RADIOLOGICAL SITUATION IN THE AREA OF FURNACE 3 CALAN, HUNEDOARA COUNTY

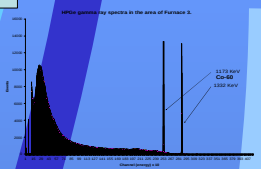
Vilmos ZSOMBORI
National Commission for Nuclear Activities Control
14 Libertatii, Bucharest 5, Romania
Vilmos.zsombori@cncan.ro

1. INTRODUCTION

Furnace nr. 3 of the former Iron Works "Victoria" Calan, Hunedoara County, Romania was equipped in 1985 with 38 radioactive sources used for the control of the technological process. The sources were Co-60 and Ag-110m with activities of 10 to 200 mCi (values reported for year 1985). The ownership over Furnaces nr. 3 and 4 changed several times after year 1990 following the commercial liquidation of the former state owned Iron Works.
The present owner, Company "FOREVER" Ltd., commenced the dismantling of Furnace nr. 3 in August 2000. The dismantling had the purpose of commercial recovery of scrap iron and ceramic bricks. No radiological safety measures were taken during the dismantling activities and no recovery of the radioactive sources was made as the owner declares that they did know nothing about the existence of the radioactive sources. The dismantling activities of Furnace nr. 3 were stopped in June 2001 following the inspection performed by The National Commission for Nuclear Activities Control (NCNAC). The inspection revealed the clear violation of Safe Deployment of Nuclear Activities Law 111/1996 republished in 1998, in regard with the unauthorized possession of radioactive sources and unauthorized performing of activities employing radioactive sources. The legal requirements to be fulfilled as established by the NCNAC inspection team in June 2001 were not observed by the owner, thus determining NCNAC to request a Police investigation at the site. A common NCNAC – Police investigation was performed in November 2001 in order to produce evidences based on radioactivity measurements at the site.

2. CNCAN RADIOLOGICAL INVESTIGATION

Radiological investigations performed in November 2001 focused on the area surrounding the base of Furnace nr. 3 with the scattered carbonic fragments around the base of the furnace. Furnace nr. 3 is almost completely demolished and the site displays a rough and dangerous surface with unstable carbonic fragments, pieces of ceramic bricks and concrete, bended concrete steel and mechanical structure remains.



All spectra indicate the presence of Co-60 in the area around the base of Furnace 3. Samples collected in the area show various levels of contamination.

3. RESULTS

- Co-60 contaminates the area around Furnace nr. 3. Some of the radioactive sources are not dammaged, while other are fragmented and dispersed in the debris at the site.
- Gamma dose rate values are in places three orders of magnitude higher than the natural gamma doserate values in Romania (0.1 – 0.2 μSv/h).
- The exposure recorded by the individual instrument of one of the NCNAC inspectors during this mission was 5 μSv during the 5 hours spend in the investigations. This reflects the existence of an average gamma field delivering some 1 to 2 μSv/h in the area of the furnace.
- Various exposure scenarios for the workers employed in the dismantling of the furnace and for members of the public show that the dose received could exceed the permitted levels (the additional yearly exposure of the individual considering all pathways is 1 mSv/year for members of the public and 20 mSv/year for the professional worker).