



Gammagraphy

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

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Major application

Broken wires / Voids detection in post-tensioned bridges



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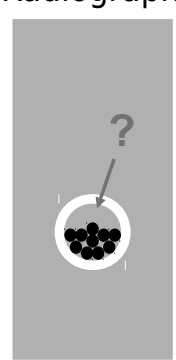
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 Testing techniques for structures inspection **29th and 30th May 2012**

Principle


Radiography by gamma (or X) radiation

Source γ

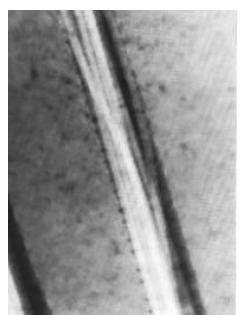






Silver Film



=>



Source	Radioactive half-life	Weight 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


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Device



Source : Iridium 192





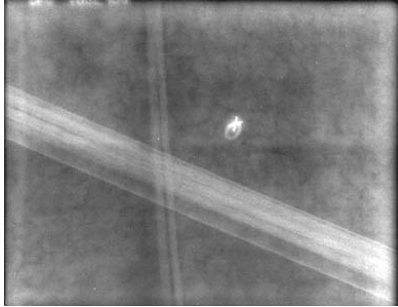
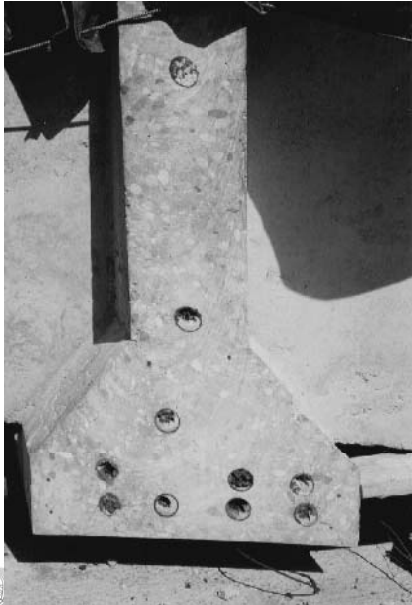
ATLANTIC AREA - Interregional Programme
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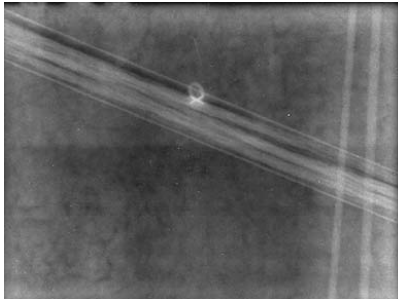




Example of results



Duct well grouted



Lack of grouting
Broken wire



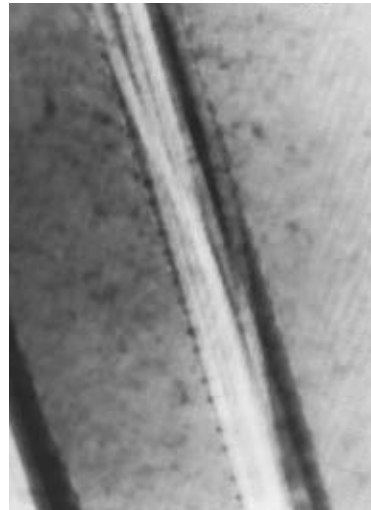
on future



Applications (1/2)



Void



Broken wire



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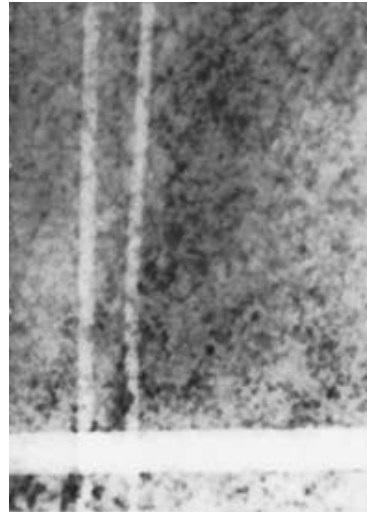




Applications (2/2)



Void



Broken wire



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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 !!



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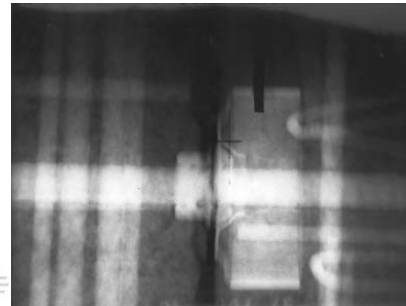




Numerical radiography

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

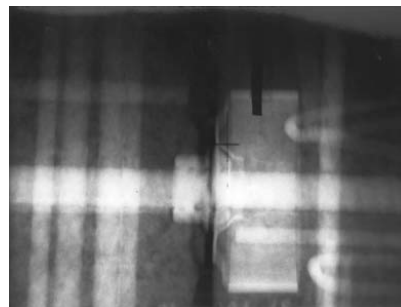
Evolution : la radiographie numérique

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





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Thank you



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