**George R. Clark**

3711 Brookwood Lane • Wisconsin Rapids, WI 54494 • (715) 972-2345 • [George.Clark@conjoinersystemsllc.com](mailto:George.Clark@conjoinersystemsllc.com)

[](https://www.linkedin.com/in/george-clark-a2968935/)

**CAREER OVERVIEW**

***Sr. Specialist Process Control Infrastructure and Cyber Security |***

***Sr. Systems Engineer | Systems Administrator | Process Control Engineer***

A versatile, project oriented, results-driven **Industrial Control System (ICS) and** **Engineering Professional** with a focus on the delivery, operation, and engineering of control systems; industrial cyber security; and manufacturing support services. Skilled in project management, maintenance of multiple manufacturing facilities, employee engagement, and customer relations. A resourceful leader recognized for ability to assess needs, manage expectations, and deliver solutions. Skilled communicator who can present complex information to a variety of audiences.

**CORE COMPETENCIES**

• Real Time Process Control • Industrial Control Systems Cyber Security • Systems Engineering

• Process Network Administration • Secure OPC/OPC UA Communications • Process Protocols

• Project Management • Control System Administration • Process Integration

• Software Development • System & Laboratory Administration • Process Historians

• Process Measurement & Visualization • Manufacturing Measurement & Control • Profile Historians

• Lean Six Sigma – Green Belt • Operational Quality • Training / Coaching

**TECHNICAL EXPERTISE**

* ICS and SCADA Audits and Assessments - NIST SP.800-82 and ISA 62334
* Real-Time computing, administration, and support
* Process Networks: multi-vendor system integration
* Software Development: control, interfaces, and communications
* Process Databases: applications, data analysis, and visualization
* Manufacturing process control: implementation, configuration, and support
* Hydro-electric generation SCADA experience
* Laboratory instrument engineering and systems administration
* Pulp & Paper: manufacturing operations, measurement, and process control

**SELECT ACCOMPLISHMENTS**

* Co-developed a NIST SP.800-82 based Industrial Control Systems (ICS) Cyber Security audit/assessment framework. Applied said plan in audits at four Verso Corporation operating facilities identifying potential incursion risks, malware susceptibility, and inadequate recovery procedures. Presented remediation policies and procedures to correct the identified risks and limit potential production losses.
* Coordinated a combined multi-vendor and Verso Corporation team that developed a Converged Plantwide Ethernet (CPwE) process network architecture employing the Industrial Demilitarized Zone (IDMZ) concept championed by Rockwell Automation and Cisco.
* Led a Rapid Lean Six Sigma process improvement project resulting in the conversion of an aged DCS system (Bailey INFI90) to Rockwell ControlLogix® ***without*** modifications of any field wiring. The team implemented control of the NewPage Research and Development Division Pilot Coater. This project was completed 40% below its original budget estimate. The new installation ran successfully on its *first* post-implementation coating trial.

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* Designed, installed, and maintained Consolidated Papers' first Process and Business DECnet ETHERNET network spanning three geographically separate mills and the Research facility. Continued support, expansion, and migration to Windows protocols until corporate IT assumed the responsibility and extended networking corporate-wide.
* One of three System Engineers in a team of equals. The team created -- designed, developed, coded, implemented, and maintained -- Consolidated Papers’ 2nd generation of proprietary real-time Process Control systems. At peak, there were two IBM System/7 and sixteen IBM Series/1 systems in five facilities running 24/7/365. All executed a mix of proprietary control algorithms for: Basis Weight, Moisture, Color, Wet End (Total Head, Total Flow, & Slice), Speed, Stock blending, Lab profile gauging, plus Automatic Speed & Grade Changes. Data acquisition and control was communicated through complex serial (RS-232) networks of connected proprietary and vendor systems as well as the traditional analog & digital field wiring. Operator workstations were a mix of true graphic terminals, PC based graphics emulation, and proprietary multi-tasked C code-based operator workstations running on Windows PCs connected via serial links – later connected via the nascent ETHERNET networks. Operator interfaces were fully interactive with real time displays.

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**PROFESSIONAL EXPERIENCE**

[**CONJOINER SYSTEMS LLC**](http://www.conjoinersytemsllc.com) **-** Wisconsin Rapids, WI (**715) 972-2345** **2017 to Current**

**Owner / Principal – Senior Systems and Controls Engineer**

*Provide select project, program, and expert witness services including:*

* Cyber Security audits and Mill asset surveys
* Manufacturing process control: implementation, configuration, administration, and support
* Process and Profile Historians: data validation, analysis, and visualization
* Process networking and vendor integration
* Software development: control, interfaces, and communications
* Laboratory instrument engineering and systems administration
* Pulp & Paper: manufacturing operations, measurement, and process control

**VERSO CORPORATION (f/k/a/ NewPage Corporation; StoraEnso; Consolidated Papers)**

**Sr. Specialist - IT Technical Process Control Infrastructure** (2015 to 2017); Verso Corporation

*I supported process infrastructure cyber security projects including back-up and recovery, malware prevention, remote access, and design of a secure network architecture.*

* Co-developed a NIST SP.800-82 based Industrial Control Systems (ICS) Cyber Security audit/assessment framework Applied said plan in audits at four Verso Corporation operating facilities identifying potential incursion risks, malware susceptibility, and inadequate recovery procedures. Presented remediation policies and procedures to correct the identified risks and limit potential production losses.
* Teamed with Rockwell Automation and Cisco, coordinating the design of a secure Industrial Control System network architecture. The architecture – IDMZ centric, Converged Plantwide Ethernet (CPwE) - was established as policy to guide future corporate network installs, upgrades, and modifications.
* Developed back-up and disaster recovery procedures for the process control infrastructure and vendor systems integrated into the process network.
* Supported a multi-vendor cyber security audit of the company’s hydroelectric facility that audited the network to FERC, NERC, and NIST SP.800-82 baseline standards. Reported results used to construct a prioritized remediation plan for execution by the supporting mill’s IT Staff.
* Co-led a corporate team that upgraded Verso’s mix of vendor servers and workstations running aged, obsolete, or unsupported Windows operating systems.
* Provided support and maintenance for Verso Technical Center’s pilot coater, process network, Historian, and Rockwell ControlLogix®.

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**Sr. Research Systems Engineer** (1980 to 2015)**;** NewPage Corporation; StoraEnso; Consolidated Papers *Developed/supported mill systems corporate wide, innovating/employing the latest technology available.*

* Project lead for the Pilot Coater DCS upgrade from Bailey INFI90 to Rockwell ControlLogix®.
* Led Technical Center’s Pilot Coater Rapid Lean Six Sigma Team which specified said DCS upgrade.
* Served as Tech Center’s first System Administrator and its DECnet ETHERNET file & print network.
* Designed and directed install of initial Process/Business file & print DECnet ETHERNET network
* Wrote IBM Series/1 and DEC VAX serial and TCP/IP based communication, data acquisition, and networking interfaces for DCS systems manufactured by Honeywell, ABB, Impact, and Bailey.
* Designed and implemented an IBM Series/1 based mill-wide Stock Preparation and Blending system.
* Developed and installed 5 separate IBM Series/1 based lab automated paper testing instruments to measure basis weight, caliper, and gloss.
* Co-developed and maintained eighteen 2nd generation proprietary IBM Series/1 and System/7 based process control systems for paper machines and pulp mill operations.
* Developed and implemented first Mill-wide IBM Series/1 based profile (scanning gauge) historian.
* Developed and implemented first Mill-wide IBM Series/1 based process (time-based) historian.
* Converted and supported profile and process historians’ vendor solutions when same were acquired.
* Supported a correlation-based scanning gauge certification program applied corporate-wide.

**Supervisor - Process Control** (1976 to 1980) Consolidated Papers Wisconsin Rapids Mill

* Responsible 24/7/365 for the IBM 1800 mill-wide – four paper machine -- control system.
* Led construction of multi-computer serial network between IBM 1800, System/7, & Fabritek MP12
* Led team that created a Fabritek MP12 (PDP-8 clone) micro-computer based front-end processor for remote scanning gauge data acquisition.
* Upgraded the mill IBM 1800 control system mainframe to its maximum hardware configuration.
* Created a scanning gauge correlation-based certification package for process improvement.
* Rewrote software to lessen memory demands, improve code efficiency, and eliminate control upsets.

**Scientist - Process Development & Control** (1974 to 1976**)**; Consolidated Papers R & D

* Developed first mill-wide Paper and Pulp Test Lab database, data entry, and reporting system.
* Created first CRT based graphics displays of real-time profile -- scanning gauge -- data.
* Wrote the first automated Pulp Mill Reporting system for Daily pulp production and KAPPA number.

**EDUCATION**

BS - Pulp & Paper Technology / Major: Systems Analysis; Miami University - Oxford, OH

Electricity I & II / Electronics I & II; Mid-State Technical College - Wisconsin Rapids, WI

OPC & DCOM – Levels I & II; OPC Training Institute – Edmonton, Alberta, Canada

**TECHNICAL SKILLS**

Cyber Security Audits // Mill Asset Surveys //Windows Servers & Workstations // VMware

OPC & OPC UA // ETHERNET networking (TCP/IP) // Process Control Design and PID Tuning

Process and Profile Historians: IP.21, PI, and RQMS

Programming: Assembly // EDX // EDL // FORTRAN // C // C++ // VBA // SQL

Independent study: Raspberry PI // LINUX // PYTHON // R // JavaScript

**PROFESSIONAL MEMBERSHIPS**

Institute of Electrical and Electronics Engineers (IEEE)

Instrumentation Society of America (ISA)

TechRepublic