BrigGen (ret'd) Ioannis Galatas, MD, MA, MC (Army)

Do you think it is easy because it is anticipated?

Athens 2016

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In almost all CBRNE threat analysis' we usually discriminate between a "single" attack against a given target during a mega event (anticipated) and "multiple" attacks against various places/targets in a city hosting a mega event (random/non-anticipated). In both settings, one or more CR agents can be released with or without explosives (CR[E]). Usually we consider the anticipated attack as the best case (worst) scenario mainly because if the target is known then we can deploy our response forces according to our detailed and in depth plans. But is reality consistent with this mindset? This paper will try to show that the anticipated scenario is the most difficult one to handle and share some proposals that might help cope with the operational picture and consequences' management.

Case study

It is important to remember that a universal "one-size-fits-all" CBRNE response scenario does not exist. Each target has its own peculiarities and basic principles should be tailored to fit each target. Case study chosen is related to the coming Rio2016 Olympic Games mainly because this is the coming mega event and 2015 is the year to finalize the preparatory phase in all security issues (first 6 months of 2016 would be the testing period before the actual opening of the Games [05-21 August]). Both opening and closing ceremonies will be conducted at the **Maracanã Stadium** in **Rio de Janeiro, Brazil.**

The stadium

Maracanã **(**Estádio Jornalista Mário Filho**)** stadium is a 3-story football stadium (build in 1950) that was partially rebuilt in preparation for the 2013 FIFA Confederations Cup, and the 2014 World Cup, where the final of the latter competition was held. Its dimensions are 298 x 260 m (field size: 105 x 68 m). The stadium is part of a complex that includes an arena (Figure 1) known by the name of *Maracanãzinho*, which means "the Little Maracanã" in Portuguese. It has a capacity of 78,838 spectators.

Fig 1 – Maracanãzinho Arena

The original stadium's roof in concrete was removed and replaced with a fiberglass tensioned membrane coated with polytetrafluoroethylene. The new roof covers 95% of the seats inside the stadium, unlike the former design, where protection was only afforded to some seats in the upper ring and the bleachers above the gate access of each sector (Figure 2). Fans are placed close to the performance on the pitch

at a distance of 14.4m from players. Under FIFA regulations the stadium requires 14,000 parking spaces. Almost 1,000 parking spaces have been constructed at the stadium. The remaining spaces are provided in adjacent areas, including the State University of Rio de Janeiro (UERJ), military colleges and army land.

Maracanã stadium in February 2009, showing the two-tier configuration and concrete roof

Maracanã stadium in 2014,

Fig 2 – Maracanã's new roof

http://en.wikipedia.org/wiki/Maracan%C3%A3_Stadium

The stadium has four main entrances/exits (Figure 3) and two trunks (Figure 4) leading to floors 1-3.

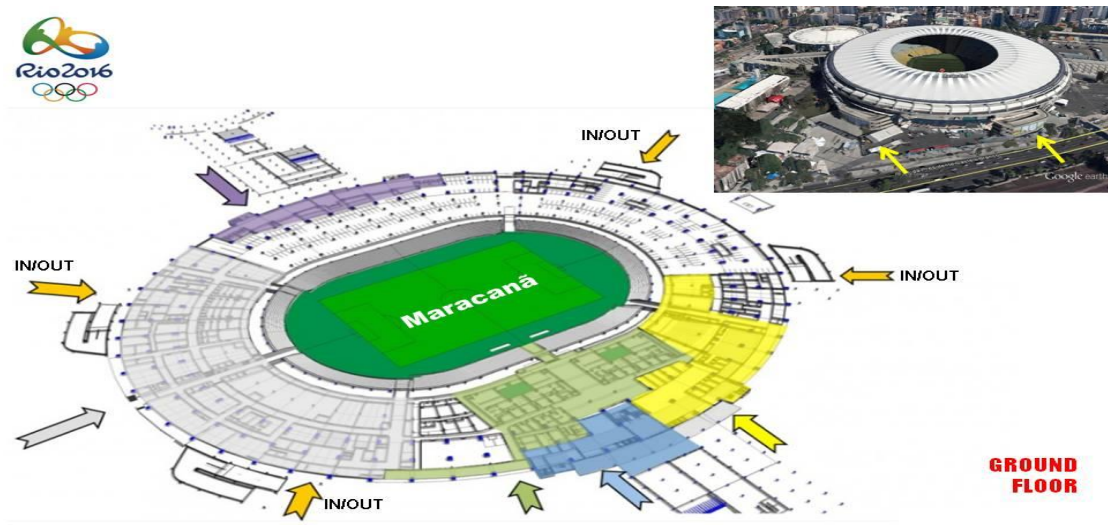

Fig 3 – Ground floor

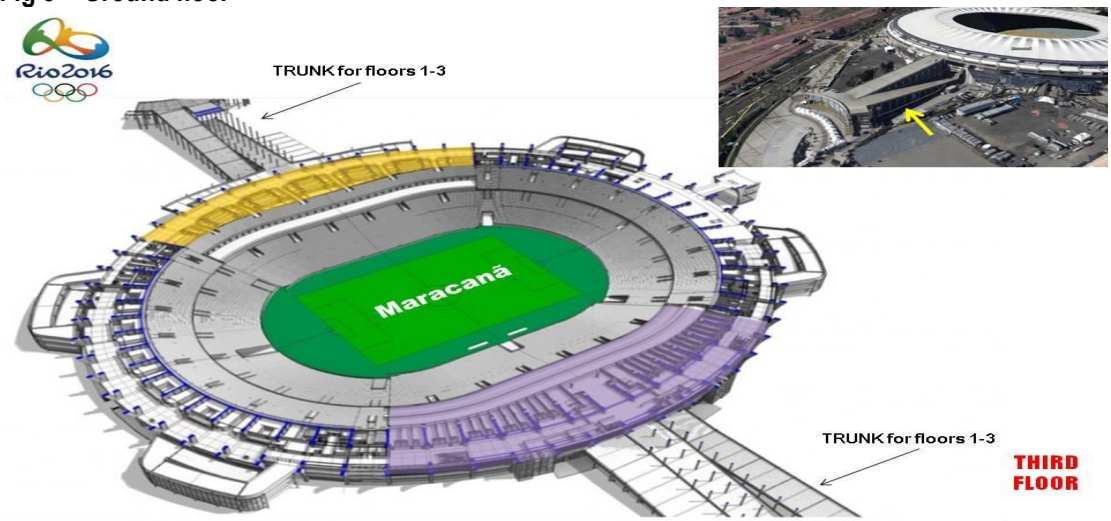

Fig 4 – Third floor

The stadium is adjacent to a highway (one side – yellow arrow) while surrounded by urban web in all other three sides (Figure 5).

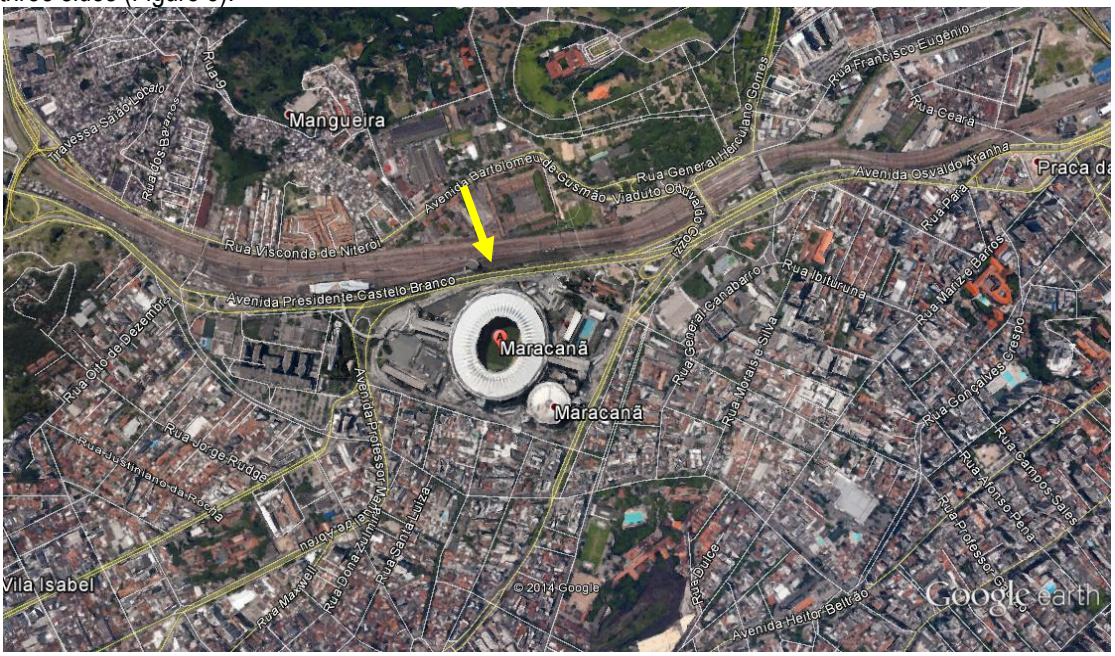

Fig 5 – Maracanã's aerial view

The mega event

Rio 2016 Summer Olympic Games is expected to attract 10,500 athletes from 205 countries that will compete in 34 venues in four regions (Figure 6) of Rio (Deodoro [9 events]; Maracanã [5 events]; Barra [14 events] and Copacabana [5 events]). Four co-host cities will host the Olympic football tournament (Bello Horizonte; Brasilia; Salvador and São Paulo). Billions of spectators are expected to watch the Games from television and follow its progress via mass media and Internet.

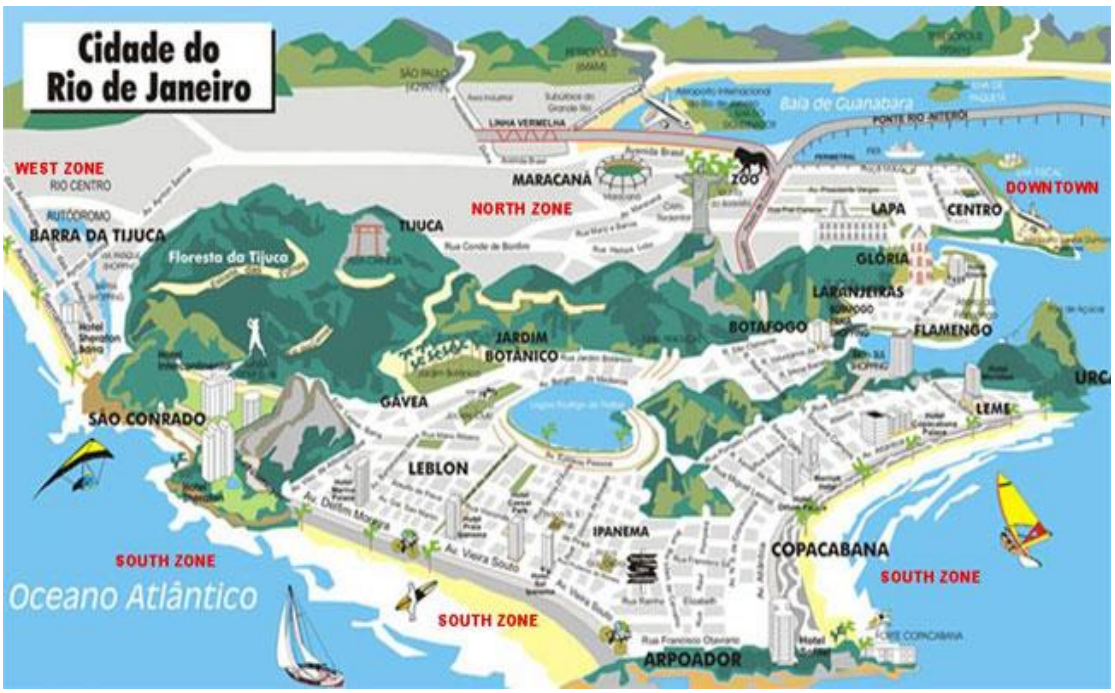

Fig 6 – Rio's venues (http://www.gopixpic.com/640/olympic-venues-mapjpg)

Following the Olympiad the 2016 Paralympic Games will start in September (07-18) and 4,350 athletes from 176 countries will participate distributed in 21 competition venues.

Agent to be released

The agent used at the Tokyo subway incident – sarin in gel form – was chosen for the case study mainly because it can be released without an explosion. An explosion of small impact (or a fireworks' barrage along with some typical "Allahu Akbar" screams) can be a tremendous add-on to the overall chaotic situation expected with sarin release in a crowded setting. Instead of sarin, a RED (Radiation Emitting Device) setting can be used either alone or in combination with the deadly chemical.

Areas to be released

Usual scenarios involving spraying the stadium from a light airplane with a deadly chemical are in general considered as non applicable. Besides the new roof is not suitable for this compared with wide open air stadiums.

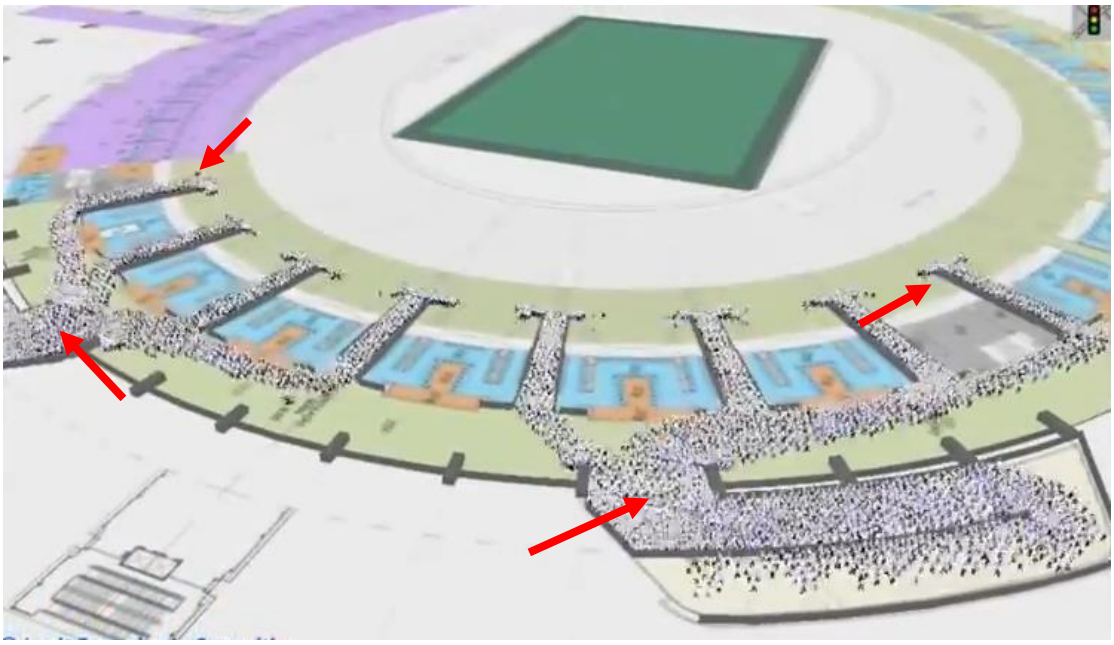

Fig 7 – Evacuation of Maracanã – red arrows indicate the sites where sarin was released

In present case study the chemical agent's dispersal will take advantage of the crowded chocking points (exits and trunks – Figure 7) during the departure of the spectators after the end of the opening (preferably)/closing ceremony. Spectators will step on the agent (in plastic bags on the floor of multiple locations) while running for the exits due to the explosion heard and the organizers' notifications to evacuate the stadium. A huge stampede is expecting to happen resulting in additional "crash victims" in huge analogies.

Watch the simulation of evacuation in the following videos (sources of Figure 7):

- https://www.youtube.com/watch?v=gpJ6HgasRz8
- https://www.youtube.com/watch?v=xY-LrpWLT2o

Overall operational picture following the attack

Spectators

A human stream of approximately 80,000 people will come out from the stadium. Many will be contaminated; others will be injured (+ contaminated); a number of them will be left behind (killed or severely wounded and/or contaminated). And all these people will come out of the stadium trying to save their souls.

Response force

Before the beginning of the ceremony, state's response forces are set in place according to the plans authorized by the IOC and national authorities. Planning speculations (because safety/security plans are "top secrets" in all mega events) might include the following:

- Traffic ban/control (no car area; traffic deviations; free emergency lanes to nearest hospitals; etc) in the North Zone (Figure 6);
- Deployment of First Responders (both conventional and CBRNE/HAZMAT) around the stadium;
- Deployment of decontamination facilities around the stadium;
- Most of the specialized First Responders in MOPP3 (full PPE with gas mask on hand) or MOPP4 mode (full PPE);
- Big number of ambulances in stand-by status (big compared to a usual football final match);
- Additional medical trucks with support equipment;
- Extra deployment of fire service with a variety of engines around the stadium;
- Pre-set assembly points for rescue vehicles and additional mass transportation means;
- Incident command vehicles with sat communications etc;
- Notification of hospitals in close proximity to the event;
- Armed Forces set in alarm status (before-during-after the ceremony)

The big question
What we (the response force located just outside the stadium) can do to halt/control the contaminated human stream?

Related response mode
In a scenario of this magnitude it is obvious that "no plan stands contact with the enemy!" If this is the case then Plan B has to be executed. In this plan we have to automatically restructure our resources and act accordingly (and **in parallel**) within a 15min window (max):

- Create extensive wet decontamination corridors with fire engines ("water curtains" delivering water with high volume/low pressure [60psi]) in all exits of the stadium. Practically wind direction plays no significant role in a situation like this one. The main objective is to wash ALL people coming out of the stadium.
- Withdraw our forces ~500m backwards (to create enough operational space) and regroup organizing "undressing" and "fast triage" teams. Ambulatory victims are gathered into certain areas while those in a more severe condition (but still walking) are directed to First Aid stations.
- Stop the function of field fans and air-conditioning of confined spaces.
- Activate roof fire extinguishing systems.
- Block entrances to stadium's parking lot and stop the operation of the nearby subway station.
- Notify ALL hospitals in Rio about the event.
- Instruct populace in the nearby residential areas (1km radius) to stay at home in combination with restriction of movement for a preset period of time (hours).
- Order the CBRNE responders in proper PPE (Level-A to enter the stadium and make an initial assessment of the premises while conducting: (1) search for secondary IEDs aiming First Responders; (2) sampling and detection; (3) collect forensic evidence) to enter the stadium.
- Initiate the crisis management and communication management plans.

Problems identified
These are only a few response measures to activate if Plan A is not applicable. The major problem is that we usually we do not have a Plan B. And even if we have it in papers we do not test it in real or realistic drills during the preparatory phase. In a chaotic environment it is very easy (not to say excused) to lose control of our people and resources and this would be catastrophic! It takes a genius leader to take over but these people are rare or not existing at all. The only solution is testing not any all worst case scenarios but also to test different and mutable environments that will provide the necessary expertise and familiarize with unexpected situations threatening human lives. Unfortunately this is not done due to lack of imagination, funding, asymmetric way of thinking and lack of the cinematographic magnitude these non conventional attacks might bring into surface.
On practical level, the scenario reveals that traditional inflated decontamination tents are not suitable for immediate relocation (Plan B). Decontamination containers on tracks or trailers should be preferred instead.

Big portion of the problems identified in all state CBRNE response plans is attributed to planning process and planners themselves. An emergency response plan is a plan of action for the efficient deployment and coordination of services, agencies and personnel to provide the earliest possible response to an emergency. One or more planners are needed to design the plan and test its effectiveness. In that respect planners must have an in depth knowledge of all the aspects of the hazards they are planning against and this knowledge should be both theoretical and operational. Unfortunately in most cases one of these parameters overweighs the other resulting in plans and directives not compatible with real operations (especially when no relevant experience exists worldwide – e.g. a CBRNE attack during a mega event). The easy solution to "copy-and-paste" plans of the past (i.e. previous Olympic Games security response plans) with a touch of innovative technology of the present is not a clever way to deliver plans that one day might be used to save lives.

Hospitals' CBRNE preparedness was intentionally not mentioned herein since it is considered an unsolved problem that follows almost all mega events and I do not want to repeat myself. New emerging threats' content is mainly a medical/health issue and should be addressed accordingly instead of focusing on just the operational part of a CBRNE attack lasting a few hours. Medical consequences will last for days, weeks, months or even years – something to keep in mind!

Conclusions

Despite the short description of the case study and response (in which certain "details" were deliberately not mentioned) it is obvious that it is not wise to consider the "anticipated" CBRNE attack as the best case scenario compared with other possible "non-anticipated" targets in mass gathering places or "surprise" multiple incidents in various parts of a mega event hosting megapolis or a co-host city. The purpose of this article is just to ring a bell to all experts involved in CBRNE planning around the globe. The motivation behind this article arose after persistent Googling trying to collect information on CBRNE-related preparation for the coming Olympics. Only a handful of articles (mostly outdated) were uploaded and this was quite disturbing – not to say worrying. .

Only 18 months separate us from the opening ceremony of the 2016 Olympic Games. Time is not enough if proper work has not been done so far; but assuming that everything is normally progressing, this period (2015 – first semester of 2016) is enough to add some "sci-fi" scenarios even for the sake of it. If we stick on "tradition" we will end up like the boxer who keeps on "training" for years but never experienced a real punch in the face!

Brigadier General (ret'd) Ioannis Galatas, MD, MA (Army MC), is a retired military physician with 35 years military industry experience. His is specialized in Allergy and Clinical Immunology (Board certified) and for more than two decades he served as Head of the Department of Allergy & Clinical Immunology at Army General Hospital of Athens, Greece.

Since 2001 he has been involved in CBRNE operations as planner and instructor trained (including live agent training) in a number of countries abroad. His main passion is "Hospitals' CBRN Defense & Preparedness in Megapolis Environment" and "CBRNE Design/Hardening of Critical Infrastructure" [airports, shopping malls, hotels etc]. During the 2004 Athens' Olympic Games, he served as Commandant of the Olympic Hospital CBRN Response Unit – the only hospital-based specialized unit (70 people) deployed for the Games.

He holds a Master degree (with merits) on "International Terrorism, Organized Crime and Global Security" from Coventry University, UK (2010) and he is a PhD candidate since May 2012 (Athens Medical School/Dept of Forensics & Toxicology).

His last appointment (as of August 2010), was as Head of the Department of Asymmetric Threats at the Intelligence Analysis Branch, Joint Military Intelligence Service of the Hellenic National Defense General Staff in Athens, Greece.

Currently he is the Editor-in-Chief of the monthly on-line "CBRNE Terrorism Newsletter" initiated in November 2005 and delivered freely to CBRNE-CT First Responders of more than 80 countries around the globe. He is also a Research Associate at "Center for Security Studies" (KEMEA), Athens, Greece. As of Jan 2015 he will deliver classes at the University of Rome "Tor Vergata" for their International CBRNe Master program (NATO/OPCW certified).

Web: www.cbrne-terrorism-newsletter.com I **Contact e-mail:** igalatas@yahoo.com