

# Refrigerants Review Conference

Atlantis – The Palm – Dubai 20-21 March 2012

## 2<sup>nd</sup> Day, Topic 3

### Natural, yes, but are there feasibility issues?

**Q1: Can a powerful business case be made for natural refrigerants in high-temperature applications in the Middle East?**

**A1: Yes, there are many business cases in the fields of CTIAC, Food processing, Cold storage Chemical industry applications**

**Q2: Can examples of the use of natural refrigerants in TIAC applications in the region be translated to comfort cooling?**

**A2: Yes, many Gas turbines in GCC states, mainly Saudi Arabia using NH<sub>3</sub>.**

**Q3: What are the inherent challenges, if any?**

**A3: Major challenges are:**

- a. Awareness & education**
- b. Distance from populated areas in case of CTIAC.**
- c. Proper after sale service**
- d. Legislations & incentives.**



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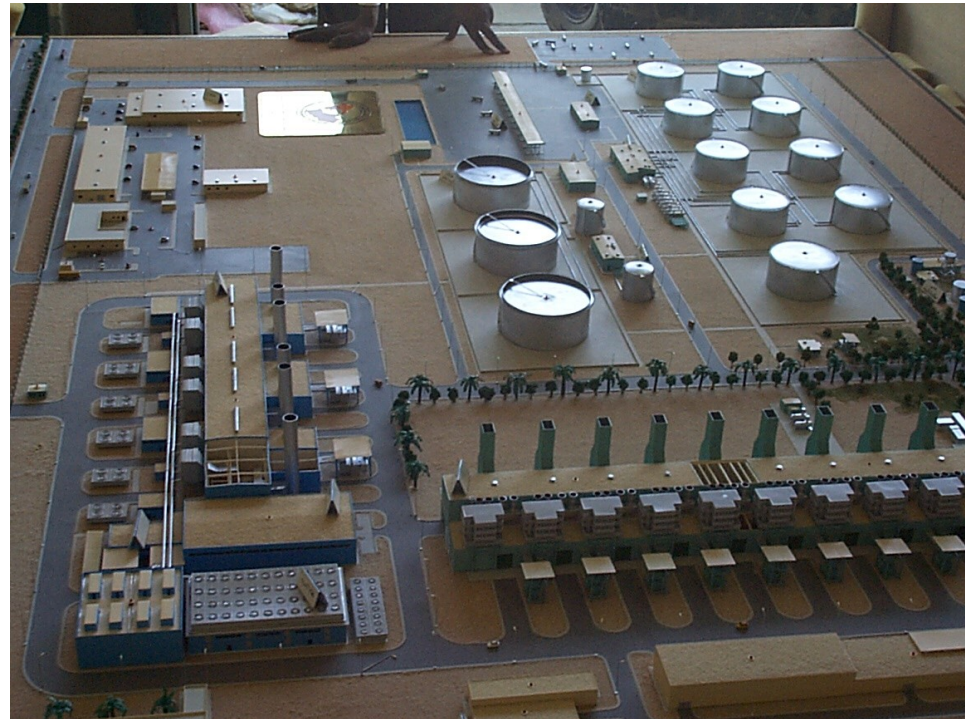
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### CTIAC example – Qaseem Power plant – late 1990's

- Inlet Air Cooling from 50°C, 10% RH to 10°C for 6 New GE Frame 7EA Combustion Turbines.
- 66,500 kW (19,000 ton) peak cooling load.
- 17,500 kW (5,000TR) air cooled, liquid overfeed, NH<sub>3</sub> vapor compression refrigeration plant.
- 12,500 m<sup>3</sup> ice energy storage tank.



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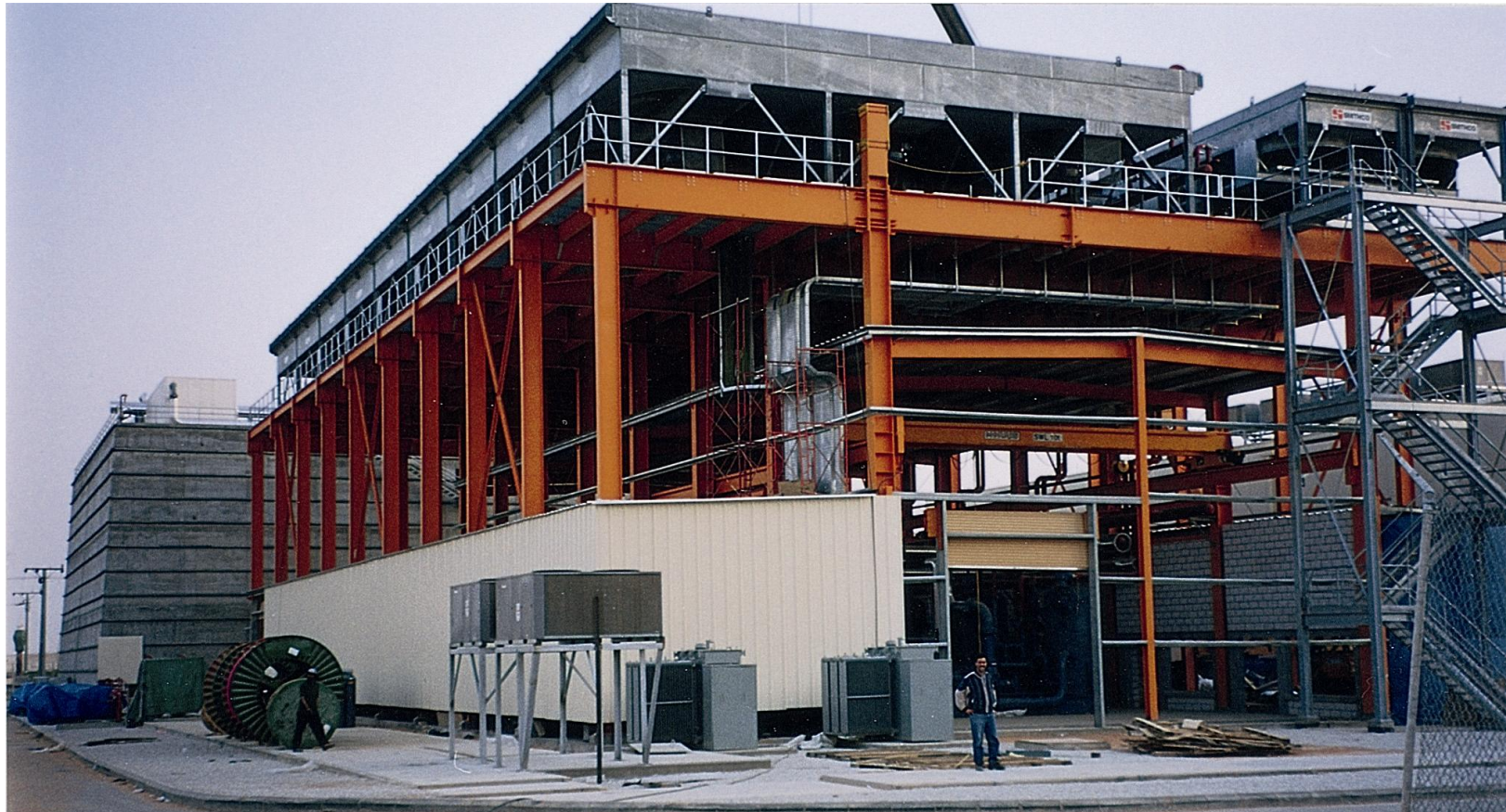
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Phase two – Qaseem 2003



**Inspection of the cooling coils, accessories and assembly, including drift eliminators**



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Phase two – Qaseem 2003



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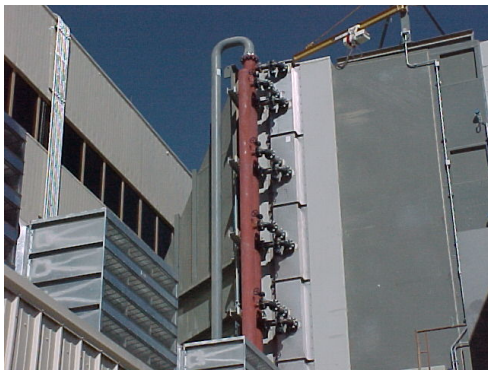
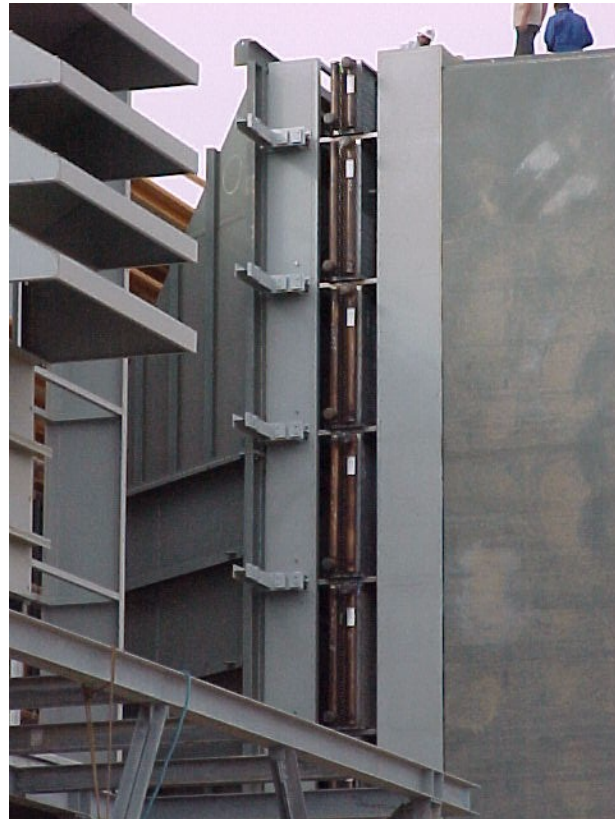
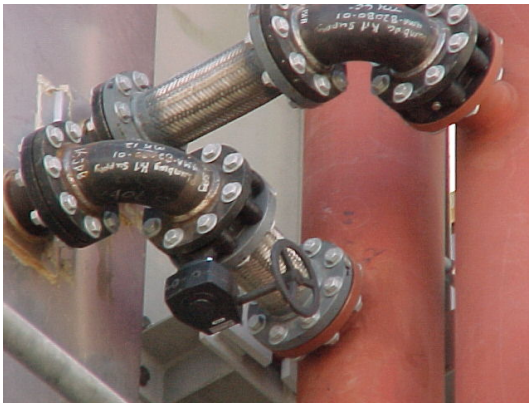
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Natural, yes, but are there feasibility issues?

Food example – Al Safi Dairy – Biggest integrated milk cows farm on Earth, Al-Kharj– Saudi Arabia



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Food example – Al Safi Dairy – Biggest integrated milk cows farm on Earth,  
Al- Kharj – Saudi Arabia



Dairy plant, cold store, milking parlors, 1990's, 32 screw compressors NH3 evaporative condensers



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**Natural, yes, but are there feasibility issues?**

**BACA – Qaseem Saudi Arabia, Centralized multi purpose 10,000 tons cold store, handling, processing, packaging and packing facility**



**Opening ceremony**



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ماكينة سحق التمر الجافة والتوى



صالة مناولة التمر والخصيل الأخرى



ممر غرف تعقيم وتخزين التمر



ماكينة تعقيم التمر



خط فرز وتدرج التمر

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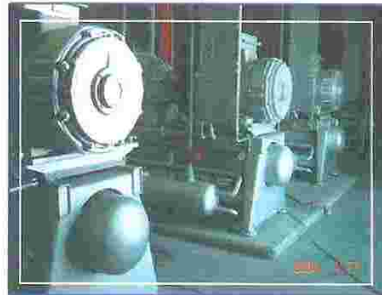
لوحات مراقبة غرف التبريد والتجميد



لوحات تشغيل الضواغط المركزية



خزان غاز الأمونيا



الضواغط المركزية



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إدارة مستودعات التبريد



منصات التحميل والتفريغ للتموز



منصات تحميل وتفريغ البطاطس والبصل



رamp صعود السيارات



الإدارة العامة للجمعية

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ميزان الشاحنات



مختبر الجودة النوعية



صناديق تخزين الترموز



طبليةات التخزين المعبأ

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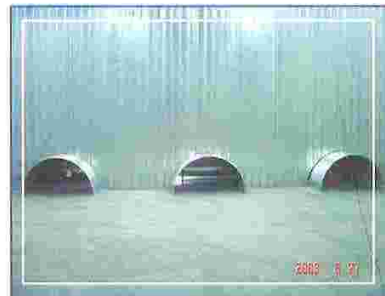
مكائن تعبئة البطاطس والبصل



مر غرفة البطاطس والبصل



صالة مناولة البطاطس والبصل



غرفة تخزين البطاطس



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