

Speaking Notes for November 9th Presentation of Cogeneration Facility Improvements

1. Good evening, and thank you for this opportunity to provide additional information regarding the improvements to our cogeneration facility included in our special use permit modification request.
2. This slide is a simple depiction of cogeneration, sometimes referred to as combined heat and power. Fuel heats water in a boiler to produce steam and then that steam is used for heating and cooling as well as to produce electricity. Because the same fuel is used to produce two types of energy simultaneously, cogeneration is twice as efficient as producing the energy separately. The middle portion of this slide is highlighted in yellow, because the improvements we are requesting in our SUP modification are all related to electricity. I want to emphasize that we are not requesting an increase in our steam production capacity or, in other words, we are not requesting an increase in the capacity to burn coal. In the negotiation with the neighbors at the time we needed to replace the coal silos, we agreed that we would abide by our 1997 steam master plan and we have. When our current capital construction program is completed, our steam needs will exceed the capacity of the cogeneration facility. We did not seek permission to expand the steam capacity at the cogeneration plant in our Development Plan application; we sought permission to construct a second steam plant on Manning Drive, which was approved. We have honored our commitment to our neighbors. When the cogeneration facility was constructed, it was sized for what was then thought to be the ultimate build-out of the campus. The campus has grown significantly since it began operation in 1991, and the facility has met the growing steam needs. However, electricity generating capacity remains at the original 28 megawatts; so much of that increased steam production cannot be used for cogeneration. The efficiency of the plant is halved when we can produce steam but not electricity. Thus our requests in this modification are all related to increasing the electricity generation capacity.
3. The improvements requested in this SUP modification, in addition to restoring the efficiency of the plant through increasing electrical generation capacity, will address three needs. I will discuss each of these in turn. The drawing on this slide is of the cogeneration facility site, with Cameron Avenue at the top. This same drawing will appear in subsequent slides.
4. The first need we are addressing in our SUP modification request is our insufficient capacity to serve critical facilities with self-generated power. In the first full year of operation of the cogeneration facility the University's peak electrical demand was about 55 megawatts. To date in 2005, the peak has been over 75 megawatts, and by 2010 it is projected to be over 120 megawatts. As the campus has grown, and our electrical generation capacity has remained static, our capacity to meet critical loads has fallen and is now unacceptably low.
5. As can be seen from this slide, UNC Hospitals has opened 3 major new facilities since 1991, with the Cancer Hospital under construction and a new bed tower, called the Memorial Pavilion, in design. UNC Hospitals is North Carolina's major quaternary care

facility, as well as a valuable health care resource to the southeastern U.S., and must be kept operating during adverse conditions. In addition, we have added several significant new research and computing facilities, and reliable power is critical for all of these. Without sufficient power, decades of critical research can be lost. Thus, we are requesting improvements that will allow us to increase our electrical generation capacity from 28 megawatts to 54 megawatts. This slide shows a close-up of the location of the addition to the plant that will contain the new turbine generator and, in the lower right corner, the placement of this addition relative to the entire site.

6. Again, I want to emphasize that we are proposing improvements to increase the electrical generation capacity of the plant, not the steam capacity.

7. The second need that these improvements address is the risk of long duration power outages. We have two separate needs that we are proposing to address. First, we are not able to start up the plant without power from Duke Power. We have a series of procedures at the plant which we invoke in times of adverse weather to disconnect from Duke Power and allow us to keep operating even if Duke Power goes down. But, if we then experience a plant trip during the time Duke Power is down, we would be unable to restart the plant, and could not generate electricity to keep our critical facilities in operation. To correct this weakness, we are proposing to install 2 generators that will allow us to restart the plant. These generators are inside the building; just the transformers are external to the facility. This slide shows a close-up of the transformer location and, in the lower right, the location of the transformer with respect to the entire site.

8. The second need we propose to address is that our most critical sub-station, the Manning substation, which feeds UNC Hospitals and our major research facilities, is served by a single feed from the south substation across 15-501. If the south substation were disrupted, or this single line were damaged, we would not be able to get a sufficient amount of power to the Manning substation. We are proposing to build a small gas insulated switchgear substation next to the current substation on Cameron, and run a connection from this substation to the Manning Drive substation, so that the Manning Drive substation can be fed from two directions. Gas insulated switchgear, or GIS, allows a much smaller footprint, and is more reliable because the components are inside a building. There is not sufficient spare capacity in the current substation for this purpose. This slide shows the location of the new GIS building and transformers, and the electrical switchgear building, both in close-up and, in the lower right, with respect to the entire site.

9. The third need we propose to address is the obsolescence of the cooling towers. The current cooling towers have reached the end of their useful lives, and need to be replaced. Cooling capacity needs to be added to accommodate the new turbine generator. We are proposing to build the new cooling towers on the site of some old storage buildings, including WW II Quonset huts. Thus we also need to build a new storage facility. This slide shows the location of the cooling towers and storage building in close-up and, in the lower right, with respect to the entire site.

10. The new cooling towers will decrease noise by 10-15 dB along the west property line. They are more modern, quieter, cooling towers and, in addition, we are building an acoustical screen wall. All the new equipment will meet the noise code. We have worked hard over the years to minimize noise, completing some 24 separate projects since the plant opened, and we will continue to honor our commitment to the neighbors to minimize noise.

11. There will be no net change in light levels at any property line. We are installing 15 additional exterior light fixtures, and 15 task lights that normally will be turned off. But the new lighting will not result in any change in light levels at the property line.

12. As Bruce mentioned, Doug Crawford-Brown will be speaking in detail about the environmental effects of the plant, but I want to make a few comments about emissions. The emissions rates at the plant are limited by the State, and the actual emissions are well below the permitted levels. For example, our sulfur dioxide emission rate is 50% that of a home heating oil furnace and our particular emissions rate is 20% of a home heating oil furnace. Our environmental controls reduce our mercury emissions by 90%. And, again, these improvements will not increase the coal-burning capacity of the plant.

13. The University has been a leader in energy technology for over 100 years. The first building on campus was electrified in 1890, we were cogenerating electricity in 1940. The 2.5 megawatts we produced at that time served not only the University but also Chapel Hill and Carrboro. Today we operate a cogeneration plant that is at the forefront of technology. We have been recognized on 3 different occasions by the EPA, for environmental performance, efficiency, and reduction of greenhouse gases. Kim Crossman from the EPA is here tonight and will be speaking about this recognition in more detail. We are proud of our energy leadership, and we are equally proud of honoring our commitments to our neighbors as we go about meeting the needs of our growing campus and the growth of UNC Hospitals.