Shotcrete Hose/ System Cleanout Safety

By Carl Baur

I am writing this article to reinforce to the members of wet- or dry-process shotcrete crews that the cleanout process can be very dangerous. There are a few precautions to be taken to ensure safety during cleaning of hoses in shotcrete systems. This is a reminder to take every precaution to be safe, because even some everyday practices can be deadly.

In this past year, I personally knew several people who sustained head injuries requiring hospital treatment. As a result, these individuals have potentially chronic health problems stemming from poor practice. In most cases, it takes at least two crew members to clean out the shotcrete hose. One person controls some source of energy to clean out the hose and the other person controls the end of the hose. The person controlling the source of energy, whether it may be a pump, compressed air, or water, should never allow a person to simply hold the hose during the cleanout process. I have seen large men thrown around like a rag doll by a hose being cleaned out with air pressure. Some of the comments were, "I thought I was tough enough to hold on to a 2 in. (50 mm) shotcrete hose with 120 psi (0.8 MPa) of air and a 700 ft^3/min (340 m^3/h) compressor pushing air through a hose 200 ft (60 m) long." Another comment was, "Just wanted to break the new guy in," or "Let's see how far we can shoot the ball." These comments demonstrate irresponsible actions that could get a crew member severely hurt at some point.

The best way to clean out a shotcrete hose is to have a crew member secure the hose to a solid object and then clear all persons from the area when performing the cleanout. When cleaning out a long-distance system without the crew members able to see one another, some sort of communication is a must; radio contact is the most common. If a 2 in. (50 mm) hose has even a small amount of water in the shotcrete hose and air is then applied to it, the hose will whip violently around even though there is no shotcrete material remaining in the hose. As a result of the potential whipping action, it is important to have the area cleared of all persons.

The following are a few suggestions or ideas you may want to implement in your cleanout procedures.

Best Practice for Cleanout

- Use low-pressure water whenever possible, as it's the safest option.
- Always strap or chain the hose to a solid object; never have a person hold the hose during cleanout.
- Clean hose into a secure, solid container of some sort (Fig. 1 and 2).
- Use a catching device for ball or bullet type, as shown in Fig. 3.
- Have a cleanout plan established before you start your pumping/shooting, including:
  a) Where cleanout will take place; and
  b) What will hold the cleaned-out material; for example, hopper, trash bin, or super sack tote.
- Have all cleanout supplies needed—such as foam balls, adapters to hook up to water fitting, and header to water/air fitting with bleed-offs to safely bleed pressure off (Fig. 4)—including devices to hold the hose, such as straps or chains.

Fig. 1

Fig. 2

A crew member is irreplaceable; the cost of a hose or system replacement is affordable. Irresponsible actions are not worth getting a crew member hurt or seriously injured.

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Fig. 3

Fig. 4