



# **GALAXY SERPENT**

## **National Nuclear Forensics Library Virtual Tabletop Exercise**



A Nuclear Forensics International  
Technical Working Group exercise, sponsored  
by the United States Department of State

## ABOUT GALAXY SERPENT

Galaxy Serpent is a series of virtual table-top exercises, in which teams from around the world use public domain or exercise data characterizing nuclear or other radioactive material to exercise the development of a national nuclear forensics library (NNFL) and understand its benefits. During the exercise, each team is provided data to develop a model NNFL, which they then utilize to determine whether hypothetical material is consistent with their NNFL.

Galaxy Serpent helps raise international awareness about the technical challenges associated with developing NNFLs and how they are used to support investigations of criminal and/or illicit activity involving nuclear or other radioactive material. The virtual format provides flexibility and helps eliminate sensitivities

associated with using national data. It also allows participants to exercise national interpretational capabilities outside of a lab, focusing instead on how to develop an NNFL, assess technical skills, and engage a diverse set of experts.

Galaxy Serpent promotes best practices by providing an opportunity for participants to share experience and to gather technical expertise in nuclear forensics interpretation—supported by combining subject matter expertise with information and data available through NNFLs. The U.S. Department of State manages and provides funding for Galaxy Serpent exercises, which are conducted through the Nuclear Forensics International Technical Working Group (ITWG). The two previous exercises have involved experts from over 30 countries and international organizations.

## NATIONAL NUCLEAR FORENSICS LIBRARIES

National nuclear forensics libraries contain key nuclear material characteristics and support nuclear forensic assessments, allowing a country to utilize the NNFL in association with other data (such as regulatory data) to more effectively determine whether material discovered out of regulatory control is consistent with its national holdings. They are an important component of nuclear forensics as a tool to promote nuclear security and can support law enforcement investigations and legal proceedings.

The responsibility for establishing and maintaining a NNFL rests with the State. A mature NNFL will fully reflect the size and complexity of a country's material holdings. Establishing a library does not oblige a country to share its information, and the library remains entirely under national control.

“**The exercise was extremely valuable both in supporting the discussion of nuclear forensics technical methodologies with others participants, and informing the development of our own NNFL.**”

—Galaxy Serpent exercise participant

## WHAT DO GALAXY SERPENT PARTICIPANTS GAIN?

Participating teams have used the exercises to advance a variety of objectives, including:



**Informing or motivating the development of a National Nuclear Forensic Library**



**Developing the pool of subject matter experts who are familiar with nuclear forensics**



**Testing and preparing to implement best practices**



**Strengthening interagency/inter-ministerial coordination and cooperation**



**Sharing methodologies and techniques among the international community of nuclear forensics experts**



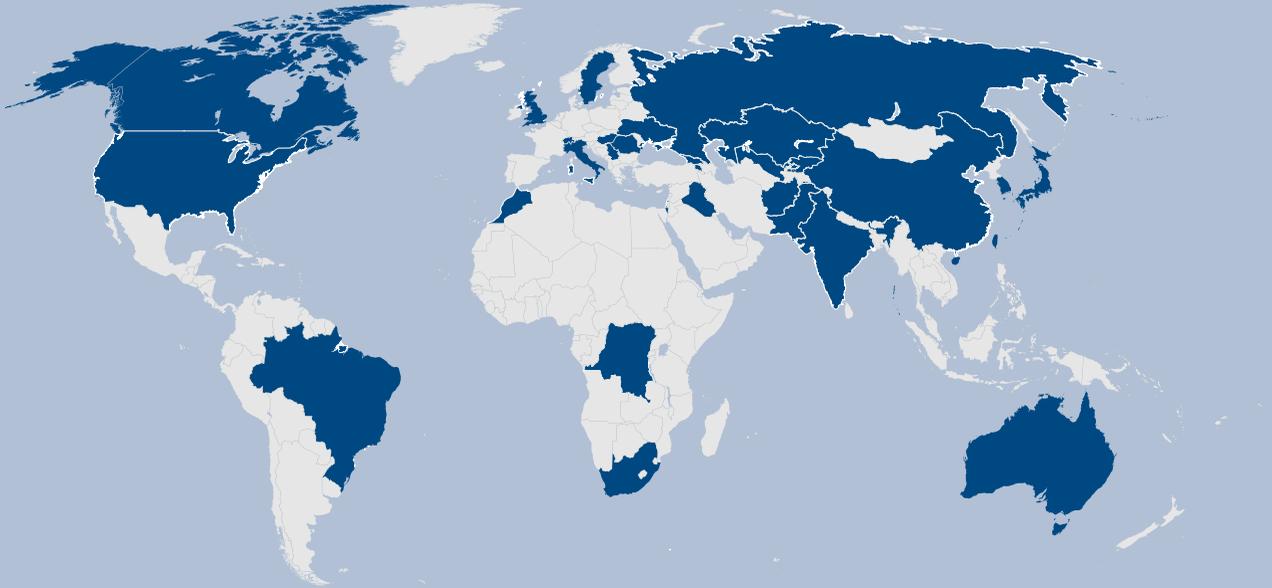
**Providing an opportunity for professional advancement and a training tool for established and emerging nuclear forensics experts**

Galaxy Serpent exercises challenge interpretational capabilities, promote the optimal use of available information, and expand expert communities by drawing on wide ranging skill sets. During play many teams draw in other experts, such as statisticians, nuclear reactor engineers,

and scientists whose involvement helps to develop the range of expertise in the nuclear forensics community. Galaxy Serpent participants have drawn from their experience in the exercises to inform their efforts to develop or refine their home countries' NNFL.



Experts from over 30 countries and international organizations have taken part in the Galaxy Serpent exercises.



## WHO SHOULD PARTICIPATE IN GALAXY SERPENT?

Participation in Galaxy Serpent is open to all States, organizations, and individuals that are recognized by competent national or international authorities with an interest in technical nuclear forensics and are participants of the ITWG. If you are an experienced or emerging nuclear forensics expert who does not yet participate in the ITWG, please go to [www.nf-itwg.org](http://www.nf-itwg.org) to learn how to participate. Multiple teams from the same country are welcome to take part in the web-based exercise.

## HOW TO GET INVOLVED

For more information about Galaxy Serpent, send email to [Galaxyserpent.itwg@gmail.com](mailto:Galaxyserpent.itwg@gmail.com)

*[Published November, 2016]*

