

WESTINGHOUSE AP1000® GENERIC DESIGN ASSESSMENT

GDA ISSUE

FUEL HANDLING AREA – SECONDARY CONTAINMENT LEAK DETECTION AND COLLECTION SYSTEM

GI-AP1000-CE-04 REVISION 0

Technical Area		CIVIL ENGINEERING	
Related Technical Areas		Fault Studies Environment Agency Control & Instrumentation Radioactive Waste & Decommissioning	
GDA Issue Reference	GI-AP1000-CE-04	GDA Issue Action Reference	GI-AP1000-CE-04.A1
GDA Issue	<p>Justification that the civil structures which retain pool water in the fuel handling area of the auxiliary building have secondary containment which each have their own dedicated system to detect potential leakage and allow collection of that leakage.</p> <p>Civil pool structures that are required to contain plant water must employ multiple barriers. The numbers of barriers are dependent on the radiological hazard, but the UK Regulator expects in a modern design that at least two barriers would be provided for a spent fuel pool to achieve defence in depth.</p> <p>This GDA Issue is concerned with minor leakage from the pools in the fuel handling area that may be undetected for a period of time. This type of leak has the potential to damage the internal structure of the CA structural modules, but also to eventually migrate to the external environment. The main concern is that these potential leakage paths would go undetected for a long period of time (chronic leaks), and the extent of the resulting damage/contamination, if finally detected, would not be quantifiable.</p>		
GDA Issue Action	<p>Secondary Containment Leak Detection And Collection System for Module CA20 SC Walls and HSC Floors</p> <p>Provide a leak detection/collection system to the secondary barrier formed by the CA steel-concrete composite construction which will:</p> <ul style="list-style-type: none"> • Allow potential leaks into the structure to be detected and monitored. • Collect the potential leakage and divert it away from the significant mild steel components of the CA module. • Protect against migration of potential leaks into the base slab below. <p>With agreement from the Regulator this action may be completed by alternative means.</p>		

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GDA Issue Reference	GI-AP1000-CE-04	GDA Issue Action Reference	GI-AP1000-CE-04.A2
GDA Issue Action	<p>Secondary Containment Leak Detection And Collection System for West RC wall to Transfer Canal</p> <p>Provide a leak detection/collection system to the secondary barrier formed by the RC wall which is cast up against the single plate stainless steel liner to the west wall of module CA20. This should include:</p> <ul style="list-style-type: none"> • Method to detect leakage through the RC wall, both above and below ground. • Collect the potential leakage, and thus protect against migration of potential leaks into the ground. <p>With agreement from the Regulator this action may be completed by alternative means.</p>		

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GDA Issue Reference	GI-AP1000-CE-04	GDA Issue Action Reference	GI-AP1000-CE-04.A3
GDA Issue Action	Secondary containment leak detection and collection system for north wall of spent fuel pool Provide a leak detection/collection system to the secondary barrier formed by the RC wall which is cast between the north single plate stainless steel liner of the spent fuel pool and the shield building. This should include: <ul style="list-style-type: none">• Method to detect leakage through/into the wall.• Collect the potential leakage, and thus protect against migration of potential leaks into the ground. With agreement from the Regulator this action may be completed by alternative means.		

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GDA Issue Reference	GI-AP1000-CE-04	GDA Issue Action Reference	GI-AP1000-CE-04.A4
GDA Issue Action	<p>Evaluate the effect of borated water from potential leakage from spent fuel pool on mild steel components within CA20.</p> <p>The water within the spent fuel pool and surrounding pools will be more highly borated than standard fuel pools. Corrosion of the mild steel reinforcing bar inside concrete walls and slabs is therefore of concern. Although actions A2 and A3 are aimed at detecting leakage through the secondary barriers comprising RC construction, the effect on the structural integrity must also be evaluated. Westinghouse should provide the following:</p> <ul style="list-style-type: none"> • A best estimate evaluation on the potential corrosion rates of mild steel reinforcing bars within the RC construction to the spent fuel pools and adjacent pools when subject to minor, chronic leaks from the pools. • An evaluation of the effects on the structural capacity of the same RC walls/slabs from the above effects on the rebar. <p>With agreement from the Regulator this action may be completed by alternative means.</p>		