BIS2: CIBFi FMECA

Provisional Results for the Analysis of the Second Version of the BIS in the LHC

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Beam Interlock System II
Outline

1) Final CIBDS link-mode configurations
2) Failure rates for AvailSim4 model
3) Data from PM database
4) Next steps
CIBDS Link Mode
2 FPGAs per CIBDS
(Minimal for CIBDS)
2 sets of 2 CIBDS

Color for geographical location
2 CISV with 1 FPGA

2 CISV with 2 FPGAs

4 CISV with 1 FPGA

2 FPGAs and 2 CISV

2 FPGAs per CIBDS

8 FPGAs and 4 CISV
## Failure rates for AvailSim4 model

<table>
<thead>
<tr>
<th>Board</th>
<th>Source</th>
<th>Value [FIT]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIBDS</td>
<td>Failure rate of the current CIBDS</td>
<td>268.20(^1)</td>
</tr>
<tr>
<td>CISV</td>
<td>Failure rate of the current CIBDS</td>
<td>268.20(^1)</td>
</tr>
<tr>
<td>GMTN</td>
<td>1 failure every 10 years</td>
<td>16,666.67</td>
</tr>
<tr>
<td>Cross-Checker</td>
<td>1 failure every 10 years</td>
<td>16,666.67</td>
</tr>
<tr>
<td>Arbiter</td>
<td>1 failure every 10 years</td>
<td>16,666.67</td>
</tr>
<tr>
<td>SMP</td>
<td>1 failure every 10 years</td>
<td>16,666.67</td>
</tr>
<tr>
<td>SMP generator</td>
<td>To be discussed</td>
<td>166.67</td>
</tr>
</tbody>
</table>


Number of RF dumps in 2018

<table>
<thead>
<tr>
<th>Event Year</th>
<th>Total number of dumps</th>
<th>Total number of RF dumps</th>
<th>Share %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>98</td>
<td>3</td>
<td>0.03</td>
</tr>
</tbody>
</table>
Next steps

1. **Energy is broadcasted via timing**: is it valid to have 2 receivers + 2 generators + arbiter architecture + timing + CISV with one FPGA to deliver it?
   1. Is it comparable for the Setup Beam Flags?
   2. Is it comparable for the Beam Presence Flag?

➢ Drawings of the schemas (like for the link mode)

2. Fault tree for CIBFi

3. CIBG – when ready
Questions