

CAPacity

Newsletter for the ISA Certified Automation Professional® (CAP®)



Fall 2009

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CAP® Profile of the Quarter: Judith Lesslie



Judith works in the petro-chemicals industry with BP at the Cooper River Plant in Wando, South Carolina, USA. It's a chemical plant that produces purified terephthalic acid (PTA), a commodity chemical used in the manufacture of polyester (PET). She earned her CAP certification in November 2008. We found her story interesting and would like to share it with the CAP Community.

How long have you worked in the petro-chemical industry and what positions have you held?

I have worked at one facility since the early 1980s, in positions including Instrument & Electrical (I&E) technician, planner, trainer, I&E discipline engineer, I&E project engineer and manager, and currently as a process safety engineer. I have found that many people don't stay with one company or one site very long; however, I was lucky enough to find the perfect location for me early in my career and to be able to progress right here.

What are some of your job responsibilities at the Cooper River Plant?

I'm transitioning into a new position as a process safety engineer. Over the past few years, I've gained a ton of experience here. I have managed projects, handled front-end loading and detailed engineering responsibilities for large and small projects, handled construction management, provided technical service plant-wide on I&E systems, served as the primary point of contact for PLC programming and other related issues, have been an active process hazards analysis leader, and recognized as the site technical authority on I&E and LOPASIS related matters.

Does your company or do your job responsibilities require certification?

Certifications are not required, but are encouraged. BP supports employees in gaining certifications because it wants employees to continuously develop their knowledge and skills.

How did you hear about the CAP program and why did you decide to pursue it?

I receive snail mail and e-mail communications from ISA on a regular basis. One in particular started me thinking about pursuing certification. I think certifications in technical areas are one way to keep up with developments in my field, and I do like to stay current. I decided to discuss the CAP program with my coworker, Tom McGreevy, and he felt the same way. In early 2008 we decided to tackle study of the material together and to take the test. We both already had a wide breadth of automation knowledge from experience and education, so it was mostly a matter of brushing up on areas of knowledge that we don't encounter much in day-to-day work. We were both able to pass the certification exam on the first try!

"BP supports employees in gaining certifications because it wants employees to continuously develop their knowledge and skills."—Lesslie

Has your employer supported the program and if so, what comments have been made about your certification?

Yes, BP was very supportive of my wanting to pursue the CAP certification. BP paid for study materials and the exam. The company also allowed me to take time away from my job to take the test. I did most of my studying during lunch breaks

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CAP Profile

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and at home on off-hours because I do have a demanding day job! My immediate supervisor offered his congratulations and made sure to publicize the news in the plant weekly newsletter, which was very nice of him. It was also noted as a significant accomplishment in my yearly appraisal. Colleagues with BP and with other companies I occasionally work with have also made it a point of offering congratulations.

Have you heard any feedback from your customers about your certification?

The majority of my direct customers are BP employees within the Cooper River Plant, so not from customers. However, a number of technical service providers for my facility have commented on it and have mentioned that they too are interested in pursuing the CAP certification.

So, Judith, what benefits has the CAP certification brought to you or do you expect it will bring in the future?

It has primarily brought professional recognition of my knowledge and skills, which is always a good thing to receive!

Do you plan to renew your certification?

Yes, I do expect to renew the certification in 2011. I don't think I'll have any trouble meeting the minimum requirements for renewal. It would be a shame to let it lapse after the effort I put into getting it in the first place. I just achieved the ISA84 SFS certificate to go along with the Certified Functional Safety Expert (CFSE) designation that I completed a few years ago.

How did you prepare for the CAP exam?

I used the CAP On-line Learning System, CAP Body of Knowledge, BP and vendor training materials, and a few technical textbooks in areas I needed work in. I also brushed up on the details of some ISA standards, especially those focused on safety instrumented systems (SIS) and electrical enclosures in classified areas. The on-line study course and especially the large bank of pre and post test questions were a huge help in pointing out where I needed to focus my study efforts most.

What advice would you give others who are considering the certification process?

Absolutely, anyone working in a full-time role in the automation profession should consider the CAP certification to gain a competitive edge and to make sure they are current in their field. I would definitely recommend use of the on-line study system to help determine which areas of study to concentrate on then set up a study schedule and stick to it. Continuous professional reading is another great way to stay current.

ISA Leadership Participates in Technology Review

By Kristy Becker, CMP, ISA Certification Administrator

This past June, at the ISA Spring Leaders Meeting, eleven leaders from North and South America participated in a three-day, instructor-led review course to help prepare themselves to take the Certified Automation Professional® (CAP®) exam. The complimentary course was offered to ISA Society leaders worldwide to further promote the value of being certified as automation professionals.

The late Vernon Trevathan, PE, PMP, CAP, and ISA's "father of CAP," promoted the CAP program to ISA leaders from the program's inception in 2004. Though many were interested in CAP, most leaders were apprehensive about taking the next step—applying for and preparing to take the exam. It was Trevathan's idea to offer and teach the course.

Scott Sommer, PE, CAP, and Automation Technology Manager with Jacobs Engineering Group, served as the instructor for the review course in Trevathan's place. He knew he had big shoes to fill. "I was honored to be offered the opportunity to teach such a knowledgeable group of automation professionals," says Sommer. "The number of years of experience and breadth of knowledge in instrumentation, control systems, and automation among the group was remarkable," he adds.

To take the course, Society Leaders were required to apply for the CAP exam by May 2009. Those who participated are project engineers, engineering consultants, manufacturing professionals, and sales personnel. They work in process control and automation in the pharmaceutical, petrochemical, and power generation industries.

Michael Chaney, CAP, Consulting Analyzer Specialist with Lyondell-Basell in League City, Texas, and Member of the ISA Analysis Division and Houston Section was one of the participants and comments on his experience with the review course:

This was an opportunity for my own personal growth as a professional in the automation field, but also was developmental in my appreciation for the value of the CAP certification program. The CAP program has had my interest for some time and I have considered registering several times. I have been reading the questions published in *InTech* [magazine], thinking - I know that one! I am now aware of the amount of refresher training I need to prepare for the exam. Regardless of my ability to pass the exam, I will be an advocate of CAP in my interaction as an ISA leader.

Another participant in the course and the first of the group to pass the CAP exam was John Campbell, PE, CAP, and Principal Engineer for Instruments and Control Systems with Conoco-Phillips in Houston, Texas. Campbell has been a leader in ISA for many years, serving on the Council of District 7 several

times and as part of the ISA Safety Division and Houston Section leadership. "My company[s] internal career system includes a pre-populated list of professional registrations," says Phillips. "I am trying to have CAP added to the list to provide some leverage for others to become more aware of CAP."



Nicholas Sands, CAP, Process Control Engineer for DuPont, and recently appointed Vice President of the ISA Professional Development Department, says, "The importance of the CAP certification program for ISA and for the automation profession is huge." "[The] CAP [program's] scope is broad, but so is the amount of knowledge automation professionals must have to effectively do their jobs," he continues.

Sands was one of the ISA and Automation Federation industry experts who developed the Automation Competency Model with the U.S. Department of Labor. The model is a federal document that defines automation, and will serve as a formally recognized model for automation careers. The final Automation Competency Model can be viewed online at www.isa.org/acm.

Campbell, Chaney, Sommer, and Sands are all Senior Members of ISA. Membership in ISA is not required to become a CAP, but the technical information one can obtain through ISA membership is very helpful in preparing for the exam.

To find other CAPs you may know, or for more details on what is happening with the CAP program, visit www.isa.org/CAP. If you have specific questions about the CAP requirements, contact me at kbecker@isa.org or (919) 990-9219 at your convenience.

Welcome New CAPs

Congratulations to our newest group of Certified Automation Professionals!

David Bergeron

Michael Bovenkamp
AcelorMittal Dofasco Inc

John Campbell
ConocoPhillips

Michael Chaney
Lyondell Basell

Trent Faulkner
Cornerstone Controls Inc

Vitor Finkel
Finkel Engineers & Consultants

James Hazelwood
Revere Control Systems

Tomas Jankovsky
Siltronic Corp

Mark Maupin
Weatherly Inc

Gary Nichols
Jacobs Engineering Group

Charles Nnenkwo
USA LP

Alvin Rosenfeld
Siemens Energy Inc

Alan Splettstosser
Climax Molybdenum Co

Ramakrishna Vordhi
Honeywell

Jason Wright
ACE Technologies LLC

Safety first

Looking for the logic behind single loop logic solvers

By Jim McConahay

Article compliments of *InTech* online, June 2009

The industrial process industry is experiencing a huge boom in functional process safety applications.

Much of this growth comes from increased awareness of destruction of property, injuries and loss of life associated with tragic events widely publicized in the worldwide media. Needless to say, companies have a moral and legal obligation to limit risk posed by their operations. In addition to their social responsibilities, the costs of litigation measuring in the billions of dollars have caught the eye of risk management executives worldwide.

As a result, management recognizes the financial rewards of utilizing a properly designed process system that optimizes reliability and safety. That is why companies are now actively taking steps to comply with various national and worldwide safety standards such as ANSI/ISA 84 and IEC 61508/61511.

To accomplish this, safety practitioners look to a "new generation" of equipment specifically designed and approved for use in Safety Instrumented Systems (SISs) that utilize Electrical and/or Electronic and/or Programmable (E/E/PE) technologies.

Safe state

A SIS is an instrumented system used to implement one or more Safety Instrumented Functions (SIF). A SIS consists of any combination of sensors, logic solvers, and final control elements for the purpose of taking a process to a safe state when predetermined conditions no longer exist. A SIF is a function implemented by a SIS that achieves or maintains a safe state for the process with respect to a specific hazardous event.

Examples of SIF applications include:

- Shutdown in a hazardous chemical process plant
- Open a valve to relieve excess pressure
- On/off control to prevent tank overflow
- Shutdown fuel supply to a furnace
- Add coolant to arrest exothermic runaway
- Automatic shutdown when operator not present
- Close a feed valve to prevent tank overflow
- Initiate release of a fire suppressant
- Initiate an evacuation alarm
- Safety guidelines

To help companies implement a SIS, the International Electrotechnical Commission (IEC) developed IEC 61508, the standard for "Functional Safety of Electrical/Electronic/Programmable Electronic Safety-Related Systems."

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The main objective of IEC 61508 is to provide a design standard for SISs to reduce risk to a tolerable level by following the overall hardware and software safety life cycle procedures, and by maintaining the associated stringent documentation.

IEC 61508 has become the benchmark used mainly by safety equipment suppliers to show their equipment is suitable for use in Safety Integrity Level (SIL) rated systems.

For legacy products, suppliers are performing a Failure Modes, Effects and Diagnostic Analysis (FMEDA) hardware only assessment, which provides failure data for SIS designers and may also provide proven-in-use data. This does not include any assessment of the product development process which contributes to systematic faults in the product design.

New products fully compliant with IEC 61508 address systematic faults by a full assessment of fault avoidance and fault control measures during hardware and software development.

Risk assessment

To determine a SIL, the safety practitioner team Risk/Process Hazard Analysis procedure identifies all process hazards, estimate their risks, and decide if that risk is tolerable. Once a SIL has been assigned to a process, the safety practitioner has to verify the individual components (sensors, logic solvers, final elements, etc.) that are working together to implement the individual SIFs comply with the constraints of the required SIL.

For any device used in a SIS, the team must pay close attention to each device's Safety Failure Fraction (SFF) and Probability of Failure on Demand (PFDavg). For each device in the SIF, both numbers have to compare to the rules outlined in the safety standards to ensure they are sufficient for use in the required SIL of the SIS. If these devices end up classified as Type B, such as micro-processor based devices, the development process including software must also undergo assessment and approval for the required SIL level. While the standards do allow proven-in-use data as proof of a device's reliability, such information is usually very hard to verify and document.

For this reason, many end users prefer fully assessed devices by third party organizations.

It is always the responsibility of the end user to perform or verify the calculations for the entire safety loop. Since a SIF relies on more than one device, it is imperative all devices in the loop work together to meet the required SIL levels. The device's SFF and the PFDavg values used for these calculations should be in a FMEDA report.

IEC 61508 requires a quantitative, as well as qualitative, assessment of risk. FMEDA provides a systematic way to assess the effects of all probable and known failure modes, including on-line monitoring and error checking, of a SIS component. It is a detailed circuit and performance evaluation that estimates failure rates, failure modes, and diagnostic capability of a device.

To read the complete article visit www.isa.org/caparticle.

Last 2009 Testing Window Deadline Approaching

The last electronic testing window for 2009 is 1 November–31 December. The deadline to postmark and/or submit an application is 15 September. Remind those you know who may be interested in CAP to prepare now. The online CAP application can be found at www.isa.org/cap/apply. It is user friendly and can be completed in less than 30 minutes!

2010 Exam Testing Windows and Exam Application Postmark Deadlines

Exam Testing Window	Exam Application Postmark Deadline
Window 1: 1 March 2010–30 April 2010	Friday, 15 January 2010
Window 2: 1 July 2010–31 August 2010	Friday, 14 May 2010
Window 3: 1 November 2010–31 December 2010	Wednesday, 15 September 2010



Founded in 1945, the International Society of Automation (www.isa.org) is a leading, global, nonprofit organization that is setting the standard for automation by helping over 30,000 worldwide members and other professionals solve difficult technical problems, while enhancing their leadership and personal career capabilities. Based in Research Triangle Park, North Carolina, ISA develops standards; certifies industry professionals; provides education and training; publishes books and technical articles; and hosts the largest conference and exhibition for automation professionals in North America. ISA is the founding sponsor of The Automation Federation (www.automationfederation.org).

Certification

ISA certification provides an objective, third-party assessment and confirmation of a person's skills, and gives them the opportunity to stand out from the crowd and be recognized. ISA currently offers two certification programs: Certified Automation Professional® (CAP®) and Certified Control Systems Technician® (CCST®).