HOW THE RADIOLOGICAL ACCIDENT OF GOIÂNIA WAS INITIALLY DETERMINED

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Abstract

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Mainly the initial actions adopted to minimise the consequences of radiological accident involving the public are very important for bringing the situation to the normality. In this work the author presents a short history about the radiological accident with a ^{137}Cs source occurred in the city o Goiânia, Brazil in 1987 as well as the actions adopted by him during the first hours after the detection of the accident.

1. INTRODUCTION

The radiological accident, occurred in September 1987 in the city of Goiânia, Brazil, was generated by the robbery of a teletherapy unit containing a ^{137}Cs source. This unit belonged to the Instituto Goiáno de Radioterapia – IGR and this fact showed to the world the severe consequences of an accident with radioactive sources, mainly, when the population is directly involved. The contamination of large areas in the city, economical damages and loss of lives pointed out the complexity of the accident.

The accident started when the Instituto Goiáno de Radioterapia moved to a new address, leaving the ^{137}Cs source completely abandoned, without any security measures. The owners of the clinic had not given any notification to the competent authorities.

This paper describes the original version of the history of the accident, which was detected and revealed by the author on 29 September, 1987.

2. DESCRIPTION OF THE ACCIDENT

On September 29, 1987, at 08:00, I received a call from Dr. J. P. from the Fundação Estadual do Meio Ambiente – FEMAGO (State Environmental Protection Foundation), who requested some information about ionising radiation. He related that a friend of him, Dr. A. M., from the Hospital de Doenças Tropicais – HDT (Tropical Diseases Hospital) was investigating some cases of intoxication in persons, for which he was not able to define a diagnostic.

I contacted Dr. A. M., by telephone, to discuss his doubts he had about the effect of radiation. Dr. A. M., described that he had some patients which presented fever, diarrhoea, vomit, depilation and he could not establish a proper diagnostic. He asked if people submitted to radiation could present such symptoms. I told him that such symptoms where characteristics for acute radiation syndrome, but I could not believe that the State of Goi◁s had radioactive material that could generate such a situation.

Dr. A. M., describing the patients which had been interned with the above symptoms, suspected already that a metallic "cylindrical piece" that was left in the State Sanitary Department for investigation by G.S. and M.F.I. would be the main reason for the intoxication of those persons.

He suggested to get in contact with Dr. P. M., veterinary and head of the Inspection and Analysis Section of the Sanitary Department who had received the "piece" on September 28, for more information about the piece.

After my first contact with Dr. P. M., I told him that I would borrow from Nuclebrás, a Brazilian uranium prospecting company, a detector to perform a survey measurement. The detector, a very sensitive scintilometer, indicated full scale 50 meters from the place were the "cylinder" was. In order to confirm this unbelievable fact, I got a second scintilometer which confirmed my finding.

During the time interval between the first and the second measurement, the fireman people were called to take the "piece" from that place and throw it in a river named Capim Puba, from were the water for the City of Goiânia is taken, in order to definitively solve the problem.

I convinced the firemen not to perform the action informing them that that material was radioactive and could not be charged in that way. I requested to the Sanitary Department that the workers should immediately get out of that place and, with the help of the fireman should isolate the area and maintaining it under permanent control.

The same day at 12:00, I received the information from Dr. P. M. that the piece came from a certain junkyard, where I found a large area in its vicinity contaminated. Later Miss. M. G. I. who lived in the junkyard confirmed that the piece was taken form the IGR and sold by the scavengers W. M. and R. A. S. to her husband, D.A.F.

I contacted the medical responsible for the IGR and they stated that they had transferred a ^{60}Co source to a new installation and left a ^{137}Cs source in the old clinic, without notifying the National Atomic Energy Commission (Comissão Nacional de Energia Nuclear (CNEN)). I informed them that the Caesium source had been robbed.

Dr. C.F. B. one of the responsible by the IGR have not believed ion what had happened. I requested from him the manual of the ^{137}Cs source in order to verify its characteristics. He said that he had no more the manuals. I went to the old clinic where, trough a survey measurement, I could verify that the source had not been not violated in that place.

Due to the severity of the situation, I went to the Health Secretary to inform the authorities about the occurrence. The people in the Secretary did not believed, at the beginning, in what I explained to them. After some resistance they allowed me to speak to the head of the Health Secretary, to whom I related what had occurred and the necessity to communicate the facts, immediately, to the competent authorities, CNEN located in Rio de Janeiro.

On 15:00, the Nuclear Installations Department from CNEN was informed about the disappearance of ^{137}Cs source.

Until this moment, the population had no knowledge about the severity of the situation. The actions which were started after this moment, in co-operation with the local authorities, were:

- Notify the Governor of the State of Goi<s (it was done by the head of the Health Secretary)

- Call the Civil Defence (fireman, military police) to isolate the contaminated areas.
- Hospitals and ambulances would be used following the necessities.
- The selection of a large place, located in the center of the city to screen contaminated persons.

The place that offered the best conditions was a Soccer Stadium, the Estádio Olímpico, located in the center area of the city. Together with the Health Secretary and using a Geiger-Müller detector from the I.G.R. were isolated; Junkyard I, sited at Rua 26-A; Junkyard II (where the child L.N.F. lived) on Rua 06, Setor Norte Ferroviário and the house of E. F., where part of the source was taken and thrown in a cesspool.

All the people from these places were conducted to the Estádio Olímpico and isolated in tends mounted by the Civil Defence. Until 22:00, twenty and two contaminated persons had been identified and isolated in this place.

On 00:30 of September 30. 1987, the Director of the Nuclear Installations Department of CNEN, Dr. J. J. R. assisted of two persons from the Instituto de Pesquisas Energeticas e Nucleares – IPEN, located in São Paulo, assumed the command of the operations.

On 07:00 of the same day, the 57 street, located in the central sector of Goiânia, where the source was opened, was isolated and the resident people evacuated and on 09:00 the same happened in the Junkyard II, located on P-19 street, Setor dos Funcionários.

3. SUGGESTIONS AND CONCLUSIONS

The radiological accident of Goiânia can be divided, during its initial phase, in two steps:

1) Accident confirmation phase.
2) Decisions phase.

When I was called by Dr. J. P. and the medical doctor Dr. A. M., I could not believe that a region located far from the industrial centres of the Country, where the concentration of radioactive sources is higher, would have an amount of radioactive material sufficient to generate an accident irradiating and contaminating a large number of persons.

Due to my friendship with Dr. J. P., I decided to investigate the denunciation, expecting not to find any trace of radioactive material, in special as was described, one "piece" 23 kilos weight that was deposited on a chair in the State Sanitary Vigilance.

The initial measurements performed with the scintilometer could not be quantified. However the determination to evacuate the Sanitary Vigilance was not well accepted due to the lack of knowledge about "radiation" regarding the local workers.

Which criteria should be adopted to isolate the areas? I have used occupational limits based on international standards for workers, even knowing that in an accident these values are not applicable but could be justified when persons from the public are involved.

However, the suggestions related below, are derived from the self experience of the author and the lesson experienced in the accident allow to present them:

(1) Always to fully investigate a denunciation;
(2) Immediately evaluate the occurrence;
(3) Never don't believe on your detector;
(4) Even working alone in a mission, the initial actions can save lives and minimise any tragedy;
(5) Good sense and fast action is very important for the control of the abnormal situation;
(6) To learn to work with the media, adopting a frank dialogue, explaining the occurrence in a comprehensive and clear language for the population;
(7) Suffering pressure from the authorities, remember that the protection of the population is the base of your work;
(8) You must do your work as the "abnormality controller" without worrying about any detail, even with the established panic;
(9) Re-evaluate always your action since the scenarios are, sometimes, mutable;
(10) The relevant information and observations are generated by your own action.

REFERENCES

[1] INTERNATIONAL ATOMIC ENERGY AGENCY, The Radiological Accident in Goiânia, Vienna (1988).