Duke Energy®

Bryan J. Dolan
VP - Nuclear Plant Development
526 South Church Street
MailCode: EC05R
Charlotte, NC 28202

704 382 0605

704 382 4545

(17)

9/22/06

71 FR 55517

December 4, 2006

Rules and Directives Branch
Division of Administrative Services, Office of Administration
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Comments on Draft Regulatory Guide, DG-1164, "*Meteorological Monitoring Programs for Nuclear Power Plants*"

Duke Power Company LLC d/b/a Duke Energy Carolinas, LLC (Duke) offers the attached comments relative to the solicitation for public comments regarding Draft Regulatory Guide, DG-1164, (Third Proposed Revision 1 of Regulatory Guide 1.23 (Safety Guide 23), dated February 1972), "*Meteorological Monitoring Programs for Nuclear Power Plants.*"

Please address any questions to Peter Hastings at (980) 373-7820.

Duke appreciates the opportunity to provide these comments.

Sincerely,

Bryan J. Dolan
Vice President Nuclear Plant Development

Attachment

E-RIDS = ADM-03

Add: R. B. Harvey (RBH)
S. O'Connor (SCO)
J. Ridgely (JNR)
S. T. Yerokun (STY)

SUNSI Review Complete

Template = ADM-013

Attachment

Duke Energy Carolinas, LLC
Comments on Draft Regulatory Guide DG-1164 (October 2006)
Third Proposed Revision 1 of Regulatory Guide 1.23 (Safety Guide 23),
"Meteorological Monitoring Programs for Nuclear Power Plants"

Item	DG-1164 page and section	Topic	Comment
1	Page 10 Table 2 Section 4	System Accuracy of Vertical Temperature Difference and Atmospheric Stability Classes	The system accuracy specification for vertical temperature difference (delta-T) is ± 0.1° C. However, the system accuracy of the temperature probes used to determine the temperature difference is only ± 0.5 ° C. Thus, the accuracy of ± 0.1° C for delta-T cannot be met. In order to meet an accuracy specification of ± 0.1° C, a field standard would have to be developed to an accuracy of ±0.025 ° C (i.e. 4 times better in accuracy, per standard practice). Implications on atmospheric stability classification are apparent. Stability classes A and D-G could be estimated from a ± 0.5 ° C system accuracy for temperature. However, stability classes B and C might not be measurable. Overall accuracy of the stability classification would be within 1 to 3 stability classes, for a (60m-10m) delta-T.
2	Page 7 Footnote 6 Section 2	Atmospheric Stability Class Methodology	If extreme conservatism is necessary to provide an upper bound on X/Q concentrations, then an assumption of G stability class and wind speed near the starting threshold (e.g. 0.5 mph) should just be made for all hours of meteorological data input. In cases where realistic results are more important, a site's meteorological data could be used, aided by a more accurate method for characterizing turbulence in the environment. Item (1) above lends support to the need to advance the nuclear air dispersion models in the area of atmospheric stability classification. NRC should consider models which utilize more accurate methods of stability categorization than the delta-T method for estimating atmospheric stability class,. One option would be EPA's SRDT method. A second option would be to incorporate current boundary layer (BL) meteorological parameters to characterize atmospheric turbulence. NRC should then also provide standard methods of calculating the BL parameters from commonly/easily measurable variables.

Attachment

Item	DG-1164 page and section	Topic	Comment
3	Page 10 Section 5	Daily Channel Operability Checks	Please specify what is meant by "channel operability checks" in the statement "Channel operability checks should be performed daily and channel calibrations should be performed semiannually, unless the operating history of the equipment indicates that either more or less frequent calibration is necessary." Remote zero and span of data processors can be done daily via a datalogger. This would be more practical than daily site visits to inspect the tower(s). However, the zero and span would not ensure that the tower instrumentation is operating properly; it only checks the viability of the processors in the equipment building.
4	Page 6 Definitions Section 1	Dew Point Temperature	For Dew Point, add to the explanation that "(T > Twet > Tdew)". This will aid the understanding on non-meteorologists who use the Reg. Guide.
5	Page 6 Definitions Section 1	Pasquill Stability Class	For Pasquill Stability Class, the NRC should state preferred methods, if any. Alternatively, NRC could amend the use of stability class in lieu of other methods for turbulence characterization in the planetary boundary layer. In any case, it would be useful to include words to the effect that other methods for determining stability class or turbulence can be justified by the applicant, when appropriate.
6	Page 6 Definitions Section 1	System Accuracy	For System Accuracy, please clarify to what extent network-displayed meteorological data from a nuclear facility should be considered in the calculation of "display" accuracy. (e.g., specify accuracy at the collection point/tower only, in Control Room, at the location where "QA'd" data is archived, or at the General Office or other location via the utility's computer network)
7	Page 6 Definitions Section 1	Temperature	For Temperature, add to the explanation that (T ≥ Twet ≥ Tdew). This will aid the understanding of non-meteorologists who use the Reg. Guide.

Attachment

Item	DG-1164 page and section	Topic	Comment
8	Page 6 Definitions Section 1	Vertical Temperature Difference	Vertical Temperature Difference – please amend wording from "...on the same tower" to "…typically on the same tower." Depending on tower size and arrangement, the lower level temperatures sensor (e.g. 10m) may in reality be on a separate, shorter tower, but still in the vicinity of (beside) a taller tower with a wide base, which would prohibit installation of a very long boom for the temperature sensor. In this case, delta-T should be considered as being from the same monitoring location, even though not quite on the same tower. Depending on the site's terrain, it is also possible that an overall stability class for an entire nuclear plant site could be determined from delta-T measurements using separate towers, that are not co-located, but which are instead on different parts of the plant property. This could, in fact, be more representative of the vicinity than would just a standard delta-T measurement at the primary tower. For example, the delta-T at the taller, primary tower could be calculated, and also a delta-T for an adjacent valley below the plant grade using a shorter 10m tower, combined with upper level temperature data from the separate taller tower; thus deriving an indication of stability class in and over the valley.
9	Page 7 Definitions Section 1	Wet-Bulb Temperature	For Wet-Bulb Temperature, add to the explanation that (T $\geq$ Twet $\geq$ Tdew). In last sentence of the definition of wet-bulb temperature, delete the word "relatively": "…the ~~relatively~~ drier air." Please provide a preferred or standard equation (that can be automated) for calculating wet-bulb temperature from measurements of temperature, dew point temperature, and pressure.
10	Page 7 Section 2	Meteorological Parameters	For readability and ease of use, it would be useful to separate the discussion of each meteorological parameter into subsections, or at least separate paragraphs, and move information out of footnotes into the main text, to the extent practical.

Attachment

Item	DG-1164 page and section	Topic	Comment
11	Page 7 Section 2	Vertical Temperature Difference and Atmospheric Stability Class	For Vertical Temperature Difference (Delta-T), please clarify what constitutes a release point height "...significantly greater than 60m." Stability for the region and not just the site should be represented. Are offsite temperature soundings from NWS or other sources acceptable for greater heights above 60m? It would be helpful if the main text indicated that other methods of determining stability class can be justified by the applicant, but use of an alternative method in modeling may require modifications to the models (i.e., as opposed to this information being implied or footnoted). It would also be useful if the NRC would described the acceptability of any X/Q models or non-radiological models (e.g. toxic gas) that currently allow for stability class based on the SRDT method or boundary layer parameterizations of turbulence, whether any are being developed, or any other possible options as alternative models. Conservatism in modeling should be limited to design basis items. Less conservative and more realistic modeling of impacts is also needed, with inherent error bounds identified. Recommendations and decisions, based on more realistic modeling, could then be made as conservatively as desired, in the situation at that time.
12	Page 8 Section 2	Dew point vs. Cooling Towers	It would be helpful to indicate how much can the measurement height for dew point temperature can vary from the cooling tower release height, and still be representative of ambient conditions at that height.
13	Page 9 Section 4	Instrument Range	Please clarify, in stating that the instruments should be able to operate over the range of climatic conditions for the region, whether this means the range of climatological "extremes" per variable, or the range of climatologically "normal" values. Consider that wind speed measurements lose some accuracy in measuring lower wind speeds, if the instrument is set on the higher scale (0-90 mph). Measurements are more accurate at lower wind speeds if the instrument is set on the lower scale (0-60 mph).

Attachment

Item	DG-1164 page and section	Topic	Comment
14	Page 11 Section 6	Digital Data Sampling Interval	In discussing the sampling interval and compilation of data, please clarify "mean" values as either an arithmetic mean (i.e. averages), or as a geometric mean.
15	Page 11 Section 6	Wind Speed and Wind Direction	It would be helpful if the NRC were to include information on the preferred measurement of wind speed and wind direction, as either scalar or vector averages.
16	Page 11 Section 6	Fogging and Icing	It would be useful for the NRC to discuss/provide acceptable methods for determining joint frequencies for fogging and icing caused by plant operation only, and not due to ambient fogging and icing. Note: The frequency of (T=Tdew) or (T<32F) would only indicate ambient, natural conditions, not necessarily due to the plant operation.
17	Page 11 Footnote 11	Protective Actions	Please clarify what is meant by the term "keyhole" protective action.
18	Page 12 Section 8	EAL's vs. MET Sensors	It is not clear why the meteorological instruments must be able to survive the extreme conditions upon which a facility's emergency action levels are based. It would seem the EAL could be entered into sooner, based on loss or over-ranging of the sensor. Further, an EAL could be based on forecast conditions, and thus, the actual measurements may not matter anyway. Note: On the Saffir-Simpson scale, Category 1 hurricane wind speeds are 74-95 mph. Example: If a high wind EAL exists at 75 mph, then a station could implement the EAL when the anemometer peaks out at 60 mph (when on a 0-60 mph scale). This is a more conservative approach and provides the best accuracy for the routinely lower wind speed measurements.

Attachment

Item	DG-1164 page and section	Topic	Comment
19	Page 12 Section 8	Display of MET Data	Display of MET data in the control room and Emergency Operations Center, or on computers therein, provides the current conditions, but formatting of data for model input is usually handled by pre-processors, internal to or associated with the emergency response models. The guidance should state that, while the parameters used should be displayed, they do not need to be in the same format as the model's input stream. If atmospheric stability is not calculated on plant computers, only Delta-T measurements would be displayed as an indicator of stability class in the control room or in ERDS. Stability is calculated either by the emergency dose model, or manually, as part of the station procedure for the Dose Assessment groups.
20	Page 12 Section 8	ERDS	At the June 2006 NEI EP and Communications Forum, Eric Leeds (NRC) stated that ERDS was going to be replaced with a better system. While ERDS is routinely tested and does work, it was created in the late 1980s and is a non-networked system. Many improvements could be made to facilitate the transfer/sharing of plant information and meteorological data during an emergency. Will a replacement for ERDS be available in time to be referenced in DG-1164? Note that all of the available meteorological data points for a particular facility might not be set up in ERDS. In addition, station emergency response procedures may require the use of upper level wind direction with lower level wind speeds in dose assessment models for conservatism. Thus, there is a chance for miscommunications between NRC and a facility's Emergency Response Organization (ERO) staff, depending on which information is available and which is used for dose assessment and plume tracking by NRC versus ERO staff.

Attachment

Item	DG-1164 page and section	Topic	Comment
21	Page 12 Section 8	Alternative MET Data Sources	When onsite delta-T data is not available, are other methods for determining stability class acceptable to NRC during an emergency? Some possibilities may be use of convective potential or helicity related indices from NWS soundings or weather forecast models. Should the alternative MET data be input/substituted into ERDS? Current station emergency procedures include calling the local NWS office to obtain back-up data verbally, if the onsite MET data is unavailable.