

## **The Path towards Strengthened Safeguards: Experiences in Iraq, South Africa, and North Korea**

This video series is a collection of dialogues centered on the immense role played by the IAEA, and in particular how the Agency supports nuclear nonproliferation through the practice of safeguards. This current update is a chronicle of events during the 1990s, Iraq, South Africa, and North Korea, that led to the development of the Additional Protocol.

### **7.14 Satellite Imagery<sup>1</sup>**

**Keywords: ddvantages of satellite imagery, verification of completeness**

Jacques: A technology that I've not mentioned yet, that we used in Iraq, is overhead imagery. Through the 90's, we benefited from these high altitude plane, so called U2, that provided the overhead assistance to the inspection activities in Iraq. It was something of tremendous help, because even going to a site where we have been before, we could have visited the site, and we prepared the inspection ahead of time based on satellite imagery. On an overhead imagery.

Thanks to the progress of the technology, at the end of the 1990's - actually we got the first sample at the end of 1999 -commercial satellite imagery became available. High resolution imagery, and what I mean by that, is resolution that is 1 meter. Because if you start to get satellite imagery which is 1 meter or ½ a meter, you have the capability to understand the potential of a site and of an infrastructure to support some activities that could be nuclear relevant. So today imagery has become a key component of safeguards, of information driven safeguards. I would say that no inspector would in some future, I'm not saying it's already done, simply because we don't have the resources to accumulate from a financial standpoint all the images, and recent images that we would like to for all facilities worldwide, nor do we have the capability to do the analysis, but through time, we are building these basis. So that any facility could be virtually visited by an inspector before he or she went out on inspection.

So the coherent picture can be challenged by all the other technical means. I mentioned Environmental Sampling for instance. And there could be input from so called 3<sup>rd</sup> party sources. Maybe I need to come back on that with what I said earlier. The Agency benefited from 3<sup>rd</sup> party information, but that was something that was very well structured. The Agency, for any matter, talks to missions in Vienna, and this transfer of knowledge from a state, knowledge acquired from national technical or human means, would then be provided to, for Iraq was to the DG, the head of the Action Team, and then when there was the need for specific technical knowledge, then the team members having the need for the knowledge would benefit from the briefings. That's something that worked very well. Sensitive information was always handled on a need to know basis. But the need to know also translated into the need to share. The need to translate something that could have been ... information with sensitivity about the source, into information that could be shared with the right people, so that the right actions could be taken. There is no point for a system receiving information if it is not translated into actions through the adequate processing of it.

Rich: But I think an important point is that much of the information as time went along that came to the Agency came as a request of the Agency, not the other way around.

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<sup>1</sup> <http://isis-online.org/isis-reports/detail/development-of-the-al-tuwaitha-site-what-if-the-public-or-the-iaea-had-over/9#images>

Jacques: I completely agree with you Rich, I missed the 6 first months, so you can answer those far better than me, but later on, in front of the deficiency of Iraq's declaration in particular, in front of the inconsistencies we were finding in the field, we had to ask questions to those who could help us. And I would say that one key example for instance was, in order to reinforce the credibility of our OMV<sup>2</sup> system, we wanted to demonstrate that, as part of the monitoring system, we would keep the same right to go anywhere in Iraq as we had implemented in the discovery phase. This is when we entered into this program of so called "capable sites."

We asked for the assistance of countries with heavy overhead means to provide us with site imagery which had the industrial capability to be of assistance. With time going by, we developed our own approach and generally our own capable sites, because we were getting overhead images, and we could determine ourselves that these sites looked capable. Our own analysts over time became an additional source of sites. It was at the time as a demonstration of our ability to continue to implement access anywhere as part of the ongoing monitoring.

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<sup>2</sup> Ongoing Monitoring and Verification