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(57) Abstract: This invention relates to a computational system and method for performing a safety analysis of a postulated Loss of Coolant Accident in a nuclear reactor for a full spectrum of break sizes including various small, intermediate and large breaks. Further, modeling and analyzing the postulated small break, intermediate break and large break LOCAs are performed with a single computer code and a single input model properly validated against relevant experimental data. Input and physical model uncertainties are combined following a random sampling process, e.g., a direct Monte Carlo approach (ASTRUM-FS) and advanced statistical procedures are utilized to show compliance with Nuclear Regulatory Commission 10 CFR 50.46 criteria.

[Continued on next page]
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INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8): G21C 9/00 (2012.01)
USPC - 376/282

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8): G21C 9/00 (2012.01)
USPC: 376/282

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
IPC(8): G21C 9/00 (2012.01)
USPC: 376/282-284, 293,298

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWEST; PQPB, USPT, EPAB, JPAB; Google Scholar, Google Patent; Search Terms: LOCA CPU model simulation loss of coolant nuclear reactor core training template solution optimization constraint computer memory algorithm software dependent variable random perturbation Monte-Carlo input

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>US 2008/0154838 A1 (Waterford et al.) 26 June 2008 [26.06.2008] para. [0004] through [0133], Fig. 1-15</td>
<td>1-11</td>
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<tr>
<td>Y</td>
<td>US 2006/0149515 A1 (Horton et al.) 06 July 2006 [06.07.2006] para. [0028], [0029], [0039], [0053], [0054], Fig. 5, 6</td>
<td>1-1 1</td>
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<tr>
<td>Y</td>
<td>US 2005/0089381 A1 (Russell et al.) 28 April 2005 [28.04.2005] para. [0032], [0033], [0034], [0040], Fig. 1B, 2, 3</td>
<td>2 and 10</td>
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