

Dr Christina Baxter, of [Emergencyresponsetips.com](http://Emergencyresponsetips.com), offers helpful advice for first responders. This issue is fourth generation agents.

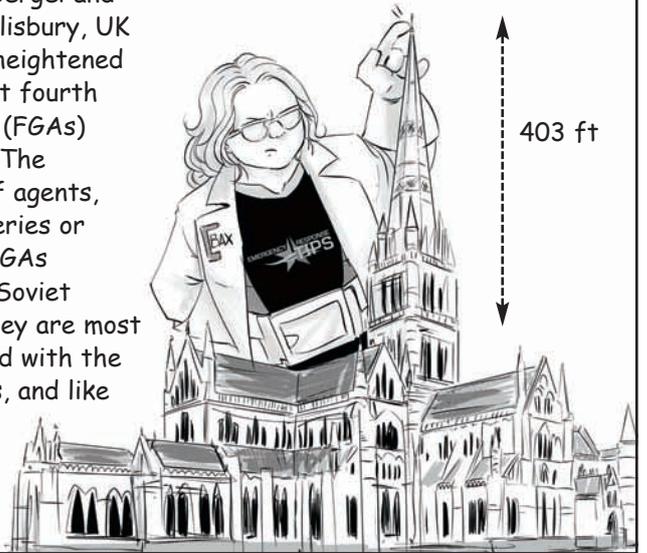
# Keeping you safe!

The column is intended to provide operational guidance to the hazmat/ CBRNE community regarding the selection and

performance of equipment and tactics. This time around, we are focussing on emergency response to fourth generation agents.



The poisoning of Sergei and Yulia Skripal in Salisbury, UK on 4 March 2018 heightened the concerns about fourth generation agents (FGAs) around the world. The Novichok series of agents, also known as A-series or 'newcomers', are FGAs developed by the Soviet regime in 1971. They are most strongly associated with the V-series of agents, and like the V-series the FGAs are liquids with low vapour pressure.



### Toxicology

As happened in the UK, it is likely that the first knowledge of an event involving FGAs will be from the medical community treating a patient. Early indications will probably lead the first responders to synthetic opioid exposure or organo-phosphate exposure as the causative agent due to the presence of pinpoint pupils and excessive salivation. Until those patients are transported to a medical establishment and undergo continuous treatment, it is unlikely that an A-series threat would be determined.

FGAs are predominantly dermal hazards but can also be absorbed into the body via mucous membranes, inhalation and ingestion. Sergei Skripal, Yulia Skripal and Charlie Rowley were likely exposed to the agent via dermal contact resulting in delayed symptoms and a higher lethal dose (1mg) whereas Dawn Sturgess was more likely exposed to the agent as an aerosol via inhalation resulting in the fast onset of symptoms and a lower lethal dose (low to mid mcg).

### 4GA vs zombie-ism:



- Drool
- Pin point pupils
- Bad smell
- No heart beat

### Detection

Field detection of the FGAs at levels of toxicological interest (ng) is accomplished using flame spectrophotometry while unique identification is accomplished using gas chromatography mass spectrometry or high-pressure mass spectrometry devices. Other technologies such as Raman, FTIR, and colorimetric can be used for detection and identification of larger sample volumes (high mcg to mg).



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**Protection**

Due to the information available about the persistence of the A-series agents and their ability to permeate through the skin, the US government recommends the use of NFPA 1991 vapour protective ensembles or NFPA 1994 class 1 and class 2 ensembles for initial entries. Operationally, the NFPA 1994 garments are a better choice as the totally encapsulating NFPA 1991 garments are known to have physical restrictions in movement, hand function, hearing and loss of comfort associated with them. Once the detection and identification devices confirm the threat identity, NFPA 1994 class 3 ensembles can also be employed. If not utilising protective equipment certified against the NFPA standards, be sure to use chemical resistant butyl rubber gloves that are at least 14mm thick.



**Decontamination**

One of the major concerns with FGAs is their persistence in the environment and, specifically, in water. When decontaminating both people and equipment, a hybrid decontamination approach is recommended. For skin, whether human or animal, first blot the affected area with an absorbent material, being careful to not apply pressure. Next, remove any affected clothing. Finally, wash the affected area of the skin with soap and water. Avoid contact with the wash water as the FGAs are not degraded by water.

When decontaminating protective clothing or equipment, first blot any residual material that is observed, then apply an appropriate decontaminant, followed by rinsing or the removal of the decontaminant. It is imperative with highly toxic threats such as FGAs that continuous detection and identification are used to ensure complete degradation of the threat materials. Do not be surprised if you have to apply the decontaminant multiple times as the FGAs are not easily destroyed.

Most importantly, if you have reason to believe that an FGA has been deployed, it is always best to call upon your specialised assets at local, state, federal, or international level to deal with the incident.



Until next time,



**CBax away!**

Images are courtesy of Phil Buckenham  
<https://philbuckenhamart.wixsite.com/philbuckenham>

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