



Spinline 3 E-DCIS Platform Family ECCS/ESF

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- *SPINLINE 3* design conforms to international nuclear licensing standards
 - > Qualification for NRC certification was independently assessed by EPRI/MPR as documented in EPRI TR-1012574, September 2005, in accordance with EPRI TR-107330:
 - “The SW development process appears to comply with 10CFR50 App B and NUREG0800 Chapter 7, HICB BTP-14” (will comply with ESBWR requirements)
 - EMC and seismic testing will be supplemented to meet ESBWR requirements
 - Will comply with ESBWR requirements
 - > DS&S is collaborating with GE to issue a Licensing Topical Report to support SER

- DS&S supports its DCIS customers with Long Term Service Agreements (LTSA’s)
 - > DS&S LTSA’s have supported all vintages of the DCIS product line for 30 years
 - > DS&S has a unique LTSA to provide DCIS support for all 58 EDF Units

- Qualification for NRC certification has been independently assessed by EPRI/MPR as documented in EPRI TR-1012574, September 2005, in accordance with EPRI TR-107330
- This assessment provides recommendations on the qualification testing needed according to US standards. In particular, it provides guidance on required EMC and seismic testing
- General
 - > Testing can be performed either in a laboratory in France (need dedication if not operated under Appendix B) or in a laboratory in the US operated under Appendix B
 - > It is recommended that DS&S performs qualification testing of the Spinline 3 system apart from the DS&S supplied cabinets

- EMI/RFI testing
 - > TR-107330 requires EMI/RFI testing to levels specified in TR-102323. The NRC has also issued qualification withstand levels in RG 1.180 Rev1 and endorsed IEC 61000 test methods
 - > Because DS&S has already done EMI/RFI testing to IEC 61000, MPR recommends that SPINLINE 3 EMI/RFI is performed in accordance with the IEC 61000 test methods endorsed in RG 1.180 and with the test set-up and test protocol specified in TR-107330
 - > If a generic qualification is considered, MPR recommends to perform EMI/RFI emission testing (IEC 61000-6-4) in accordance with Military Standards CE101, CE102, RE101, RE102, in order to fully meet RG 1.180 expectations.
 - > The EMI/RFI test levels in TR-107330 and/or RG.180 are directly applicable to qualification of SPINLINE3 hardware
 - > Compliance to EMI/RFI TR-107330 requirements (i.e. §4.3.7.6, §4.6.1.1.G, §6.3.2) will be substantiated in the EMI/RFI test procedure and test report

For EMI/RFI susceptibility, the IEC 61000 test methods endorsed by Regulatory Guide 1.180 include:

Conducted Susceptibility	Test Method IEC 61000-4-13	16 Hz to 2.4 kHz
Conducted Susceptibility	Test Method IEC 61000-4-16	15 Hz to 150 kHz
Conducted Susceptibility	Test Method IEC 61000-4-6	Radio Frequency
Conducted Susceptibility	Test Method IEC 61000-4-4	EFTs/Bursts
Radiated Susceptibility	Test Method IEC61000-4-8	50 Hz and 60 Hz
Radiated Susceptibility	Test Method IEC 61000-4-9	50/60 Hz to 50 kHz
Radiated Susceptibility	Test Method IEC 61000-4-10	100 kHz and 1 MHz
Radiated Susceptibility	Test Method IEC 61000-4-3	26 MHz to 1 GHz

DS&S has previously tested the Spinline 3 hardware and shown compliance with methods 61000-4-3, 4-4, 4-6, and 4-8. As noted above, this testing should be repeated using the guidance and acceptance criteria given in TR-107330.

- Surge Withstand testing
 - > TR-107330 requires testing for electrical surge withstand capabilities in accordance with TR-102323 and IEEE Guide C62.45-1987. The NRC has also issued surge withstand qualification levels in RG 1.180 Rev1 and endorsed IEC 61000 test methods (IEC 61000-4-12, IEC 61000-4-5)
 - > Surge testing of signals and communication lines is addressed in IEC 801-5
 - > DS&S has performed surge withstand testing according to IEC 61000. MPR recommends that SPINLINE 3 surge withstand testing be performed in accordance with the IEC test methods endorsed in RG 1.180 and the test set-up and test protocol specified in TR-107330
 - > The surge withstand test levels in TR-107330, TR-102323 and DG-1119 are directly applicable to qualification of SPINLINE3 hardware
 - > Compliance to surge withstand TR-107330 requirements (i.e. §4.3.2.1.1.H, §4.6.2, §6.3.5) will be substantiated in the surge withstand test procedure and test report

- Electrostatic Discharge testing
 - > TR-107330 requires testing for Electrostatic Discharge withstand capabilities in accordance with TR-102323. The NRC has accepted the position that electrostatic discharge testing is not required when it can be demonstrated that protection is provided by design or procedural control
 - > Demonstrating the SPINLINE3 electrostatic discharge withstand capability through testing will likely not be required
 - > Surge withstand TR-107330 requirement (i.e. §4.3.8) will not be demonstrated. appropriate guidance will be provided to avoid exposure of SPINLINE 3 hardware to electrostatic discharges

- Seismic testing
 - > TR-107330 requires testing in accordance with IEEE 344:
 - resonance search followed by five Operating Basis Earthquake (OBEs) and one Safe Shutdown Earthquake (SSE)
 - vibrations are applied triaxially, are random and multi frequency in content
 - > TR-107330 provides seismic test levels taken from SQRTS-01 (assumes floor motion typical of lower level plant location, and applies cabinet amplification factors. These levels are directly applicable to qualification of SPINLINE3 hardware
 - > Compliance to seismic TR-107330 requirements (i.e. §4.3.4.6, §4.3.9, §6.3.4, §6.4.4.3) will be substantiated in the seismic test procedure and test report