

How To Analytically Troubleshoot Complex Electrical Systems

Cost: \$2499.00

City & Prov	Dates	Code
Richmond, BC	Mar 05, 2012 - Mar 09, 2012	OR12007
Winnipeg, MB	Mar 19, 2012 - Mar 23, 2012	OR12010
Edmonton, AB	May 28, 2012 - Jun 01, 2012	OR12015
Saskatoon, SK	Jun 18, 2012 - Jun 22, 2012	OR12017
Dartmouth, NS	Sep 17, 2012 - Sep 21, 2012	OR12064
Toronto, ON	Oct 01, 2012 - Oct 05, 2012	OR12037
Calgary, AB	Nov 05, 2012 - Nov 09, 2012	OR12021

This five-day program is designed for electrical troubleshooters and is *guaranteed* to improve their troubleshooting processes and significantly reduce downtime costs.

This system was developed by a team of Master Troubleshooters and then honed over twenty years of continuous improvement. During this time hundreds of programs were taught to several thousand participants with constant feedback and refinement. Participants spend 90% of their time troubleshooting realistic faults utilizing both hardwired and software simulators under the guidance of a Master Troubleshooter.

Based on Canada Training Group's proprietary Analytical Electrical Troubleshooting™ methodology, this program is flexible enough to develop strong processes in younger troubleshooters and still challenge experienced troubleshooters to fine-tune their skills.

Our experience shows that we can improve the skills of experienced troubleshooters 25%, 200-300% in others and immeasurably for some. This translates into major reductions in unplanned downtime.

A major outcome from this training will be a huge increase in job satisfaction. Your troubleshooters will be keenly aware of their increased competence and feel capable of extraordinary achievement. The natural result is a dramatic increase in productivity; your people will see the impact of a job well done and will want to do more.

Any troubleshooter determined to improve their game will be able to apply our Analytical Electrical Troubleshooting™ methodology to electrical and other systems, collectively saving hundreds of thousands of dollars of downtime during the career of the successful participant.

Our instructors have 30-40 years of electrical troubleshooting experience, including 15-20 years as troubleshooting instructors, and work closely with each participant to advise them on how to improve every aspect of their troubleshooting skills.

Hi, Dave Smith here, President of Canada Training Group and one of the instructor/developers of

“How to Analytically Troubleshoot Complex Electrical Systems”

I am writing to tell you about this amazing course.

Not amazing because I helped develop or teach it but because we wanted significant, measurable and provable results and our students achieve that in every course. Six years ago, myself and the other instructors, set ourselves the goal to redesign an electrical troubleshooting course, with 30 years of successful history, into an analytical thinking and deductive reasoning course whereby the successful graduates would have the skills to solve problems, whether they were electrical or whatever, on any kind of system, whether the students had ever seen it or not. Huge challenge but we have nailed it.

I know you get a lot of information about courses but I guarantee you won't regret taking eight minutes to learn how we do this. HATCES is a five day analytical thinking and deductive reasoning course that significantly improves the troubleshooting speed, accuracy, and confidence of electrical troubleshooters.

Bob Skinner, a senior refinery electrician for 32 years, had this to say: “What used to take me days will now take me hours; what used to take me hours will now take me minutes.”

This system was developed by a team of Master Troubleshooters and then honed over thirty years of continuous improvement. During this time hundreds of programs were taught to several thousand participants with constant feedback and refinement. Participants spend 90% of their time troubleshooting realistic faults utilizing both hardwired and software simulators under the guidance of a Master Troubleshooter providing a program flexible enough to develop strong processes in younger troubleshooters and yet still challenge experienced troubleshooters to fine-tune their skills.

Our experience shows that we can improve the skills of experienced troubleshooters 25-50%, 100-200% in others and immeasurably for some. This translates into major reductions in your unplanned downtime.

John Power of Newfoundland Power evaluated HATCES and this was what he told his manager:

“The troubleshooting course that I recently completed will benefit me greatly. The techniques I learned during the week were very helpful and as a bonus my confidence level has improved as well. I highly recommend that we move forward with bringing this to other people in our department.”

John Power

His co-worker, Ray Bartlett also evaluated HATCES and had the same advice to their management about HATCES:

“I just completed the troubleshooting course and it was excellent. It gave me some good troubleshooting tools to use in my job. I learned to approach a problem from different ways to come to a solution. I think all my co-workers should be given the same course.”

Ray Bartlett

John and Ray were members of a select team of senior troubleshooters from Newfoundland Power chosen to critically evaluate HATCES.

The team's response was unanimous and overwhelming for choosing HATCES as the troubleshooting standard for their power company.

If you go to this URL you can hear it for yourself!

<http://www.canada-training-group.ca/ates1>

We have now completed several rounds of HATCES training for Newfoundland Power's E&I troubleshooters.

Detailed entrance, exit and project measurements proved conclusively that the skills of their troubleshooters improved up to 300% meaning massive reductions in unplanned downtime.

As you can imagine, these increases in troubleshooting speed and accuracy will make a huge impact on their production outages and lost revenues.

If your troubleshooters are troubleshooting regularly, and your downtime costs you significant money, then this training course will pay for itself in no time. Many students claim that return on investment will be less than 1 month.

Their Superintendent of Electrical Maintenance, David Manning, P.Eng., was so happy with these HATCES results that he agreed to provide us with a video testimonial. If you go to the following URL you will hear Dave explaining Newfoundland Power's commitment to HATCES based on this data and the high positive feedback from all participants.

<http://www.canada-training-group.ca/ates1>

We have spent years developing and evolving this course. HATCES is the end result of extensive international research and is a distillation of the best concepts from dozens of troubleshooting methods and mental processes. What other courses lack, but is the entire foundation of HATCES, is the teaching of deductive reasoning and analytical thinking skills.

I have been a member of Mensa since 1984. Mensa is an international high IQ organization and you need to test in the top 2% of the population to belong. These people are not brilliant or geniuses but they do have high speed processors. As a member you are continuously exposed to excellent thinking processes and the working of the human mind. I am keenly interested in this, both from a safety perspective and from a troubleshooting perspective. We have evaluated and trained thousands of troubleshooters and we are always looking at how their minds work and teaching them how to use their minds more effectively in any situation.

We regularly find experienced troubleshooters who are effective and poor at the same time. Effective because they can eventually find problems but poor because it takes so much longer than it should unless they have seen the problem before.

Where these people, and their methods, fall down is when they are presented with something they have never experienced. When we watch these troubleshooters in slow motion on an unfamiliar problem we see that more than half of their testing is wasted because they do not use a logical, analytical, planned approach. Hours, and sometimes days, drag on before faults are found.

A common complaint a manager hears is "I can't fix it; I haven't been trained on it." As it is not possible to train everyone on every machine, we improve the speed and accuracy of even the best of troubleshooters on any machine or system by teaching them deductive reasoning and developing analytical thinking skills they can apply to any situation.

Additionally, our experience, supported by our research and observations, has shown that even the best troubleshooters make expensive mistakes. An example is the smelter foreman called in at 2 a.m. because a 125 ton overhead travelling crane was down and the two night shift journeymen could not find the problem after several hours of consternation. The foreman was understandably choked when he discovered the clue that had been missed.

Another example is the grinding line that was down for 5 hours in the mill of an open pit mine. Troubleshooter #1 was at the scene when troubleshooter #2 arrived and asked, "Did you check the resets?" T/S #1 said "Yes", forgetting that on that system there was another set of resets. T/S #2 assumed T/S #1 was referring to all of the resets, never inquired further and proceeded to help with the troubleshooting. 5 hours later, a third troubleshooter checked the second resets and found them open. The lost profit from that was enormous, well over \$300,000.00.

Both of these happened to typical experienced journeymen; they had years of experience troubleshooting but had never been taught to think and to reason, analytically and deductively.

In HATCES we train your troubleshooters so that mistakes like these should never happen again. We give them tools and methods that prevent them from overlooking basic items, clear up bewilderment and give them a clear path to solving complex problems.

HATCES is not just designed to make your people better troubleshooters but to improve all of their analytical thinking processes and to make cognition over-rule the emotions at play during troubleshooting.

We will teach your troubleshooters logic, analysis and systems thinking to solve failures and problems in any type of system, the same kind of thinking taught in engineering schools.

A major outcome from this training will be a huge increase in job satisfaction. Your troubleshooters will be keenly aware of their increased competence and feel capable of extraordinary achievement. The natural result is a dramatic increase in productivity; your people will see the impact of a job well done and will want to do more.

Many actual industry examples of troubleshooting mistakes are used to illustrate the importance of using these skills properly.

They will learn these skills and more, and then they will hone them razor sharp on 4 progressively more complex hardwired simulators, 18 software simulators, 5 instructor-led case studies and a number of paper based projects.

Your troubleshooters will be amazed at their results because their results will be amazing!

At this URL you can see a video clip of Dean Oakes and his reaction to his results from one of our many computer simulated projects! It is worth watching.

<http://www.canada-training-group.ca/ates111>

If you go to this next URL you can read similar testimonials from 35 other very happy troubleshooters.

<http://www.canada-training-group.ca/ates1111>

Psychologist Mihaly Csikszentmihalyi of the University of Chicago pioneered a concept he called "Flow". He defines flow as a mental state of operation in which the person is fully immersed in what he or she is doing, characterized by a feeling of energized focus, full involvement, and success in the process of the activity. In his research he worked with athletes, artists, musicians, surgeons and others to determine what they were

feeling at those moments of peak unconscious maximum achievement.

Musicians for decades have referred to this as being “in the groove”; others call it being “on a roll”, or “batting a 1000.”

Whatever you call it, your mental and physical processes are operating seamlessly, cohesively and very successfully.

In Dean’s video clip, this is his spontaneous reaction to experiencing “Flow” while troubleshooting.

In our HATCES research we have reviewed the studies done with sophisticated brain scanners called Functional Magnetic Resonance Imaging machines. These show blood flow to specific parts of the brain during particular tasks as evidenced in these pictures:

For instance, we know that one critical aspect of troubleshooting involves sequential decision-making and neuro-scientists know that the neural pathways controlling these processes involve areas of the brain such as the ventral medial prefrontal cortex and the anterior cingulate cortex.

When a person is “in flow”, “in the groove”, “on a roll”, “batting a 1000”, etc. the proper areas of the brain have to be engaged to begin learning the skill and then they have to be engaged and re-engaged time after time until the person has mastered or begun to master the skill.

Developing Troubleshooting Mastery is just one thing your troubleshooters will gain from HATCES.

Remember, we are not just interested in teaching your troubleshooters how to fix a circuit or system; we want them to be able to fix any circuit or system, whether it is electrical, mechanical, electro-mechanical, electronic, robotic or whatever.

We researched the mental processes used to solve technical problems and created projects and systems to engage these.

Then we built this course to give your troubleshooters these mental processes that can be successfully applied to any problem. In a recent course for one of the world’s largest mines, two mechanics participated in the course. They are responsible for troubleshooting on the 400 ton ore trucks. At the end of the course they told our instructor their change in thinking skills was going to “seriously help our mechanical troubleshooting.” With the use of over \$ 50,000.00 worth of electrical, electronic and computer simulators we create problems that require troubleshooters to engage the parts of their brains that are used during ALL troubleshooting situations. To drill this into your troubleshooters we provide them with over 200 real life problems and as they gain mastery they slowly and then quickly increase their speed and accuracy.

HATCES is designed as a highly structured learning experience that commits 90% of class time to personal hands-on skill development under the mentorship of master troubleshooters.

Just like a golf pro reviewing your grip, we start right at the basics to make sure nothing is missed and then we guide them through an escalating series of increasingly complex problems. At critical milestones, we give your troubleshooters innovative tools and concepts that significantly accelerate their troubleshooting speed and accuracy, resulting in huge gains in their confidence to solve complex industrial problems correctly in record time!

Perhaps your troubleshooters won’t become 3 times better but can you imagine them:

Being twice as fast with their troubleshooting speed and accuracy?

Having the analytical tools to be able to tackle and solve any problem?

Having total confidence in their troubleshooting ability?

How much more valuable would they be to your organization?!

Your investment to improve their skills will be quickly repaid; most of our clients report that this investment is returned within months; in fact,

Max Hutchcraft, Utilities Superintendent with Abitibi, stated that their payback was within weeks!

Your payback will depend on the hours per week your troubleshooters are troubleshooting and your cost of downtime. If you have high downtime costs and regular troubleshooting you will have a very quick return. Or perhaps you are in a health care facility and lives are at risk or in an entertainment venue and you have thousands of frustrated fans wanting it fixed right and fixed now.

No matter what industry you are in, HATCES teaches the concepts and skills to solve problems anywhere on anything.

This is why HATCES will be a great opportunity for you and why I wanted to let you know about this course.

If you have any other questions, call 1-800-661-1663, ask for me and I will answer all of them.

Thanks for your time; we love doing this.

Sincerely

Canada Training Group

Training superior troubleshooters since 1980

Any troubleshooter determined to improve their game will be able to apply HATCES to your electrical and other systems, collectively saving you hundreds of thousands of dollars of downtime during the career of the successful participant.

Who Should Attend:

Electricians, Instrumentation Mechanics, Technicians, and any other worker who must be relied on to quickly and accurately diagnose and fix electrical systems.

You Will Be Able To:

Significantly reduce electrical equipment downtime by rigorously applying our proprietary troubleshooting process

TROUBLESHOOT USING AN ANALYTICAL PROCEDURE

Objective: Troubleshoot an electrical circuit or system following a logical, structured procedure.

SUBTOPICS:

- Describe Analytical Thinking
- Apply Convergent Thinking Skills
- Apply Divergent Thinking Skills
- Apply Deductive Reasoning Skills
- Apply Inductive Reasoning Skills
- Develop an Analytical Troubleshooting Procedure
- Develop an Analytical Electrical Troubleshooting Procedure

PREPARE TO TROUBLESHOOT

Objective: Develop preparatory skills.

SUBTOPICS:

- Gather Data
- Make Factual Observations
- Select Troubleshooting Tools

ANALYZE THE FAULTED SYSTEM

Objective: Use a systematic process to localize the problem.

SUBTOPICS:

- Deduce Fault Type
- Deduce Location

PLAN YOUR TROUBLESHOOTING APPROACH

Objective: Use both empirical and inferred data to plan your steps.

SUBTOPICS:

- Evaluate Hazards
- Select Starting Point
- Plan Minimum Troubleshooting Steps
- Deduce Test Results

TROUBLESHOOT THE SYSTEM

Objective: Apply a non-redundant series of tests supported with documentation of the process.

SUBTOPICS:

- Control Hazards
- Conduct Tests
- Record Tests and Results

INTERPRET DATA

Objective: Utilize results of troubleshooting to both fix the current problem but to also deduce root cause.

SUBTOPICS:

- Evaluate Test Results
- Adjust Troubleshooting Approach
- Identify Cause of Failure

TROUBLESHOOT DC SYSTEM PROBLEMS

Objective: Apply analytical electrical troubleshooting procedure to dc circuits.

SUBTOPICS:

- Open Circuits
- Short Circuits
- Voltage Drops
- Grounded Circuits
- Crossed Circuits

TROUBLESHOOT SINGLE PHASE SYSTEM PROBLEMS

Objective: Apply analytical electrical troubleshooting procedure to single-phase circuits.

SUBTOPICS:

- Open Circuits
- Short Circuits
- Grounded Circuits
- Crossed Circuits

TROUBLESHOOT THREE PHASE MOTOR CIRCUIT PROBLEMS

Objective: Apply analytical electrical troubleshooting procedure to three-phase motor circuits.

SUBTOPICS:

- Open Circuits
- Short Circuits
- Grounded Circuits
- Crossed Circuits

TROUBLESHOOT ELECTRICAL CONTROL SYSTEM PROBLEMS

Objective: Apply analytical electrical troubleshooting procedure to electrical control circuits.

SUBTOPICS:

- Open Circuits
- Short Circuits
- Grounded Circuits
- Crossed Circuits

TROUBLESHOOT UNKNOWN SYSTEM PROBLEMS

Objective: Apply analytical electrical troubleshooting procedure to unknown systems

SUBTOPICS:

- What is Known
- What is Unknown
- Applying the Process

CONCLUSION

Objective: Conclude course and evaluate troubleshooting skill progression in both speed and accuracy.

SUBTOPICS:

- Evaluation of Learned Skills
- Review of Course Goals

“ Very effective and efficient way of how to solve a problem...from start to finish”

- **Craig Knee, Electrical Maintenance, Newfoundland Power**

“ Excellent content with plenty of hands-on troubleshooting and demo-circuits to use/test the techniques.”

- **James Froese, Instrumentation Tech, Abitibi Consolidated**

“ A good variety of content, and a well informed and open instructor. I will be teaching this method amongst my apprentices and co-workers.”

- **Ed Wilhelm, Station Electrician, SaskPower**

“ Excellent, an invaluable troubleshooting tool.”

- **Jim King, Electrician, Williams Operating Corp**

“ Good course content and lots of hands on to solidify the theory. This course will pay for itself in two weeks”

- **Dion Antle, Electrical Supervisor, Kruger Pulp and Paper**

“ How to analyze, document and test efficiently... this course is for anyone who works on electrical systems.”

- **Michael Irving, Maintenance Electrician, Shell Canada**

“ I enjoyed it. It was very mixed. You were not overdoing just one aspect but always covering something new. I like the troubleshooting tools...thinking, observing, analysis, then test!”

- **Wade Harrogate, Maintenance Supervisor, Molson Breweries**

“ Documentation is the key to successful troubleshooting. Excellent job! I will be recommending to my supervisor that the other techs take this training”

- **William Patey, Technician, GN Plastics**

“ If you want everyone playing on the same team to work correctly and in an efficient manner, do this training”

- **Thomas Veysey, Technician, Vermont Electric Company**

“This course will pay for itself the first time a critical motor is down. If it saves one hour of downtime that is \$100,000.00”

- Patrick Kachur, Electrician, Syncrude Canada

"The hands on work was well organized and the computer work was a nice change from the norm, both of which made you think. This is a must have course for technologists."

- Jason Dalton, Substation Electrician, Newfoundland Power

"This is an excellent course. I learned a lot of valuable information, especially regarding the application of thinking and learning patterns. Draw out your problem area and focus on the underlying issue."

- Steven Crane, Substation Electrician, Newfoundland Power