INSTITUT INTERNATIONAL DU FROID
INTERNATIONAL INSTITUTE OF REFRIGERATION

Careers in Refrigeration "CaRe"

IIR Working Group of all Commissions

TERMS OF REFERENCE

INTRODUCTION

The refrigeration industry plays an important and increasing role in today's global economy. In all sectors, refrigeration makes significant contributions, e.g., to food, health, energy and environmental domains, by ensuring dedicated temperature levels for each application underlining the impact on everyday life. Although the applications and number of refrigeration systems is increasing, the number of technical experts, researchers, and commissioners do not follow the trend. Thus, this vast technology needs engineers to develop, research and repair it.

Refrigeration is a thriving industry that offers excellent career opportunities for people with all kinds of interests and skills, such as working in a laboratory, a technical studio, or out on the road, there is a career available for all. In the lab, the industry needs engineers and technicians developing and testing the generation of refrigerant cycles and their controllers. Technical studios help design the systems to meet the customers' needs, e.g., high-end design, compact construction, or straightforward retrofit options. On the road, there is an urgent need to deploy, commission, maintain, repair, and dismantle refrigeration systems highlighting the broad range of careers in refrigeration.

At the 24th International Congress of Refrigeration in Japan, the IIR organized the second "Reception for Students and Young Researchers", a student and senior researchers speed networking event and the Women in Refrigeration network. Those two events stimulated a new initiative: to create a "Career in Refrigeration" working group and IIR "Woman in Refrigeration" sub-working group.

REASONS FOR ESTABLISHING A 'CAREER IN REFRIGERATION' WORKING GROUP

UNESCO[1] has identified issues, challenges and opportunities for development in more than 50 fields of engineering and focused on its contributions to sustainable human, social and economic development. An acute and growing shortage of engineers worldwide has become a threat to global development, revealed a UNESCO report. More than ever, the world needs creative engineering solutions to face its biggest challenges, from poverty to climate change. Yet, many countries are seeing a decline in the enrolment of young people, especially women, in engineering studies. The slump endangers future engineering capacity, particularly in developing countries where brain drain is an additional problem.

For those reasons, the IIR is supporting the initiative to create a "Career in Refrigeration" working group and IIR "Woman in Refrigeration" sub-working to address the following issues:

1. Careers opportunities and paths: Refrigeration does not seem to have a defined career path. People from many different disciplinary backgrounds move into refrigeration; according to one attendee "80% of them as a result of learning on the job". The different qualifications backgrounds contribute to the development of the profession and are obviously encouraged to the young generation at early stage.

2. Visibility: By comparison to other disciplines refrigeration is invisible. Its low profile means that there is not much information available about what is involved in refrigeration careers. The limited number of courses available further exacerbates this problem.

3. Role models: There was some agreement that women have more opportunities in engineering and refrigeration now than ever before but that the need for more female role models was paramount. Some suggestions were made on how the IIR could help this to be achieved.

4. Remuneration: Refrigeration is perceived to be less well-paid than other areas. In the EU, generally, mechanical engineers are less well-paid than economists. This can create an interest in disciplines and industries other than refrigeration.

5. Cultural issues: Cultural issues can impact the uptake of refrigeration careers in several ways. For example, the status (and pay) of engineering is lower in some countries than others (e.g., it is high in Germany), which some felt impacted the quantity and calibre of individuals entering the profession. However, it was also argued by others that, by itself, remuneration was perhaps less of a consideration for women. The research showed that communist and ex-communist countries already have a higher percentage of women working in engineering and refrigeration. However, the liberation of women within new

[1] United Nations Educational, Scientific and Cultural Organization (UNESCO), 2010. Engineering: issues challenges and opportunities for development. ISBN 978-92-3-104156-3.

democracies was also seen as a way of offering them greater freedom of career choice.

6. Language: ‘Mechanical’ engineering and similar words used in some course descriptions are perceived as dirty and can put women off. Conversely descriptions like ‘environmental’ engineering are appealing to the young generation, are not perceived as dirty, hardworking and simultaneously speak to sustainability aspirations.

OBJECTIVES

The objectives of the WG on Careers in Refrigeration are:

- to reverse the predicted shortage of engineers, particularly in the refrigeration field;
- to make the importance of the refrigeration industry more visible to the public and particularly to the young generation;
- to contribute to the creation of employment for young generation including women in refrigeration;
- to identify problems and obstacles that stop the young generation to aspire and envisage a career in refrigeration;
- to develop and put forward an international and national strategic plan to promote refrigeration career to the young generation including women;
- to develop synergy and coordination between the different stakeholders in the refrigeration field;
- to provide the necessary recommendations to attract more young people including women to a refrigeration career, considering the social, economic, technical and environmental aspects of the different countries.

DELIVERABLES

To reach the above objectives, the Careers in Refrigeration WG will have to:

- demonstrate the importance of the refrigeration industry to the young generation by actively promoting dissemination activities e.g. career fairs, school visits, workshops, conferences, etc.
- identify problems and obstacles that stop young generation to aspire and envisage a career in refrigeration;
- work closely with the different national associations of refrigeration to establish a qualification routes directory;
- demonstrate the different careers opportunity and advantages to the young generation;
- examine existing initiatives have been carried out or are in place (on a national level in targeted countries) to engage with the young generation including women;

- create and propose a national strategy for the development of an effective Careers in Refrigeration with the national associations;
- establish a preliminary plan of action to establish youth engagement in schools;
- act as a reference point and guide for activities relating careers in refrigeration;
- initiate and develop collaborative research projects;
- organise conferences, workshops, and networks;
- create publications, press releases;
- get involved in international and national events related to youth and women enhancement in engineering;
- assure communication and exchange of information about problems and solutions for the development of careers in refrigeration.

MEMBERSHIP

The members of the Working Group should be:

- Members of all Scientific and Technical Commissions
- IIF private, juniors or collective members
- Experts or specialists whose knowledge or scientific input in this field would be considered beneficial for the Working Group

The member's contributions will concern the following:

- Sharing of information
- Promotion of the WG (website link)
- Support and contribution to the WG activities and the development of the action plan
- Sponsorship of WG activities

STATUS OF THE WORKING GROUP

The Working Group is based on voluntary contributions. There is no funding provided by the IIF to WG members (travel, accommodation and other expenses).

COMMISSIONS INVOLVED

The Working Group will involve all Commissions

CHAIRMAN AND BUREAU

President: Christian VERING (Germany)

Vice-Presidents:

Jingyu CAO (China)
Binfei ZHAN (China)
Michael KAUFFELD (Germany)
Laura FEDELE (Italia)
Gratiela TARLEA (Romania)
Monique SENE (Senegal)
Judith EVANS (UK)
Catarina MARQUES (UK)

Secretariat:

Yulong SONG (China)
Dr. Ina COLOMBO (France)
Dr. Monique BAHA (France)

OPERATION OF THE WORKING GROUP

The WG operates on a temporary basis and will carry out its activities through the exchange of electronic information for all members (electronic discussion group) or through physical meetings. With the aim of facilitating communication, a directory of members will be put on the website of the work group, which will allow direct contact via email.

The members of the WG will meet as many times as judged valuable and possible, at least once a year, as convened by the Chair to debate the issues raised on the established agenda and communicated to members at least two weeks before the meeting date.

This committee will choose, during its first physical meeting, the member or the institution charged with permanent leadership among its members. This institution will ensure the permanent secretary and the motivation of the WG. The 3 Vice-Presidents will also be elected.

Each important decision will be sent to all the members of the work group by email, which is the responsibility of the work group presidents.

Decisions will be taken during long-distance or physical meetings by general consensus; if this process fails, the majority can be reached if the quorum of 2/3 among voters is met.

RUNNING – MEETINGS

The possibility of holding a meeting of members soon after the setting up of the Working Group will be examined. Such a meeting could be held during:

- A first meeting of the Working Group on Careers in Refrigeration, will be held during the 4th IIR Conference on Sustainability and the Cold Chain, 7-9 April, (Auckland, New Zealand).
- A second meeting of the Working Group will be held 12th IIR-Gustav Lorentzen Conference on Natural Refrigerants – GL2016, 21-24 August, (Edinburgh, UK).

SUB-COMMITTEES

The Working Group will set up “Women in Refrigeration” sub-group in order to address the underrepresentation in the fields of engineering and especially in the refrigeration industry.

WEBSITE

A Web site shall be set up in order to disseminate relevant information on “Careers in Refrigeration” and to promote the activities of the working group and the IIR.

The site will be periodically updated thanks to technical assistance from the head office of the IIR, under the responsibility of the President of the Working Group.

Also in order exchange documents, a Dropbox file will be set-up to enable members to upload and download documents. This file will be administrated by the IIR, the chairman and bureau.

EXISTING IIR PUBLICATIONS

The first Women in Refrigeration network in INC2015: http://www.iifiir.org/clientBookline/recherche/NoticesDetaillees.asp?VIEWALL=TRUE&ToutVisualiser=1&INSTANCE=EXPLOITATION&iNotice=13&ldebut=

Women in the cold chain industry articles. 4th IIR Conference on Sustainability and the Cold Chain, 7-9 April, (Auckland, New Zealand).

Women in the Refrigeration Industry. The 2016 ASHRAE Annual Conference, 25-29 June 2016, St Louis, Missouri, USA.