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REPORT TO GANGES SEWER LOCAL SERVICES COMMISSION
MEETING OF FRIDAY 18 JUNE 2010

SUBJECT **GANGES WASTEWATER TREATMENT PLANT SUPERVISORY CONTROL AND DATA ACQUISITION SYSTEM 2010 CAPITAL UPGRADE**

PURPOSE

To request that the Ganges Sewer Local Service Commission (GSLSC) approve a funding increase to complete the approved Supervisory Control and Data Acquisition (SCADA) 2010 capital project.

BACKGROUND

In 2009, the commission authorized a project to replace the SCADA system for the Zenon membrane process in the Ganges wastewater treatment plant. The approved budget of $30,000 was based on the assumption that the SCADA hardware would be replaced at a cost of approximately $1,500 (materials and labour), and that the existing process control program would be translated and revised to work with the new hardware at an estimated cost of $28,500 (labour). The existing process control program, which was developed by the vendor and has been modified several times to optimize the process, has been found to be unusable for continued use.

Capital Regional District (CRD) electronics technical staff have advised that although not included in the original scope of work, writing a new program to control the membrane process would be more efficient than attempting to salvage the existing program, and would prove more reliable in operation. It is estimated that this task will require up to approximately 190 hours that were not included in the approved plan. A budget increase of $15,000 would be required to accommodate this additional work and to complete the SCADA update.

The 2010 SCADA upgrade project has incurred approximately $24,000 to date. It is anticipated that there is approximately $21,000 of outstanding electronic programming and supporting operations staff time left to complete and commission the process, and have the plant fully functional under a single Programmable Logic Controller (PLC). Total anticipated cost to complete the 2010 SCADA upgrade work is $45,000.

Two separate PLC systems currently remain in operation at the plant. The outstanding programming work is necessary to complete, as detailed in the attached technical report (Attachment 1).

ALTERNATIVES

1. That the Ganges Sewer Local Service Commission increase the 2010 capital budget for SCADA System/Remote Monitoring to $45,000 and authorize staff to transfer up to $15,000 from capital reserve funds to complete the SCADA upgrade.

2. That the Ganges Sewer Local Service Commission receive this report for information and request further information from staff.

FINANCIAL IMPLICATIONS

The approved 2010 SCADA project's $30,000 capital budget has approximately $6,000 funds remaining. The project is expected to be completed with no impact to the operating budget as sufficient uncommitted funds are available in the reserve fund (currently at $73,500), to support the additional $15,000. Remaining reserve funds will be approximately $58,500 if the additional funding is approved.

If the project is not completed, the ZeeWeed PLC will eventually be un-serviceable given its obsolescence. Potential emergency situations may occur, with a non-functioning membrane bio-reactor treatment process unable to communicate with the remaining treatment processes. This could result in increased operating costs and emergency technical support to replace and rectify.

SUMMARY

The 2010 SCADA upgrade project has incurred approximately $24,000 to date for materials and technical/operating staff in the programming of the system. It is anticipated that there is approximately $21,000 outstanding electronic programming and supporting operations staff time left to complete the process and have the plant fully functional under a single PLC. Approval to increase budget funding to complete SCADA upgrades by $15,000 will leave approximately $58,500 in reserves.

RECOMMENDATION

That the Ganges Sewer Local Service Commission increase the 2010 capital budget for SCADA System/Remote Monitoring to $45,000 and authorize staff to transfer up to $15,000 from capital reserve funds to complete the SCADA upgrade.

Gary Plevert, AScT
Engineering Technician 5

Colwyn Sunderland, AScT
Local Services Engineering Coordinator
Concurrence

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Attachments: 1

GANGES WASTEWATER TREATMENT PLANT
CURRENT STATUS OF THE PROGRAMMABLE LOGIC CONTROL (PLC) SYSTEMS UPGRADES

1. The two existing PLC's, each controlling separate areas of the plant, make it difficult for the processing areas to interact with each other because of their logic incompatibilities.

2. The most critical PLC, for the ZeeWeed membrane bio-reactor controls, has no spare Input or Output (I/O) cards of slots for expansion, making it impossible to consolidate both PLC's into a single unit. The ZeeWeed PLC is now obsolete which has resulted in it being more difficult and expensive in getting spare parts; a trend that will continue to worsen.

3. The ZeeWeed PLC program has many problems that are extremely difficult to troubleshoot by electronics staff, due to obsolete programming protocols that came with the original unit. On several occasions, the plant was close to overflowing because of miscommunication between the two different incompatible PLCs.

   The solution remains the consolidation of process control for the entire plant into the new single unit, thereby allowing staff to troubleshoot and develop the program from afar using a remote Virtual Private Network (VPN) connection. This invaluable tool will allow staff to work, monitor and modify the unified system without any travel costs. However, when major program changes need to be made, site visits are still required. Moving to a new single PLC will allow staff to eliminate redundant wiring.

Stages completed so far (outside of the actual Motor Control Centre (MCC) upgrade) are:

1. Completed PLC program and SCADA software development to allow new MCC and old PLC equipment to function together (although not optimally).

2. Systematic transfer of I/O process and equipment to new PLC, allowing the plant to function as normal. This includes:

   - Influent, effluent, equalization pumps, roto-strainer and compactor
   - Kubota valves, transfer pump and level transducer.
   - Air compressors AC86A, AC86B and mixer MX76.
   - Transfer pumps, wasting valves and effluent flowmeter.
   - Blowers B85, B87 and B85-S and airflow transducer.
   - Cyclic aeration valves and bleeder valves.

3. SCADA software development for ZeeWeed control.

4. Partial rewrite of PLC program pertaining to the ZeeWeed control.

It has been difficult to convert the ZeeWeed portion of the PLC program and continue to keep the plant running as normal without shutting down the entire process in order to move forward and allow enough time to move equipment controls over during normal plant operation. The current transitional state of the plant has made some pieces of equipment operable only in a manual mode, requiring increased operator attention.