

Iowa Electric Light and Power Company

December 18, 1992  
NG-92-5581

JOHN F. FRANZ, JR.  
VICE PRESIDENT, NUCLEAR

Dr. Thomas E. Murley, Director  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Mail Station Pl-137  
Washington, DC 20555

Subject: Duane Arnold Energy Center  
Docket No: 50-331  
Op. License No: DPR-49  
Changes to DAEC's Offsite Dose Assessment  
Manual

Reference: 1) Letter, J. Franz, Jr. (IELP) to  
T. Murley (NRC) dated 6-26-92  
(NG-92-2884)

File: A-100, A-107a

Dear Dr. Murley:

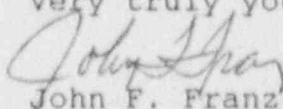
In the referenced letter, Iowa Electric Light and Power Company (IELP) advised the NRC that changes would be made to the Offsite Dose Assessment Manual (ODAM) in response to NRC comments on Rev. 3. The enclosed revised ODA (Rev. 5) incorporates the changes discussed in the referenced letter and its Attachment.

Revisions to the ODA are described in Attachment 1 to this letter. Items 1 through 36 correspond to the numbered items in the Attachment to the referenced letter. Other changes that are not related to NRC comments are listed in items 37 through 50.

If you have any further questions, please contact this office.

Very truly yours,

070022

  
John F. Franz

Vice President, Nuclear

JFF/DSR/pjv

Attachments: 1) Description of Changes Made in the Offsite Dose  
Assessment Manual (Rev. 5)  
2) DAEC Offsite Dose Assessment Manual Rev. 5

cc: D. Robinson\*  
L. Liu\*  
L. Root\*  
R. Pulsifer (NRC-NRR)\*  
A. Bert Davis (Region III)  
NRC Resident Office\*  
DCRC

\*w/o Attachment 2

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DESCRIPTION OF CHANGES MADE IN THE OFFSITE DOSE ASSESSMENT MANUAL

I. Changes in Response to NRC Comments on ODAM (Rev 3)\*

1. No change has been made.
2. No change has been made.
3. No change has been made.
4. No change has been made.
5. Section 2.5 of Rev. 3 became Section 2.6 of Rev. 5 because a new Section 2.3 has been added. Section 2.6 now explains that the computer program MIDAS is normally used to calculate the dose attributable to aqueous effluent releases, and that, in the event MIDAS is not available, the dose calculation methodology in the ODAM (including dose factors in Appendix C) will be used to perform calculations by hand. New dose factors in Appendix C now have units that match the equation in Section 2.6. Additionally, text was added to show the origin of the dose transfer factors to be LADTAP II and standard values from Reg. Guide 1.109, Revision 1 (pages 11, 13 and Appendix C).
6. A new Section 2.3 provides the basis for the dilution factor of 5 used for the fish consumptive pathway (pages 3 and 4).
7. Section 3.4 now explains why the gaseous effluent monitors may have independent setpoints (page 21).
8. The equation in Section 2.6 (formerly Section 2.5) has been reconfigured to illustrate more clearly the order in which mathematical operations must occur. This also makes clear that each applicable environmental pathway is included. The definitions for the factors F1 and F2 used in calculating dilution when assessing dose (pages 11, 12, 13) have been clarified.
9. The equation for the conversion constant 2120 in Section 3.3 has been corrected (page 19).
10. Section 3.4 now explains why the ODAM includes a method for calculating noble gas monitor setpoints based on unrestricted area concentration limits (pages 23, 24).
11. Section 3.5.1.1 has been revised to explain how the dose conversion factors in Table 3-4 were determined (pages 28, 29).

\* The items are numbered as in the Attachment to IE's June 26, 1992, letter to the NRC (NG-92-2884)

12. The equation in Section 3.5.1.1 has been revised to produce an answer in units of mrem/yr. The same revision has been made in the equation in Section 3.5.1.2 (pages 28 and 30).
13. The two equations in Section 3.5.2.1 have been corrected to include the proper conversion constant of  $8.766\text{E-}3$  (Ci hr)/( $\mu\text{Ci yr}$ ) (pages 32, 33).
14. The units for  $\text{TA}_{\text{ani}}$  in Section 3.5.2.1 have been revised to be compatible with the inhalation dose transfer factors in Appendix A (page 33 and A-4, 11, 18 and 25).
15. No change has been made.
16. Explanations have been added to Section 3.6 and Table 3-3 on the origin of air dose transfer factors (page 35 and 53).
17. The first two equations of Section 3.8 were modified as recommended (page 40).
18. The dose transfer factors in Appendix A have been replaced; the units are compatible with the transfer factor definitions in Section 3.8.
19. Section 4.2 now specifies that the total dose from direct radiation is to be assessed annually by using environmental TLDs (page 59).
20. No change has been made.
21. A new diagram of Radioactive Water Effluent has been added as Figure 2-1. It includes a diagram of the liquid radwaste treatment system. A reference to the diagram was added to the text in Section 2.2 (pages 3 and 16).
22. Figures 5-1 and 5-2 illustrating the Radiological Environmental Monitoring Program are now more legible. They include direction and distance indicators. The site boundary is indicated on the map of sampling locations near DAEC (pages 62 and 63).
23. Figures 3-3 and 3-4 have been renumbered as Figures 5-1 and 5-2, respectively. References to these tables on page 61 were also corrected (pages 61, 62 and 63).
24. No change has been made.
25. No change has been made.

26. Section 2.6 (formerly Section 2.5) has been revised to explain that MIDAS is normally used to calculate the dose attributable to radioactive aqueous effluent and state that MIDAS conforms to Reg. Guide 1.109 dose calculation methods. Additionally, new dose factors are specified in Appendix C for use if calculations are done by hand. These new dose factors were calculated using the LADTAP II documentation and Reg. Guide 1.109 except as noted in the Appendix. Previously, dose factors for only three pathways were provided. The ODAM (Rev. 5) has aqueous dose transfer factors for 14 pathways. This allows DAEC to have the data needed for dose calculations should land use outside of the site boundary change, or if there is a radioactive liquid effluent release (page 11).
27. No change has been made.
28. New dose transfer factors have been calculated for Appendix A using the GASPAR II computer program. The nuclides included in the new Appendix A are the same 35 that are included in the MIDAS Program. The nuclides Tc-99m and W-187 are not included.
29. A new set of Appendix A dose factors, using the GASPAR II computer code and Reg. Guide 1.109 default values for the maximally exposed individual, except as noted in the Appendix, has been provided. A tape using the new dose factors will be given to DAEC and will be downloaded into MIDAS with a new set of airborne dose factors.
- 30, 31 and 32. See item 29.
33. Section 2.4 (formerly Section 2.3) has been revised to explain that the radwaste effluent line monitor provides automatic isolation as stated in the ODAM Table 6.1-1 (formerly Technical Specification Table 4.14-1). The new Figure 2-1 indicates the monitoring locations (pages 4 and 16).
34. The equations in Section 3.5-2 have been changed to provide dose rates in mrem/yr to be consistent with the limits stated in ODAM 6.2.2.2 (formerly Technical Specification 3.15.2.2) (pages 32 and 33).
35. No change has been made.
36. Pages C-2 and C-3 have been left blank intentionally. They contained incorrect references to RG 1.109, showed methodology to combine fish and potable water pathways and the origin of irrigated strawberry dose factors. There has been no irrigated strawberry production for several years downstream of DAEC. In order to prepare the ODAM for potential changes in land use at



the farm downstream of DAEC where irrigation equipment may be used, all possible pathways have now been included in Appendix C. The irrigated strawberry pathway would be treated as an irrigated fresh leafy vegetable pathway should strawberry production be resumed.

II. Other Changes:

37. Page 14. At the end of the first paragraph, the word "appropriate" was changed to "the pathway exists". This change makes it more clear that the strawberry (irrigated food) pathway is not always present.
38. Page 14. The word "also" has been added to the last sentence. This indicates that the variables F<sub>1</sub>, F<sub>2</sub> and F<sub>0</sub> are defined in both Sections 2.2 and 2.6.
39. Page 43. Text in the top half of the page has been revised to allow the flexibility of using actual meteorology or reference meteorology. Previously the text appeared to require the use of reference meteorology.
40. Pages 45 and 46. The shielding factor of 0.7 was removed from the equation because it is already included in the dose factors in Table 3-5 and Appendix A.
41. Pages 45, 46 and 47. The units were changed from  $\mu\text{Ci}$  to Ci to be compatible with the new Appendix A factors and with MIDAS.
42. Page 46. The first two paragraphs have been rewritten to clarify that normally MIDAS calculates the noble gas plume dose factors and that the MIDAS values for the semi-infinite cloud gamma-to-total body dose factors can be found in Appendix A. Other assumptions used by MIDAS are also discussed such as the residential shielding factor and the air dose-to-tissue dose conversion. The text explains that if MIDAS is inoperable, the values in Table 3-5 are to be used. The old text lacked clarity and depth of information.
43. Page 48. Figure 3-1 has been updated to show more accurately the location of the gaseous radioactive monitoring system. This is in response to IELP Quality Assurance Audit I-92-10, Finding 2.
44. Page 50. A more legible Figure 3-2 has been provided. No changes were made in the figure.
45. Page 54. Table 3-4 has been revised by adding a reference to the origin of dose factors, and removing unneeded text at the top of the table.

46. Page 55. Table 3-5 has been revised by adding references to the origin of dose factors, and a note that residential shielding factor is already included in stack gamma factors.
47. Page 57. Section 4.0 has been revised to clarify that the maximal X/Q may be determined using concurrent meteorological data in MIDAS or by using reference meteorology.
48. Page 68. Station number 50 has been changed to indicate that it is a control location.
49. Pages 98 and 103. References to the LLRPSF effluent radiation monitor have been added.
50. Page B-3. The reference of 3.5.1 has been corrected to 3.6.1.