Experiencias en la gestión de incidentes con chatarra contaminada en las industrias Españolas

Experiences in Management of incident with Contaminated Scrap Metal in Spanish Industries

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Carlos Sánchez – UNESID / Riva Group Spain
Presentation structure:

- **Case 1.** Contingency management of a Cs source melting
  
  Place: Alcalá de Guadaíra, Sevilla (Spain)
  
  Company: Siderúrgica Sevillana, S. A

- **Case 2.** Video presentation
  
  Contingency management of a Cs source fragmentation.
  
  Place: San Andrés de los Tacones, Gijón (Spain)
  
  Company: Daniel González Riestra S.L.
Evolution of detections in Siderúrgica Sevillana, S. A.

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Contingency summary in Siderúrgica Sevillana, S. A. (1)

- Date: 07th December 2001
- Source activity: Between 3 and 4 Curios (Ci) roughly.
- Total volume of generated waste: 340 m³
- For the cleanup operations it was engaged an authorized company with professional exposed personnel, supervised by a Technical Radiological Protection Unit (UTPR), according to in force regulation.
- Shutdown period for decontamination: 30 days.
Horno eléctrico
y cuchara
Acero en uso
Alto horno y convertidor
Colada continua
laminación Producto terminado
Chatarra y parque de chatarra
Ciclo del Acero
Contingency summary in Siderúrgica Sevillana, S. A. (1)

- Date: 07th December 2001
- Company subscribed to the *Protocol for Collaboration on the Radiation Monitoring of Metallic Materials*. Compromise: operate and maintain a surveillance and control system, with Radiation Portal Monitor, spectrometric control of steel probe and specialized technical personnel.
- Source activity: Between 3 and 4 Curios (Ci) roughly.
- Total volume of generated waste: 340 m³
- For the cleanup operations it was engaged an authorized company with professional exposed personnel, supervised by a Technical Radiological Protection Unit (UTPR), according to in force regulation.
- Shutdown period for decontamination: 30 days.
Contingency summary in Siderúrgica Sevillana, S. A. (2)

- Exemption limits set by the regulatory body (CSN)
  - Dose rate: 1 µSv/h
  - Surface contamination: 4 Bq/cm²
  - Activity concentration: 10 Bq/g
- No facility personnel contact contamination or consumption. Maximum dose per worker <<<1 mSv/year.
- No atmosphere contamination.
- Contingency total accounted cost rises to 3 millions €, including facility decontamination and produced waste management. *(Activity cease cost not include)*
Crisis management on the 7/12/2001

Situation totally new and unknown to the company. Need to make decisions very quickly about unusual matters.

The worst time of the company's existence. Brought about the beginning of a new era of great improvements.
FIRST: Thanks to all the people who collaborated without a break on the resolution of the contingency.

Thanks to:

• **CSN** Nuclear Safety Council
• **ENRESA** Empresa Nacional de Residuos Radiactivos
• **PROINSA** Authorized UTPR by the CSN
• **CESPA** Qualified personnel assistance
1.- to Know what's happening, to RATIFICATE the incident:

Needs:

• Suitable Surveillance System
• Correct Interpretation of the information
• External expert help
2.- to Know the MAGNITUDE of the incident:
   • Affected areas
   • To inform
   • Weigh up the situation and engage the necessary resources
   • Introduce protection measures
   • Stop the exit of waste from the steelmaking process.

3.- to ISOLATE the affected areas to avoid unnecessary risks.

4.- Decontamination, CLEANUP in the shortest time possible.
Analisis of possible causes of the contingence on 7/12/2001

- Surveillance system failure (checked this didn’t happen)
- Inadequate surveillance system (checked the suitability of the compulsory surveillance equipment)
- Not attended alarms (checked that no other alarms did occurred)
- The melting occurred during the cleanup of a scrap stock yard, therefore the source might have been at the back of the yard for an undetermined period of time.
  - Radioactive source was in the stock when the surveillance system was implemented in 1999.
Problems with the Initial Surveillance System. Evolution

- Protocol initially didn't foresee the installation of a control system for the exhaust gases in the facility. It considered detectable the Cs in the steel casting probe.
- Company installed voluntarily and in an experimental way, a exhaust gas sensor purchased in the market. The first level alarm comes fixed by the supplier in 50 mSv/h
- This sensor warned the company about the melting.
- After the event, it has been substituted by a more efficient equipment with double sensor that warns above 1 µSv/h.
- The spectrometric analysis in the steel probe doesn't produce a significant increase of the activity (<0,1 Bq/g).
- The surveillance system have been strengthen with a scrap redundant control during the basket charge before being moved to the furnace. Advantage: it’s able to control less amount of scrap (truck <25 t, octopus crane <8t).
Final considerations from our experience about the SP Protocol

• Spanish Protocol has demonstrated its ability to adapt unexpected situations.

• After the experiences the compile knowledge has reduced the “unexpected” situations.

• Our company has had the ability to analyze the problematic of these inadvertent materials on equal footage with the administration, which gives a rather proactive environment.

• Spanish iron steel covered by the Protocol offers an add value due to their guaranteed radioactivity security.
Thanks for your attention