

COMPRESSED AIR TRAINING; IT'S A GOLD MINE!

By Ron Marshall for the
Compressed Air Challenge®



Employees of New Gold's New Afton Copper/Silver/Gold Mine, located just West of Kamloops, British Columbia, Canada have just completed an intensive round of Compressed Air Challenge and in-house compressed air efficiency training for their employees. The awareness raised by these seminars has already led to significant improvements to system

efficiency. Further efforts initiated by Andrew Cooper, an Energy Specialist hired through special support from BC Hydro's Power Smart program are set to gain even more power savings and improve their compressed air system reliability and stability. Anchored by Compressed Air Challenge's Fundamentals of Compressed Air Systems webinar and through

CAC's two-day Advance Management of Compressed Air Systems seminar, led by CAC L2 instructor Jeff Yarnall, the employees of New Afton mine now have a new appreciation of the true costs of compressed air.

CAC interviewed Andrew to find out more about his improvement efforts:

Please describe what you do at New Gold and the relationship between New Gold and BC Hydro:

I am employed as the Energy Specialist at New Gold. New Gold took advantage of the Energy Manager funding opportunity available through the BC Hydro's Power Smart program and established this position.

Why were you interested in Compressed Air Challenge training?

Since the majority of employees deal with compressed air in one way, shape or form,

Fundamentals of Compressed Air Systems WE (web-edition)



Learn about the high cost of compressed air and how to optimize your system by signing up for our *Fundamentals of Compressed Air Systems WE* (web-edition) coming September 10th. Or try one of our many in-person seminars being held in the coming months at locations across the country. Visit www.compressedairchallenge.org for more information.

If you have additional questions about the new web-based training or other CAC® training opportunities, please contact the CAC® at info@compressedairchallenge.org.

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we felt it was important to create awareness around its use. This started with the Energy Specialist doing a 30 minute Compressed Air Awareness training session for all employees on site. To date, approximately 300 people have been through this training.

A narrower cross-functional group of 20 people were selected to do the CAC Fundamentals of Compressed Air Webinar. This group was made up of employees from Mechanical & Electrical Maintenance, Engineering, Mine Operations, Processing, IT and Purchasing as we felt it was important for

people across all functions of the organization to be aware of compressed air efficiency.

To further enhance compressed air knowledge, 13 New Gold employees attended the recent CAC Advanced Management of Compressed Air course. This course was co-sponsored by New Gold and BC Hydro and was attended by other Power Smart Energy Managers as well as by a few suppliers, both from BC and Alberta.

We feel that in order to be sustainable, energy management and efficiency should not be dependent on one person, but should be what

is done by all employees on a day to day basis, as part of what we do at New Gold. The more people with the awareness and knowledge about compressed air efficiency, the better it is for the company as a whole.

Any idea how much your air systems are costing?

A recent audit done on the compressed air system for the underground compressed air supply only, estimated that the underground air was costing us about \$315,000 per year. This did not include two 50 hp compressors



Andrew Cooper at New Gold's New Afton Mine.

at our batch plant, the 250 hp compressor a contractor had connected up to supply their surface jet-creting machine, or the various smaller compressors dotted around site. One could safely estimate that compressed air was costing the company approximately \$400,000 per year. There are 3 new 350 hp compressors (2 running, 1 standby) soon to be commissioned in the new mill. This will obviously add significantly to the cost.

Any problems with them?

The underground compressed air system has one 300 hp compressor in a bad location underground, in warm dusty air. This makes for a high maintenance, inefficient machine.

Due to the large distances between the various compressors, they do not “talk” to each other and control independently. This results in uncoordinated load and unload times.

Although there is a huge volume of piping feeding underground, there are no receivers underground to accommodate large demand surges from equipment. It therefore takes a

while for compressors 4 km away to react to a big demand from a piece of equipment. This is more than likely why the one 300 hp compressor was installed underground.

As a result of the CAC seminar did your employees find some issues with a new compressed air system?

The 3 new 350 hp mill compressors have been designed to feed into a common header in the compressor room. There is a check valve between each compressor and the header. The control pressure transducer for each compressor sits between the compressor and the check valve, so all compressors will not be able to see a common header pressure. Also the compressed air feeds enter the bottom of the header, so removing the check valves would mean that oil and water will be forced down the outlet pipe of an idle compressor

What are your future plans regarding your air system?

Funded by the BC Hydro Power Smart program, a local consultant is doing a

CAC® Qualified Instructor Profile

Jeff Yarnall

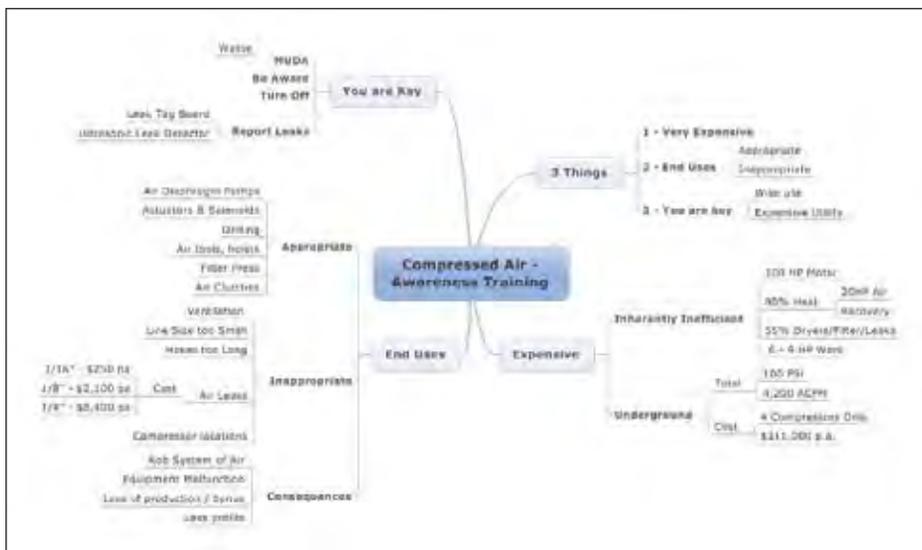
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Jeff Yarnall is a Certified CAC L1 and L2 instructor and has over 30 years experience with compressed air and process vacuum systems, including; system design, applications, installation, troubleshooting, maintenance, controls and energy audits. A registered Professional Engineer his responsibilities include major capital project management, both in the United States and abroad, from engineering, sales, procurement, and documentation. Jeff also serves as consultant to clients for energy audits and assessments, educational instruction, and system design.

Jeff has devised comprehensive deterministic simulation models for compressed air systems which allow the evaluation of “what if” scenarios for clients.

Over 1500 people have attended Jeff’s classes on compressor maintenance, system optimization, and the Compressed Air Challenge with excellent reviews. In addition to class room theory, Jeff uses the experience of over 800 audits to illustrate the practical side of compressed air systems operations.



COMPRESSED AIR TRAINING; IT'S A GOLD MINE!

Best Practices for Compressed Air Systems Second Edition



This 325 page manual begins with the considerations for analyzing existing systems or designing new ones, and continues through the compressor supply to the auxiliary equipment and distribution system to the end uses. Learn how to use measurements to audit your own system, calculate the cost of compressed air and even how to interpret utility electric bills. Best practice recommendations for selection, installation, maintenance and operation of all the equipment and components within the compressed air system are in bold font and are easily selected from each section.

feasibility study on relocating all compressors feeding the underground air system to a centralized location and, if possible, installing receivers at strategic locations underground. We expect that significant savings will be realized by doing this.

The mill compressors are water cooled, with a centralized chiller doing the cooling. We are looking at a project to recover heat from this chiller and use this heat for space heating in our mill during the winter.

We will be auditing the batch plant compressed air system ourselves as there are opportunities for efficiency improvements and heat recovery in this area.

Did the training help with these plans?

The training has most definitely helped with these plans. We are more aware of what to look for in terms of inefficiencies and of what is required when redesigning or upgrading a compressed air system. Cross functional training has made people more aware of life cycle costing, the importance of maintenance and the importance of minimizing leaks in the mine.

An electrician who had been through the basic awareness training discovered an always open ½" blow down valve on a contractor's 250 hp compressor receiver. Because of the training he approached the contractor and notified me. The drain was open because the air was too wet. We found that the solenoid valve on the

oil/water separator after the compressor after-cooler was not working. This was repaired and we purchased a no-loss drain for the receiver. I've had numerous people approach me and tell me that they have fixed small leaks. Little things like this prove that even basic awareness training can pay dividends.

In addition to the above plans, we have launched a leak tag and repair program. BC Hydro supplied leak tag boards, New Gold had leak tag cards made up and set up the coding in SAP, our computerized maintenance system, to process and sort air leak notifications. We are currently finalizing training on the correct way to enter a notification so that we can monitor and track the progress of leak repairs.

Can you tell me more about your 30 minute compressed air training?

This was designed to be more of an awareness session rather than training. I wanted to make it informal so did not use any slides. The objectives were to:

- Create awareness around why compressed air is so expensive
- Create awareness about the compressed air management initiatives New Gold is undertaking
- Promote discussion around the uses of compressed air



“New Gold is a company that has gotten serious about compressed air and has sent several people to both CAC classes. I expect great things from them in the coming year.”

— Jeff Yarnall, Rogers Machinery Co.

What do you talk about in the training, do you have an outline?

We created the training in a Mind Map format (Figure 1). The discussion was based on 3 points I “stole” from a consultant’s presentation at the BC Hydro Powersmart Forum last year — I did get his OK. We made up a demonstration air system with some “leaks” and a hand pump “compressor” to show the folks the effect increasing air leak sizes have on a system. We had the leak tag boards, leak tag cards and an ultrasonic leak detector to show as well.

What is the most common feedback/impression you get from the attendees about this training?

Attendees were surprised at the small percentage of work output you get from

a compressor relative to the input. I equated this to heating in a home, which made the numbers more realistic.

How are you tracking the results of your improvement efforts?

We had to set up our maintenance system to be able to track improvements and have recently completed this project. We have a summer student starting next week whose main task is going to be setting up systems for compressed air leak management and recording.

For our underground air system, we wanted to do a proper baseline test prior to the start of major improvements. We currently have data loggers on the system for purposes of creating a baseline and looking at the feasibility of an efficiency upgrade projects.

Based on the Compressed Air Challenge training, what are the top three things you feel you have learned that are the most valuable?

Things learned:

- Importance of up-front design to save time and money down the line
- Calculations for storage to deal with short duration, high cfm applications
- Need for constant diligent monitoring and maintenance of compressed air systems,
- Control compressors to match plant demand

Comments from L2 Instructor Jeff Yarnall:

Companies like New Gold know that to prosper in a competitive world-wide market every cost must be managed. Compressed air and its associated costs were rarely managed in the past, but now you can. Training offered by the Compressed Air Challenge helps to stimulate awareness and action. New Gold is a company that has gotten serious about compressed air and has sent several people to both CAC classes. I expect great things from them in the coming year. Remember, you can dig gold out of the ground or you can create it by managing your compressed air system wisely. **BP**

To read more **System Assessment** articles, visit www.airbestpractices.com/system-assessments/leaks



New Gold's Leak Tag Board raises awareness by taking a prominent position in their facility.