



CONTROL SYSTEMS UPGRADE AT CLEARWATER POWER PLANT

Riverside Public Utilities

City Council
November 18, 2025

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BACKGROUND

Clearwater Power Plant

- Commissioned in 2005
- Acquired by Riverside Public Utilities (RPU) in 2010
- Combined cycle power plant that uses both a gas and steam turbine
- Capability of producing 30 megawatts of efficient power



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BACKGROUND

1. Balance of Plant (BOP) Control System

- Comprised of over 250 hardware and software components
- Monitors and controls support systems
- Essential to maintain reliability, environmental compliance, and safe operations
- Existing system installed during the commissioning of the plant
- Proprietary product developed by ABB, Inc. (ABB)

2. ABB Conducted a Lifecycle Assessment

- First performed in 2013 and a minimal upgrade was completed
- Another assessment in November 2024 to evaluate status and viability through forecasted retirement of Clearwater in 2040



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BACKGROUND

Lifecycle Assessment Results

- Substantial increase in obsolete components
- Software is outdated
- Difficult to source replacement parts
- Existing control system is not sustainable until forecasted retirement
- Upgrade is strongly recommended

Lifecycle Status	Description
Active GREEN	Product Actively Marketed, Sold and Supported
Classic YELLOW	Product Sold and Supported; Newer Technology Product Available
Limited RED	Product Supported; not Actively Marketed and Sold
Obsolete BLACK	Best Effort Support Only

City of Riverside, Clearwater Cogen, Harmony System Overview				
Installed system description:	Lifecycle Status	Support Status	Comments	Recommendation (Priority to Evolve)
Operator Workstations	Obsolete	Evolution Recommended	Upgrade path is 5+ Operations v3.3	1 to 3 years
Engineering Tools	Obsolete	Evolution Recommended	Upgrade path is 5+ Engineering v2.4. Also, SPE v2.4 is the prerequisite for supporting newest controllers and newest IO.	1 to 3 Years
Server Cabinet Power Supplies	Obsolete	Evolution Recommended	Upgrade to PN800, and replace MPS I with 24VDC DIN power supply	At same time as "Operation Workstations" upgrade and PN800 upgrade
PCU Cabinet Power Supplies	Limited	Evolution Recommended	MPS IV is the latest power supply system. Consider upgrading at same time as upgrading to PN800/SPC810ev. Some PCUs may change to retrofit I/O drops and the power supplies can be replaced with 24VDC DIN power supplies at a reduced cost to customer.	1 to 3 Years
System Communication	Obsolete	Evolution Recommended	PCU communication modules are removed/not needed when upgrading to PN800/SPC810ev. CIUs are replaced by PN800.	1 to 3 Years
System Communication	Classic	OK	Replaced by PN800 when upgrading to PN800 Network/SPC810ev	1 to 5 Years
Controllers	Obsolete	Evolution Recommended	The MFP controllers are replaced by SPC810ev in pairs. For FDI, use replaced MFP as spares until next step.	1 to 3 Years
Controllers	Classic	OK	The BRCA10 controllers are replaced by SPC810ev	1 to 5 Years
IO	Limited	OK	After controller upgrade to SPC810ev, SDO I/O modules are direct replacement of Rack I/O modules while maintaining same Termination Unshielded wiring.	No Action Required
IO	Active	OK		No Action Required

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DISCUSSION

1. ABB designed and commissioned the original BOP Control System
 - a. Technical expertise of the existing complex and customized control system
 - b. Immediate access to compatible replacement parts
 - c. Proprietary knowledge to complete upgrade efficiently with minimal integration risks
2. ABB Proposal for BOP Control System Upgrade – 3 Primary Tasks
 - **Task 1: S+ Human-Machine Interface (HMI) Software Upgrade**
Upgrading outdated software, computer equipment, and operator workstations.
 - **Task 2 – Distributed Control Systems (DCS) Evolution**
More than 115 obsolete components will be replaced while utilizing existing infrastructure. Some parts will be repurposed as spares.
 - **Task 3 – Three-Year Software License Agreement**
Regular software updates, security patches, unlimited technical support, and access to future vendor discounts.



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DISCUSSION

1. Project Cost Summary

Task	Cost
S+ HMI Software Upgrade	\$ 525,499.17
DCS Evolution Upgrade	\$ 774,987.00
<i>Upgrades Subtotal</i>	<i>\$1,300,486.17</i>
10% Contingency	\$ 130,000.00
3-Year Software License Agreement	\$ 210,485.00
Total	\$ 1,640,971.17

2. 10% Contingency

- a. Amendments required for any unforeseen changes in work scope
- b. Up to 30 days to process a fully executed amendment
- c. Delays will increase costs and prolong the non-operational period
- d. Does not guarantee payment nor increase cost for the project
- e. Covers unforeseen and reasonable changes to the project
- f. Requires Riverside's authorization prior to any project changes



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RECOMMENDATIONS

That the City Council:

1. Approve the Professional Consultant Services Agreement with ABB, Inc. of Cary, North Carolina to perform control system upgrades at the Clearwater Power Plant for \$1,640,971.17; and
2. Authorize the City Manager, or designee, to execute the Professional Consultant Services Agreement with ABB, Inc., including the ability to make non-substantive changes.



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