



# Gammagraphy

- Fundamentals
- Equipments and handling
- Test procedure
- Examples of results

Speaker : X. DEROBERT

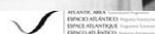


Investing in our common future



# Major application

Broken wires / Voids detection in post-tensioned bridges



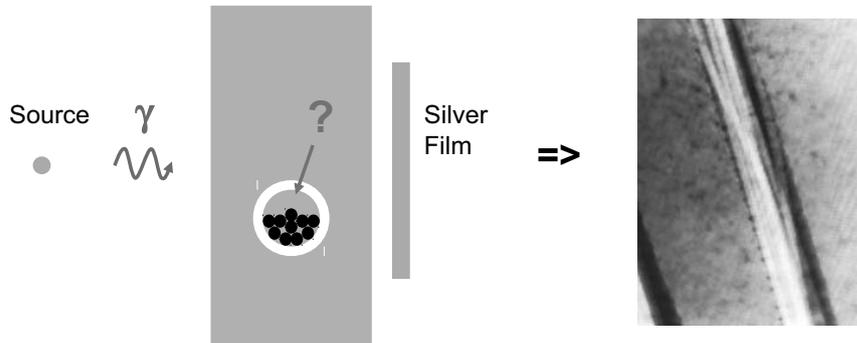
Investing in our common future





# Principle

## Radiography by gamma (or X) radiation



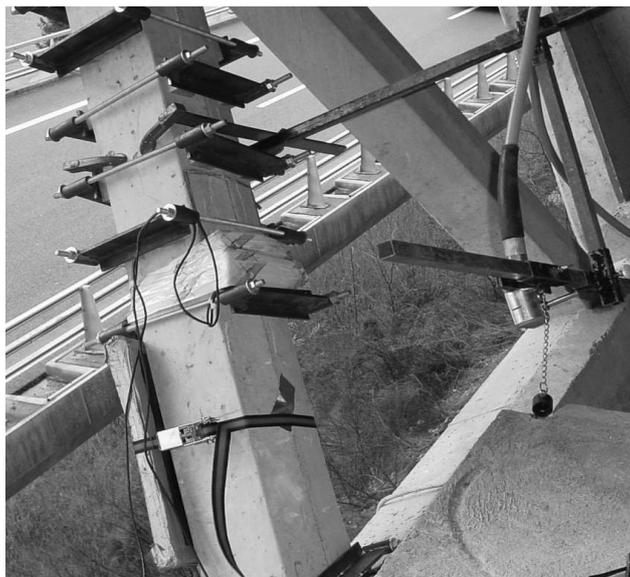
Source	Radioactive half-life	Wheight of the source (kg)	Maximal thickness (cm)
Iridium 192	74 days	25	30
Cobalt 60	5.3 years	120	40
Cobalt 60	5.3 years	350	65
X	-	45 to 120	130



# Device



Source : Iridium 192



Investing in our common future

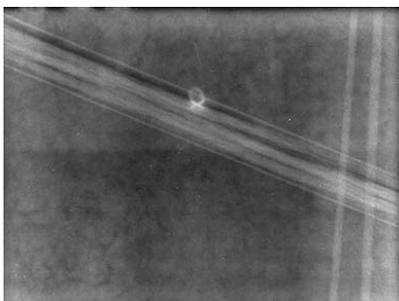




## Example of results



Duct well grouted



Lack of grouting  
Broken wire



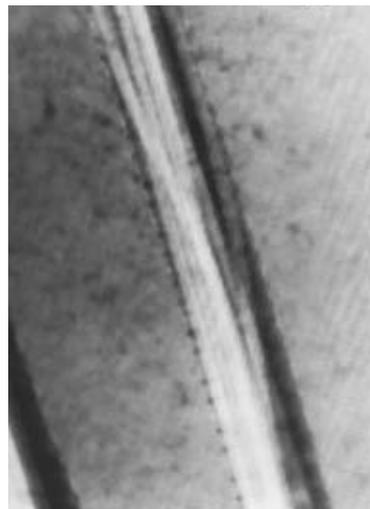
on future



## Applications (1/2)



Void



Broken wire



Investing in our common future

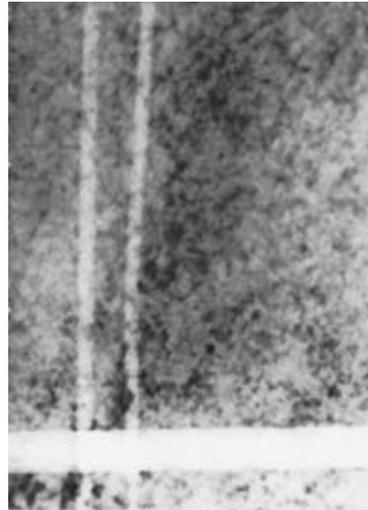




## Applications (2/2)



Void



Broken wire



Investing in our common future



## Generalities

- Dangerous technique
  - Specific qualification required (accredited operators)
  - Protected areas in the neighbouring (far from urban zones)
- Long time of exposition (1 to 4 meas. /h) / Chem. Processing (30')
  - Small films (30\*40 cm)
  - Chemical products
- Transmission technique (2 faces) / constant thickness
  - => inaccessible areas
- Black/White films => limited resolution

- Referenced technique !!



Investing in our common future

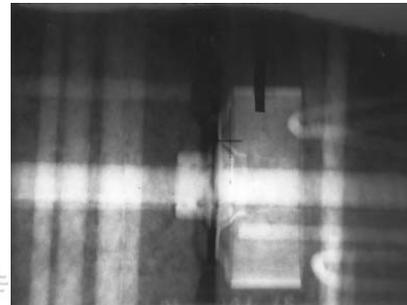




# Numerical radiography

Last evolution: numerical film base

- Black/white films numerised in 8 bits (eq. Resolution)
- Time exposure : from 30' to 4'
- Time processing : from 30' to 2'
  - Post-processing possible for various thicknesses
- No chemical products
- New Performances to be evaluated...



# Radiographie numérique

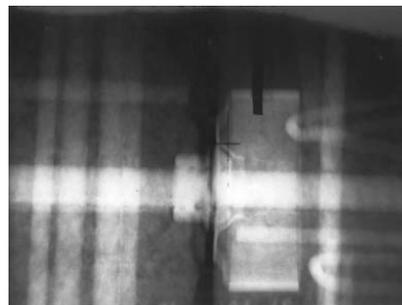
Evolution : la radiographie numérique

Temps d'exposition (30 ' => 4 ' )  
ou source moins radioactive  
*- Zones urbaines, sécurité du personnel*

Temps de traitement (30 ' => 2 ' )  
*- Résultat instantané*

Films noir / blanc numérisé (8 bits)  
*- Résolution équivalente*

Plus de produits chimiques





**COURSE**

**Testing techniques for structures inspection**

**29th and 30th May 2012**

Thank you



Investing in our common future

