

# **NUCLEAR RADIATION ACCIDENTS**

Radiation accidents in today's world are not as common as we may think, but when they do occur, they have some devastating effects on the lives of those unlucky enough to be involved

Today we will take a brief look at two such accidents and see if we can determine what went wrong

A serious radiological accident occurred in Peru, in South America, on the 20th February 1999 when a welder picked up a "pigtail" that had fallen from a radiographic exposure device which contained an Iridium-192 source

- The welder kept the pigtail in his pocket for just.....

**Six and a half hours !!!**



**This is a typical source pigtail that is usually secured inside the radiography exposure device or projector.**

**The activity of Ir-192 source on day of accident was 37 curies, which is similar in strength to the ones used by NDT contractors**

The welder did not know what he had put into his pocket and the radiographers did not know they had lost the pigtail containing the radioactive source !

**2 days after irradiation, on the 22nd of February 1999, the welder developed a blister surrounded by inflammation on the rear of his right thigh**





27 days later, the blister became infected



Things got worse.....



And worse still, as other parts of his body suffered the effects of the radiation burns...Hands...



And left leg.....



8 months later, the welder had to have his leg amputated....



Unfortunately, at the time of the original incident, the man took the source home and his wife was also badly burned when she sat on the man's jeans for about **25 minutes**

Two and a half years later, his wife was still suffering



As a result of the radiography crew's negligence while performing their duties, the welder's life was changed forever.....not only did he suffer serious injury and pain for several months, he also lost his leg, lost his job, and thus lost the means of supporting his family



# What Went Wrong ???

- The radiographers did not know they had lost the source, WHY ??
- They did not follow safety procedures and make use of **radiation monitors**
- They did not have sufficient **training or qualifications** to perform radiography safely
- They were **not supervised properly** by a Radiation Safety Supervisor
- There was a **lack of Regulatory Control** over

- On the 24<sup>th</sup> -25<sup>th</sup> Jan 2000 in Samut Prakarn, Thailand, a serious radiation accident occurred after some men broke into a car park where the owner had stored some redundant radiotherapy units
- The owner of the car park was also a supplier of these radiotherapy units which are used to treat cancer patients in hospitals
- The men stole part of the internals of the unit which contained a Cobalt 60 radioactive source of around **425 curies**
- The men saw the radiation warning sign on the unit, but either ignored it or did not know what it meant

- The men took what they thought was scrap metal, to a scrap yard for further dismantling
- Workers at the scrap metal yard cut the unit up and removed the radioactive source
- The scrap metal workers did not know what they were dealing with and came into very close contact with the source
- **All three of the scrap yard workers died within two months of being irradiated**
- The men involved in the actual theft of the unit suffered severe radiation burns and injuries as a result of handling the source container

# Early Signs Of Radiation Burns



# 2 Months Later, Unsuccessful Skin Grafts



**6 Months Later**



21. 7. 2000

One Year Later.....



# What Went Wrong ??

- The owner of the radiotherapy units **either did not have, or did not follow safety procedures**
- He did not inform the authorities of the movement or missing of the radioactive materials
- He did not store the units in a safe place
- There was a lack of regulatory control



# What Can We Learn From These Accidents ?

- Radiation can be extremely dangerous and sometimes fatal **if not used, transported and stored in a safe manner**
- Only **Qualified and Trained Personnel** must be involved when working with radioactive sources
- **NEVER** enter an area where radiography is taking place and obey warning sign and barriers
- **NEVER** handle a radioactive source
- **NEVER** interfere with or get close to anything that has a radiation warning sign on it
- **Always** ensure safety devices are in place and functioning
- **Always** follow safe work practices and procedures
- **Always** comply with applicable rules and regulations
- **Always** follow written procedures for high risk or unusual activities.

**Finally, take note of this last slide, as it is the one that may save your life if you remember it**

**DANGER**



**RADIOACTIVE  
MATERIAL**