

**EDF AND AREVA UK EPR GENERIC DESIGN ASSESSMENT**  
**GDA ISSUE**  
**PROTECTION SYSTEM INDEPENDENT CONFIDENCE BUILDING MEASURES**  
**GI-UKEPR-CI-02 REVISION 2**

<b>Technical Area</b>		<b>CONTROL AND INSTRUMENTATION</b>	
<b>Related Technical Areas</b>		None	
<b>GDA Issue Reference</b>	<b>GI-UKEPR-CI-02</b>	<b>GDA Issue Action Reference</b>	<b>GI-UKEPR-CI-02.A1</b>
<b>GDA Issue</b>	The programme of Independent Confidence Building Measures (ICBMs) to support the safety case for the TXS Protection System to be fully defined and agreed.		
<b>GDA Issue Action</b>	<p>The programme of Independent Confidence Building Measures to support the safety case for the TXS Protection System to be fully defined and agreed.</p> <p>The proposed elements that will constitute the ICBMs are:</p> <ul style="list-style-type: none"> <li>• Statistical testing (ST)</li> </ul> <p>EDF and AREVA have proposed 5000 tests on the TXS equipment with the potential for 50000 on a simulator to be investigated as a research activity. ONR expects the RP to more fully define the ST approach in terms of number of tests. The RP is required to submit its analysis of the number of tests that it considers is reasonably practicable to undertake having given full consideration to any time and programme constraints. It remains ONR's expectation that 50,000 tests will be performed. ONR considers that the plant transients are sufficiently defined to allow a reasonably accurate definition of the time to undertake the tests to be established. Undertaking this analysis will give good guidance to the site specific programmes sufficiently early in the process to ensure that adequate time can be given to the statistical testing process without causing delays to the plant going into operation.</p> <p>In addition the RP needs to demonstrate, by the provision of a monitorable programme, that all of the activities required to implement ST have been defined and can be delivered to a timescale which allows ST to commence following completion of Factory Acceptance Testing of the PS (i.e. the final validation activity before the equipment is shipped to site). It should be noted the ICBM activities should be undertaken on the final version of the software (i.e. following the end of the software production process – see ONR TAG 46). The activities required to undertake ST are defined in a report produced by CINIF (Ref. Further development of Dynamic Testing 2 – Phase 2 (NewDDT2-3 PP/40115457/MB – Guidelines on Statistical Testing for logic or Software Elements used in Nuclear Safety Related Systems.)</p> <ul style="list-style-type: none"> <li>• Static analysis</li> </ul> <p>The feasibility and full extent of the application of MALPAS analysis to the Protection System application code needs to be confirmed. To date the RP has reported that it has undertaken a feasibility study which indicates that the technique is viable but the RP has</p>		

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	<p>stated that further work is required to ensure the technique is scaleable and applicable to the full scope of the PS application code.</p> <ul style="list-style-type: none"> <li>• Compiler validation.</li> </ul> <p>With regard to compiler validation, ONR is aware that the RP is considering a number of options from a Sizewell B type Source to Code Comparison to running a compiler validation test suite (along the lines of an approach developed by NPL).</p> <p>The ICBM approach (Scope, depth and rigour) for each of the above needs to be fully defined before ONR can come to a conclusion on the adequacy of the safety case for the Protection System. Currently there are too many elements that have not been fully defined and as a result further work will be required to confirm the adequacy of the proposed ICBMs, or alternative means agreed by the Regulator.</p> <p>For further guidance see also T16.TO2.09 in Annex 6 and T15.TO2.07, T15.TO2.18 and T15.TO2.19 in Annex 5 of Step 4 C&amp;I Division 6 Assessment Report, No. 11/022 Revision A (Draft).</p>		