FREE COOLING AND RADIANT SYSTEMS

Project type [] Diploma project [X] Bachelor [X] Master [] Special course	 	
rerequisite	11127 (desired)	
Background	Modern office building has often problems with too high indoor temperatures resulting in a cooling demand. An energy efficient office building has to solve this challenge. As energy saving has become increasingly important over the past years and at the same time the demand for domestic cooling has stately increased, it is prudent to minimize energy (e.g. exergy) consumption of HVAC Systems. The combination of free cooling with high temperature cooling systems (e.g. TABS) offers this chance.	
Project Description	The aim of the project is first to identify possible sources for free cooling and then evaluate their ability for usage in conjunction with radiant systems. It could also be studied whether any identified free cooling sources could also be used as a heat source for low temperature heating purposes during winter.	
Notes		
Contact	Benjamin Behrendt 45 25 18 51 benbe@byg.dtu.dk	Jørgen Erik Christensen 45 25 18 53 jec@byg.dtu.dk

The following is a suggestion on what questions the project could try to deal with and how they could be addressed. Splitting the project in (four) parts offers the chance to adjust each following part in accordance to the results/findings of the previous part.
Changes are of cause possible and even encouraged.

Part 1: Literature Study on the use of TABS in building construction today.
- What is the definition of free cooling
- Existing material on the combination of free cooling and TABS
- What are the possibilities and limitations of TABS in combination with free cooling?

Part 2: Compilation of a catalogue of free cooling sources with a preliminary assessment of their usability with TABS.
- Classification of free cooling sources according to their availability and usability with TABS.
- …

Part 3: Detailed assessment of most promising combinations of free cooling source and TABS.
- Based on the preliminary assessment a detailed analysis for the (three) most promising combinations of free cooling source and TABS should be made.

Part 4: Evaluation of findings
- General benefits/costs of combining free cooling with TABS.
- Why it is better/worse to combine TABS (or radiant cooling) with free cooling rather than other cooling systems
- …

Additional Information's

- Simulations in IDA ICE 4 or/and IES <ve> and possibly in a Simplified Simulation Tool
- Simulation of the BOB building in Aachen, Germany (www.bob-x.de) – Building implementation in IDA ICE and IES available.
- …

Version from Tuesday, December 06, 2011

Check for updated versions at: msc.benbehr.eu