

## Radiological Equipment

More knowledge – better informed decisions

### Challenge

#### Equipment Qualification (EQ)

As plants look to extend their plant licenses beyond 60 years, the equipment and cabling must be analyzed to determine if it will exceed its EQ radiation margin. Plant operators need equipment to stay within margin but also need the right technical tools and expertise for a thorough analysis. Safety and long-term plant life are the primary goals, while having the information that will assist with cost-efficient decisions on equipment repair or replacement.

### Solution

#### High-resolution Computer modeling

##### BWR Drywell Example

Using high-resolution computer modeling, Framatome can recover much of the radiation margin, allowing plants to reduce the amount of equipment and cabling that will need to be replaced.

##### Pre-1980 Analysis Max Dose Applied Everywhere

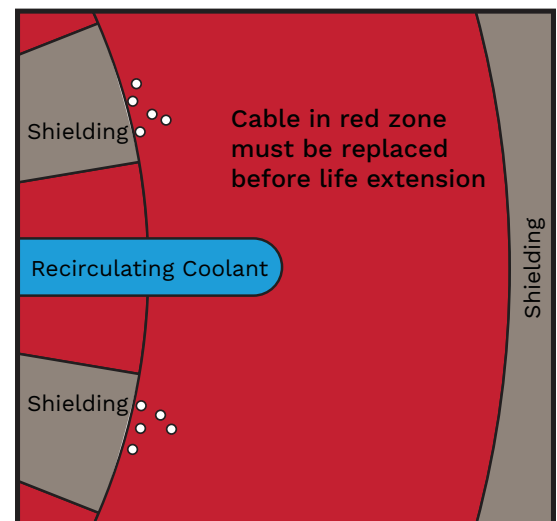
As an example, for a pre-1980 analysis, the results show the areas (red) that must be replaced for a BWR drywell. All of the cables in this area needed replacing after 60 years.

##### Result

- All cables to be replaced for life extension
- No credit for:
  - Shielding details
  - Modern radiation methods
  - Validation by measurement

### Customer benefits

- Can be used for BWRs and PWRs
- Determines what cables will not need replacing
- Allows for a more systematic replacement schedule for the cables that do need replacing
- Provides guidance to actions now (i.e. shielding placement) that could avoid cable replacement in the future

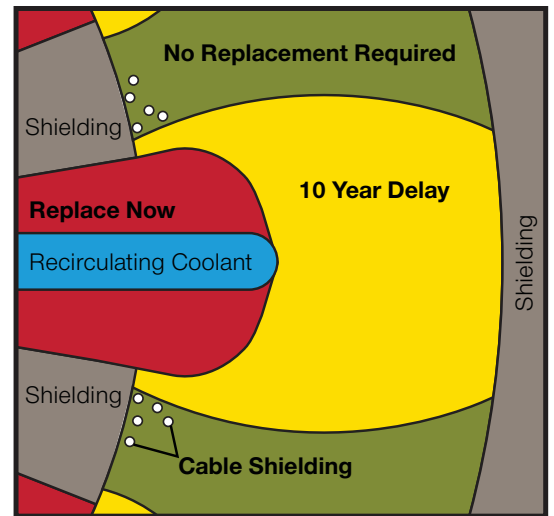


A typical result for today's high-resolution computer models shows areas (green) where the cable will have sufficient radiation margin at 60 years, areas (yellow) where the cables will need to be replaced in 10 years and a much smaller area (red) where the cables will need to be replaced immediately.

As an example, for one plant's 60 year life extension, the client saved \$1.5 million by avoiding cable replacement.

#### Typical Result

- Fewer red areas
- Most cable good for 60 years
- Shows where small shielding additions might save more cable



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