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General Comment

See 29 comments in attached word file document, with each page and bullet referenced.

Attachments

Comments RG5_44

Comments on RG 5.44 (NRC-2022-0157)-

Page 11, Paragraph 3 (list) – Fog is another condition that should be considered, recommend adding as part of precipitation. Fog tends to hinder some volumetric sensors (see https://southwestmicrowave.com/ssd/products/microwave-sensors/)

Page 11, Paragraph 3 (list) – recommend adding other Nuclear Power Plant (NPP) elements that lead to nuisance alarms or considerations. Example 1: Steam from plant processes can act a source of nuisance alarms. Example 2: vibrations from large plant equipment near the edge of a Protected Area (PA) can act as a source of nuisance alarms (see NUREG-1959)

Page 16, 1.1.6 – the ground of an isolation zone should be prepared in consideration of other factors such as wave or rain washout (drainage), wildlife repellant (birds and rodents), and the characteristics of the detection sensors (certain surfaces can cause bad reflections or too much IR).

Page 16, 1.1.8 – soil sterilization can sometimes conflict with local environmental regulations. This may be a risky recommendation to licensees.

Page 17, 1.2.4 – suggested added discussion on the disadvantages of dual sensing. Could this increase nuisance alarm, because now two systems can provide nuisance alarms (see RG 5.44, 1.2.6). Would a dual system generally lead to lower sensitivities on each system and potential increase for defeat cases?

Page 18, 1.2.7 – this is a poor recommendation. Installing a system for use and then tracking nuisance alarms could lead to a problematic installation. Would it not be better to test this prior to installation, such as during qualification testing? For example, the old system continues to run, and the new system is installed temporarily in the same zone to collect this data. This testing should be repeated after installation as well. But the recommendation could lead to misinterpretation and poor qualification testing practices.

Page 18, 1.2.10 – poorly written recommendation. To whom is the annunciation occurring? Where is it occurring?

Page 19, 1.3.1 (Bullet 1) – pointing to the RG 1.9 for Safety Related applications appears to not apply a graded approach. This is overly restrictive and provides no justification for why. Why not endorse the IEEE standards that are more applicable?

Page 20, 1.4.3 – this should exempt conduits as well.

Page 20, 1.4.3 – What makes a splice box any different than a pull through box in the sense of line supervision? This is a requirement that only adds burden with no apparent benefit. Recommend removal of the splice verbiage.

Page 21, 1.5.3.4 – this criterion could be interpreted multiple different ways. Is this an external injection from a connection to the system OR and induced signal? The worst case would be a remote injection of electromagnetic interference similar to a jamming attack that replicates the device signal. Is this the intent of this criteria? There is little further detail in the reg guide or NUREG for advice on these types of attacks if so. Recommend adding detail for clarity here.

Page 21, 1.6 – provide additional guidance for when you install per the vendors recommendation, and it still does not work. Qualification testing should be an element of this process. Vendor's have vulnerabilities they are not always willing to acknowledge.

Page 22, 1.7.6.1.1 – resolution and assessment ability should also be considered. Simply "Maximizing fields of view" may not be the best approach.

Page 23, 1.7.6.2.3 – what is the 20 minutes referencing? This is confusing. The reduction in visibility lasting for more than 20 minutes? The condition of a loss of observation for more than 20 minutes? Re-write the sentence or ad clarity.

Page 23, 1.8.1 – a Predictive Maintenance program should be recommended here as well. It is stated later in 1.8.4, but not explicitly recommended.

Page 23, 2.0 – None of the testing sections contain specifics on the most challenging testing apparatus for these technologies. Should the NRC work with the site to determine this? Vendor recommendations? Recommend more guidance on testing apparatuses.

Page 23, 2.1.1 – recommend adding more in-depth discussion on the use of bounce plates in bistatic microwave applications as mentioned on Page 78.

Page 24, 2.1.1.6 – this recommendation is confusing here and in the NUREG as written. Transmitters and receivers on the same pole? Recommend re-writing for clarity.

Page 25, 2.1.1.23 – This recommendation is unclear. Should the heads be positioned as to not block camera views? Should they be smaller zones to narrow down entry points? Recommend clarifying this recommendation.

Page 29, 2.3.1.18 – The ported coaxial sensors only have a field height of about 1 meter (NUREG-1959). This is below the recommendation of 12 feet from the electric field sensor section (2.2.1.6). Recommend adding a width criterion here. Also, NUREG-1959 states on Page 25 "the installation of ported coaxial sensor as a standalone system around a perimeter for high-security applications is generally not recommended." This RG does not repeat this recommendation. Is there a reason why? Recommend further investigation.

Page 31, 2.4.1.3.1, - what are the design considerations? Is it the device manufacturer that makes these changes? Or is it a reduction in zone length? If it is a recommendation that can be implemented by the licensee that recommendation should be here.

Page 31, 2.4.1.5 – is this position distance of 10 feet from fencing feasible? What is the basis? If the isolation zone is 20 feet wide this is tight requirement.

Page 31, 2.4.2.1 – six-beams in a straight pattern from 6 inches to 12 feet would allow for approximately 2 ft gaps between beams. Is this acceptable? Would interlacing with 6 beams be feasible? Recommend rewriting for clarity.

Page 32, 2.5.1.7 – standoff from what to what? Top of the structure to the bottom taut wire? Recommend adding information for clarity.

Page 32, 2.5.1.8 – this conflicts with the recommendation of NUREG-1959 Page 41: "A taut wire system should not be installed on the inside of a PIDAS fence because an intruder could climb the outside of the fence and then jump down without detection." The difference in the statement in 2.4.1.8 is that the system is "on" the fence. Still confusing. Recommend adding information for clarity.

Page 33, 2.6 – Why are the details of fiber optic sensing elements from NUREG-1959 and "Physical Protection Systems – Garcia," not included here? There is extensive industry application of this technology. Recommend adding detail and improving regulatory approval of the use of this technology.

Page 34, 2.9 – the last revision of this regulatory guide was released 26 years ago. There have been multiple different perimeter intrusion detection technologies developed and deployed since 1997. The NRC and Sandia should include the other technologies in this new revision. The NRC and SNLs Physical Security Directorate have received plenty of money and projects since 1997 to research these alternate technologies. Have no other technologies been assessed? Will the industry have to wait another 26 years for new technology to be assessed?

Page 79, Electric Field Systems (Bullet 4) – installing electric field sensors on fences contradicts the recommendation of 2.2.1.12. Should these sensors be used on fences or not?

Page 85, SAND-2021-XXXX Series – Why have these documents not been released to the licensees nor design organizations? The older versions were properly DC/RO'ed and released to the reactors. Can these be decoupled from their UCNI and OUO components for distribution?