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Rules and Directives

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Nuclear HVAC Utilities Group (NHUG) Comments for Draft Regulatory Guide DG-1102

1. Page 1, 1st paragraph includes DBA without definition. Definition is contained in 2nd paragraph.
2. Page 1, Footnote 1 does not contain a Footnote number. Additional, typo in spelling of "guide".
3. Page 1, Footnote 1 appears to require backfit of systems not listed as ESF or addressed under RG 1.52 previously (i.e. TSC, EOF HVAC required by NUREG 0737). This would/may require TS revisions.
4. Page 2, B. Discussion", second paragraph; third sentence - also include the term "secondary containment'. This term is widely used throughout the industry and also encompasses several of the other areas in sentence.
5. Page 3, 2nd paragraph, 2nd sentence should read "DBA radiological design conditions...". This change avoids confusion with the 3rd sentence.
6. Page 3, paragraph on moisture separators, remove "(sensible moisture)" from first sentence.
7. Page 3, The paragraph discussing electric heaters indicates electric heaters are only to be used on secondary systems. Secondary systems being defined as those ESF atmospheric systems located outside the primary containment. Heaters are required to reduce the relative humidity of the air entering the HEPA filters and iodine adsorbers to 70% or less. Since DBA conditions inside containment will in all probability exceed 70% RH this paragraph negates the use of primary ESF atmospheric cleanup systems.
8. Page 4, Prefilter and HEPA filter paragraph, Describes HEPA filters as being able to "remove the fine discrete particulate matter to minimize fouling of the iodine adsorbers, which then remove gaseous iodine (elemental iodine and organic iodides) from the air stream". As recognized by recent regulatory information related to Reg. Guide 1.183, most of the radioiodine released from a degraded-core accident is now known to be aerosol form (e.g., CsI). The RG should address this fact and the extent to which standard HEPA filters should be expected to remove the predominant aerosol form of iodines.
9. Page 4, Discussion regarding the fan location, revise locations to "inlet" and "outlet" vice "supply" and "exhaust". This will be more consistent with industry nomenclature and terminology.
10. Page 5, 1st and 2nd paragraph, need further clarification of the intent and meaning of these paragraphs. Possible clarification may include "portions of the referenced standards and codes as referenced within this guide". Additionally, where is it "As noted, not all of the ...", there is no previous statement.
11. Page 5, Position 1.0, discussion identifies that AG-1 replaces N509, however, subsequent sections reference N509. Need to eliminate this discussion or to be consistent.
12. Page 5, C.1, the paragraph states that systems are acceptable if built to ASME N509-89 and Tested to ASME N510-89 are acceptable. It also states that systems tested to earlier versions of N510 are also acceptable. It is unclear if the paragraph does mean that systems designed and built to earlier versions of N509 are acceptable. Please clarify if all versions of N509 are acceptable for the systems.
13. Page 5, Position 2.2, Clarify the meaning of the first sentence as to "to" or "from" with respect to radiation dose and as to what impact to the design this has?
14. Page 6, Position 3.1 identifies that the components are sequential. However, page 4 discussion on fan location does not agree.

15. Page 6, Position 3.1 discusses humidity control provided by SR Heaters or by NRC-approved analysis. How is the NRC approval documented for previous approvals if not specifically identified in the SER?
16. Page 6, Position 3.1, This paragraph states that the system should have a moisture separator. Position 4.9 states that heaters may be required only if entering air is expected to exceed 70% relative humidity. Moisture separators should not be required if entering air is expected to be at or less than 70% relative humidity under all design-basis accident conditions.
17. Page 6, Position 3.3, The intent of this paragraph is unclear. It can be interpreted as requiring only those components whose failure could lead to a release of fission products should be designated as Seismic Category I. It can also be interpreted as requiring ALL components being designated as Seismic Category I if the failure of ANY ONE component could lead to a release. Future auditors using verbatim compliance could interpret this as requiring the light bulbs used during servicing to be Seismic Category I. Please reword this paragraph or provide clarification. Suggested rewording: "Components whose failure would lead to the release of fission products that would exceed the limits of 10CFR20 (Standards for Protection Against Radiation) or 10CFR100 (Reactor Site Criteria) should be designated as Seismic Category I (see Ref. 12, Regulatory Guide 1.29)."
18. Page 6, 3.2 delete the words "train" to be consistent. 3.1 identified "units" as "trains".
19. Page 7, 3.5 should read "To simplify in-place testing...". As already noted in the industry discussions, there are numerous designs with greater flow. This is not necessarily less reliable testing, but more intensive. Also, include the words "with a maximum" in both planes of filter layout.
20. Page 7, Position 3.5, Why is regulatory guidance being given for items of maintenance convenience where radiological safety is not affected?.
21. Page 7, 3.10, eliminate the 2nd sentence and revise 3rd to read "...surrounding the intake openings could....industry, exhausts from diesel generators located on-site, or...system."
22. Page 8, 4.6 and 4.8 reference ERDA 76-21. ERDA 76-21 was superseded by its second edition under an NSIC number. Additionally, why is this document referencing a handbook generated many years ago when much of the handbook has been incorporated into standard or code?
23. Page 8, Regulatory Position 4.5: Change to read: "Filter and Type II adsorber mounting frames should be designed...". Type III adsorbers require a different design for mounting.
24. Page 8, Position 4.9, this section does not agree fully with section in B regarding heaters, where it states "Heaters should only be provided in secondary systems..."
25. Page 8, Position 4.9: This paragraph states that adsorption units function most efficiently, with respect to the retention of adsorbed iodine, at a input relative humidity of 70% or less. Generic Letter 99-02 requires carbon adsorbent to be tested to ASTM D3803-1989. ASTM D3803-1989 Fig. A5.1 shows that the retention of adsorbed methyl Iodide to be relatively constant between 70% and 90% relative humidity. Please indicate why the extra margin is required for the maximum relative humidity of the entering air.
26. Page 9, 4.10, discussion on adsorber fire suppression systems does not agree with industry standards or practice. ASME N509-1989 does not recommend hard pipe connections nor is automatic fire deluge recommended.

27. Page 9, Regulatory Position 4.11:This position states that only activated carbon will be discussed in this Regulatory Guide. How will non-activated carbon adsorbers be evaluated? What criteria can a licensee or manufacturer use when developing or considering a new, non-activated carbon adsorber?
28. Page 9, Regulatory Position 4.11:This states that activated carbon used in the adsorber section meet the requirements contained in Section FF of ASME AG-1-1997. Section FF-5000, subsection FF-5211, Methyl Iodide Removal (Low Temperature), states that "methyl iodide removal efficiency not to be less than 99.0% at 80°C and 95% relative humidity when tested in accordance with ASTM D 3803." This seems to be in conflict with Generic Letter 99-02 which requires testing at 30°C.
29. Page 11, Regulatory Position 5.2:Why prohibit the use of prefilters during construction? Prefilters do not perform any safety function. Prefilters extend the useful life of the HEPA filters. They perform an economic function. They can reduce the buildup of construction-related dust and foreign material in the ventilation system. As long as the prefilters are replaced after construction there should be no prohibition to their use.
30. Page 11, 6,1, recommends 10 hour run per month for heaters. This is approximately 1.5% of the available hours in a 30 day month, will not significantly reduce the moisture if system installed in area of high humidity and since carbon is hygroscopic in nature, upon de-energizing the heaters, the reduction in temperature will result in a cooldown which will allow re-introduction of moisture to the bed. If functionability of heaters and control circuits required, 15 minute run per quarter is sufficient. This 10 hour requirement should not be issued unless the data shows its effectiveness. Change Regulatory Position 6.1 to require operation of systems with or without heaters to 15 minutes per month to demonstrate functionality unless there is evidence to show the benefit of the 10 hour run time with heaters.
31. Page 11, 6.3 specifies the in-place aerosol testing should be conducted "following painting, fire, or chemical release in any ventilation zone.." Unless the painting is a spray application, it should have no adverse effects to the particulate filtration capability of the HEPA. Additionally, define "Foreign material" as referenced in item 4 of 6.3.
32. Page 11, footnote 7, revise to read "Painting,.... adsorber if the ESF....leak-tight, or another means of isolation which provides reasonable assurance that air is not ...adsorbers." Check dampers, flow paths, etc. may provide adequate isolation.
33. Page 11, Footnote 7: This footnote uses the term "leak-tight". This is inconsistent with Regulatory Position 4.13. Regulatory Position 4.13 indicates dampers are to be in accordance with Section DA of ASME AG-1-1997. The term "leak-tight" is not defined in Section DA. The Regulatory Guide should use damper leakage class terminology consistent with the referenced Code. The leakage class should be consistent with the risk of contamination of the HEPA filter. If there is no motive force, (no fan in operation or no pressure differential across the filter system to drive air through the filter), a higher level of damper leakage is acceptable.
34. Page 12, Regulatory Position 6.4:This position requires in-place leak testing of the adsorber section following the detection of any water into ANY (emphasis added) portion of an ESF atmosphere cleanup system. Water leaking into a duct hundreds of feet away will require in-place testing even if there is no probability of water ever reaching the filtration section. This

section should be re-written to require re-testing if there is indication of water or "foreign material" in the atmosphere cleanup filter housing.

35. Under C.6.4. Allowances should be made for increased bypass leakage for systems that assume less than 95% efficiency charcoal. Systems which are credited with less than 95% should have allowance for bypass leakage of 1%.
36. Page 12, 6.4. eliminate the disallowance of sealants on the ducts. Use of silicone sealants has been previously approved by the NRC for use in ductwork. Within the housing, this prohibition would be consistent with the industry practice and NRC intent.
37. Page 12, revise discussion on alternative challenge agents to read "Alternate challenge agents[9] ..."
38. Page 12, 6.4 define "foreign material". This is redundant to particulate matter.
39. Page 13, Position 7.1, Use the base-line test required under Regulatory Position 4.11 instead of requiring a separate test at the time of replacement of the adsorber trays.
40. Page 13, Position 7.2, This position requires laboratory testing of the activated carbon following the detection of any water into ANY (emphasis added) portion of an ESF atmosphere cleanup system. Water leaking into a duct hundreds of feet away will require laboratory testing even if there is no probability of water ever reaching the filtration section. This section should be re-written to require testing if there is indication of water or "foreign material" in the atmosphere cleanup filter housing.
41. Page 13, Position 7.2, Laboratory testing is required after 720 hours of system operation. Earlier discussions with the NRC regarding ASTM D3803-1989 indicated the NRC would allow extending the 720 hour run limit if the 1989 version was used. Recommend extending to 1440 or greater.

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