du Québec