THE MANAGEMENT OF RADIOGRAPHIC CONTROLS ON THE CONSTRUCTION SITE OF THE FLAMANVILLE 3 EPR REACTOR

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FRANCK VEYSSIERE (EDF FLAMANVILLE 3 RP EXPERT)

STÉPHANE LELONG (EDF FLAMANVILLE 3 RP AND SAFETY MANAGER)

GONZAGUE ABELA (EDF NUCLEAR ENGINEERING AND NEW NUCLEAR DIRECTION)
- CONTEXT AND CHARACTERISTICS

- PREPARATION : ORGANISATION & RESPONSIBILITIES

- REALIZATION & EXPERIENCE FEEDBACK
CONTEXT AND CHARACTERISTICS

Flamanville 3 is the largest construction site in Europe:
- Civil Work completed
- 4000 workers on site
- Radiographic Non Destructive Testing: 46 000 in 2015
- EPR site / Operating Units = same RP standards

SAFETY FIRST: Lost Time Injury rate = 2.1 in 2016
(French calculation, with all events on site)

Specificities and differences from operating Units:
- Some closing are not available
- No EPD on nuclear island
- No gamma detection installed
- Many provisional access
- Lower lighting
- New EPR design, unknown by workers
- Neutron and heavy doors in reactor building and baffles
- Till 16 Radio NDT teams simultaneously on site
1\textsuperscript{st} RP principle:
Justification included in the studies

Some more tests can be
• requested by the Authority
• needed by the welding quality
  (according to results of each welder)
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Source Arrival

As it arrives on site,
• The administrative status of the source is checked
• The source is under EDF control

Sources Storage

The owner need a Radiographic Work Permit delivered by EDF to take his source out of the locked room.
The NDT Radiograph Company

- Weldings identification
- Irradiation duration
- Nuclide used ($^{60}\text{Co}$, $^{192}\text{Ir}$, $^{75}\text{Se}$)
- Source activity (from 20Ci to 400Ci)
- Film Quality
Radiographic Work Permit preparation

- Where
- When
- Beaconing map
- Emergency procedure (source blocking, ....)
- Dose prevision...

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- Coordination / interactions between:
  - Other testing operations
  - Access
  - Shielding supply (lead blankets)
  - Beaconing maps
  - Radiographic Work Permit: checking and validation By site RPM

Site manager RWP approval

Unit radiographic survey map for each night

- During night shift + Week end: only Radiographic control: no other activity
Site workers information: for pedestrians and drivers
Radiograph Company + EDF Flamanville 3

- Beaconing verification on the field
- Safe zone (low radiation area) identification
- Access and exits (scaffolding ..... )
- Shieldings position
- Daily planning meeting (at 2 pm)
- CONTEXT AND CHARACTERISTICS

- PREPARATION : ORGANISATION & RESPONSIBILITIES

- REALIZATION & EXPERIENCE FEEDBACK
Pre job briefing meeting at 8:30
Animation by EDF Coordinator
All the Radiography crews
Supervisors (6 to 10 people : EDF RP contractor)
On field
• 1st “General information call” before beaconing installation (9 pm)
• beaconing installation + area evacuation checking (Radiography crew)
• beaconing verification + area evacuation checking (RP Crew)
• If risk analysis Level > 54 ⇒ RP supervisor checking before source ejection.
• 2nd Audio “General information call” before source ejection
• source ejection
• Dose rate measurement / verification on beaconing level (7,5 µ Sv/h = max)
• Films reading during night shift

End of controls (5 am)
• Source back to lockers
• 3rd Audio “General information call” end of controls
• No unplanned dose from the site work beginning.
• All procedure deviation ➔ “Significant Event” declaration to the Authority Body
• Continuous improvement process
• EDF innovations: specific EDF RP tools “sentinelle”
• EDF standards: same training level requested for Radiographer “help” and radiographer
• Weldings identification confirmation “just before” control by EDF supervisor
• EDF and contractors keep the same radiographers crews
• Source blocking and emergency response exercises
• Information of site other workers with mock-up

On progress:
• More ^75Se tests
• Planning optimization
• Access control by 3D optique captor
THANK YOU FOR YOUR ATTENTION
QUESTIONS?