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PILOT PROJECT UPDATE – ELECTRICITY DEMAND MANAGEMENT UTILIZING EXISTING EMERGENCY GENERATORS

The Finance and Administration Committee recommends the adoption of the recommendations contained in the following report, October 5, 2007, from the Commissioner of Corporate Services and General Manager, Water and Wastewater, as amended to include an additional recommendation 4:

- 4. Based on the results of the pilot project, the Region look at other opportunities in the local municipalities.**

1. RECOMMENDATIONS

It is recommended that:

1. Council concur with the continued implementation of the reduced generation capacity of 1.5 Megawatt (MW) for demand response management at the Aurora Sewage Pumping Station (SPS) with PowerStream.
2. Staff be authorized to prepare a revised contract agreement aligned with the reduced capacity enrolment.
3. The Regional Chair and Clerk be authorized to sign the above noted contract agreement upon approval of the Regional Solicitor.

2. PURPOSE

Regional Council at its meeting of March 29, 2007 directed the Commissioner of Corporate Services to report back on the status of the pilot project to the Finance and Administration Committee in the fall of 2007. Staff is recommending to proceed with the implementation of the reduced capacity of 1.5MW utilizing the existing generator at the Aurora Sewage Pumping Station. The reduced capacity will still contribute to relieve the electrical demand stress on the Armitage Transformer Station during peak electricity demand periods. The implementation of the project will exhibit the Region's stewardship role in promoting demand response management.

3. BACKGROUND

Council adopted the staff recommendations for a pilot project utilizing existing emergency generators on March 8, 2007 to assist addressing the critical power shortage in the area serviced by the Armitage Transformer Station. The project implementation

required upgrades to the existing three standby generator assets capable of generating 3.9MW of electricity at the Aurora Sewage Pumping Station. The necessary upgrades would have made the emergency generators available for peak demand management.

PowerStream and Safety Power (contracted by PowerStream) examined the existing generators at Aurora Sewage Pumping Station. Based on their assessment it has been determined that only one existing generator of 1.5MW capacity is suitable for enrolment in the program at this time. The combined impact of the emission levels from the two older generators and corrections of the previous Certificate of Approval precludes their participation at this time. Provisions are recommended to be included in this phase to accommodate future addition for the two generators. PowerStream remains supportive of this concept and has authorized Safety Power to proceed with the design of the single generator option.

4. ANALYSIS AND OPTIONS

The Aurora Sewage Pumping Station generator will be able to provide 1.5MW of electricity for the demand response initiative. PowerStream's Conservation and Demand Management program will fully fund the cost of providing and installing the necessary upgrades to ready the emergency generator for peak demand management. The program is designed to ensure the reliable operation of the Region's standby generator without compromising either the original functionality of the generator or the business processes. The estimated capital cost to be invested by PowerStream through the Conservation and Demand Management funding is \$403,000. The incremental cost of operation will be funded from revenues received due to electricity generation. In return the Region agrees to make the 1.5MW generation asset available to PowerStream for a maximum of 200 hours per year for a minimum three year period. Further renewal of the contract will be subject to a mutual agreement. The objective is to have this work completed prior to the peak 2008 summer season.

4.1 Benefits

York Region will benefit from this program as follows:

4.1.1 Reduced air emissions

The Ministry of Environment's (MOE) air emissions threshold for a peak demand management generator is 3.5 times less than an emergency standby generator. The existing emergency generator will be modified by adding a selective catalytic reduction (SCR) complete with proprietary catalyst bank on the exhaust of the emergency generator to meet the change of status. PowerStream has clarified that annual emissions from a peak demand management generator equipped with a SCR and operating for 200 hours will be less from an emergency generator without an SCR and operating for 30 hours of testing.

4.1.2 Increased generator life and reliability

Maintenance related operation of the emergency generator is limited to approximately 30 hours per year. Major reliability problems arise from inadequate run time and partial load for testing. When a diesel generator operates at partial load it will not operate at its optimum condition. A full testing load can extend the life expectancy of the generator.

Present operational constraints at the Aurora Sewage Pumping Station do not permit testing of the generator at full load. Enrolling the generator under this program will enable the generator to operate at full load resulting in increased generator life and reliability. PowerStream will undertake the regular inspection of the generator. This will reduce the third party generator inspection cost that York Region pays for this facility.

4.1.3 Increased asset value

PowerStream's proposal involves the addition of necessary electrical switch gear and post combustion emission control technology to York Region's asset. Upon expiry of the three year contract, this equipment will become the Region's asset.

4.1.4 Increased sound attenuation

With installation of additional sound attenuators, the noise level will reduce from the present level. This will ensure quieter generator operation than existing condition.

4.1.5 Utility cost savings

Once the generator starts up, the electricity generated will displace Aurora SPS consumption from the grid. Any excess electricity generated will be exported to the grid. This load displacement will result in lower electricity bills for the facility. Actual savings will be calculated once the first year's data has been analyzed.

4.1.6 Revenue generation

PowerStream has registered the Aurora Sewage Pumping Station generator in the Emergency Load Reduction Program (ELRP) and participants receive standby and generation payment. This will result in additional revenue.

Independent Electric System Operator introduced ELRP to address this peak electricity demand. Participants receive an hourly "standby" payment for each standby MW reduction in the amount of \$15 per MWh. Upon actual generation, participants receive payments based on the generator of Hourly Ontario Energy Price (HOEP) and:

- \$400/MWh for 2 hours of consecutive reduction,
- \$500/MWh for 3 hours of consecutive reduction, or
- \$600/MWh for 4 hours of consecutive reduction.

To cover the incremental cost of operating the generator as a result of participating in this demand response program, the proposal provides an additional unit rate of \$200/MWh to be paid to the Region from the gross revenues received. PowerStream will share the net revenue equally with the Region (50-50).

Attachment 1 illustrates the potential revenue that could be realized by the Region from participating in this program. This calculation shows a net revenue of \$12,225.00 for York Region however, this is subject to extreme weather conditions, generator failure, number of hour's generators run, and HOEP.

4.2 Legislation and regulation impact:

4.2.1 Changes to Electricity Act:

Ontario Regulation 215/07 under the *Electricity Act*, 1998 was amended on May 16, 2007 to specifically exempt the Region from being required by sections 144 and 142 of the *Electricity Act* to establish a separate municipal corporation under the Ontario Business Corporations Act in order to generate electricity (*see Attachment 2*).

4.2.2 Amendment to the existing Certificate of Approval:

As part of Safety Power's assessment of the existing conditions, a third party consulting firm with experience and expertise in environmental permitting was retained. All existing documentations related to the Region's Certificate of Approval for generators operation were reviewed. Based on Safety Power and their environmental consultant review, it was determined that only one generator will be able to enrol in the demand response program at this time. The two older generators will continue to perform as emergency standby generators.

The existing Certificate of Approval as issued by the MOE for operation of the 1.5MW emergency generator will be amended to reflect the change from strictly emergency use to peak demand management use. To meet the requirements of the proposed Certificate of Approval amendment, the existing emergency generator will be modified by adding a SCR based emission control system complete with proprietary catalyst bank on the exhaust of the emergency generator. The responsibility of requesting and obtaining the revised Certificate of Approval lies with PowerStream.

4.3 Operation and maintenance responsibility

Maintenance of the existing generator will continue to be York Region's responsibility. Operation of the new equipment including replacing the consumables (such as air filter, SCR fuel) will nominally increase the cost of operation. The increased operational hours may increase nominally the staff's responsibility.

There are no penalties if the generator is not available for any reasons such as unavailability of the Region's staff or equipment; however, there will be no revenue if the generator is not available for operation when required.

4.4 Relationship to Vision 2026

This Program is in line with Goal 2 "Enhanced Environment, Heritage and Culture" and supports Goal 4 "responding to the needs of our residence" of Vision 2026. Implementing this program will support the following criteria:

- Ensuring clean water and air
- Promoting conservation
- Using energy more efficiently in operations of the Regional government

5. FINANCIAL IMPLICATIONS

As there is no capital investment required from the Region, this proposal will have no impact on the budget. Although staff responsibilities will increase due to the implementation of this program, no additional staff complement is anticipated. An incremental cost associated with operating the generator for the purpose of peak demand management will be deducted from the revenue received from electricity generation.

5.1 Capital investment

York Region will not be required to invest any capital to participate in this initiative. All of the \$403,000 estimated capital investment will be funded by PowerStream's Conservation and Demand Management fund. PowerStream has included a contingency fund for the unforeseen circumstances that may arise from implementing this project. As a result, participating in this initiative has no impact on the Region's budget.

5.2 Revenue Expectations

PowerStream is seeking the right to use the generator for the maximum 200 hours per year for a minimum of three years. Depending on the number of hours that the generator is utilized for peak management purposes, revenue will be generated. PowerStream will share the net revenue equally with the Region (50-50). The Region may realize no revenue should there be no need to run the generators for peak demand management.

According to Ontario Power Authority (OPA), there were 18 days in the summer of 2005 that peak demand exceeded the capacity of the Armitage Transformer Station, in total 72 hours for the entire season. A sample calculation (*see Attachment 1*) indicates a net revenue of \$12,225.00 for York Region should there be 40 hours of generator utilization for peak demand management.

5.3 Utility cost saving

Electricity generated through this program will displace the hydro consumption of the Aurora Sewage Pumping Station. Lower Electricity usage from grid will result in lower utility bills. This benefit will be in addition to York Region's net revenue.

6. LOCAL MUNICIPAL IMPACT

The closest residential property to the Aurora Sewage Pumping Station is located 151 meters north west of the Aurora Sewage Pumping Station across from the railroads. Upon

project implementation, the sound level will be reduced from the present level. Due to the distance we do not foresee any objections from this residence as a result of implementing this project; however, a consultation will be carried out under this proposal.

7. CONCLUSION

This initiative is a partnership between York Region and PowerStream. It provides community benefit by participating in this initiative since it is focused on improving the overall reliability of the electricity grid in relieving stress on the Armitage Transformer Station. It assists in mitigating the risk of brown-outs and rolling black-outs in York Region and the Province.

It improves the reliability of the existing generator set and reduces air emissions during generator operation as a result of the emissions abatement equipment, while increasing asset value. The Region will also benefit from the operational improvements as a result of the electrical upgrades.

York Region will not be required to invest any capital to participate in this initiative and may generate additional revenues.

Most importantly, this initiative exhibits the Region's leadership in addressing the critical electricity supply issue in North East York Region.

The Senior Management Group has reviewed this report.

(The attachments referred to in this clause were included in the agenda for the November 29, 2007 Committee meeting.)