Safe Water International Ministries

CPU Training Manual

A guide for those giving demonstrations and training in developing countries on use of the Chlorine Producing Unit from S.W.I.M.

2007 edition

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Introduction

After giving hundreds of demonstrations and training sessions in 10 countries, and countless talks in churches explaining our ministry, I've made just about every mistake possible and felt that others could maybe benefit from my experiences. Teaching someone a new process can always be difficult, but add in the fact that you may be working through a translator, are in a different culture, using terms and equipment they've never seen, and working under time restraints, and you have the potential for real disaster. Knowing that you are training them in a process that can possibly save their lives is an added pressure to get it right. And then there is the desire to properly use the opportunity to present the gospel message clearly.

All this can actually be a fun process, and one that will be a blessing to you and the ones you train. Just as you would prepare for teaching a Sunday school class at church, training someone in the use of the CPU also takes preparation and planning. Many times you will be representing your church, your country, and your God in the demonstration. It's important not to let any of them down with less than your best.

I have broken the manual down into several main topic points that are necessary to cover in every talk and included a sample training transcript at the end that can be used as a guide, or you can come up with your own if you'd like.

It is my hope and prayer that this booklet will be a help to you and many will benefit from your desire to serve our Lord and Savior by helping others less fortunate with the gift of safe drinking water.

Do Your Homework

Probably the most important part is the preparation. If you are traveling to a country that you are unfamiliar with, visit the library or internet and learn all that you can. If you start out badly by not observing some of their cultural customs or dressing improperly, it's sometimes hard to overcome that. Many times they have a history of wars or other serious problems that are important to understand to really be effective in witnessing to them.

It's also likely that you won't be speaking their language. If you are using an interpreter, make sure you practice with him to be at ease with the exchanges. It's always a good idea to at least learn a few greetings or phrases in their language to make them more comfortable with you and to show that you really care.

Also familiarize yourself with the area or church that you will be working with. Find out where their water source is and what they are doing now with their water. What size buckets or storage tanks are they planning on using? Maybe they have tried other water purification methods; find out what went wrong with them. Find out if they have electricity available or a solar panel is needed. Leave nothing to chance.

Don't forget the most important preparation of all: prayer, and lots of it!

Practice, Practice, Practice

In order to teach someone something, you must be very familiar with it yourself. Don't just make some chlorine one time and think you are an expert. Experiment with it! Many times the different water or salt will affect the way it works. Find out how many capfuls of chlorine it takes to treat one of their buckets or how many liters of solution you can make before the battery runs down. It will save you from looking foolish later.

Assume Your Audience Knows Nothing

For us, hooking up to a battery or being careful with a chemical solution like chlorine is second nature. To many in developing countries, it is not. Never worry about being too basic or simplistic in your training. Explaining even the smallest detail, such as installing the battery clamp on the *metal* part of the battery, is necessary. (I had that happen twice) Or, the explanation on which side of the solar panel faces up. Or, even the opening of the toolbox. Sometimes the simple things are confusing to someone unfamiliar with them.

Stress the Need for Chlorine

Half of your work is getting them to recognize the need for disinfecting their water. Sometimes they understand that the water is contaminated and making them sick, many times they don't. I usually tell them about how we used to not understand the need for water disinfection in the US either. For example, in 1907 the life expectancy in the States was 47 years and one of the leading causes of death was dysentery. All that changed since we started using chlorine in our drinking water. Other facts are sometimes useful or I've even used water bacteria tests or a microscope to drive home the point. Many times they can just be asked about their health problems and what they think the problem is. Once they are educated on the need for chlorine, their desire to understand and learn the process is multiplied.

Tailor Your Talk

Your talk will vary greatly depending on your audience. Sometimes it will just be a couple of people, many times it will be the whole community, or it could be just the women. If the group is large it is harder for everyone to see or participate and

thus it will have to be varied somewhat. If it is an unchurched group I also change the way I tie in the gospel message.

Thank Yous and Greetings

It's always correct protocol to thank the audience for coming and to give greetings from the church or sponsoring people back home. It's also important in other countries to recognize the pastor or leaders that helped make the meeting possible and thank whoever is in charge of the meeting place. Keep your introductions and greetings short and to the point.

Add Some Humor

People everywhere enjoy laughing. It clears away a lot of the tensions and helps them realize that you are enjoying what you do. I like to make fun of the fact that I don't have a full head of hair like most of them do, or sometimes trying to pronounce some of the foreign names of communities can be reason for them to laugh at me. Always direct the humor toward your inabilities, not theirs.

Stress Safety

Working with a dangerous and caustic chemical should not be taken lightly. Always stress the safety part of use, storage, and care of chlorine- especially around the children. It's never to be allowed on the skin, in eyes, or taken internally full strength. Batteries can also be explosive if used improperly. Positive and negative terminals are never to be joined together.

Take Your Time

It's important to make the presentation in a timely manner as everyone is sacrificing their time to be present, but don't rush through the training as though you are in a hurry to get out of

there. Time is usually of less importance in other countries and it's vital that they understand something that will change their lives. Take time to answer all questions and concerns. Nothing you have to do elsewhere is of more importance.

Let Them Make Decisions

One of the leading downfalls in mission projects of any kind is to make all the decisions for the people. Even if it's not the best way to do things, if it's not something they want to do, it won't get done. For example they may want to form a water committee to be in charge of making chlorine and distributing it. Fine – if that works for them. Others may want the pastor in charge, or may want to put up a storage tank and just treat the water in it. I usually ask them questions about what their needs are and make suggestions on what I've seen other communities do, but in the end it's their decision on what is best. This also pertains to who is in charge of the equipment. I always stress that it's best to only have one or two people responsible for the equipment or it otherwise results in mayhem, but they pick the people.

Repeat Yourself

It's a fact that we retain information better if we hear it more than once, and this is no different. Add in the realization that you will most likely be working with several illiterate people and it becomes mandatory to repeat the information several times to make sure it's sinking in. Leaving written instructions doesn't cut it.

Make Them Do It

I've watched my wife knit several things, but I still wouldn't have a clue how to do it myself. They are the same way. After they have watched you make chlorine, <u>always</u> have them do it themselves until they are comfortable with it.

Keep It Simple

It's not necessary for them to have an understanding of chemistry basics to know how to make chlorine. The CPU is intentionally designed as a very simple device- keep it that way. This also applies to the chlorine tester. This is probably the most complicated part of the whole training session. I make sure they understand the chlorine making process before and if I go into the testing part. I say if because many times I will not teach this part. If the community is only going to treat a storage tank every week that holds 1500 gallons and I know that 1 liter of chlorine solution is sufficient to do that, that is all I tell them. No use confusing the matter. Or, if they are all treating 5 gallon buckets of water in their houses for drinking and it takes 2 capfuls of solution to bring the chlorine to a safe level, that's all they need to know. If the testing is too confusing for them, many times they won't feel comfortable even trying to use the CPU. Or sometimes they will get confused and think that the solution itself must be tested, or that you can make the test several hours later when the chlorine has already done its job and evaporated. I've even had them be worried about running out of the test chemical and afraid to use it. So, if this part can be safely eliminated, do it. If not, make sure you teach it well.

Ask & Take Questions

By this I don't mean asking, "Does everyone understand it OK?" Most people in other cultures want to please you and make you feel that you did a good job and they will always answer "Yes", even when that's not the case. Ask questions such as, "How long do you wait before drinking the treated water?" or "When do you recharge the battery?" or "How much chlorine solution is needed in one of your buckets?" Drill them until you are positive they have understood everything perfectly. Then, open it up for them to ask questions.

Prayer, Presentation, Gospel Message

Sometime during the training or at the end, always make them aware of why you are helping them with their water needs. Let them know that your desire to live a Christ-like life drives you to serve others. A bit of testimony or a clear presentation of the Gospel is important to share. I'm not going to go into how to do that in this booklet, there are many excellent resources if you are unsure of how to do this. Usually it's best to just share from your heart how you feel or what God has done for you.

I also like to close with a prayer and blessing of the equipment and the people of the community. Then we usually do a formal presentation of the chlorination equipment to the community and take some pictures. Many times I share with them that the pictures are to show to the people back home that are praying for them and that donated the money to make it possible to come and give the chlorinator as a free gift. This can be used as a lead in to share how Christ has also given us a free gift of salvation that we could never afford.

It's common for a spokesperson of the village to give a thank you speech. Many times it's difficult for the very poor to accept a free gift of this size because they have nothing to offer in return. Accept their thank you graciously and let them know that that is more than enough and the blessing you received is sufficient. And you know what? It always is! Jesus says that whatever you do for the least of these, you do it unto me. (Matt 25:45)

Sample Training Transcript

Good morning! Thanks so much for coming to this meeting. I know that many of you had to travel a great distance to get here. I did also. I came all the way from the United States to share with you today. I also want to thank your pastor for allowing us to use the church building and leading us in an opening prayer.

Water is such an important part of our life. It sustains us and cleanses our body of impurities. But if the water is contaminated, it can also be a source of sickness and death. How many of you have had problems with worms, diarrhea, or other water related diseases? Did you know that 80% of all illnesses are because of unsafe water? Having water that is unsafe to drink is not something that is only a problem in your wonderful country. One fifth of the world has contaminated water problems. You see, it's easy for water to be full of harmful bacteria that we can't see, simply by dust, animals, and fecal material.

Even the US used to have problems with this. 100 years ago our life expectancy was 47 years and one of the leading causes of death was dysentery. All that changed when we started treating our drinking water with chlorine. Chlorine is a very safe, fast method of killing the bacteria and parasites in the water, but sometimes it can be expensive or hard to come by. But what if we could just make our own out of salt? I'm going to show you that we can with this little machine we have with us. Now this process isn't really new, God knew about it in 2 Kings 2:19-22. (Read the verse) But instead of using God's supernatural power to change the salt to a chlorine solution, we will use 12 volts. Any 12 volt battery will work. You can use the battery of a car or tractor if something should happen to this one. Even a 12 volt battery charger will work if you have electricity.

First, we take the cup of salt and mix it in with this bottle of water. This 5 oz bottle is for the demonstration, but any size can

be used. You only have to mix in more salt in proportion to the water if a larger size bottle is used. It's like a recipe for bread, if you want to make more loaves, you mix in more of the same ingredients. Now, it's important to mix the salt and water very well. You can shake the bottle, or you can put it in your pants pocket and do a dance if you prefer. (I make a big show out of doing this, which never fails to get a good laugh. And they always remember it.) Next, you hook the machine up to the battery. Always connect the positive to positive, or red to red, and the negative to negative, or black to black. Make sure you have a good connection of metal to metal with the side the wire is on. Be careful not to arc between the battery terminals.

Next, the salt water solution is simply poured through the machine into the bottle below. Each time it passes through, the chlorine solution gets a little bit stronger. After 5 or 6 times through, it's about as strong as it will get. Always notice the bubbling action and the smell when pouring it through. If there are no bubbles or boiling sound, the connection is bad or the battery is dead. A little smoke and heat from the process is normal.

After we have passed the water through 5 times, we then disconnect the wires and pour a little bit of clean water through to wash out the machine. Be very careful not to get any fluid on the wire ends as the chlorine will corrode them.

We have just made a bottle of chlorine solution that is capable of disinfecting about 200 gallons of water. (I pass around the bottle for them to smell.) About 10 drops in a gallon of water or 2 capfuls in a 5-gallon bucket is usually enough to kill all the harmful bacteria and make your water safe to drink. However, the water must sit for an hour after the chlorine has been added to make sure it has time to work. After the water has been disinfected, if it is kept in a container with a top on it, it will always be safe. You don't need to retreat it unless more water is added.

I know what some of you are thinking, "I've tasted water with chlorine or bleach in it, and I don't like the taste." That is true with most chlorine, but this is different. This solution has very little taste or smell to it after it has been put into the water. Be aware though that it has been transformed into a caustic chemical that can be very dangerous. It needs to be kept in a special marked bottle and out of the reach of children. It should never be taken internally full strength or allowed into contact with the eyes or skin. It also loses its strength over a period of time, so it's best to use it or replace it on a weekly basis.

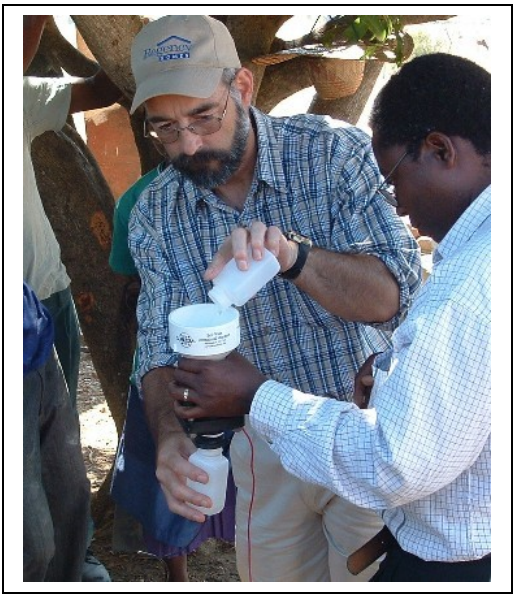
After you've made several containers of chlorine solution, the battery will need to be recharged. (If they have a battery pack with an indicator, the use of this is then explained.) If you do not have electricity, the best way to do this is with a solar panel. When the solar panel wires are connected to the battery, and the panel is placed in the full sun, the battery can be recharged in about 4-6 hours. It doesn't hurt anything if it is left on longer than that. It's usually best to place the panel in a safe place up on the roof, but always keep the battery inside out of the sun.

When not using the equipment, make sure it's kept in its storage box and safe from children and animals. Do you think this machine would be something that would be beneficial to your community? Do you have any questions? I'm going to see how well you were paying attention and have 2 people come up and make some chlorine. You can decide who should do it. (After this is done, if it's necessary to teach them about the chlorine tester, I move into that area of training.) Example: Sometimes you may be using different sizes of containers and not sure of how much chlorine is necessary. For that we have a chlorine tester. Immediately after the chlorine has been added to the water, a test can be made of the strength of the chlorine. You simply fill the tube of the tester with the treated water, add one drop of the chlorine indicator chemical, and then shake it to mix it. If a strong yellow color is shown (2 to 3 ppm), it is good. If it

is just barely yellow, more chlorine should be added. If it is an orange color, too much chlorine is present and more water should be added or you must wait several hours for the chlorine to dissipate. Once you've found the formula for the proper amount of chlorine needed to safely disinfect your water container, you need not test it every time. It should be the same formula every time. The test is only to discover the correct formula. (Some water may have more organic matter or other conditions can change, so it is a good idea to always make sure you help them with the correct formula. Again, make sure they do it.) (At this point I question them on everything I've covered.)

Now I know that this equipment is something that would be difficult for you to pay for. But I have good news- you don't have to. Some Christian brothers and sisters have paid the price of this machine so that you can enjoy the gift of safe water. Isn't that wonderful! I have some more wonderful news. There is another free gift that has been given to you that is even more valuable. That is the free gift of eternal life that God has given us through his Son, Jesus Christ. You see, even though the chlorinator will help you be healthier, save you medical bills, and maybe even save your life; you will eventually die someday. All of us will. But God has made it possible for us to live with Him eternally forever in heaven. All we have to do is accept this gift and turn over our lives to Him and do our best to change and live for Him. Is there anyone who wants to make that decision? (From this point, you can vary the talk, go into a testimony, or whatever you feel the spirit is leading you to do.)

In closing, I would like to let you know that many people are praying for you and would like to have some pictures showing us presenting the equipment to the community, if that would be OK. I would also like to again thank you for your hospitality and want to have a prayer of dedication and blessing over the community and your new water equipment before we leave.



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Philippians 2:3-5 *Do nothing out of selfish ambition or vain conceit, but in humility consider others better than yourselves. Each of you should look not only to your own interests, but also to the interests of others. Your attitude should be the same as that of Christ Jesus.*

Notes