Rockefeller Center Tour

June 12, 2012

On June 12, 2012 members of UN NGO Sustainability, Inc. toured the Rockefeller Center and analyzed the buildings' sustainable energy components. Please find the minutes from the tour below.

Rooftop Solar Panels

There are 363 General Electric solar panels on the roof of the building that are positioned at a 0 degree angle. The panels were sourced from Newark, but General Electric no longer makes these solar panels. The power generated from the solar panels comes down to the AC box and then to the grid. There is a data acquisition system to check how much power is coming in from the solar panels. Solar is very low maintenance. You can just brush the dirt off, and when it rains the panels get cleaned. After 7 years since installation we are close to breaking even. These panels should last 25 years before they need to be replaced. The inverter and tier one component have 10 years before they need to be maintained.

The Tishman Speyer Central Plant

We have four chillers that provide up to 14 and a half thousand tons of cooling capacity. In the summer time we usually only run two machines. We usually run one steam turbine, which helps us save on electricity during the summer time, and one electric, so we are cutting back on electric. As explained with the ice plant, running the ice plant will cut back on the one electric and also a little on steam so we are not running as much steam to produce the same type of cooling effect. We are now under 30 Rock and this central plant handles all of the buildings. Three large 4 thousand ton chillers. This flag was redone in 1988 where they put three large four thousand ton chillers and around 9 years ago they put in a 25 hundred ton walk chiller. At 6 oclock we have our main shutdown of most of our fans so at that time we can start cutting back and in our case the steam is the first thing we will shut down and then we will leave one of the electric ones forward with the ice clant. As the day goes on we will cut that back even more, we will go to that 25 hundred ton chiller later on in the night. Whatever we do here is just to make things run more efficiently, try to stay within our kW, lower it as much as we can while still providing the comfort cooling to everybody.

In the main engineers office there is the building management system (BMS) that he is interfacing with right now, where you have some control over certain parts of the HA A/C equipment, the pumps and the other machines. Other times you'll have to manually operate them, but it's important just to note they see alarms and major things that are happening from this point. The central plant is like the brains of the building.

We have about 7 or 8 people working at the central plant, not including the chief and system chief. We work round the clock, 24/7, 365 days of the year.

All the piping is color-coded. The light blue is the supply water going out to the buildings; the dark blue is return coming back to the chillers; and the tan or buckskin color is the condenser water, it is going between the condenser and the cooling towers up on top of them. Return water means that it is coming back from the fan units, as far as the chilling unit is concerned. That's a closed loop. Right next to the ice clamp we have snow hold area for the ice rink. When the zamboni goes over the ice it shaves a lot of the ice and dumps a lot of that snow down in the basement. This past year we put together as steam condensate system that captures the condensate and pump that condensate to melt that snow instead of using hot water. We try to save as much money as possible.

Our ice storage plant has 41 tanks used to build ice during the off-peak hours, 11 pm to 7am. We can build over 8 thousand tons of cooling capacity during that time, so we are building it at a lower kW rate on the overnight and then during the daytime we run two pumps, one to circulate the glycol through the tanks, which then sends it to a heat exchanger and through that is also our chilled water cycle. That will send out 41 degree water to mix with our plant water. By doing that that reduces the amount of water we have to send out of our plant, thus allowing us to cut back on our own machines. This time in the summer we are able to cut down one machine from running. We could be running three machines on a day like today, but we are able to run two machines and this ice plant. In the spring and the fall we will run this all day long, but in the summer we will wait till the afternoon when the peak is higher. This lets us run the machine we are running at a lower kW during the spring and fall.

We also have a heat exchanger in our main plant in the wintertime. When it is cold enough we will run that by itself all day long without having to run a machines. It is much cheaper to run the machine during the night time. During the day is when ConEd will charge a lot for electric. During the night we will build ice and store it into tanks and during the we will run our pumps and we will circulate water that goes out to the buildings and we will get our 41 degree water without even running our machine, all we are doing is running our pumps. This saves us 150 thousand dollars a month. It saves energy during the day and the electric is a lot less used. This system was put in about 5 years ago. Joe Zabo came up with this for the storage plant. A lot of people are trying to do this but they are doing it on a smaller scale. ConEd gives incentives for people to do this because ConEd get stressed with peak energy during the day. When ConEd is charging their highest rates in the middle of the day, that is when solar could come in and offset that. With a combination of ice storage and solar array you are getting more bang for your buck. Comac, a local company in Jersey, built this system. With ConEd we get incentives back from them to lower the electric, so we have to put everybody's chilled water usage down, which brings our machines down to where they are supposed to be. So, if we keep under 6 thousand kW ConEd will give us incentives. We try to go by the demand-response, and it helps everybody out. A lot of people in the city are doing it.

We always look to conserve in certain respects whether it be improving the fan coil units. A lot of the fan coils were used for 10 degree spread, but we are now operating under 16 degree spread, so that will save chilled water. The windows are all being replaced too. As tenants are relocating the floors get redone and they are redoing all of the windows.