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Part I Volume 2
Physics and Mathematics
TID-4500 (13th ed.)

# URANIUM-235 FISSION-PRODUCT PRODUCTION AS A FUNCTION OF THERMAL NEUTRON FLUX, IRRADIATION TIME, AND DECAY TIME. I. ATOMIC CONCENTRATIONS AND GROSS TOTALS

J. O. Blomeke
Mary F. Todd

OAK RIDGE NATIONAL LABORATORY
OPERATED BY
UNION CARBIDE NUCLEAR COMPANY
A Division of Union Carbide and Carbon Corporation
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**Part I, Vol. 2**
**Errata**

Please make the following changes in the above-referenced document:

Page 334, Fig. T-7. Change ordinate to read: Total Activity, curies per Original Atom $U^{235}$. Change title to read: Total Fission Product Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm$^2$/sec.

# Errata for ORNL-2127

Page 43, Table 4

1. Fifth column from left, change second decimal entry from 0.881 to 0.281.
2. Sixth column from left, change second entry from $8.16 \times 10^{-3}$ to $2.60 \times 10^{-3}$. Also change fifth entry from $8.0 \times 10^{-4}$* to $6.36 \times 10^{-3}$*.
3. Seventh column from left, change second entry from $1.50 \times 10^{23}$ to $4.78 \times 10^{22}$. Also change fifth entry from $1.48 \times 10^{22}$ to $1.17 \times 10^{23}$.
4. Change last line in footnote to read: $N_t/N_{25}^0 = 1.114 \times 10^{-2} - (2.60 \times 10^{-3} + 5.04 \times 10^{-6} + 2.18 \times 10^{-3}) = 6.4 \times 10^{-3}$.

Page 52, Table 5 (Continued)

1. Third column from left, change twelfth entry opposite 33h Ce from $6.17 \times 10^{-5}$ to $6.17 \times 10^{-6}$. Also change thirteenth entry opposite 13.7d Pr from $6.15 \times 10^{-4}$ to $6.15 \times 10^{-5}$.

Page 63, Fig. A-2d

1. Eradicate top curve labeled 13.7d $Pr^{143}$.
2. Change label on second curve from 33h $Ce^{143}$ to 13.7d $Pr^{143}$.
3. Draw straight line for 33h $Ce^{143}$ one decade lower than line previously labeled 33h $Ce^{143}$, and with the same slope.

Page 78, Fig. A-4d

1. Middle curve should be labeled 93y $Sm^{151}$.

Page 79, Fig. B-1

1. Change first label on abscissa from 10 to $10^5$.

Page 111, Fig. B-33

1. Change label on middle curve from $3 \times 10^{13}$ to $10^{14}$. Also change label on second curve from bottom from $10^{14}$ to $3 \times 10^{13}$.

Pages 193-196 are improperly numbered.

1. Change page 193 to 196.
2. Change page 194 to 193.
3. Change page 195 to 194.
4. Change page 196 to 195.

Page 199, Fig. C-56a. Change labels along abscissa as follows:

1. Change 2.4 to 3.0.
2. Change 2.8 to 4.0.
3. Change $3.2 \times 10^9$ to $5.0 \times 10^9$.
4. Change 3.6 to 6.0.

Page 208, Fig. C-58g

1. Change label on abscissa from 1.0 x $10^9$ to 1.0 x $10^{10}$.

Page 334, Fig. T-7

1. Change notation on ordinate to read, "Total Activity, Curies per Original Atom $U^{235}$."
2. Change title to read: Total Fission Product Activity as a Function of Irradiation Time and Shutdown Time for $\phi$ = $10^5$ n/$cm^2$/sec.

Page 336, Fig. T-8 Make the following changes along the abscissa:

1. Change $10^7$ to $10^5$.
2. Add label $10^7$ on abscissa between existing labels $10^6$ and $10^8$.

Page 426, Fig. T-56a

1. Change label on second curve from top from $\tau$= 3 x $10^6$ to $\tau$= 3 x $10^7$.
2. Change label on fourth curve from top from $\tau$= 3 x $10^7$ to $\tau$= 3 x $10^6$.

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J. O. Blomeke
Chemical Technology Division

Mary F. Todd
Mathematics Panel

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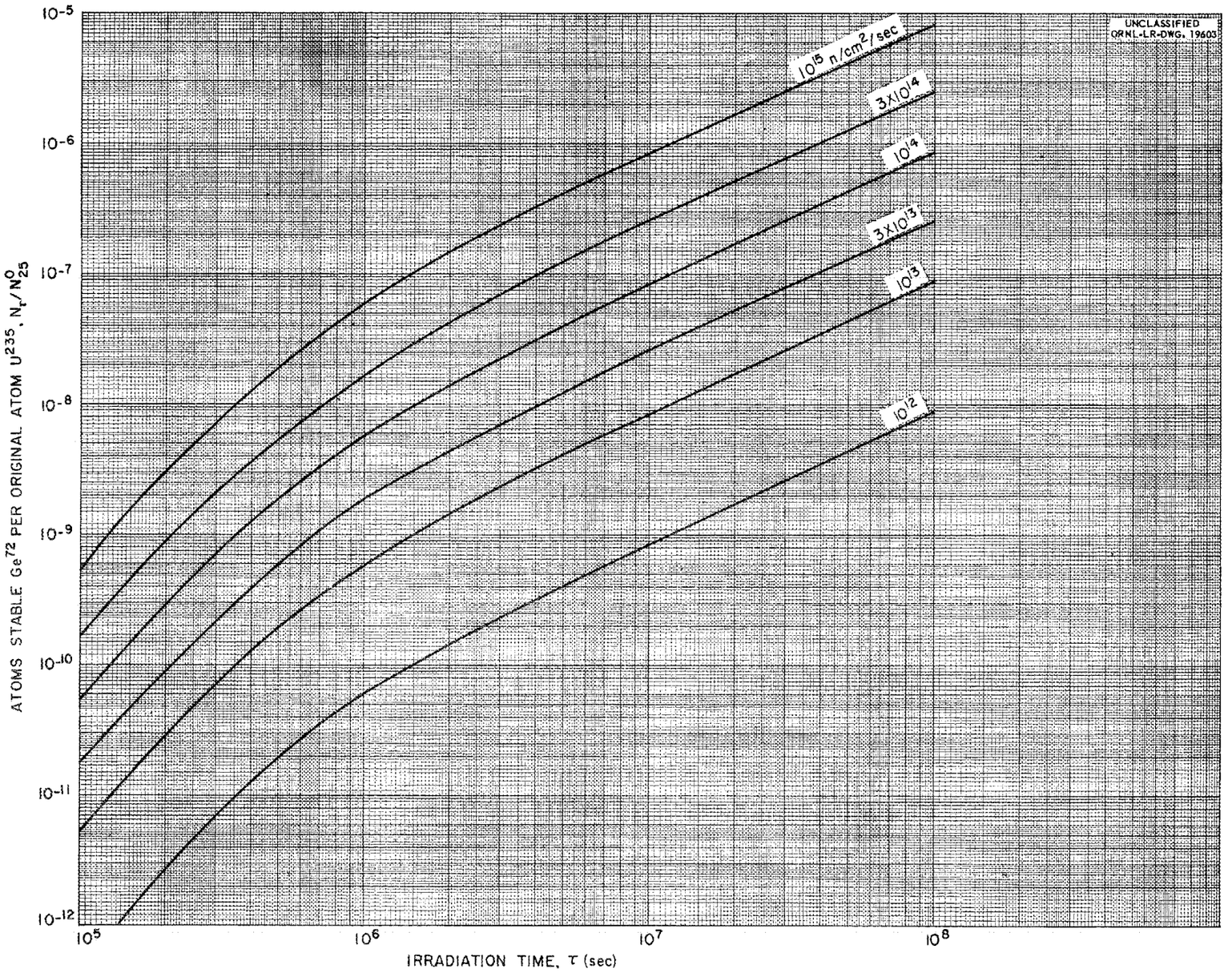



Fig. D-I. Effect of Irradiation Time and Flux on Amount of Stable $Ge^{72}$ Formed in Fission of $U^{235}$.

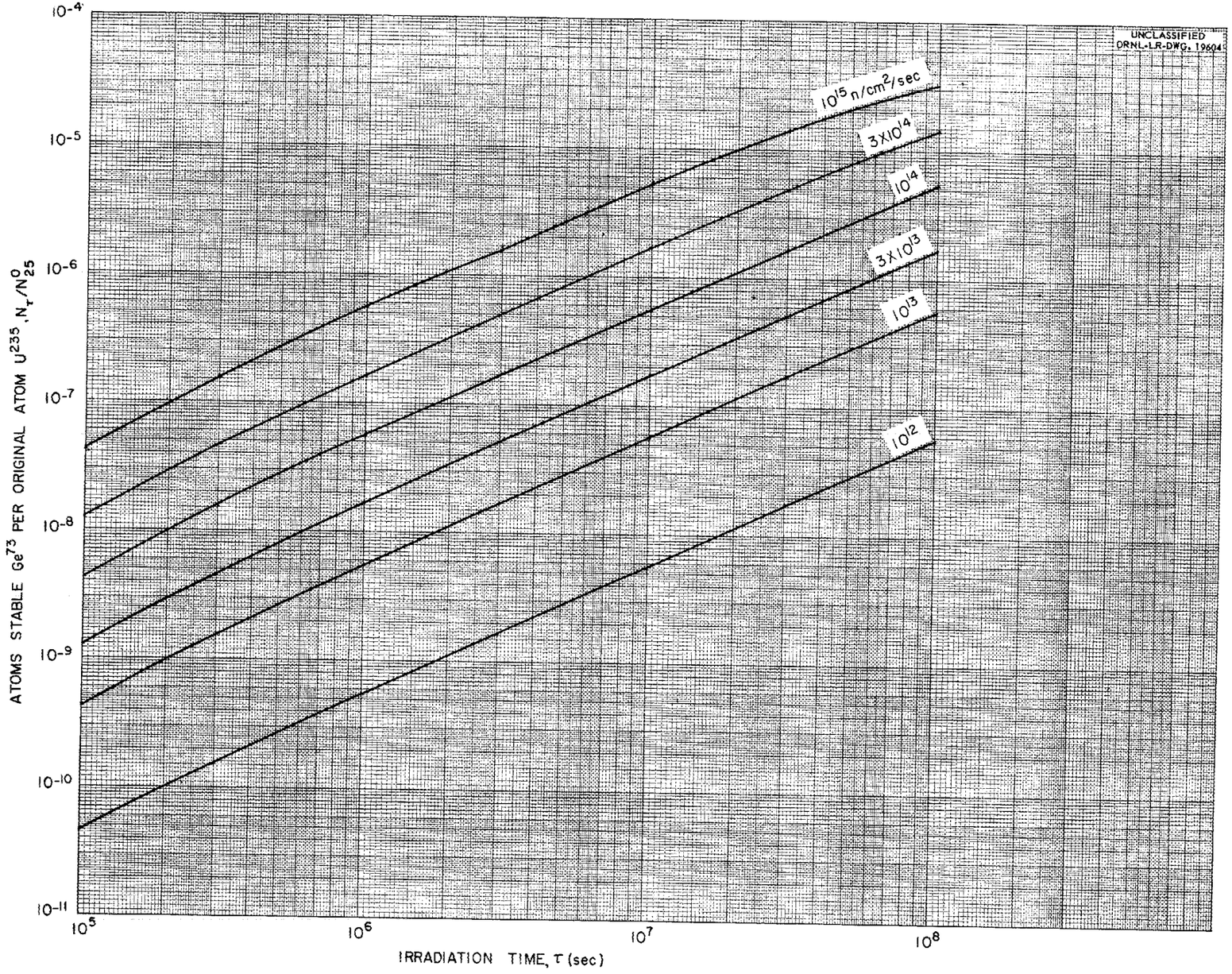
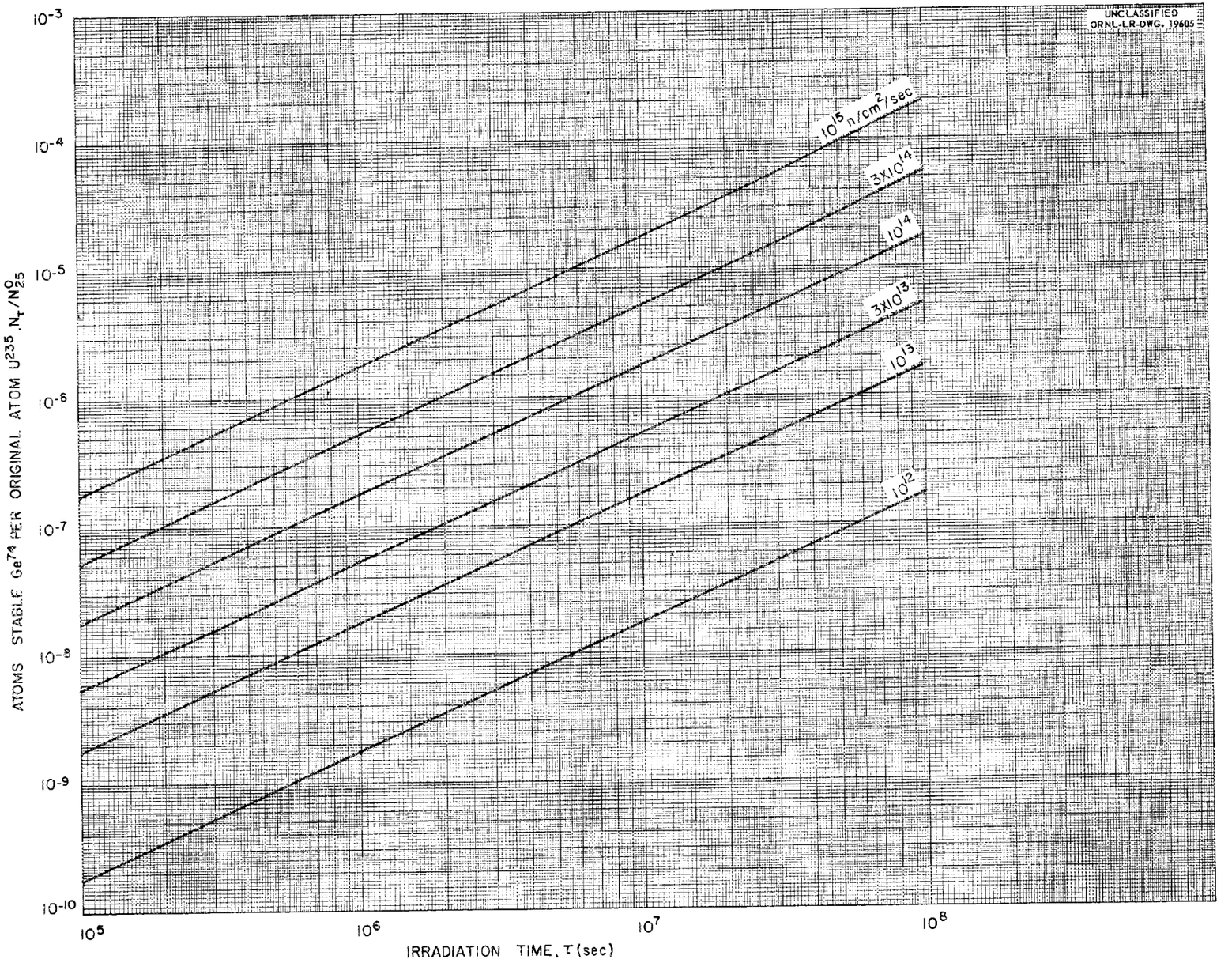



Fig. D-2. Effect of Irradiation Time and Flux on Amount of Stable $Ge^{73}$ Formed in Fission of $U^{235}$.

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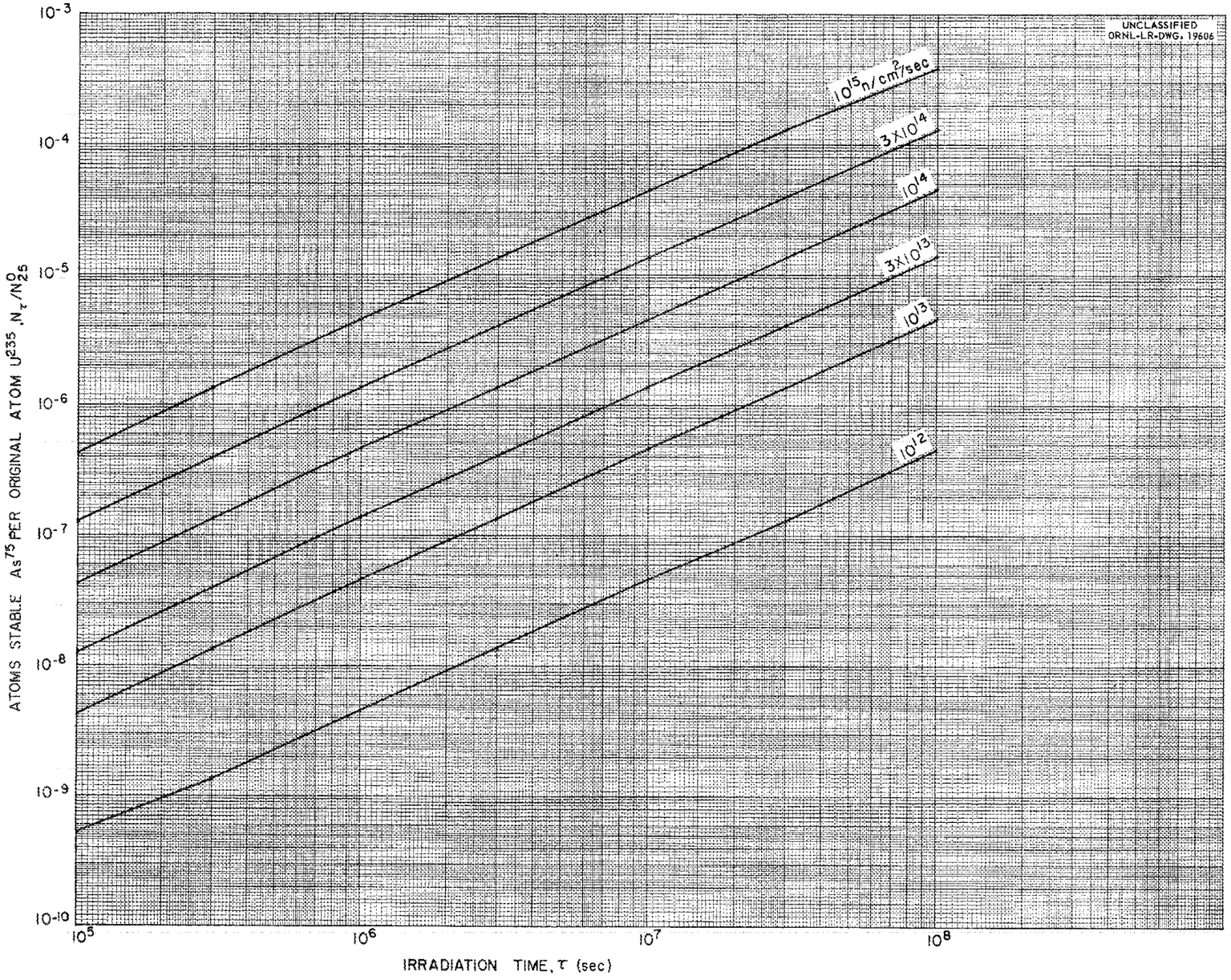


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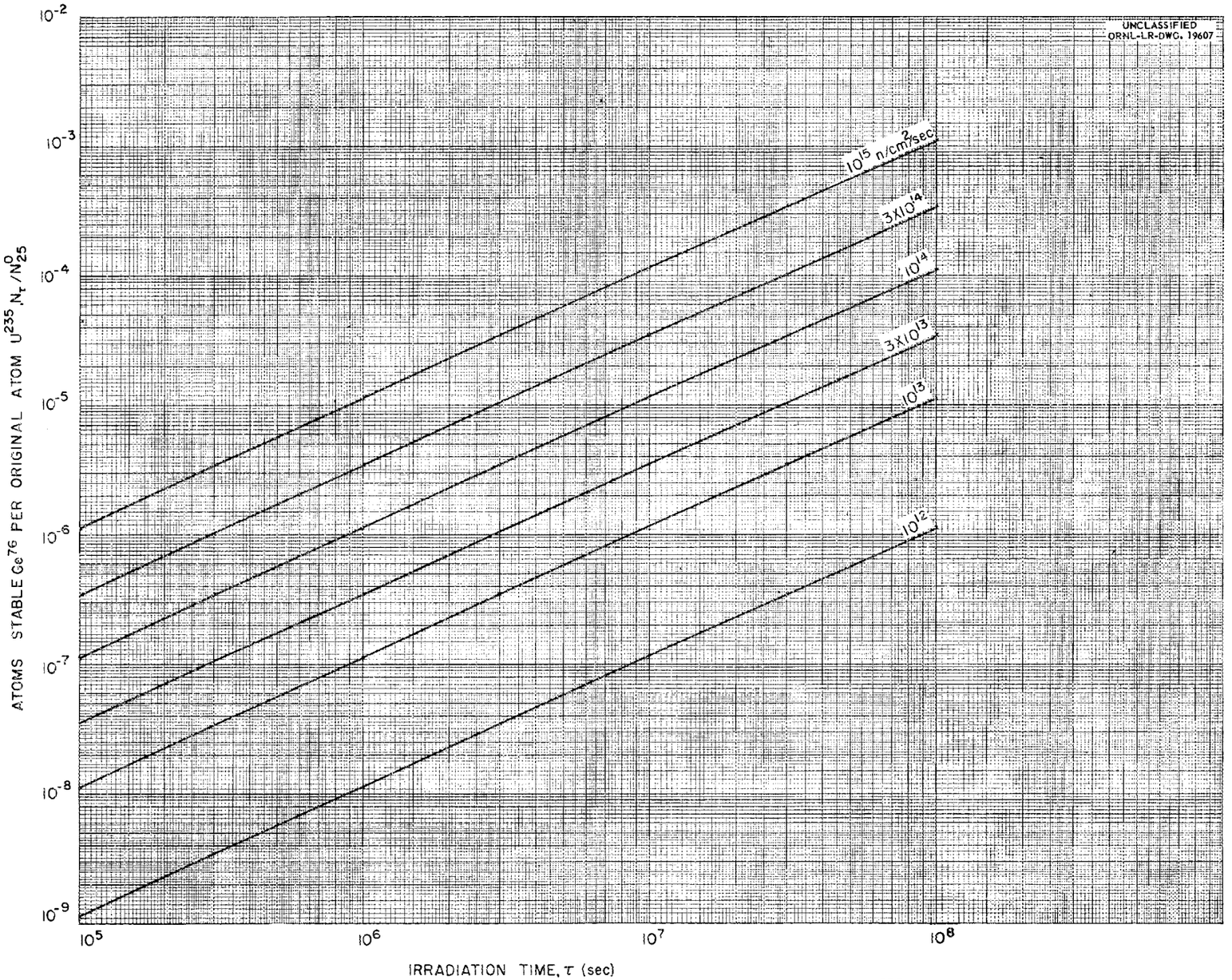


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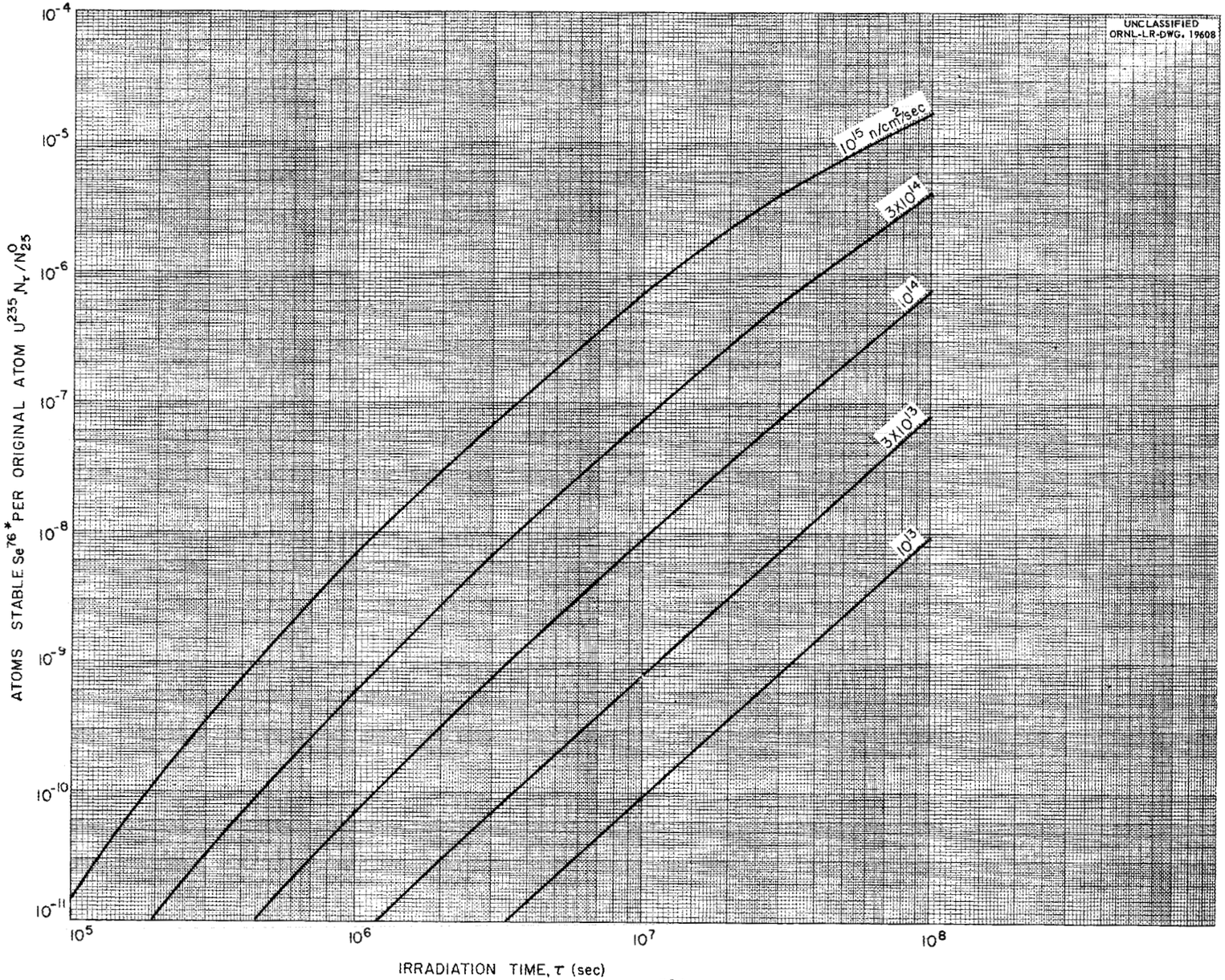
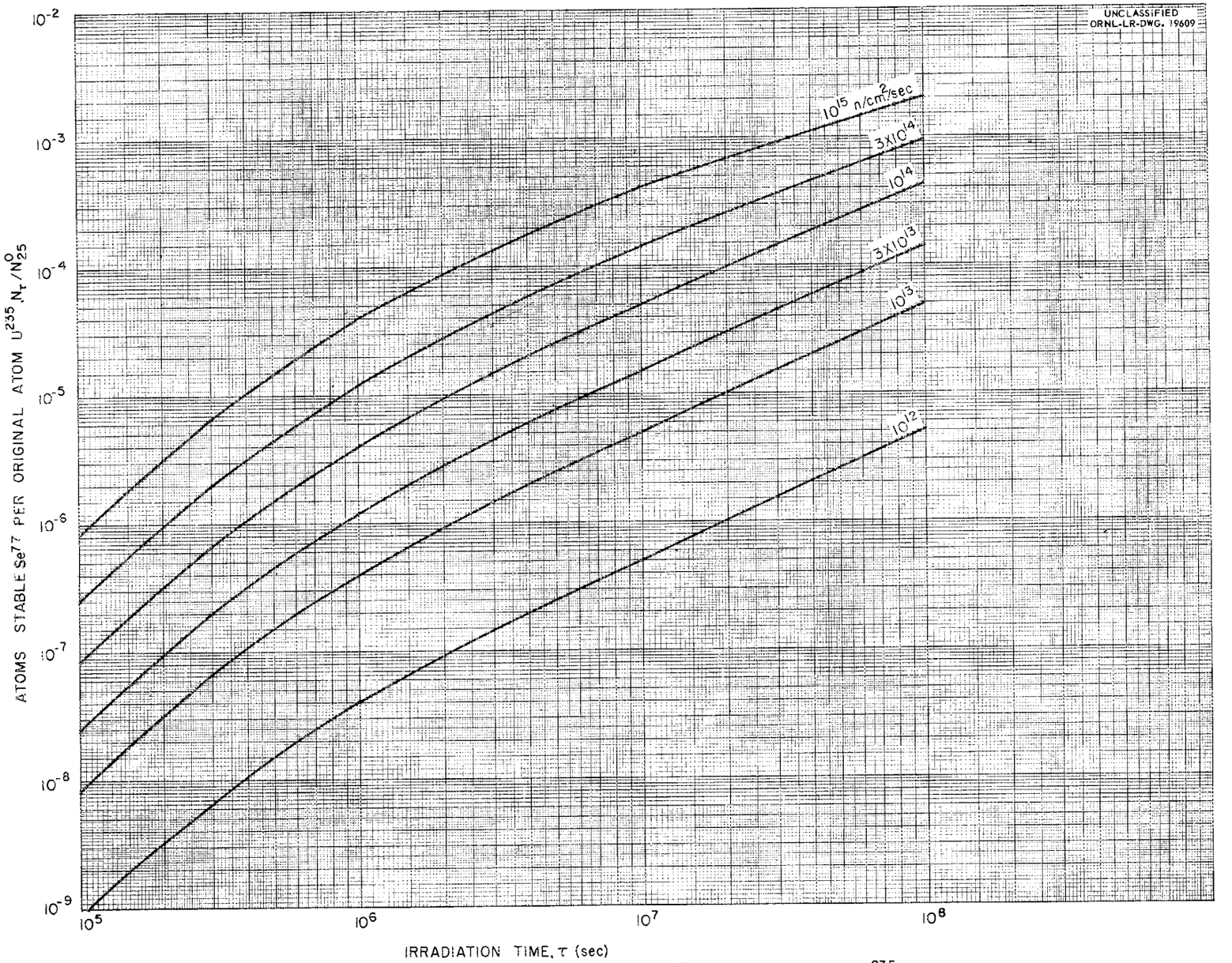



Fig. D-6. Effect of Irradiation Time and Flux on Amount of Stable $Se^{76*}$ Formed in Fission of $U^{235}$.

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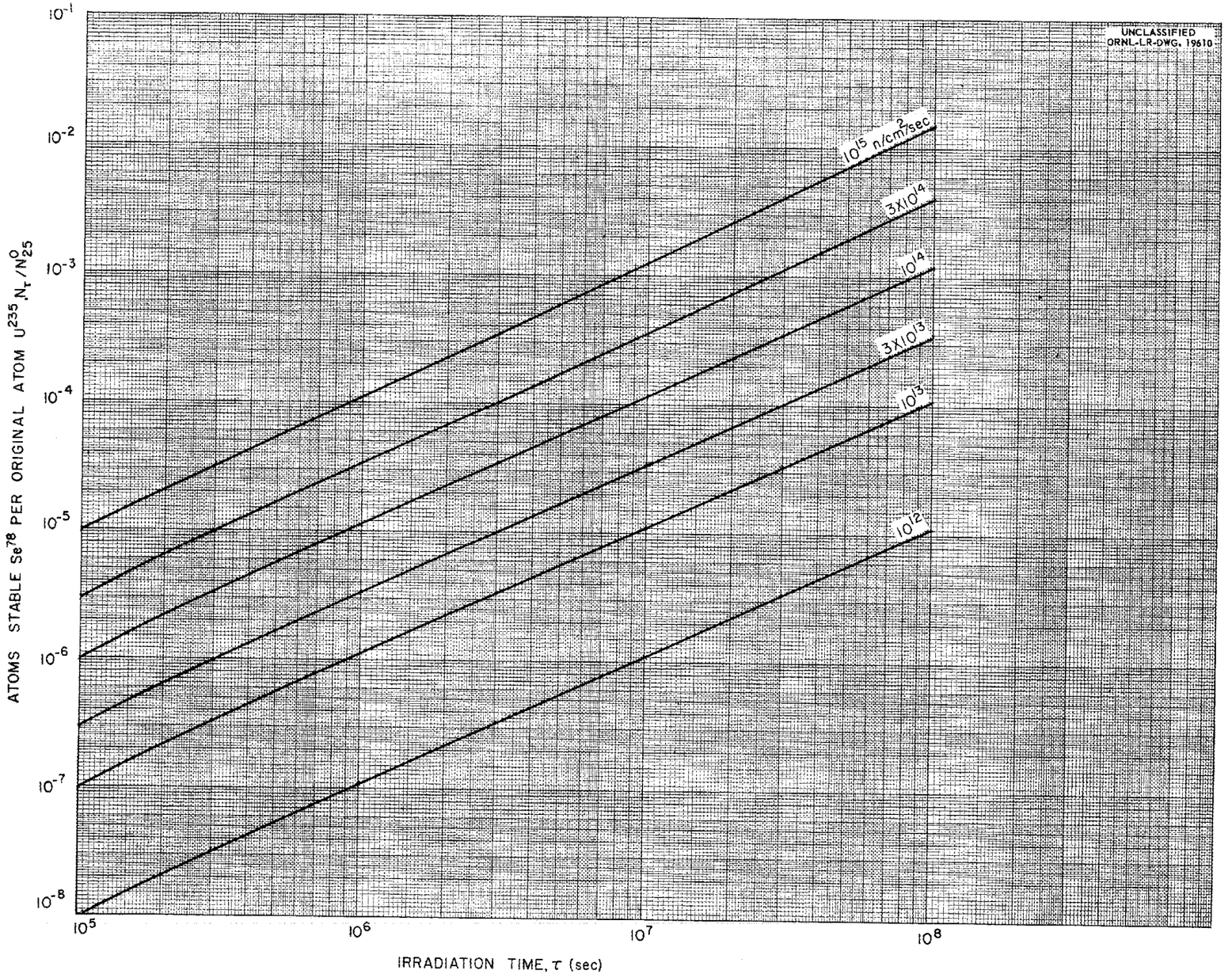



Fig. D-8. Effect of Irradiation Time and Flux on Amount of Stable $Se^{78}$ Formed in Fission of $U^{235}$.

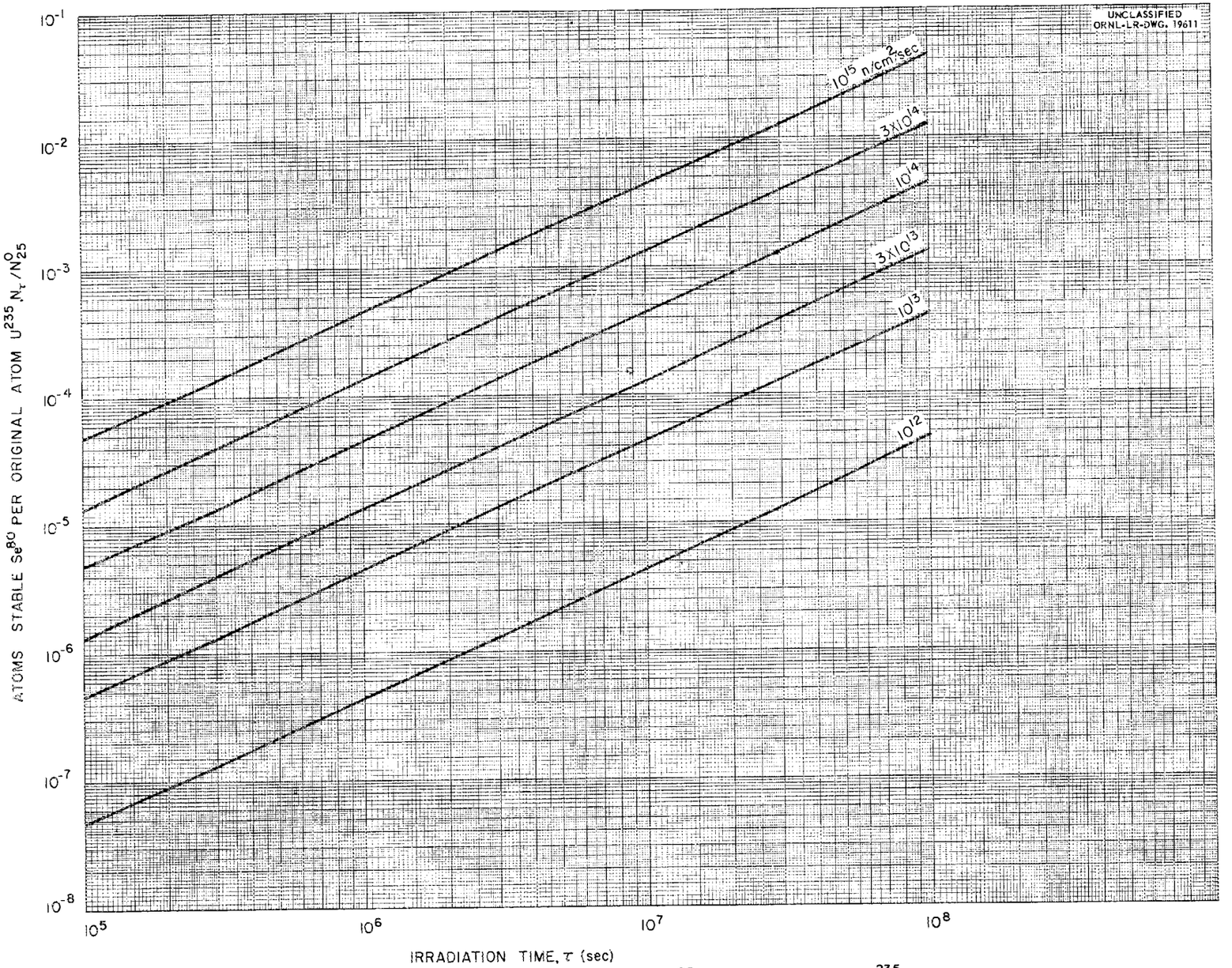



Fig. D-9. Effect of Irradiation Time and Flux on Amount of Stable $Se^{80}$ Formed in Fission of $U^{235}$.

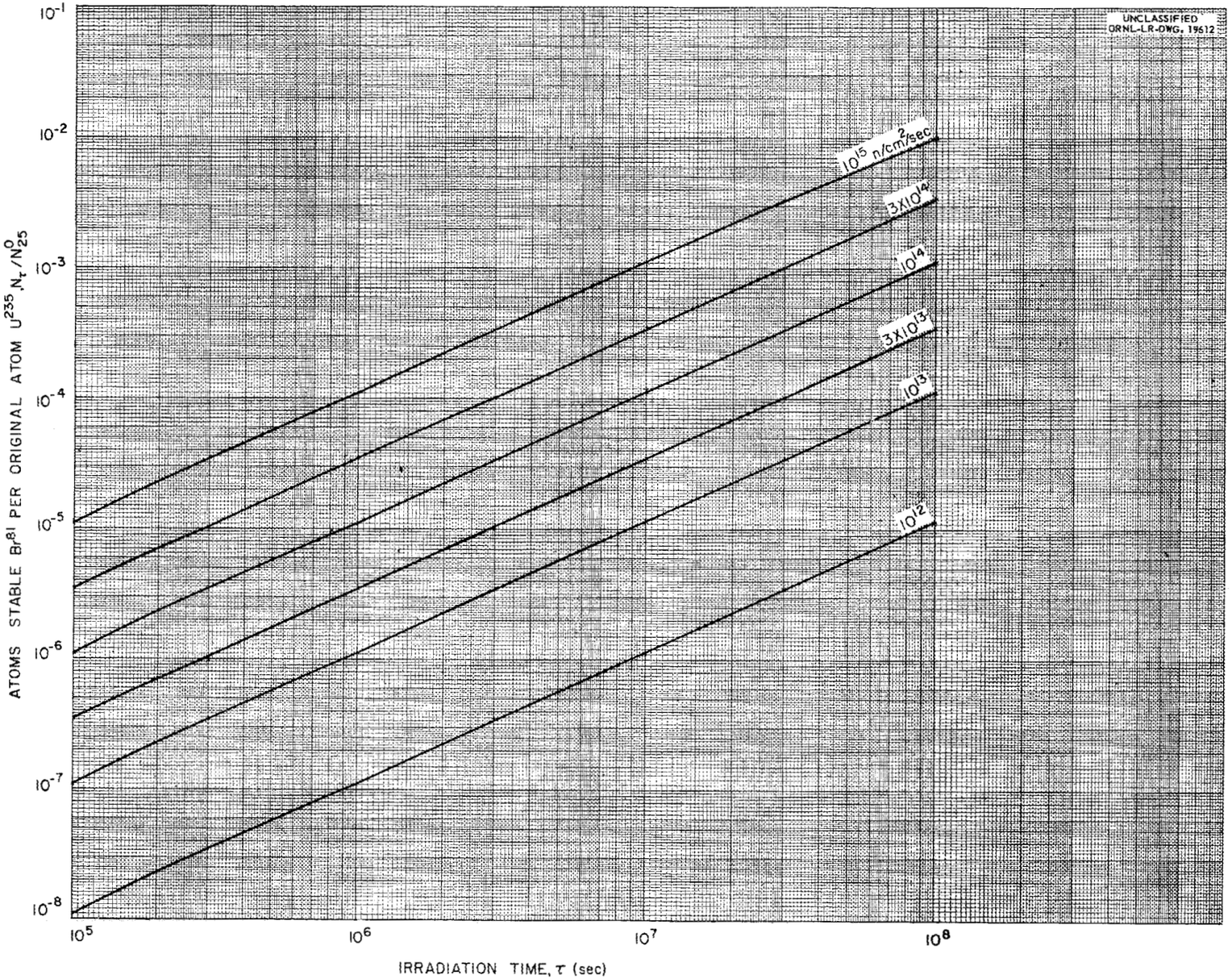



Fig. D-10. Effect of Irradiation Time and Flux on Amount of Stable $Br^{81}$ Formed in Fission of $U^{235}$.

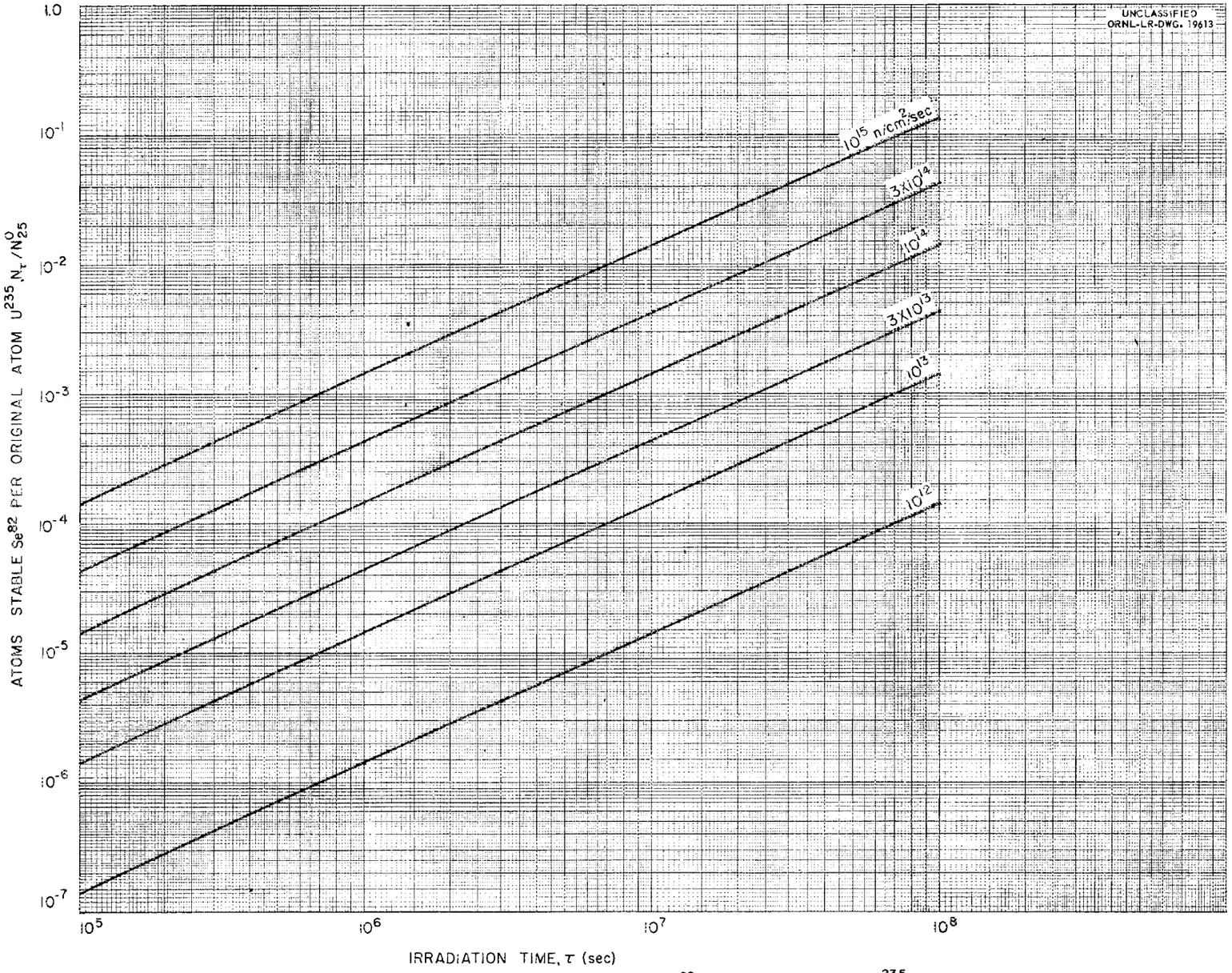



Fig. D-11. Effect of Irradiation Time and Flux on Amount of Stable $Se^{82}$ Formed in Fission of $U^{235}$.

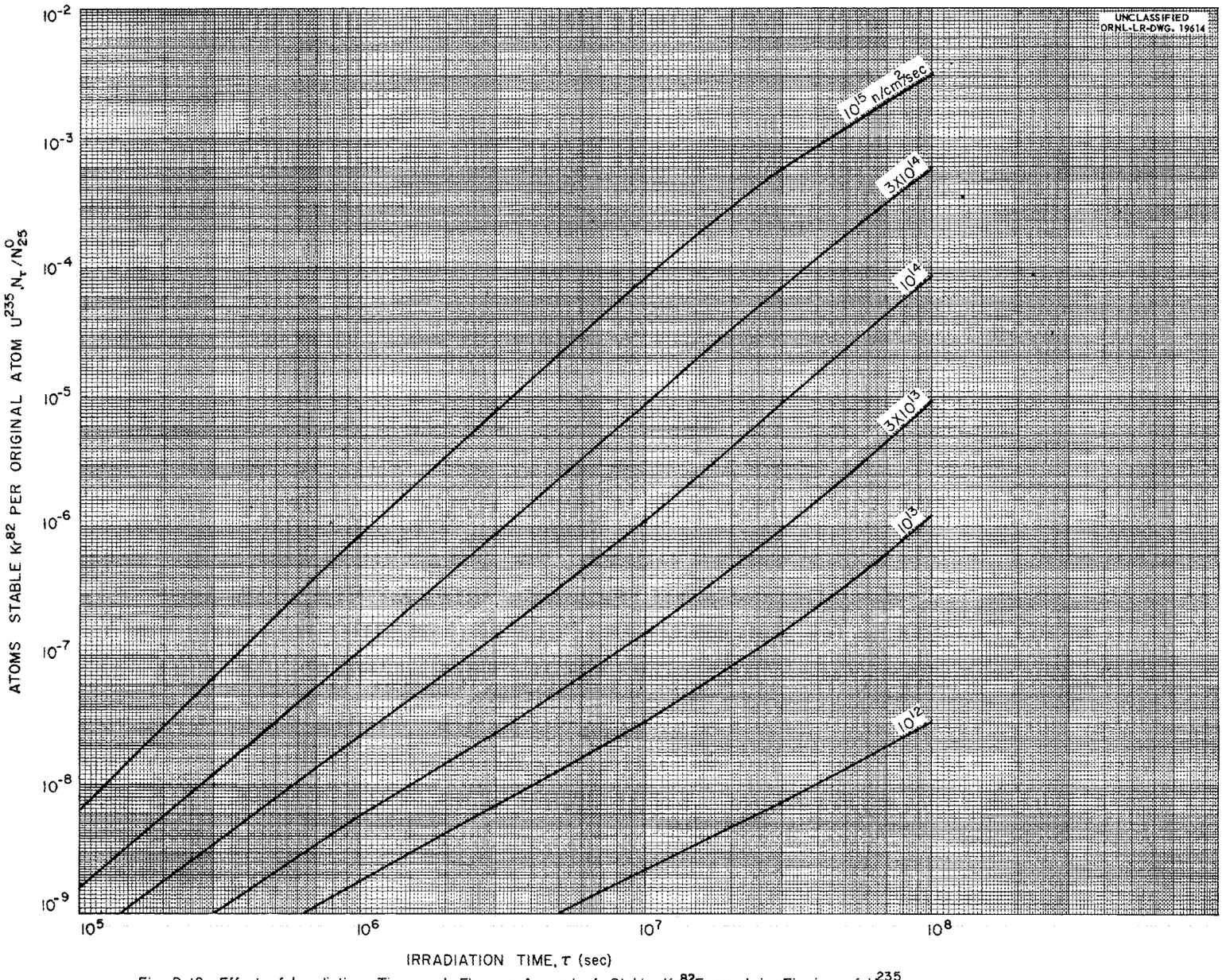



Fig. D-12. Effect of Irradiation Time and Flux on Amount of Stable $Kr^{82}$ Formed in Fission of $U^{235}$.

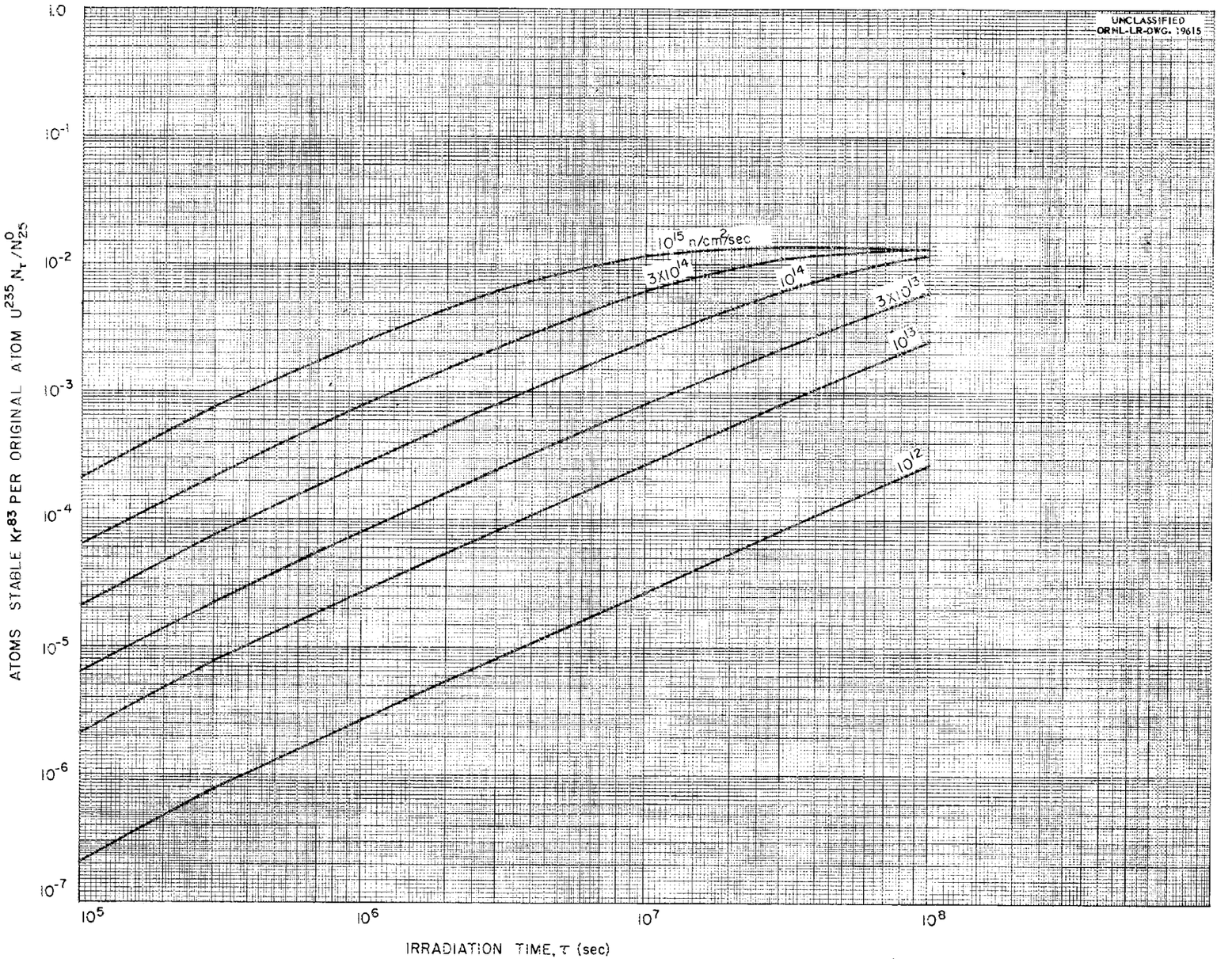
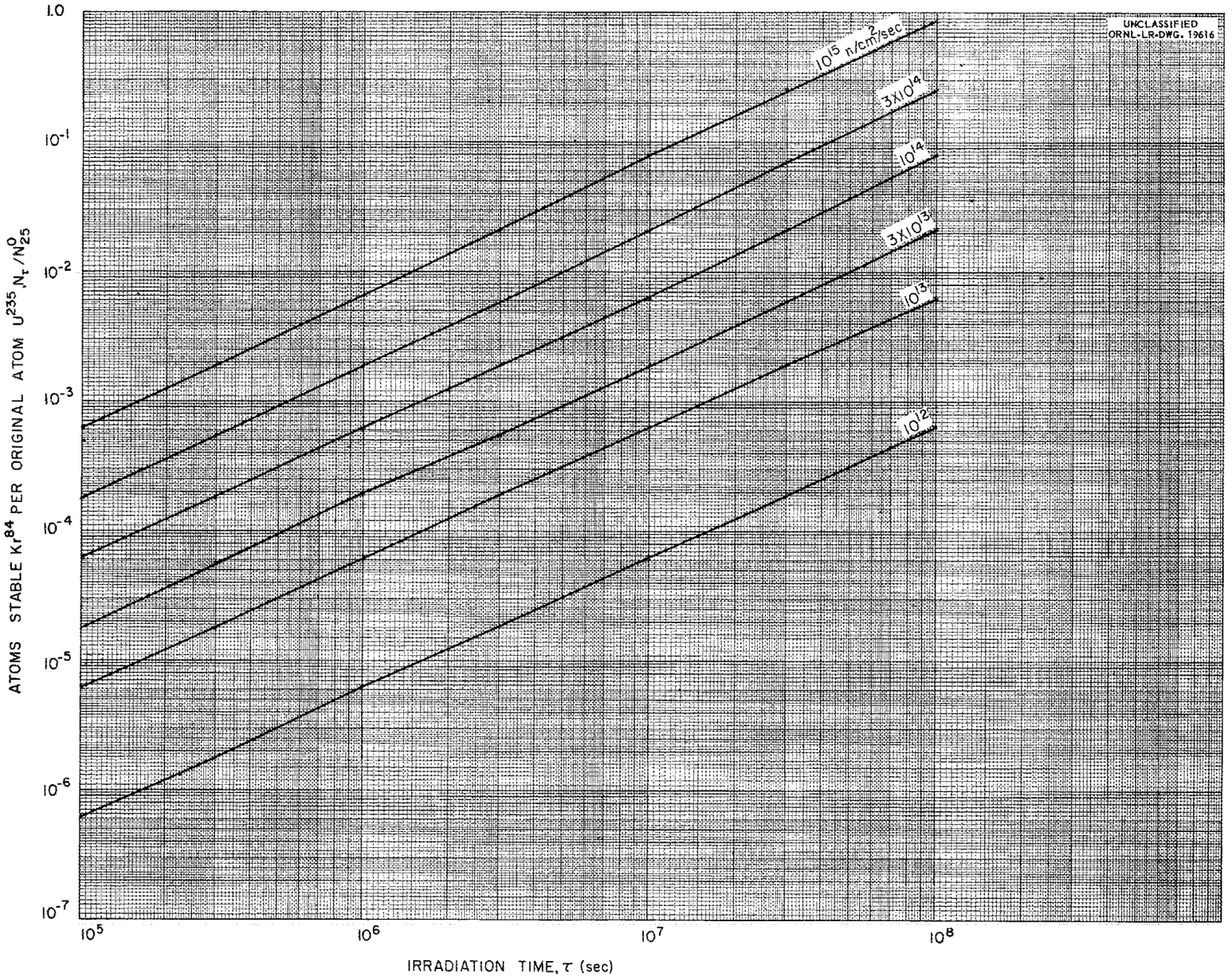



Fig. D-13. Effect of Irradiation Time and Flux on Amount of Stable $Kr^{83}$ Formed in Fission of $U^{235}$.

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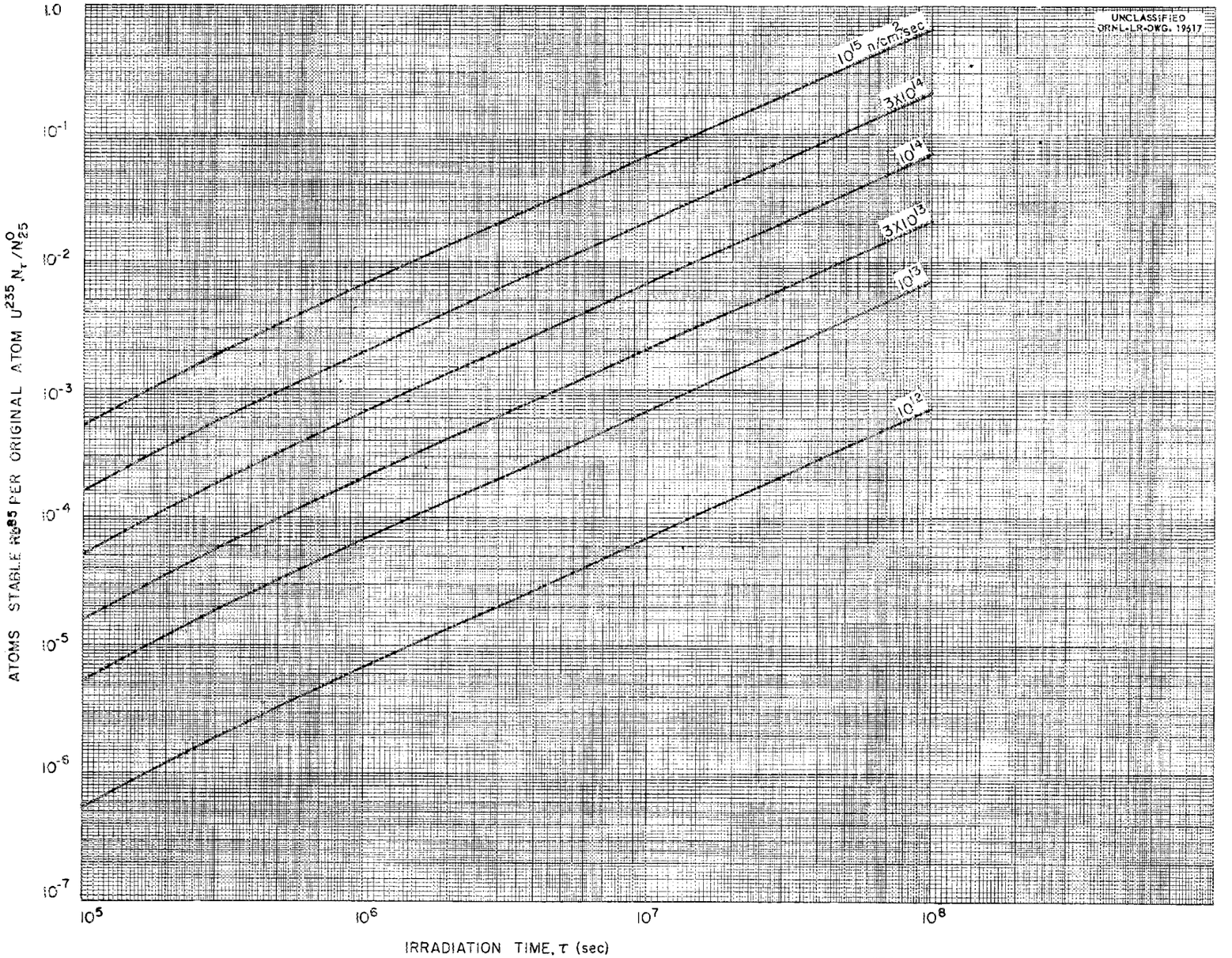



Fig. D-15. Effect of Irradiation Time and Flux on Amount of Stable $Rb^{85}$ Formed in Fission of $U^{235}$.

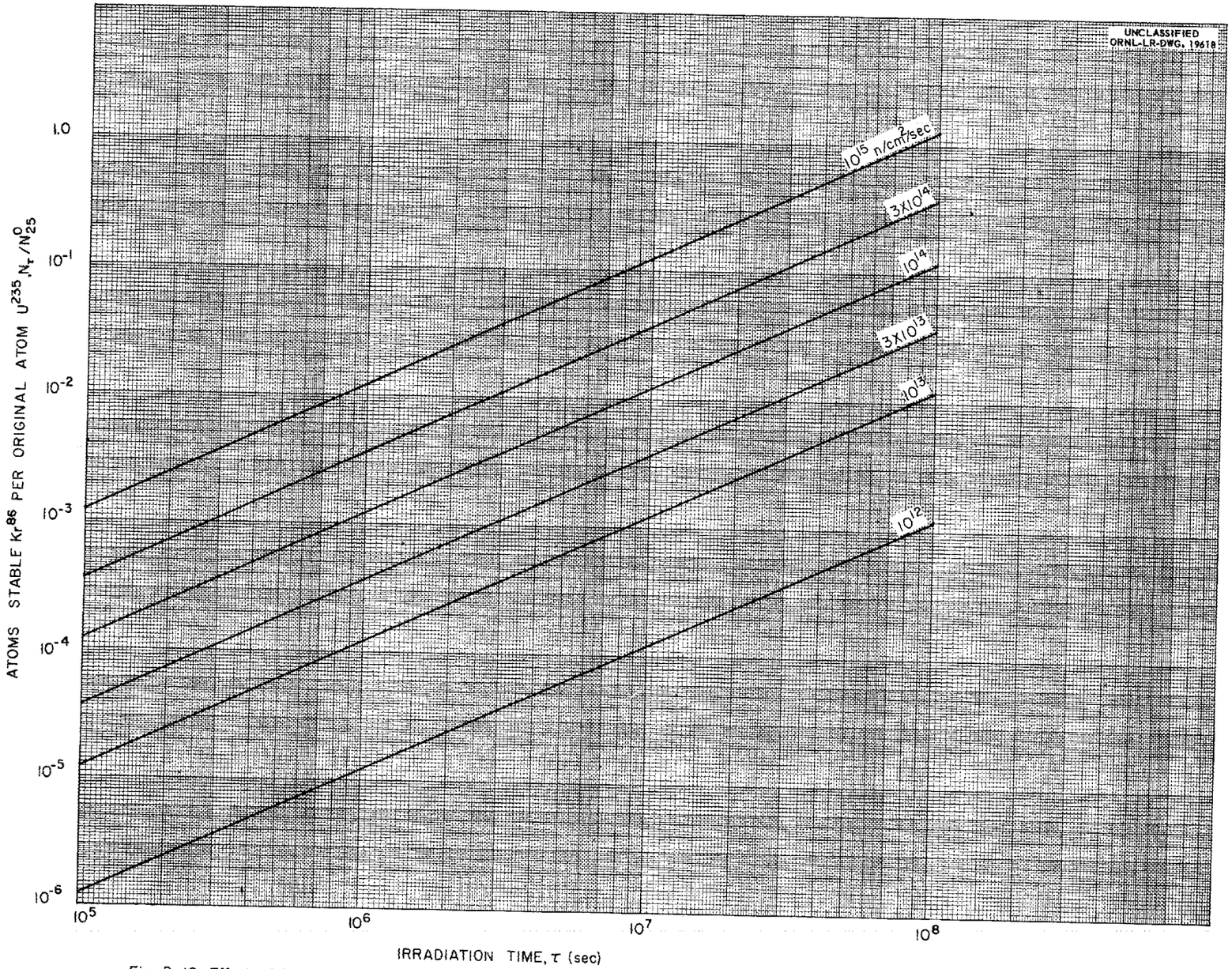
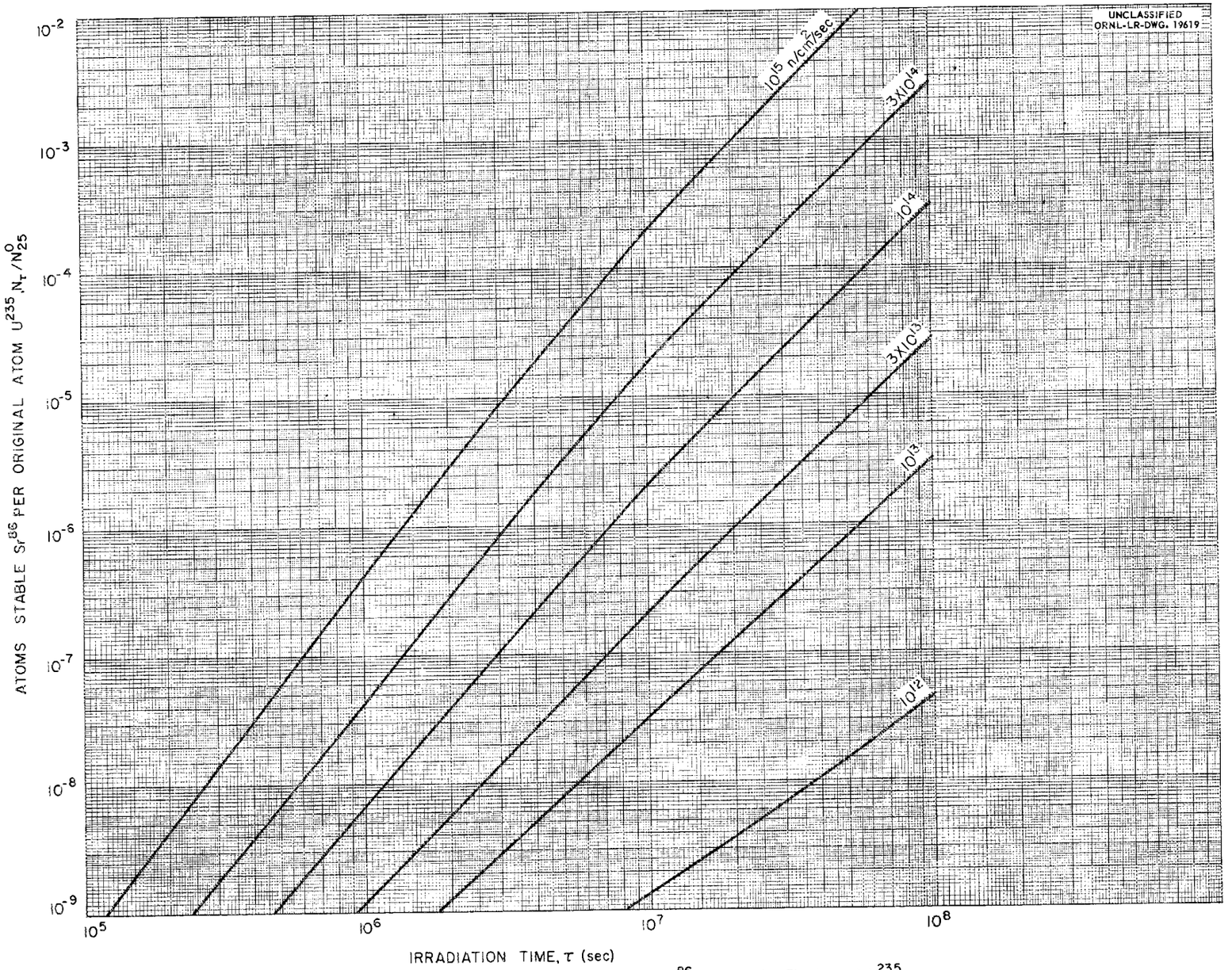



Fig. D-16. Effect of Irradiation Time and Flux on Amount of Stable $Kr^{86}$ Formed in Fission of $U^{235}$.

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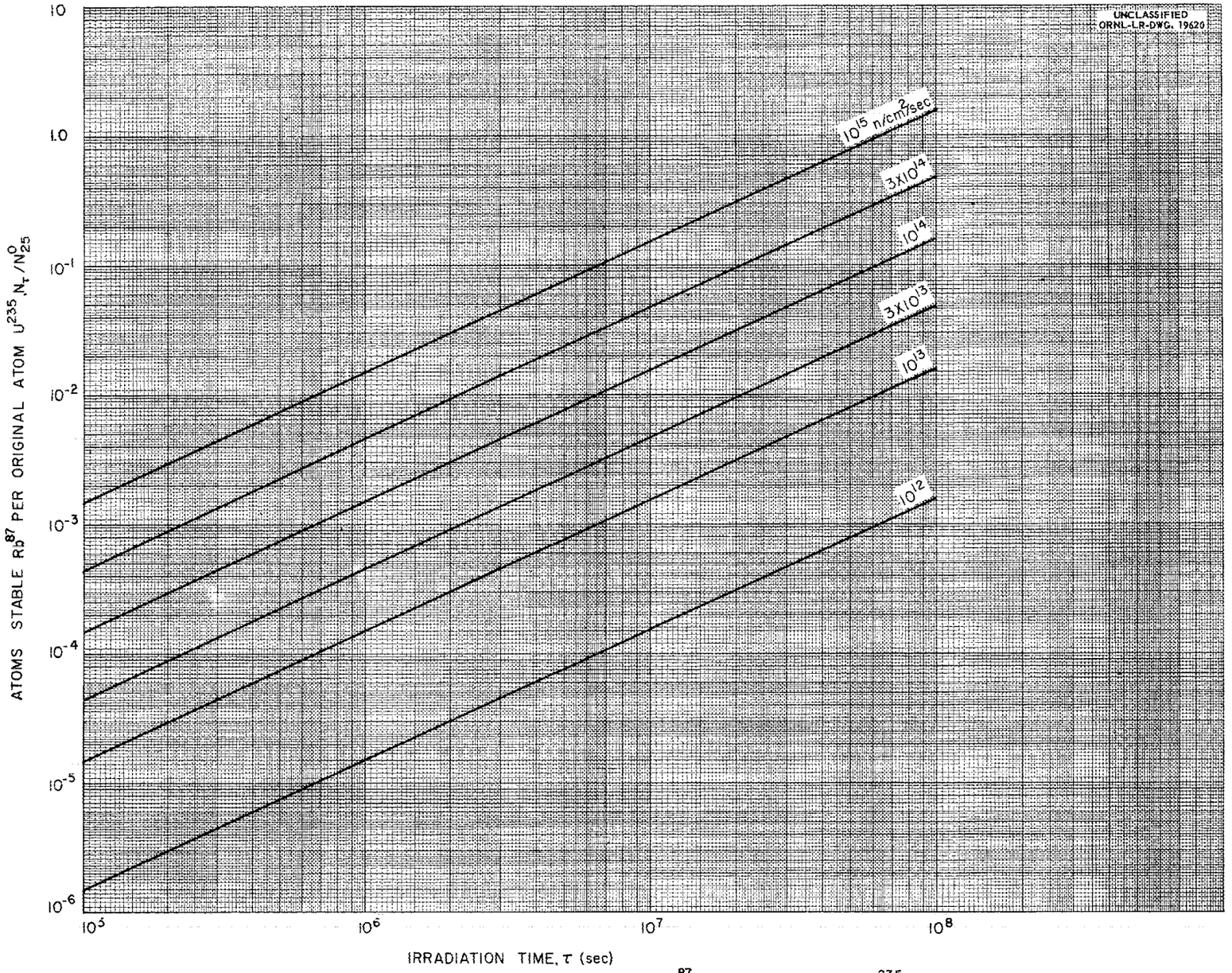


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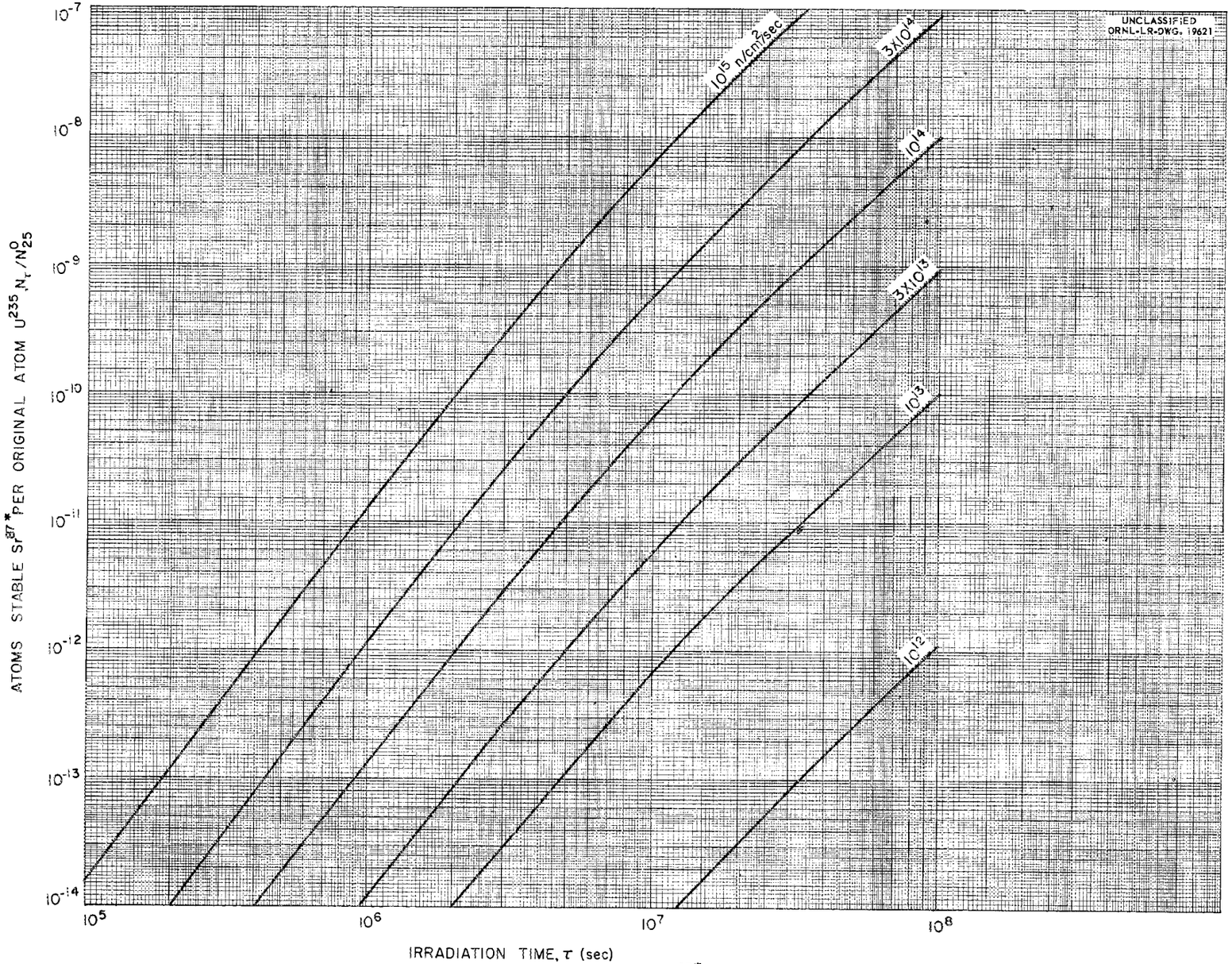


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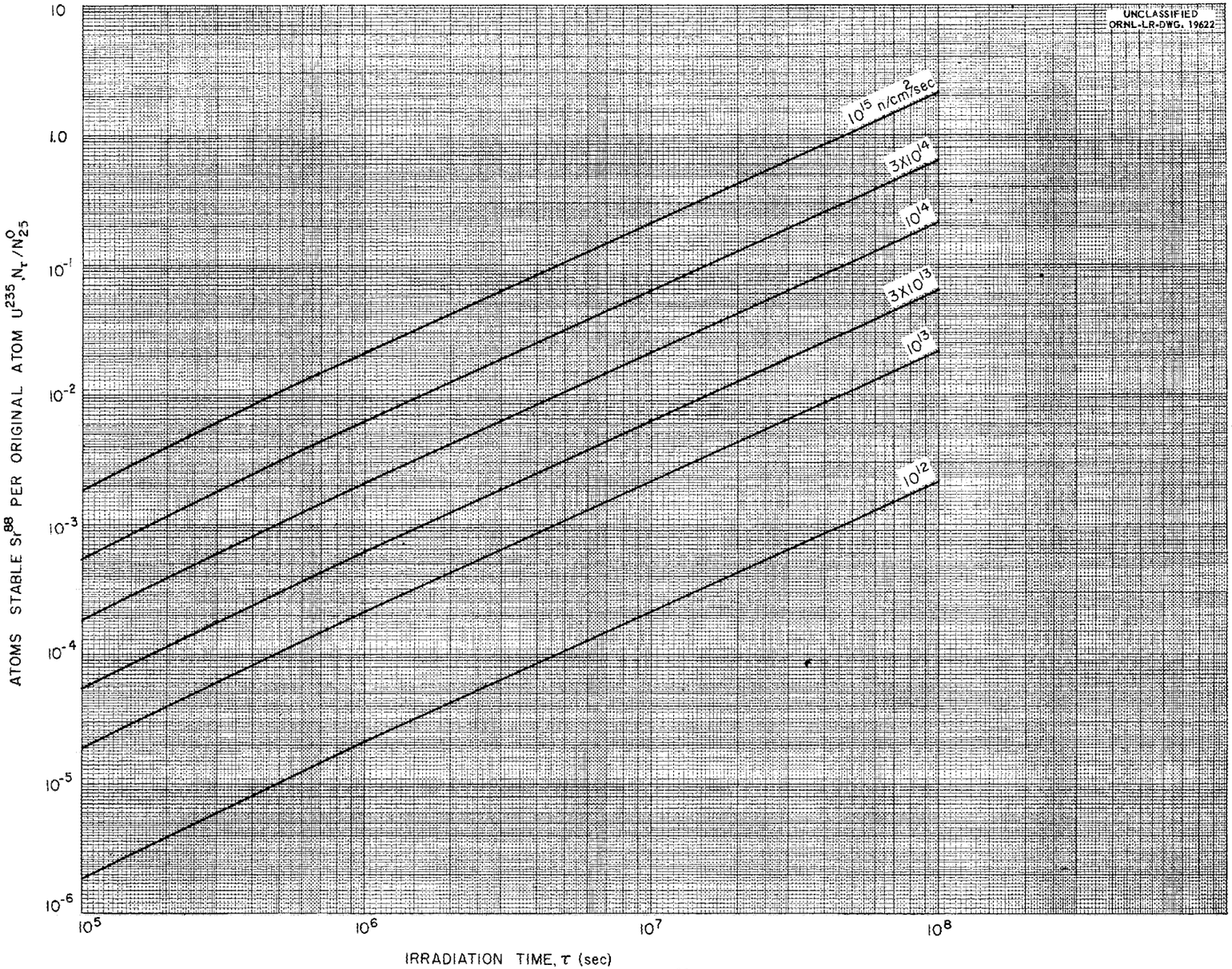


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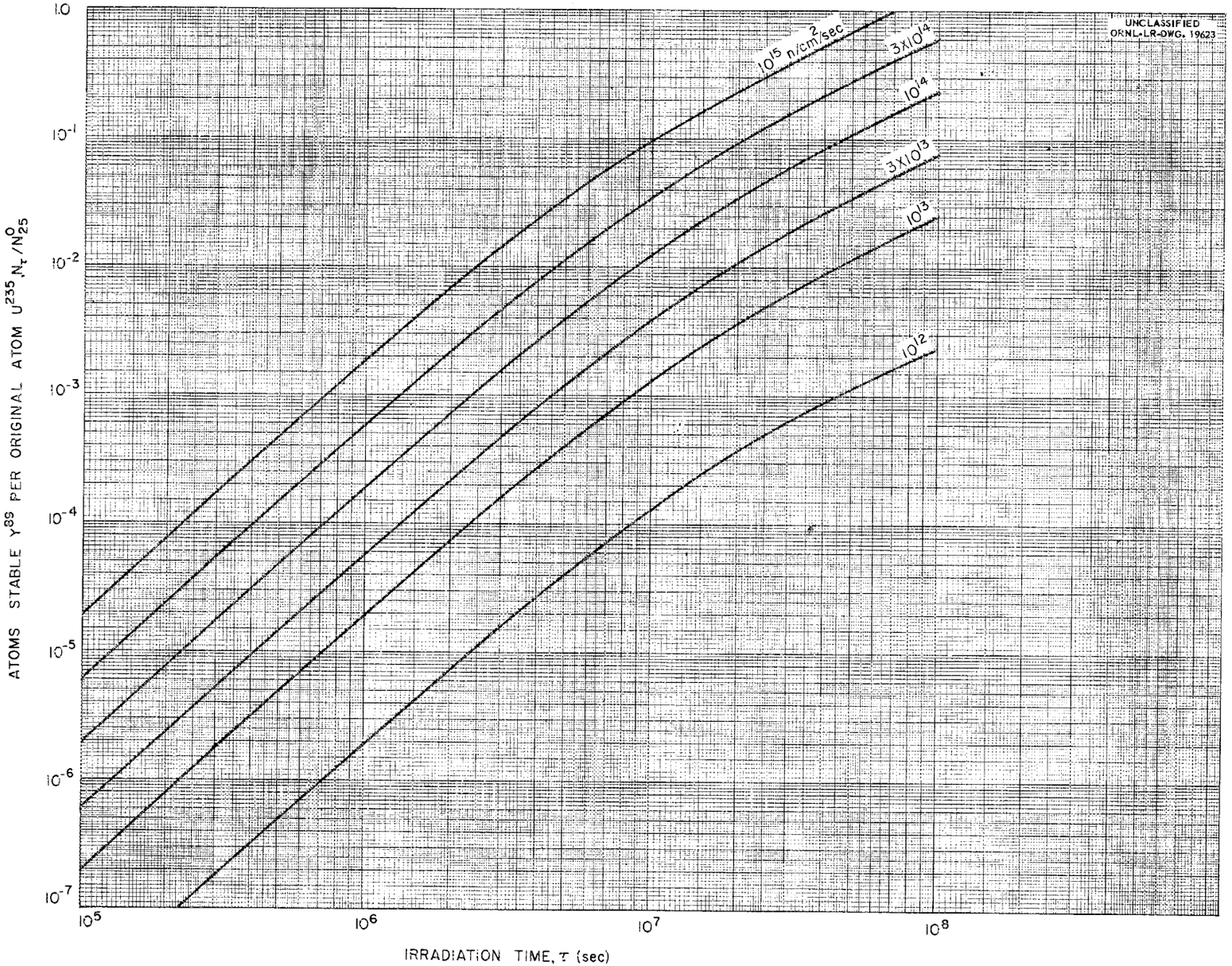


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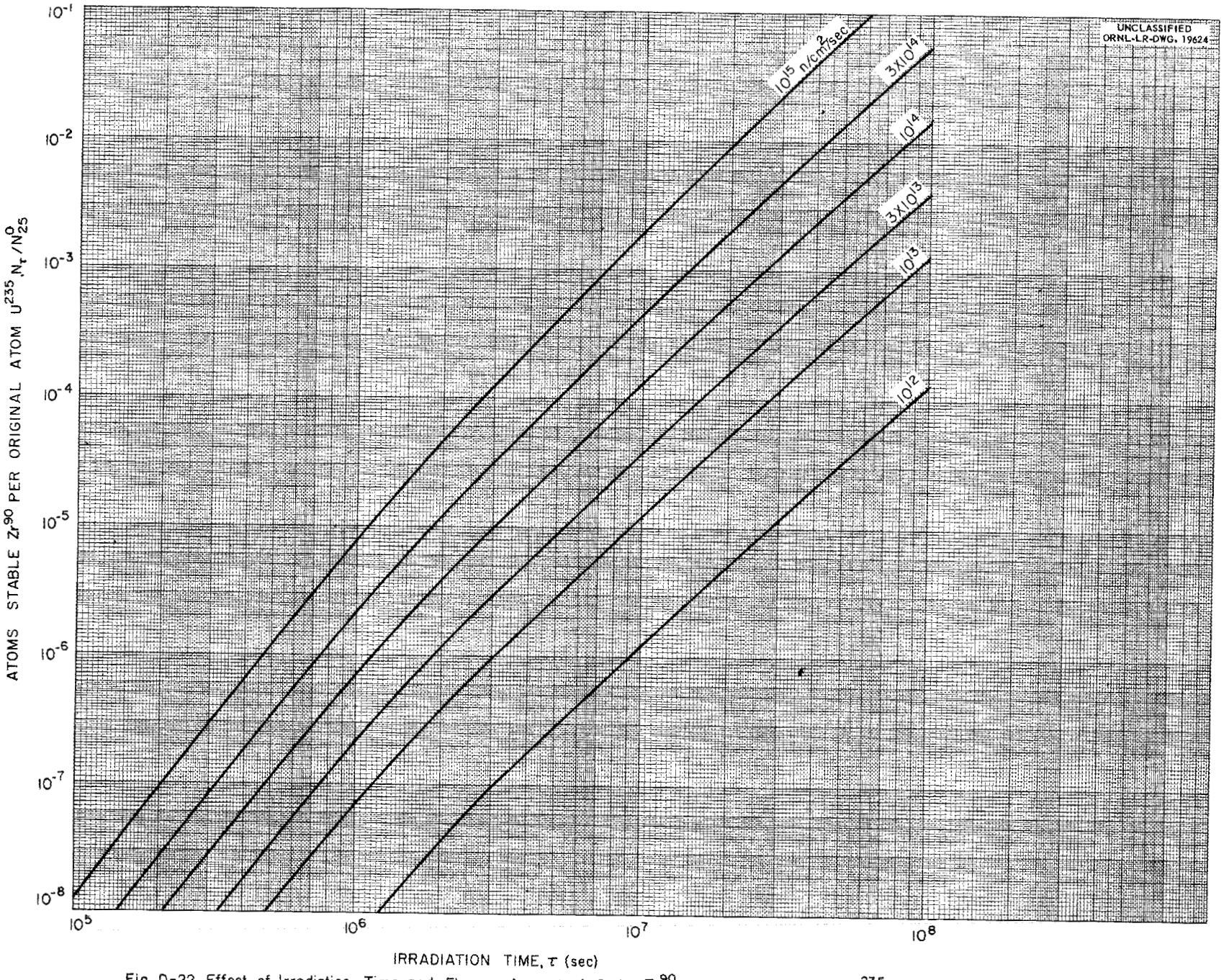


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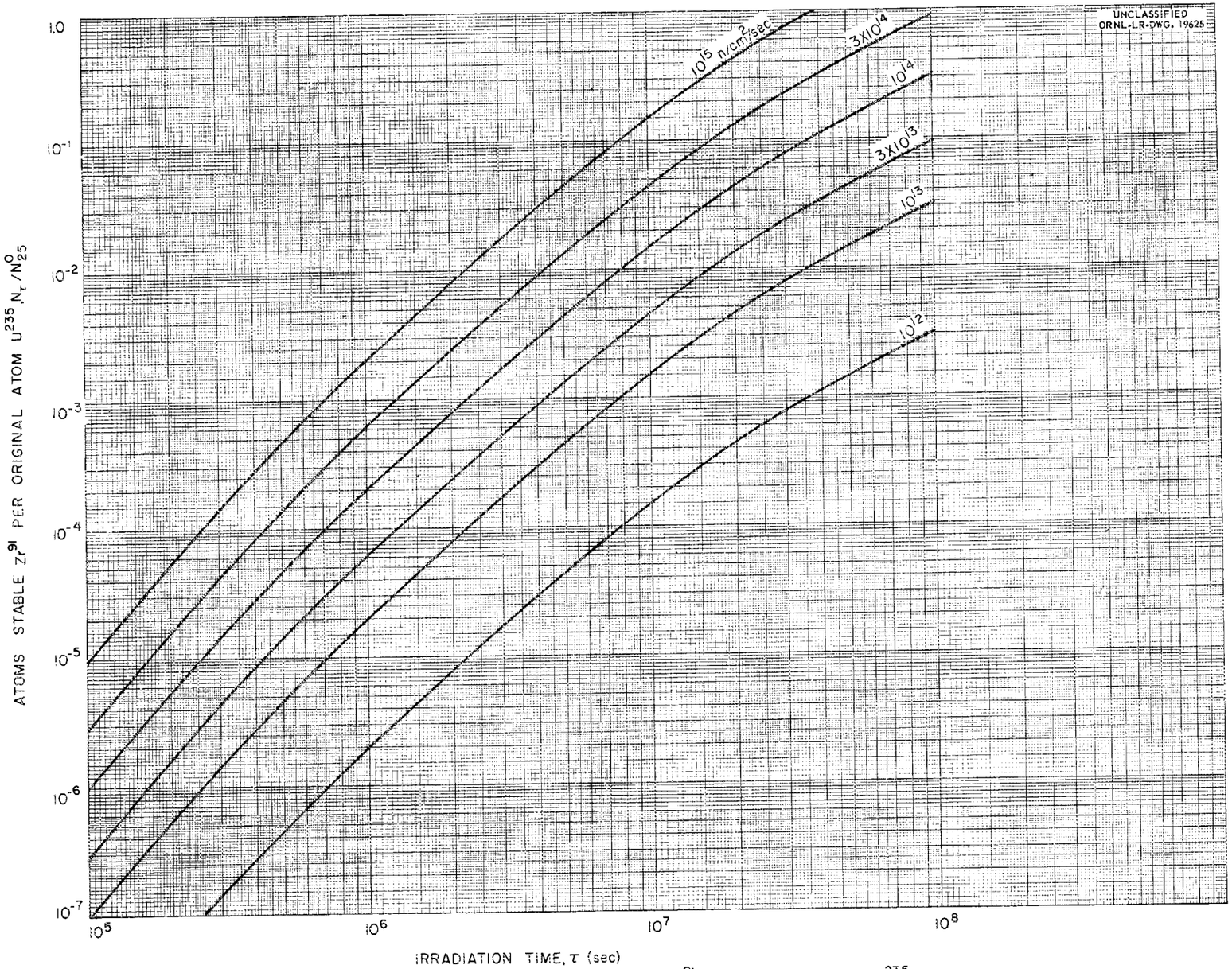


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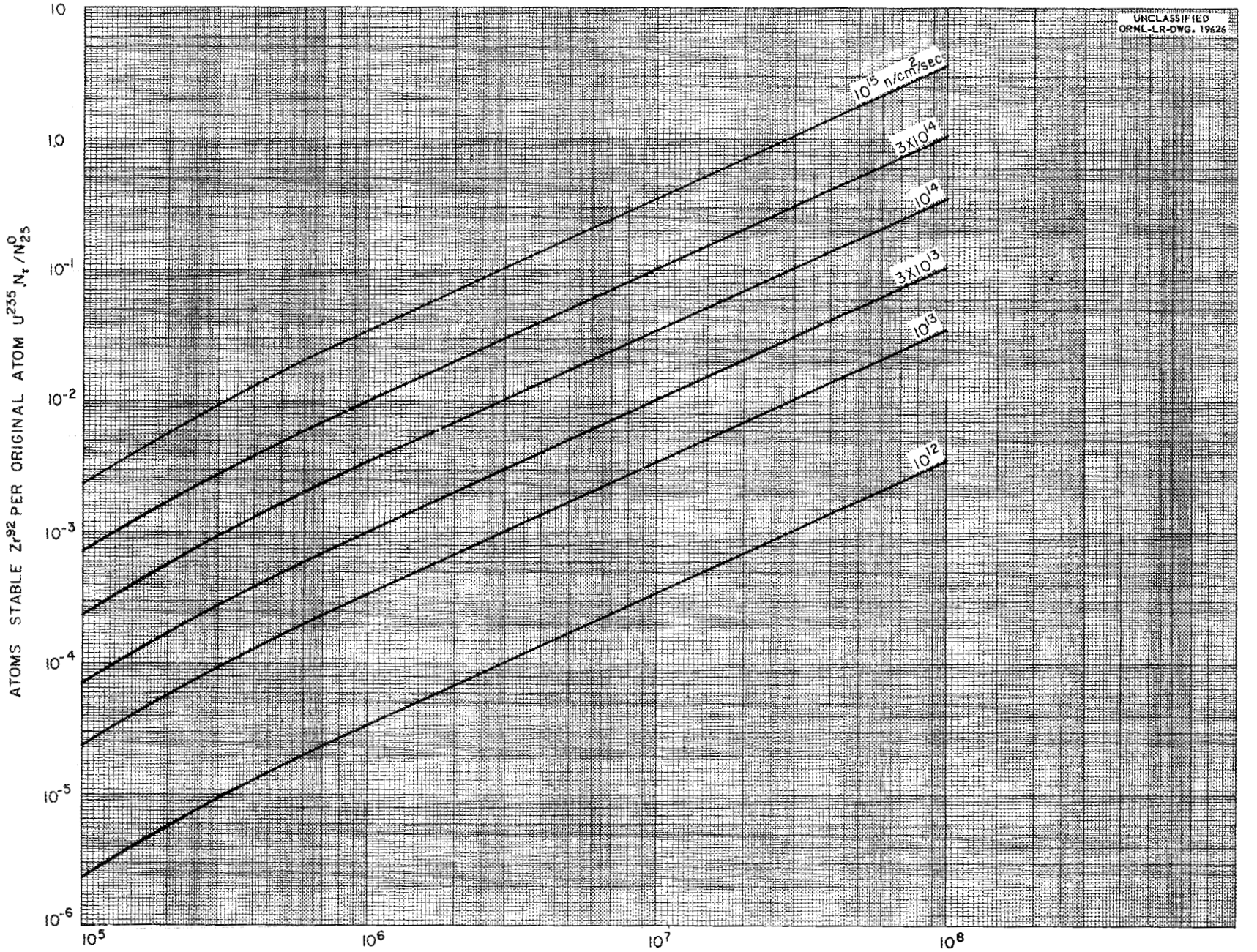


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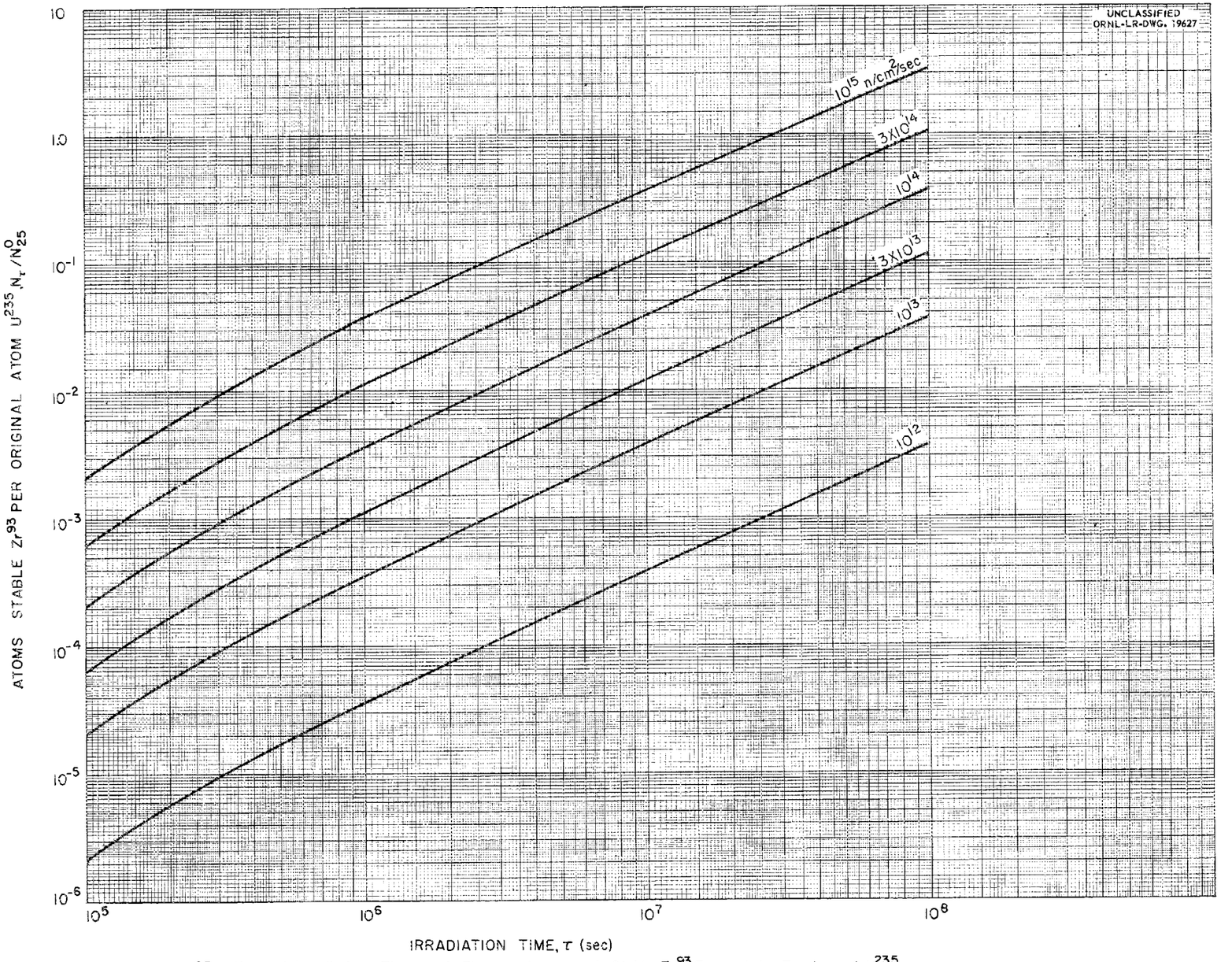


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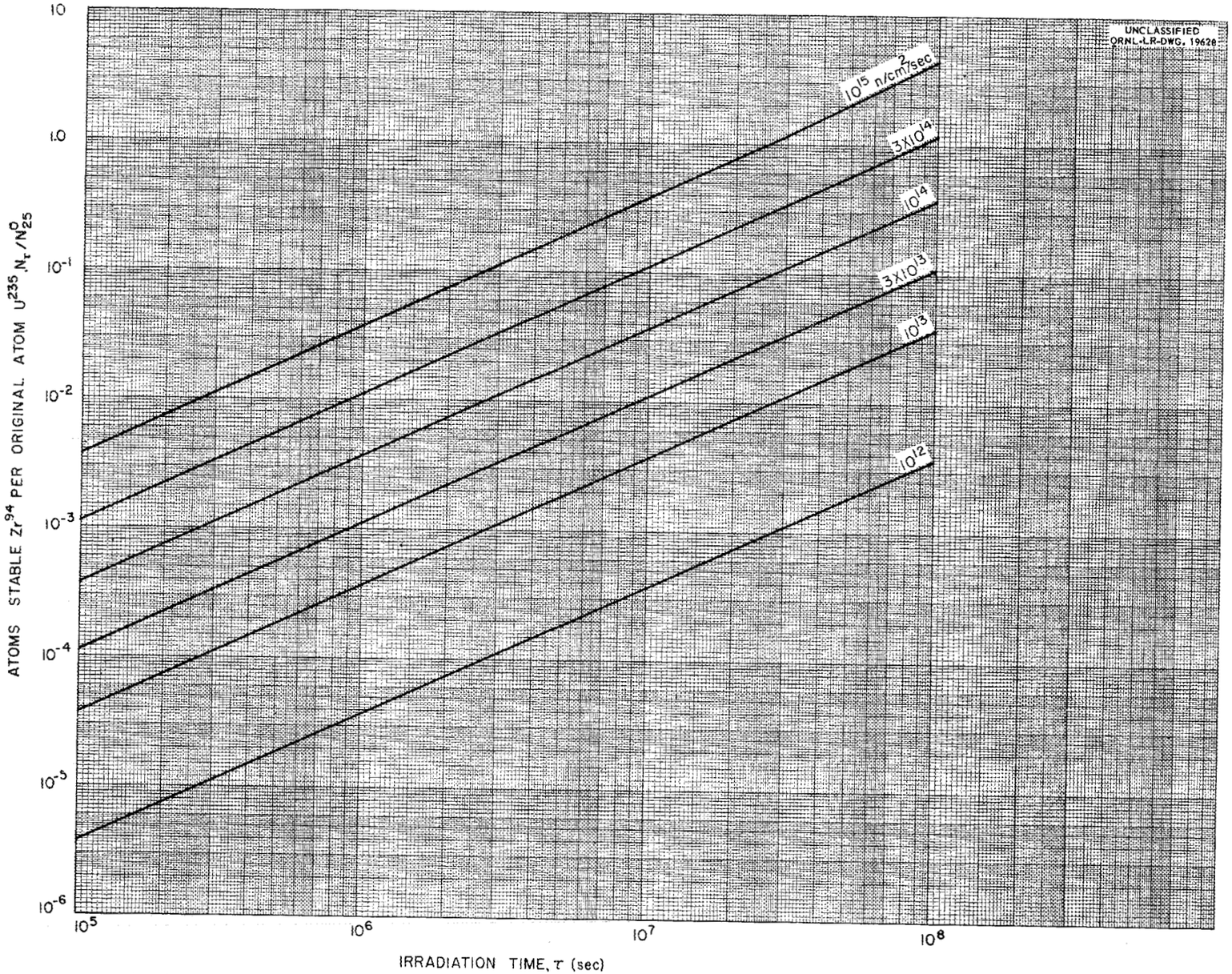


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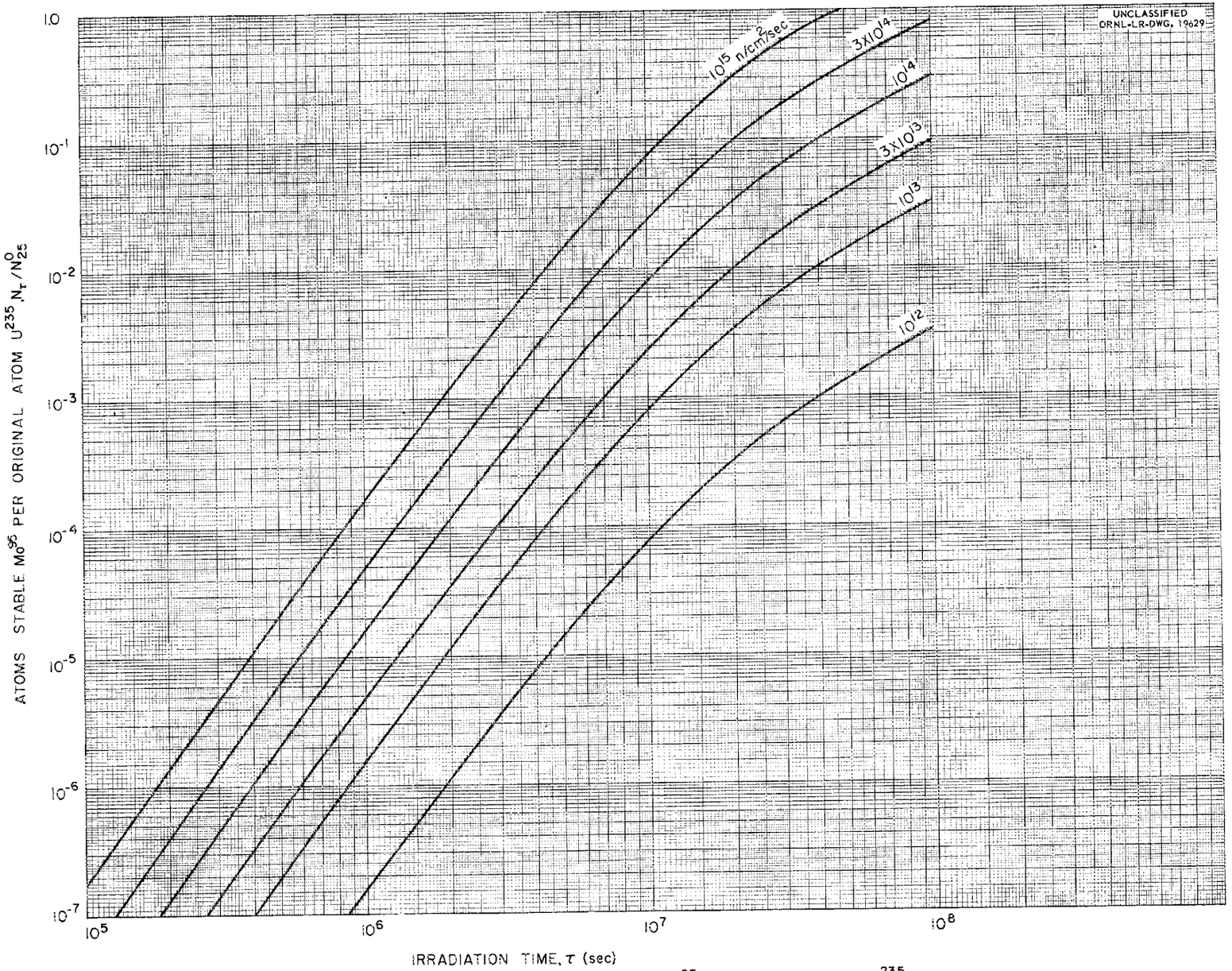


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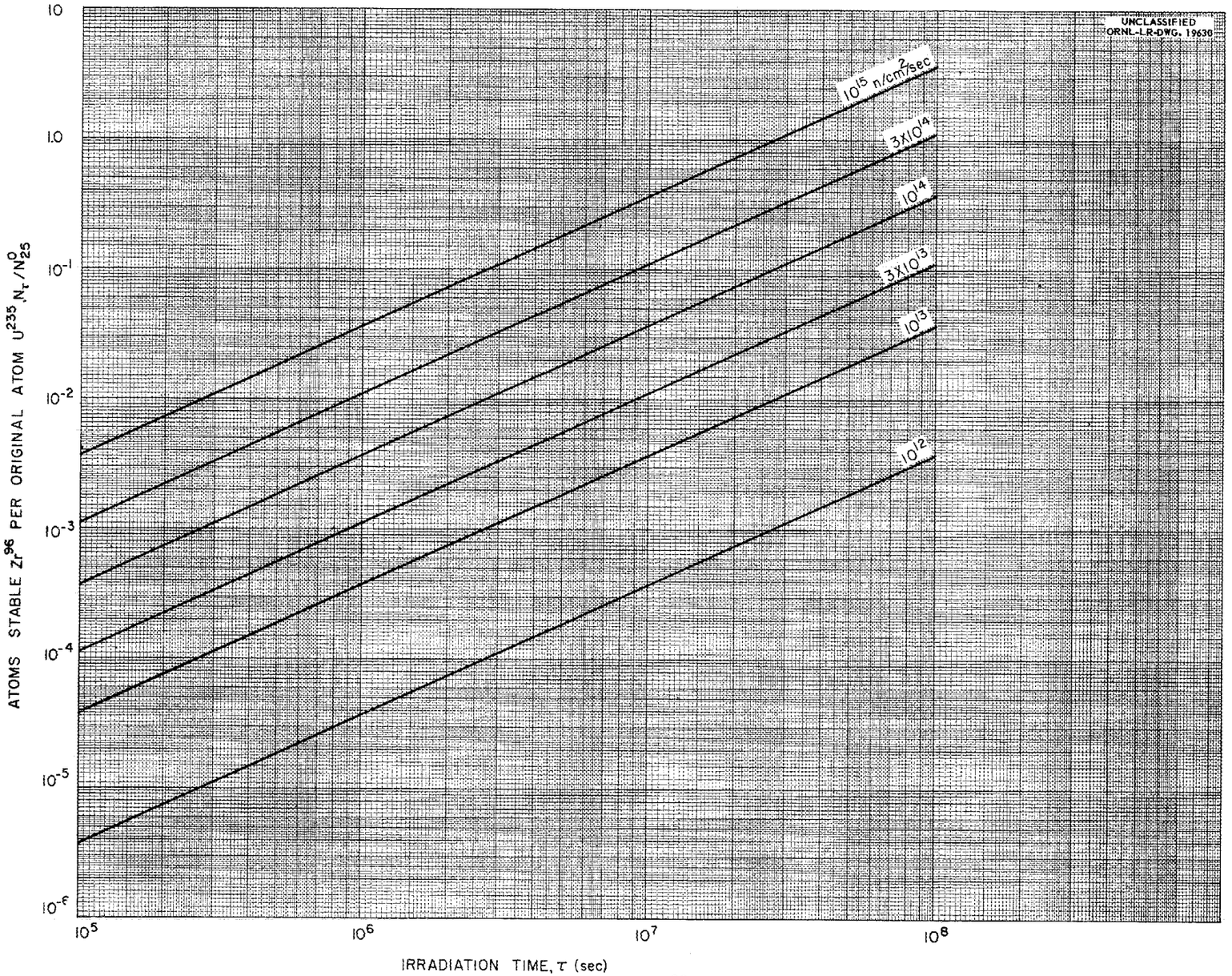


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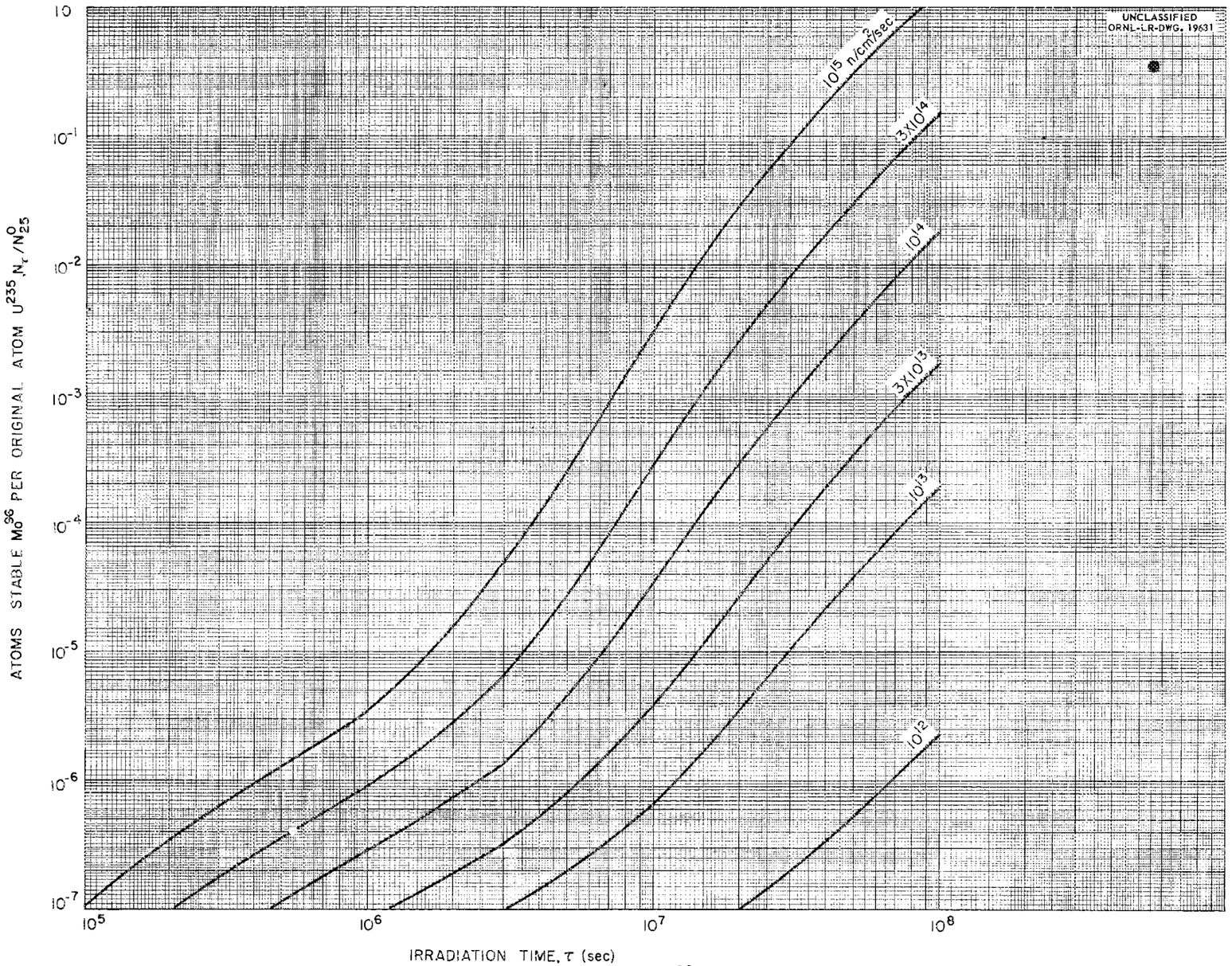


Fig. D-29. Effect of Irradiation Time and Flux on Amount of Stable $Mo^{96}$ Formed in Fission of $U^{235}$.

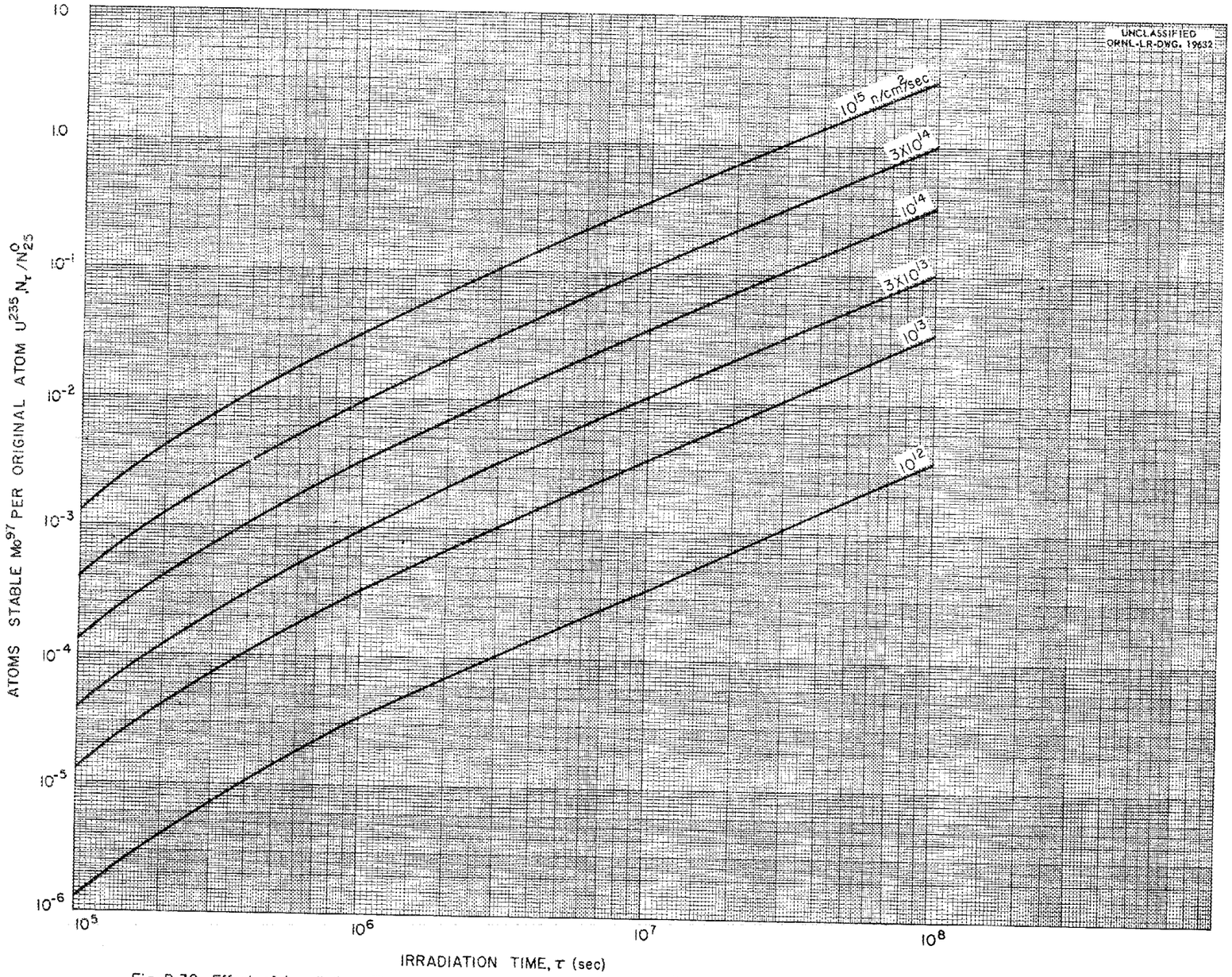


Fig. D-30. Effect of Irradiation Time and Flux on Amount of Stable $Mo^{97}$ Formed in Fission of $U^{235}$.

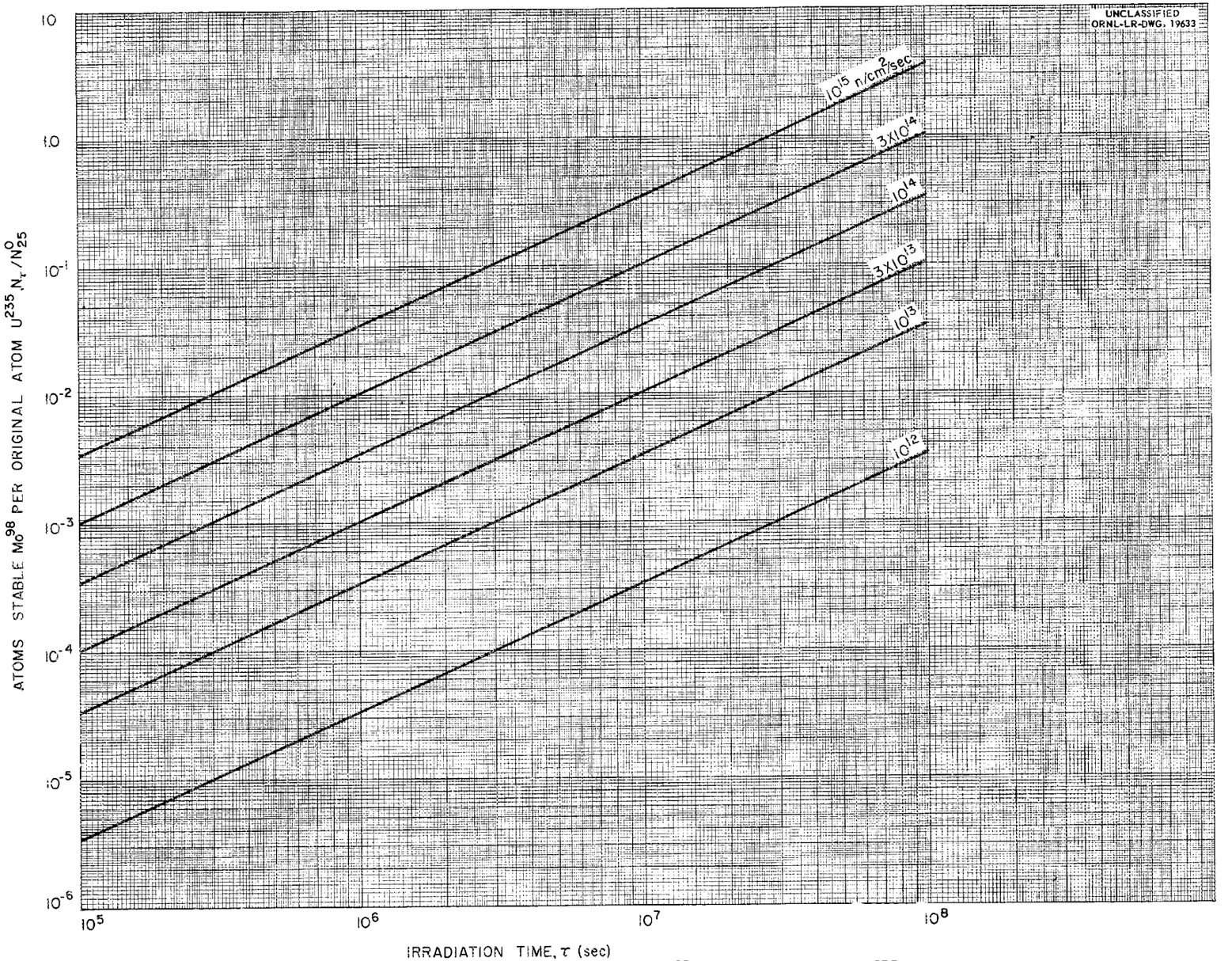


Fig. D-31. Effect of Irradiation Time and Flux on Amount of Stable $Mo^{98}$ Formed in Fission of $U^{235}$.

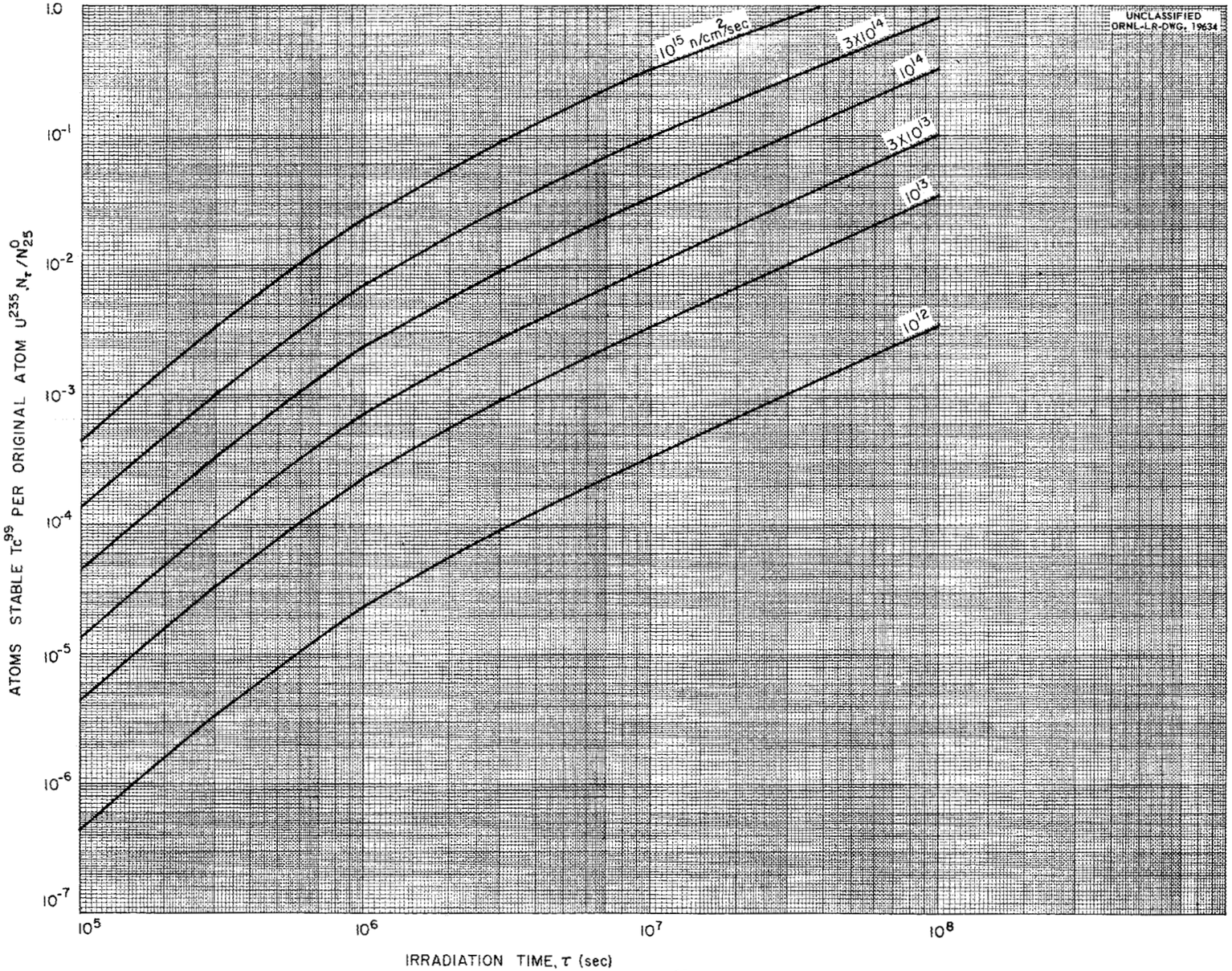


Fig. D-32. Effect of Irradiation Time and Flux on Amount of Stable $Tc^{99}$ Formed in Fission of $U^{235}$.

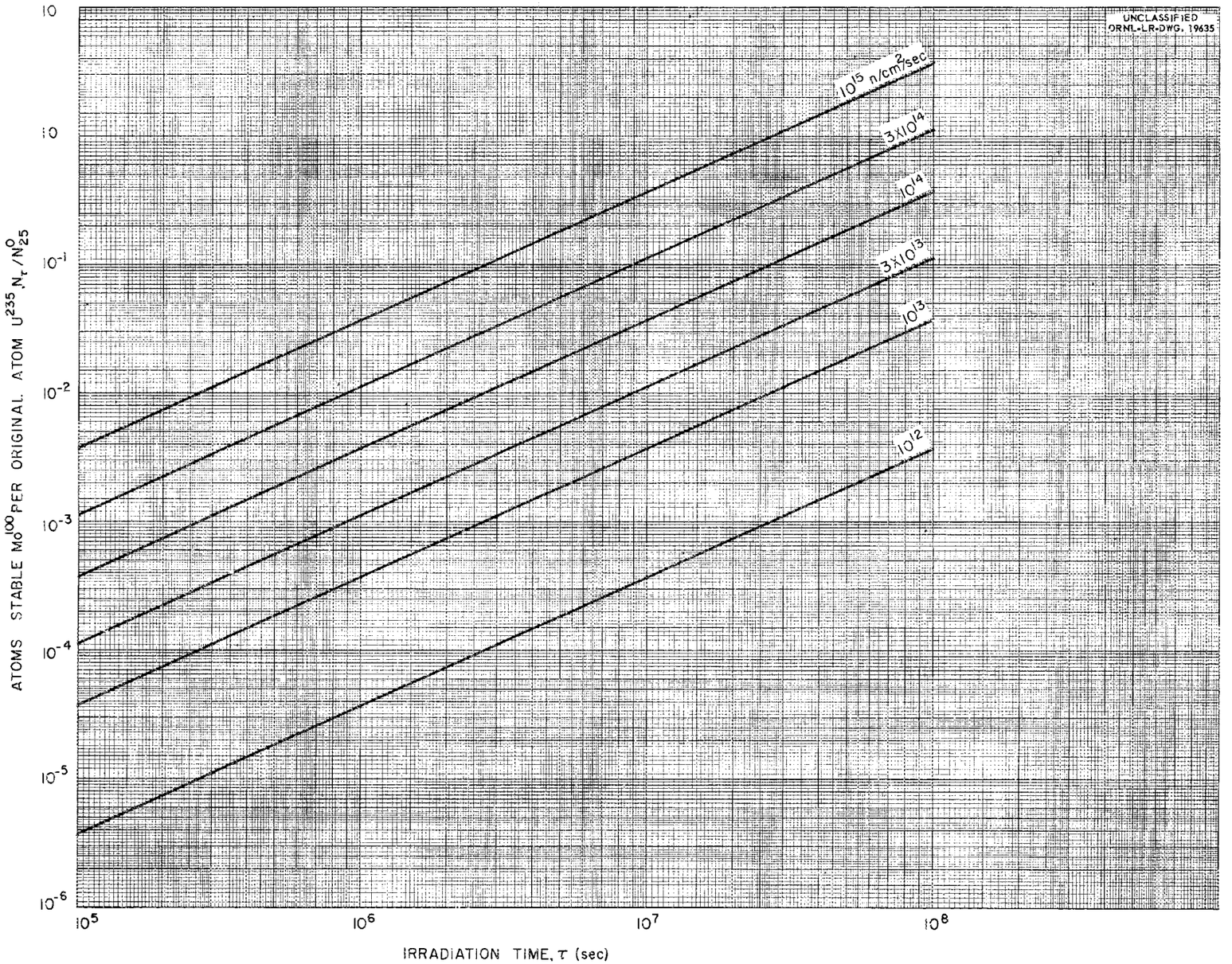


Fig. D-33. Effect of Irradiation Time and Flux on Amount of Stable $Mo^{100}$ Formed in Fission of $U^{235}$.

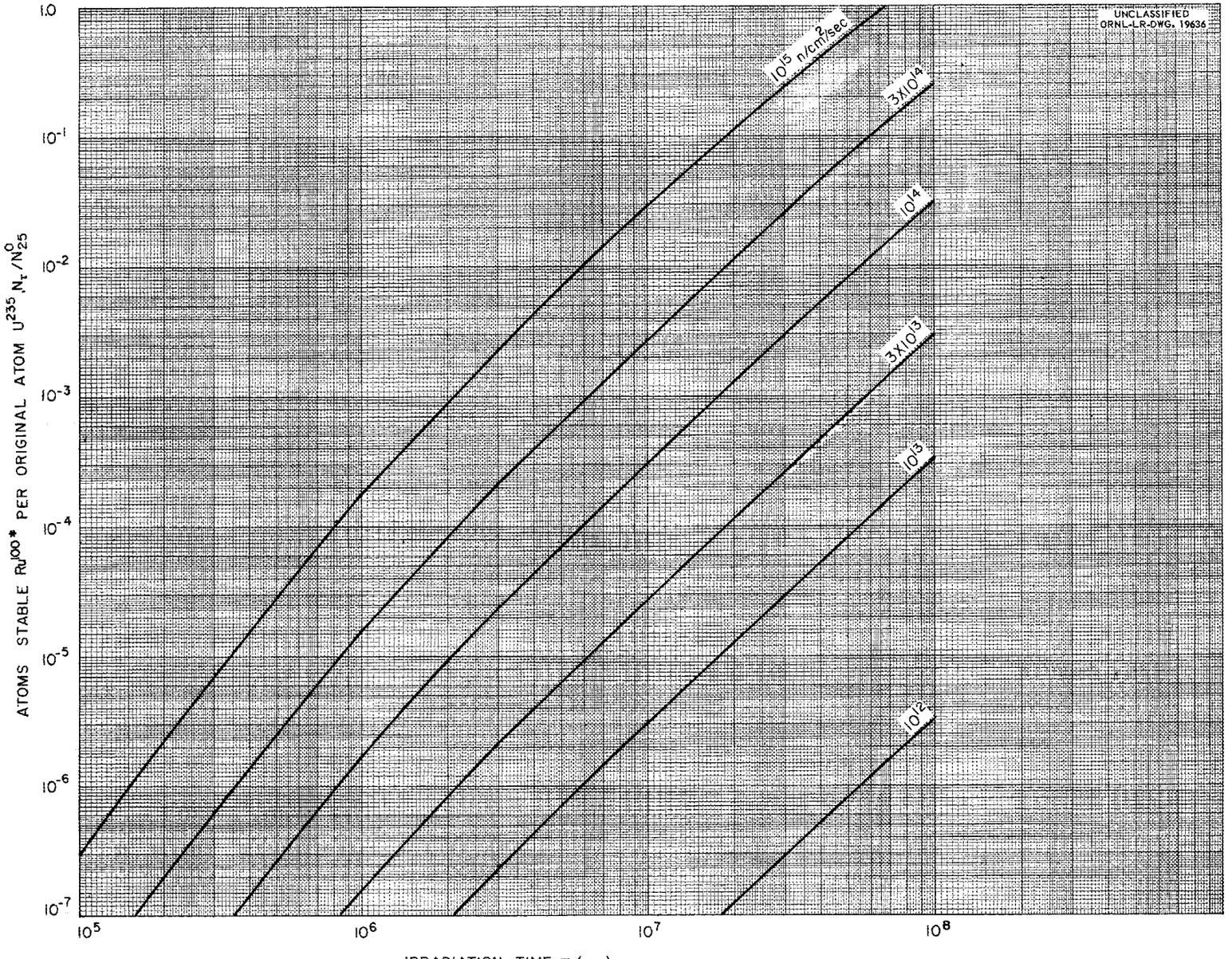


Fig. D-34. Effect of Irradiation Time and Flux on Amount of Stable $Ru^{100*}$ Formed in Fission of $U^{235}$.

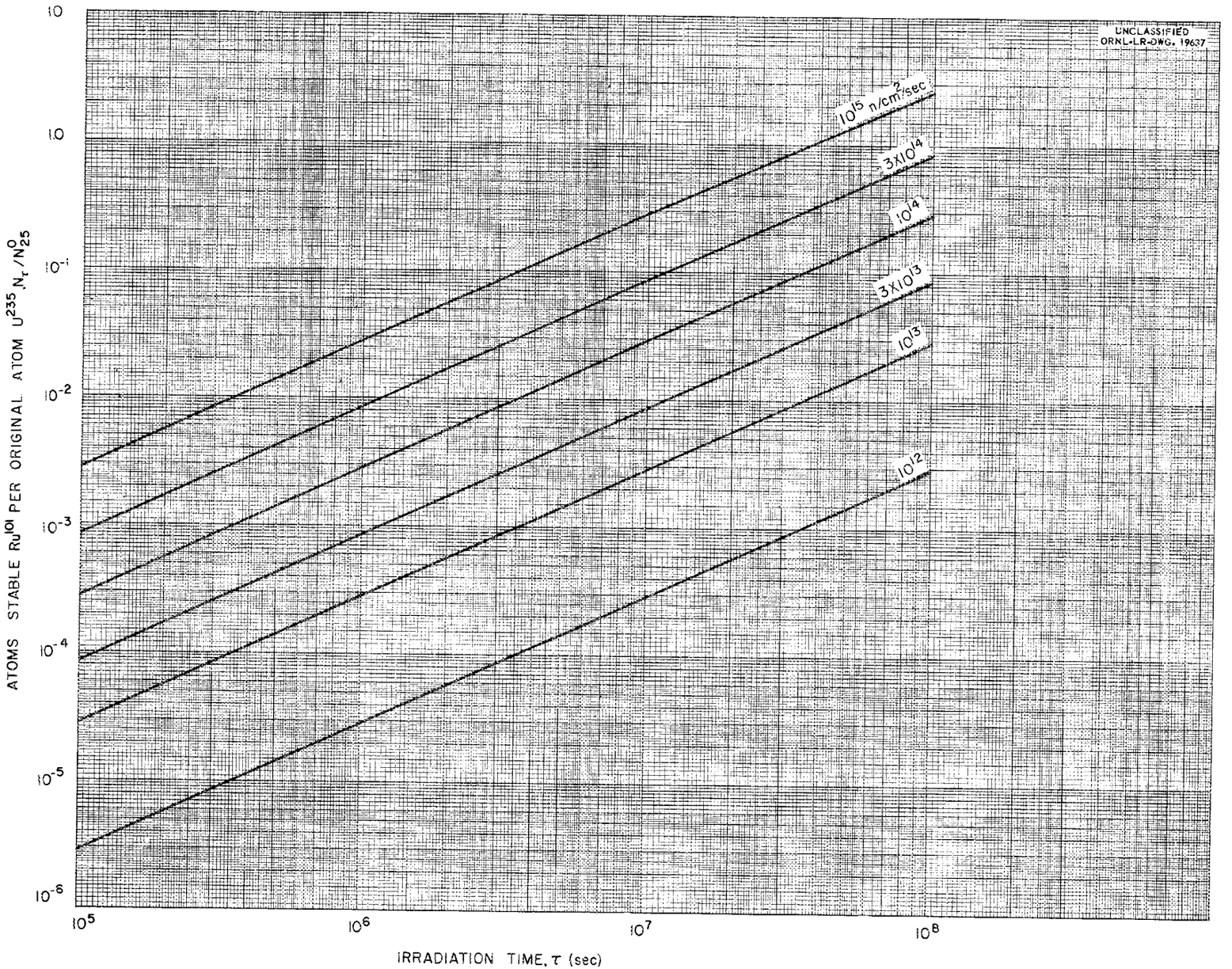


Fig. D-35. Effect of Irradiation Time and Flux on Amount of Stable $Ru^{101}$ Formed in Fission of $U^{235}$.

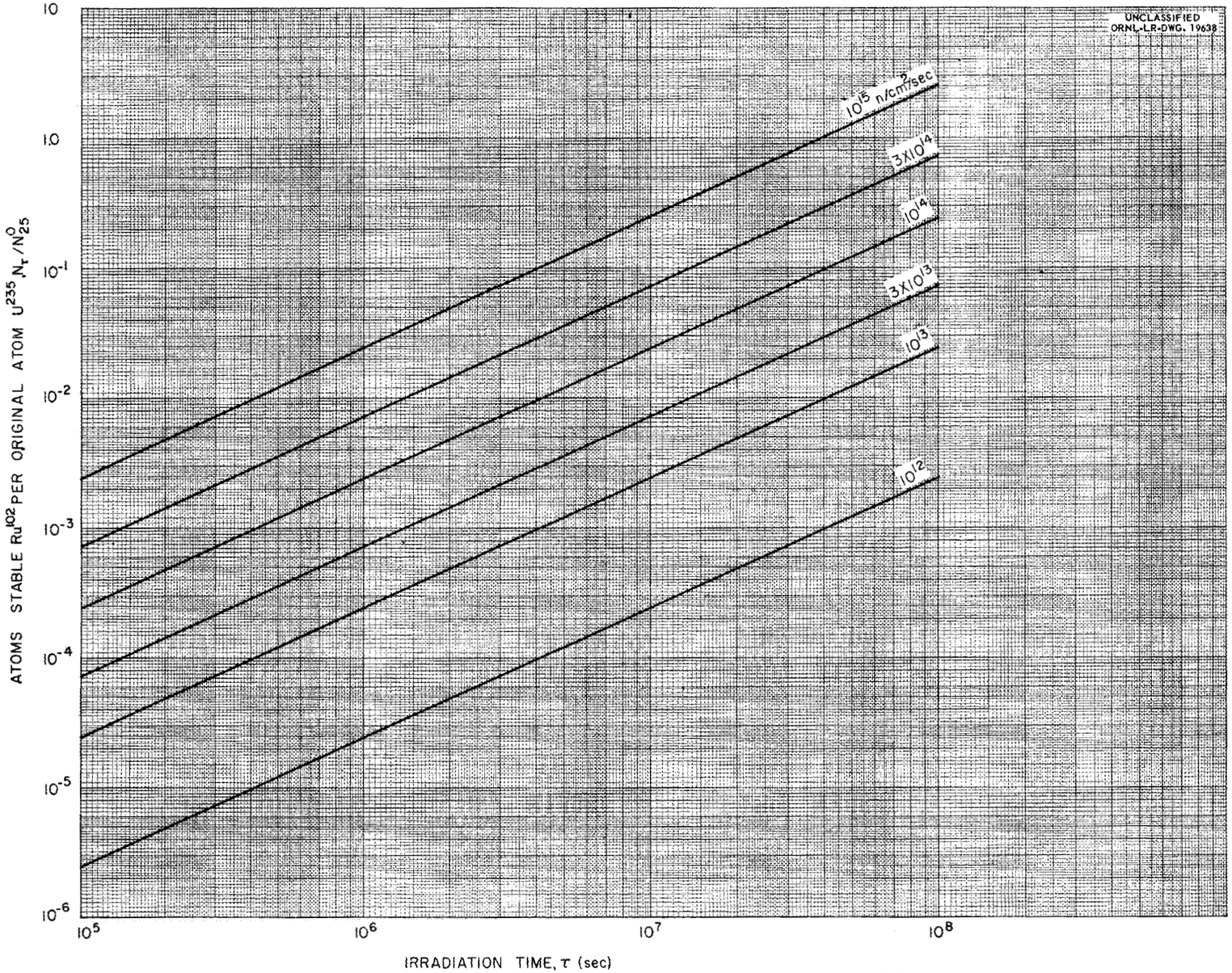


Fig. D-36. Effect of Irradiation Time and Flux on Amount of Stable $Ru^{102}$ Formed in Fission of $U^{235}$.

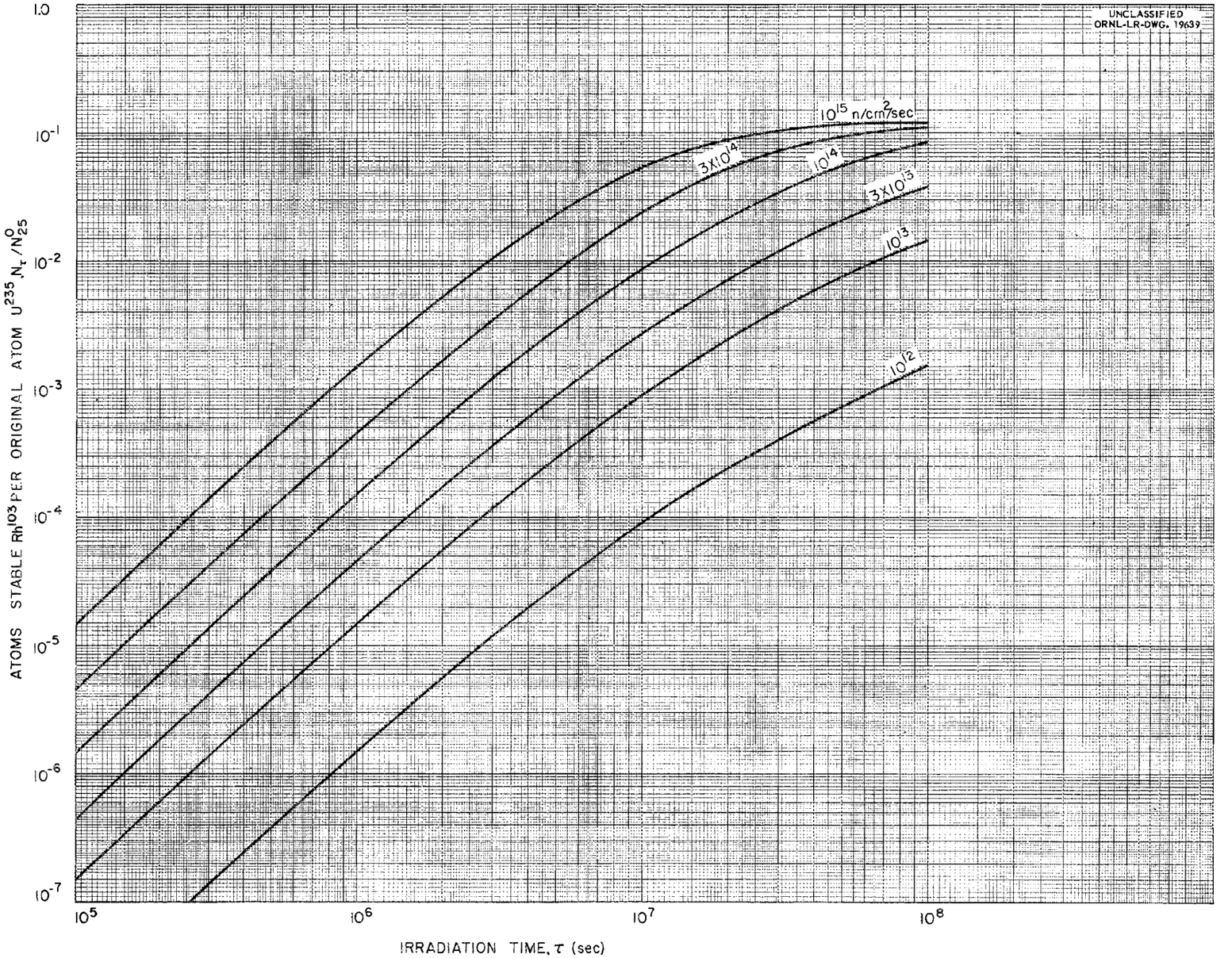


Fig. D-37. Effect of Irradiation Time and Flux on Amount of Stable $Rh^{103}$ Formed in Fission of $U^{235}$.

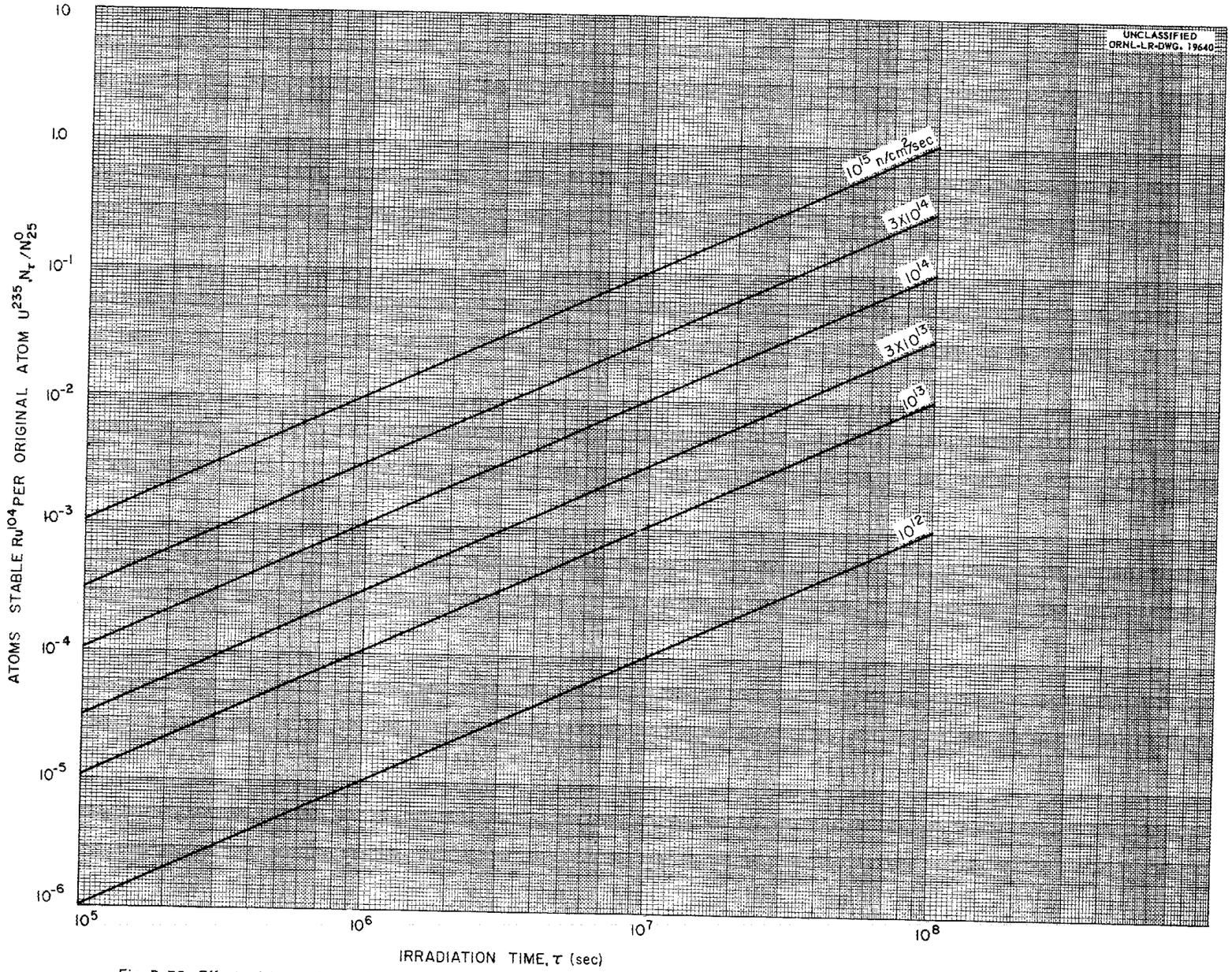


Fig. D-38. Effect of Irradiation Time and Flux on Amount of Stable $Ru^{104}$ Formed in Fission of $U^{235}$.

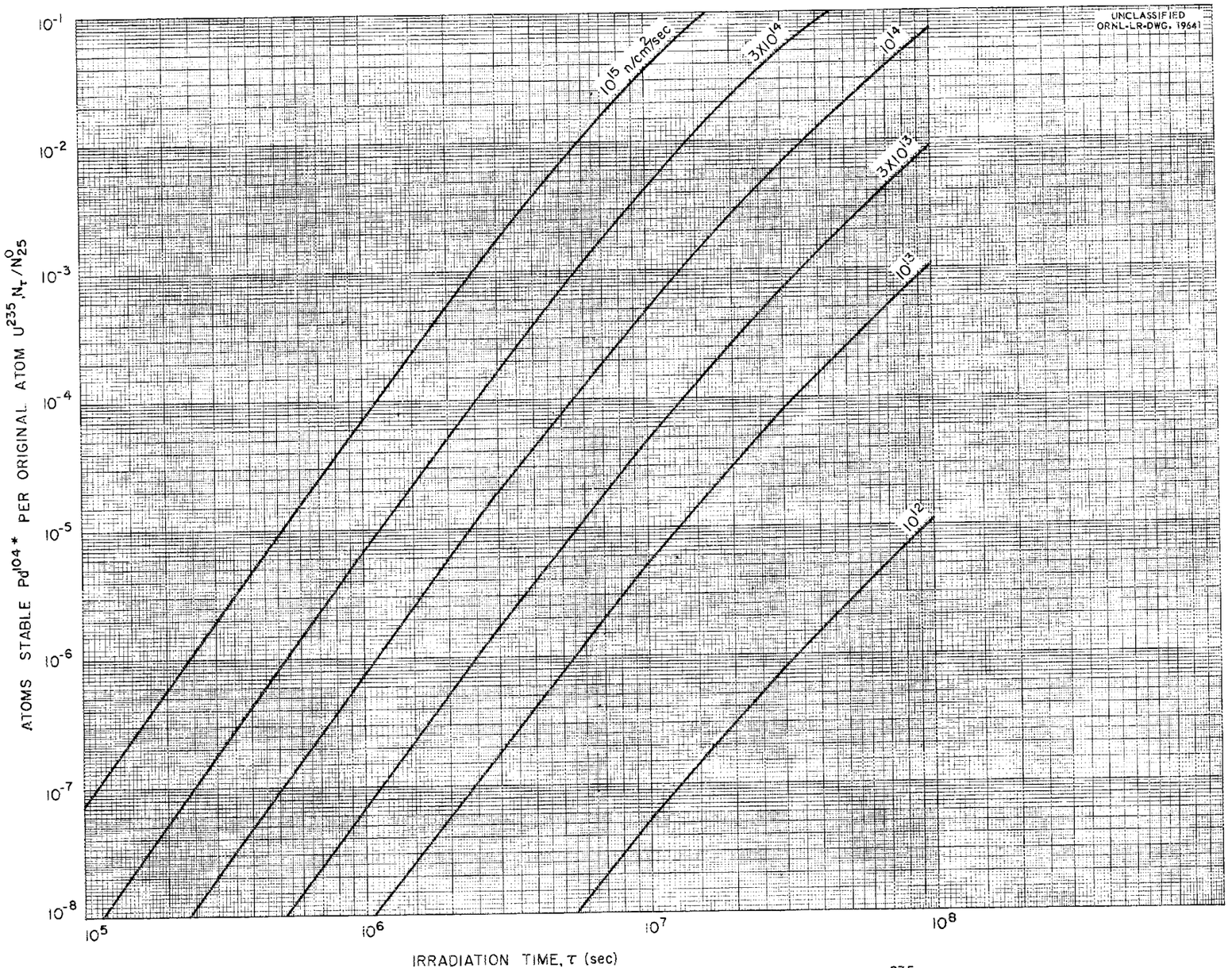


Fig. D-39. Effect of Irradiation Time and Flux on Amount of Stable $Pd^{104*}$ Formed in Fission of $U^{235}$.

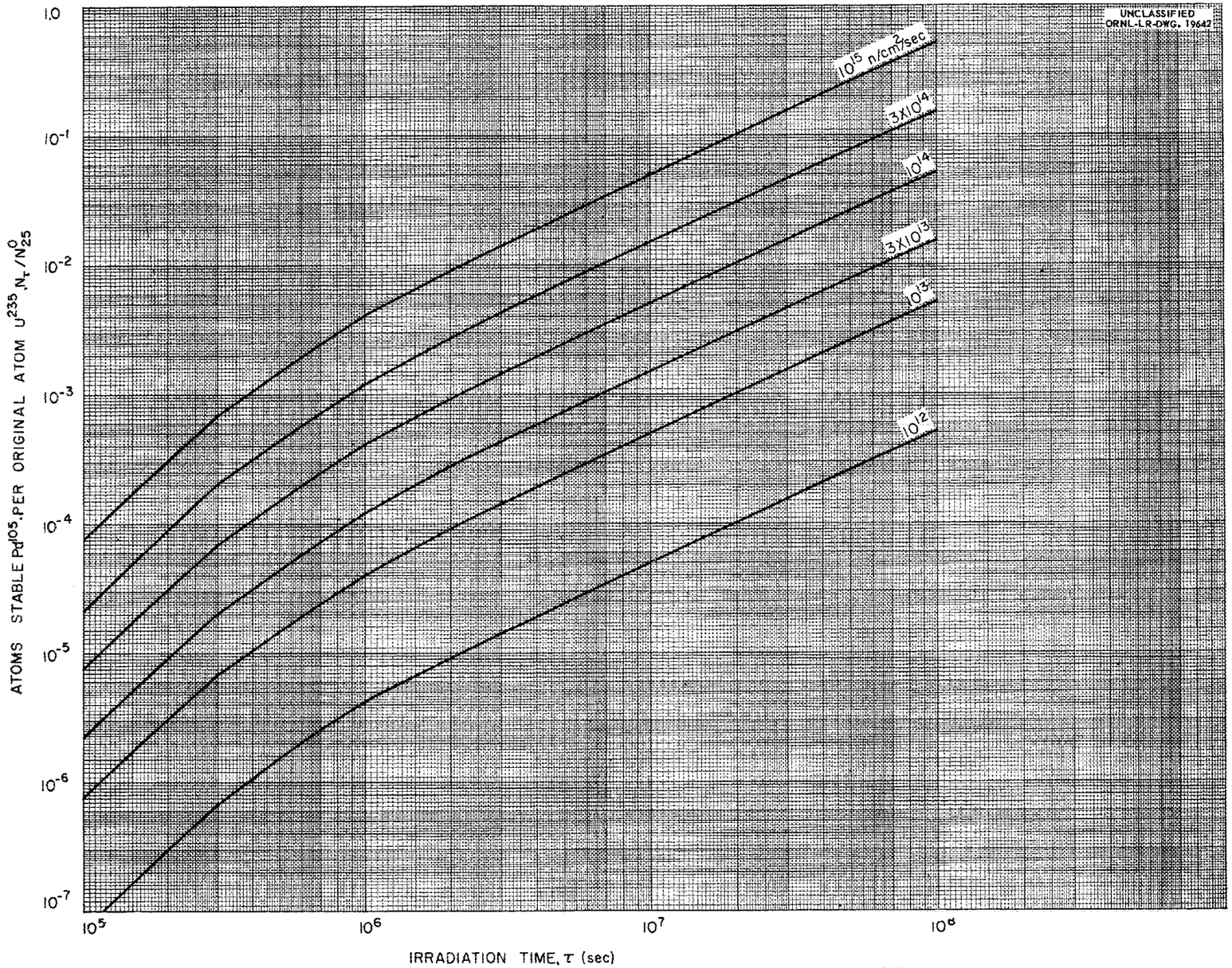


Fig. D-40. Effect of Irradiation Time and Flux on Amount of Stable $Pd^{105}$ Formed in Fission of $U^{235}$.

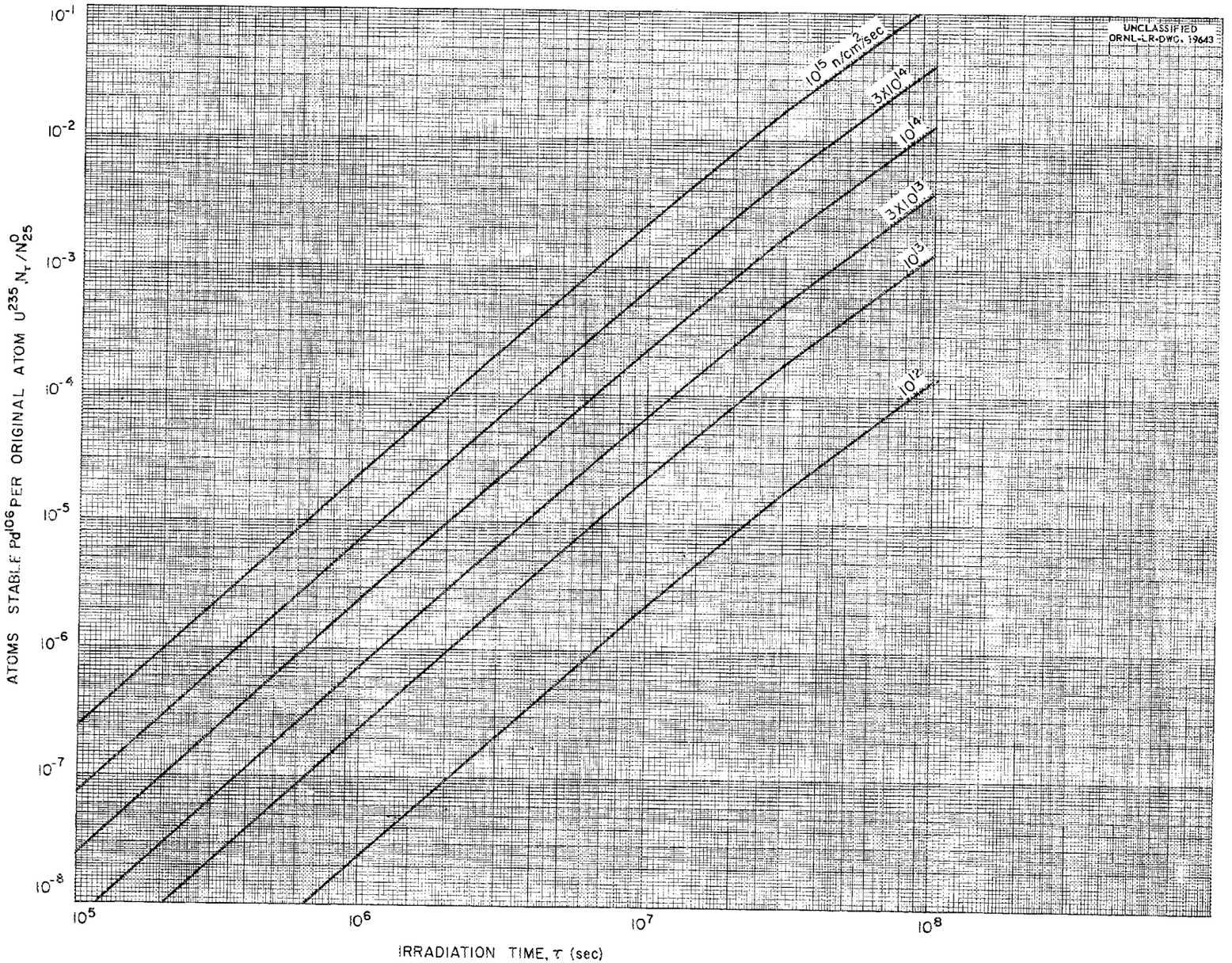


Fig. D-41. Effect of Irradiation Time and Flux on Amount of Stable $Pd^{106}$ Formed in Fission of $U^{235}$.

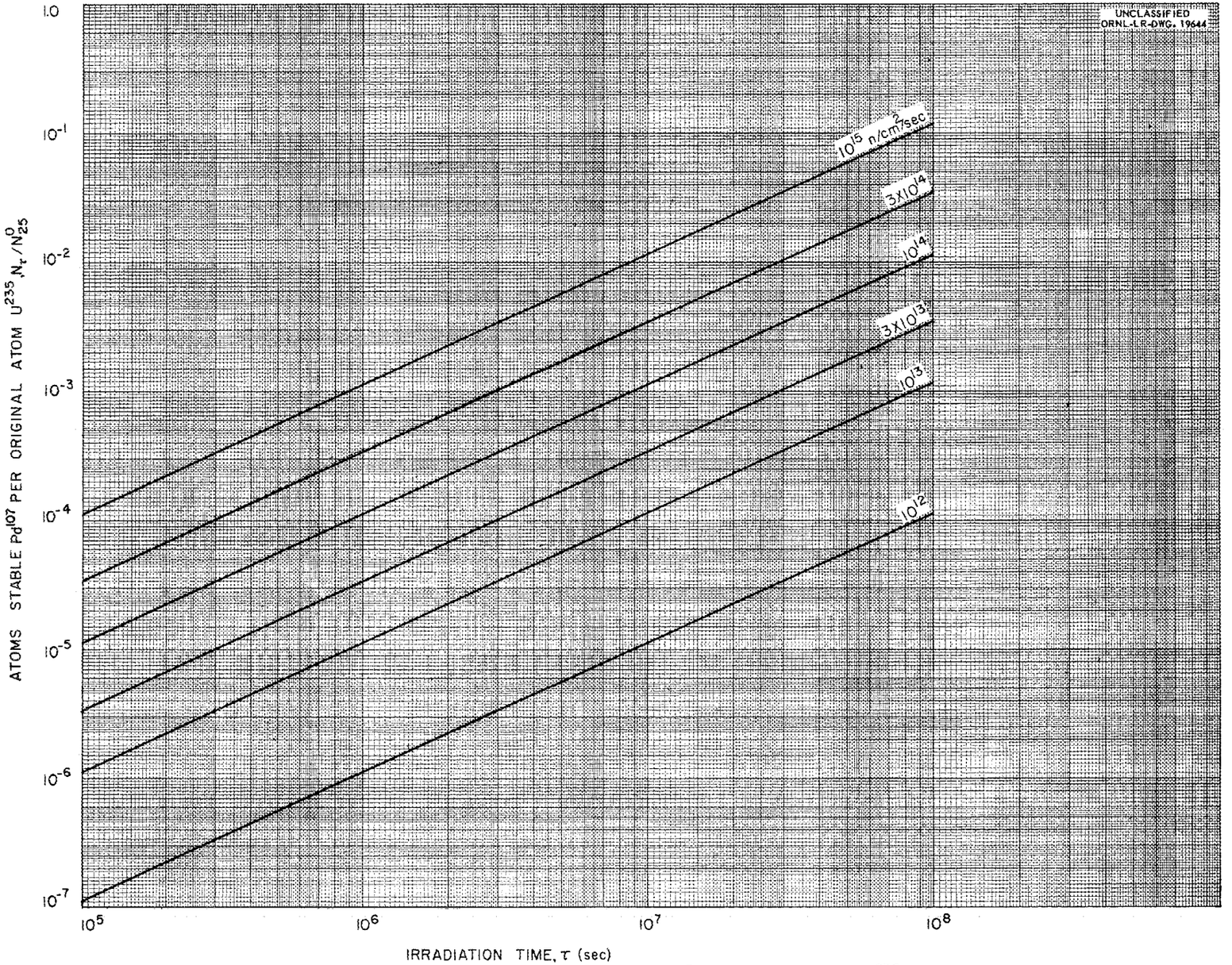


Fig. D-42. Effect of Irradiation Time and Flux on Amount of Stable $Pd^{107}$ Formed in Fission of $U^{235}$.

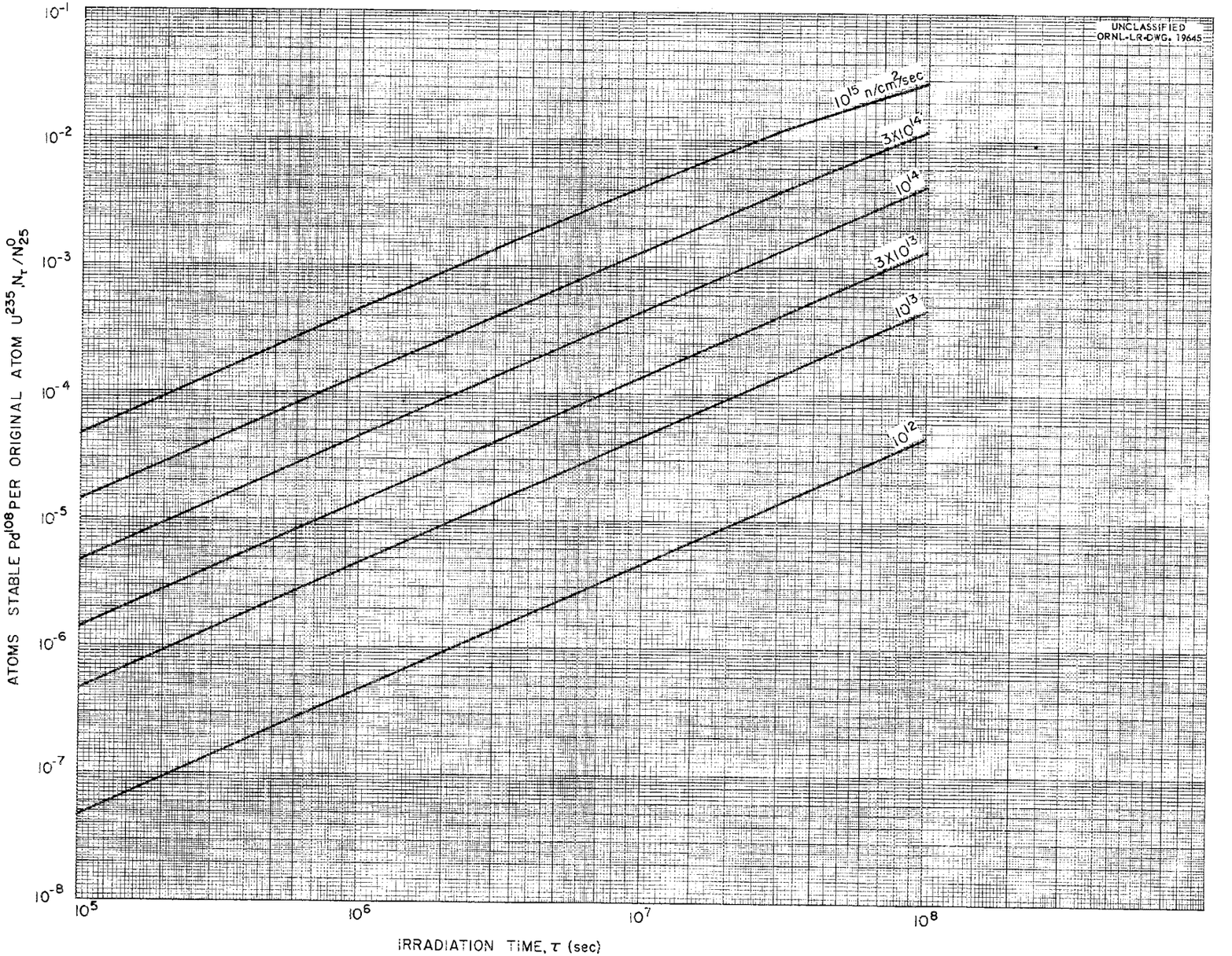


Fig. D-43. Effect of Irradiation Time and Flux on Amount of Stable $Pd^{108}$ Formed in Fission of $U^{235}$.

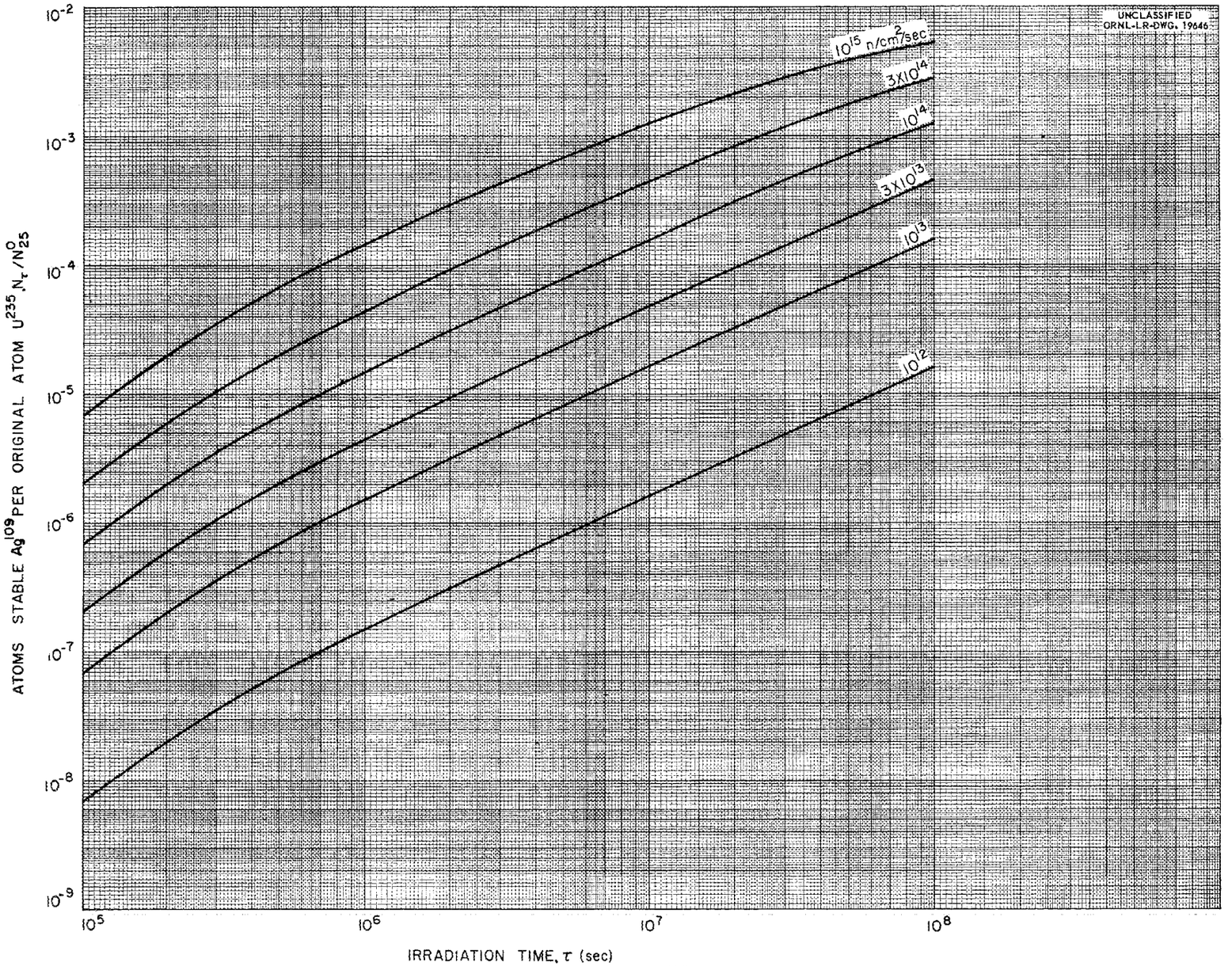


Fig. D-44. Effect of Irradiation Time and Flux on Amount of Stable $Ag^{109}$ Formed in Fission of $U^{235}$.

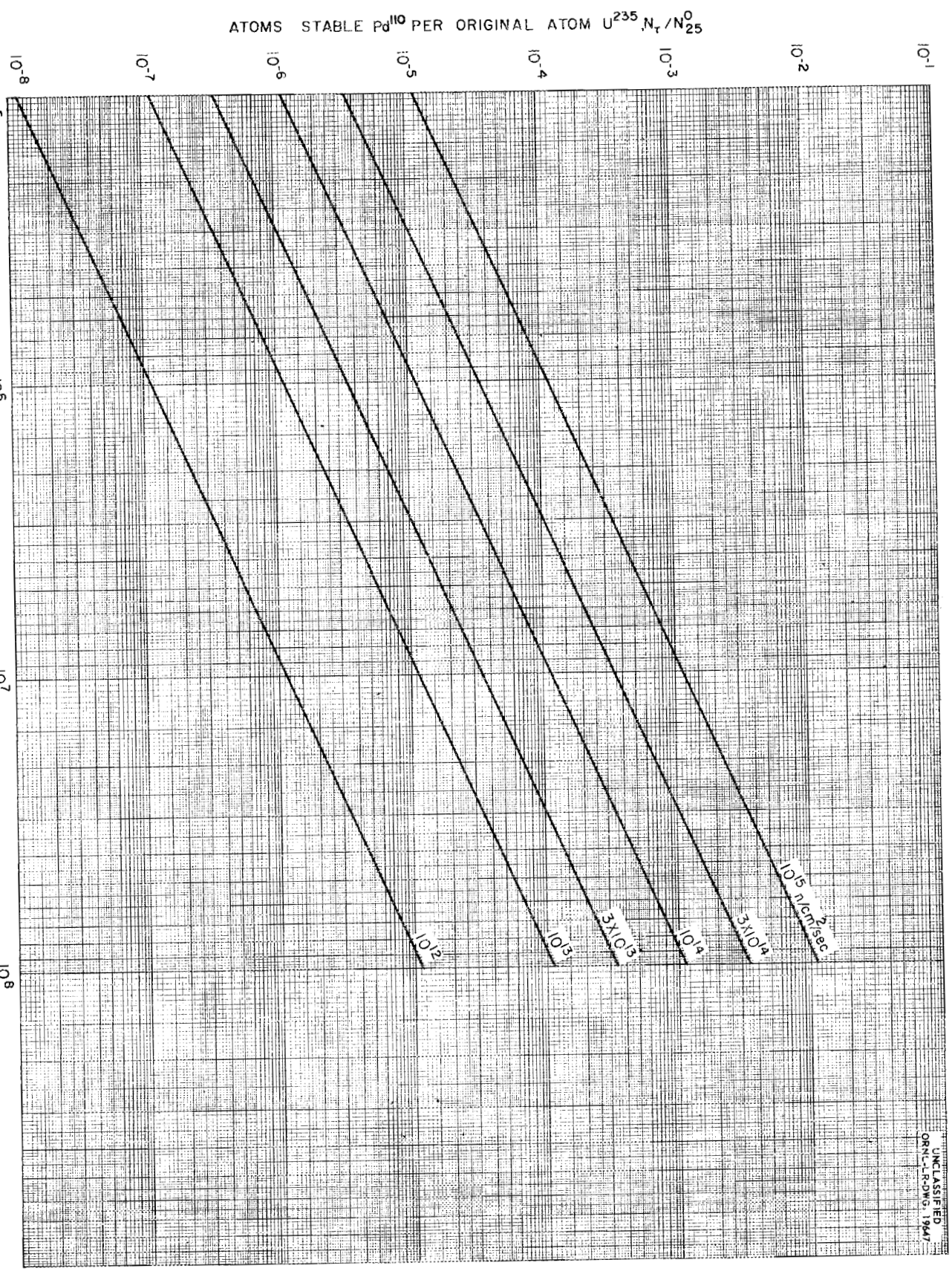


Fig. D-45. Effect of Irradiation Time and Flux on Amount of Stable $Pd^{110}$ Formed in Fission of $U^{235}$.

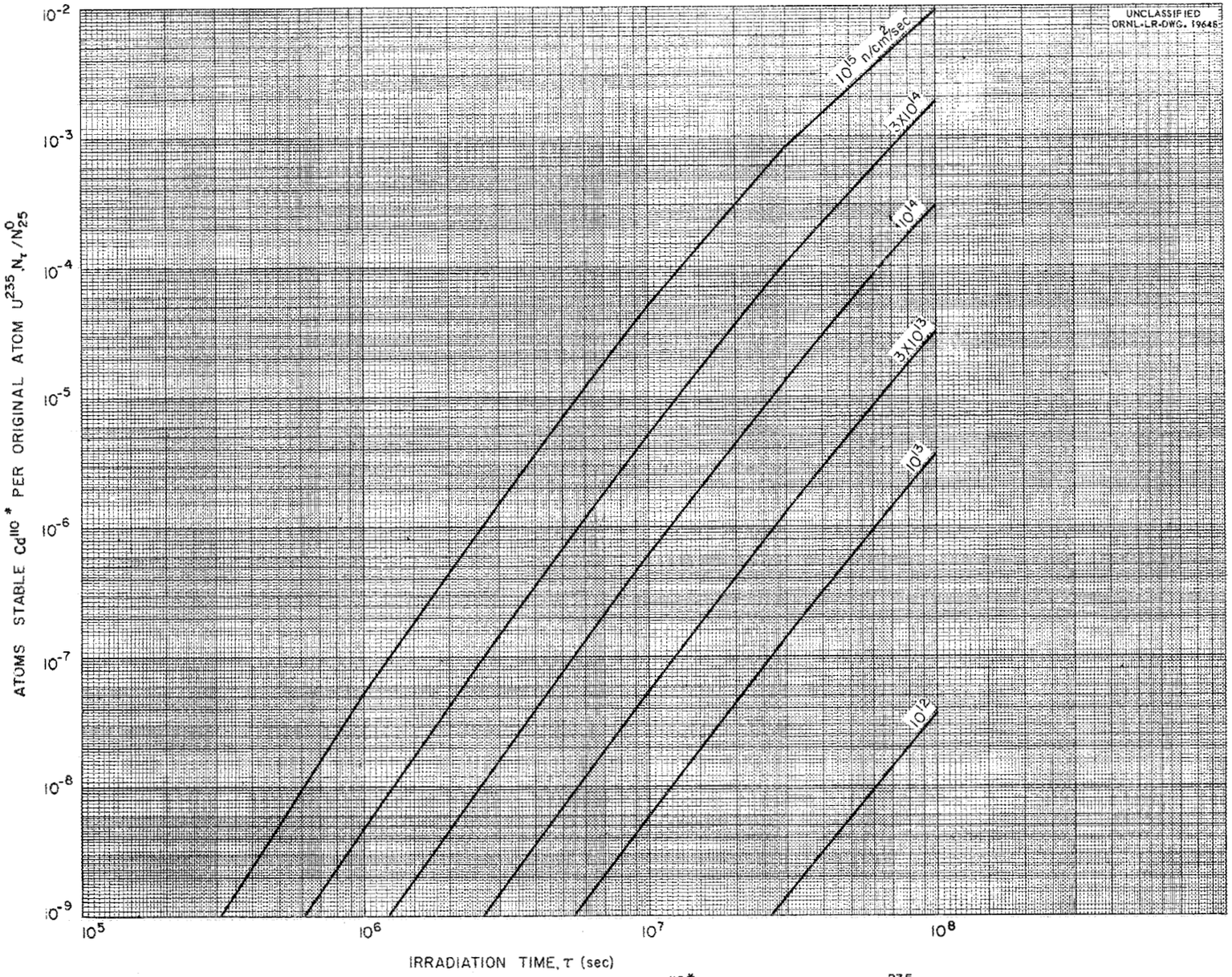


Fig. D-46. Effect of Irradiation Time and Flux on Amount of Stable $Cd^{110*}$ Formed in Fission of $U^{235}$.

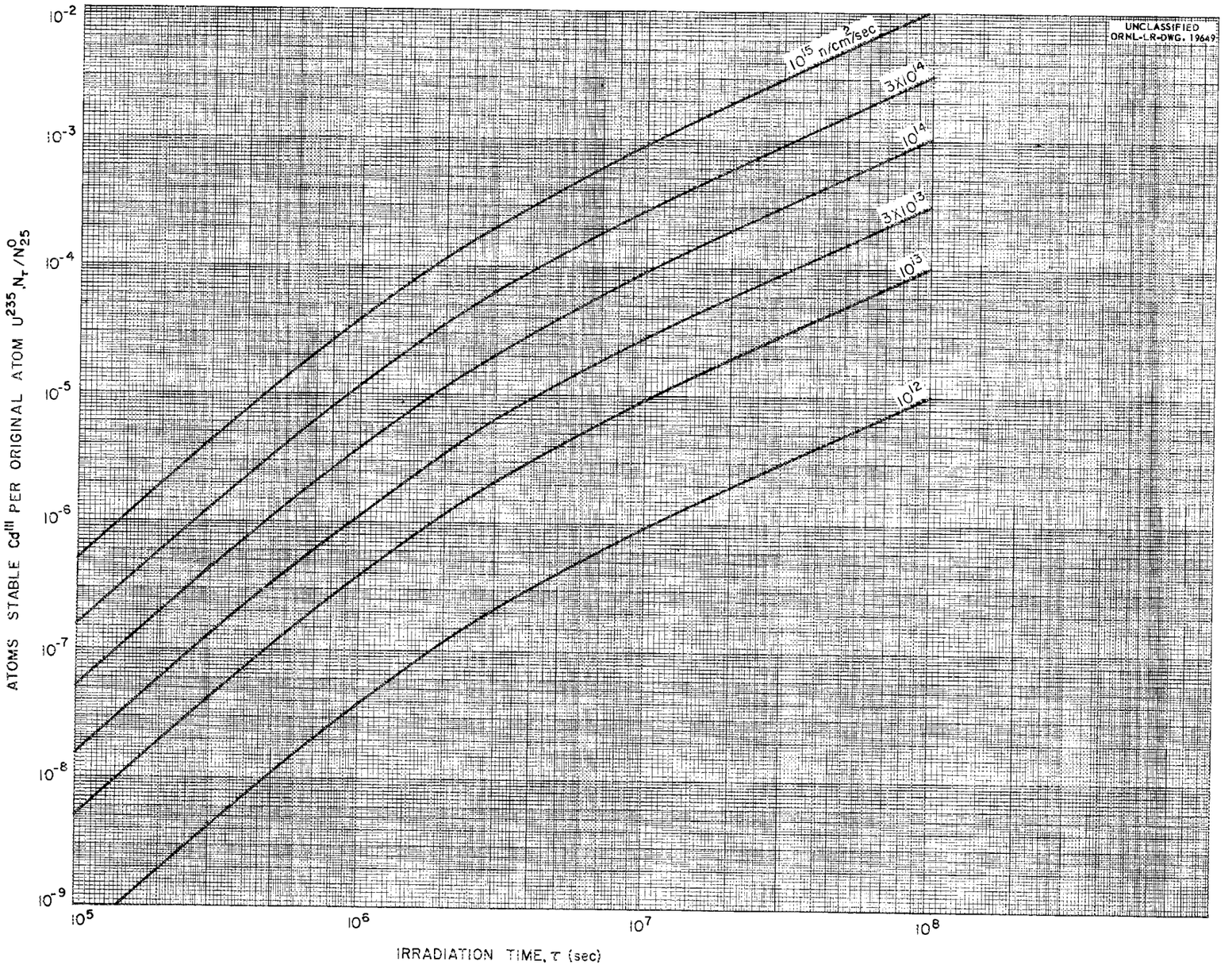


Fig. D-47. Effect of Irradiation Time and Flux on Amount of Stable $Cd^{111}$ Formed in Fission of $U^{235}$.

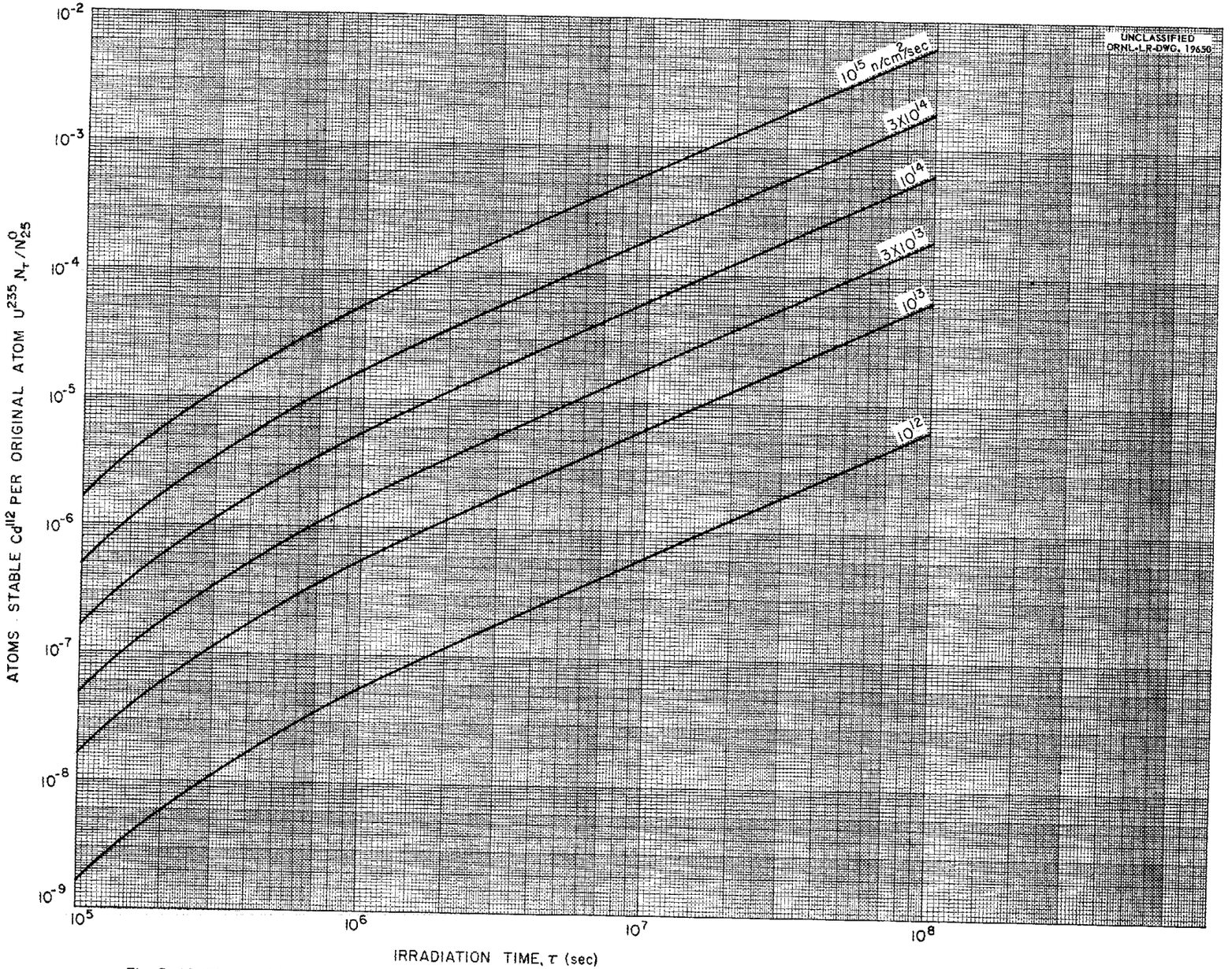


Fig. D-48. Effect of Irradiation Time and Flux on Amount of Stable $Cd^{112}$ Formed in Fission of $U^{235}$.

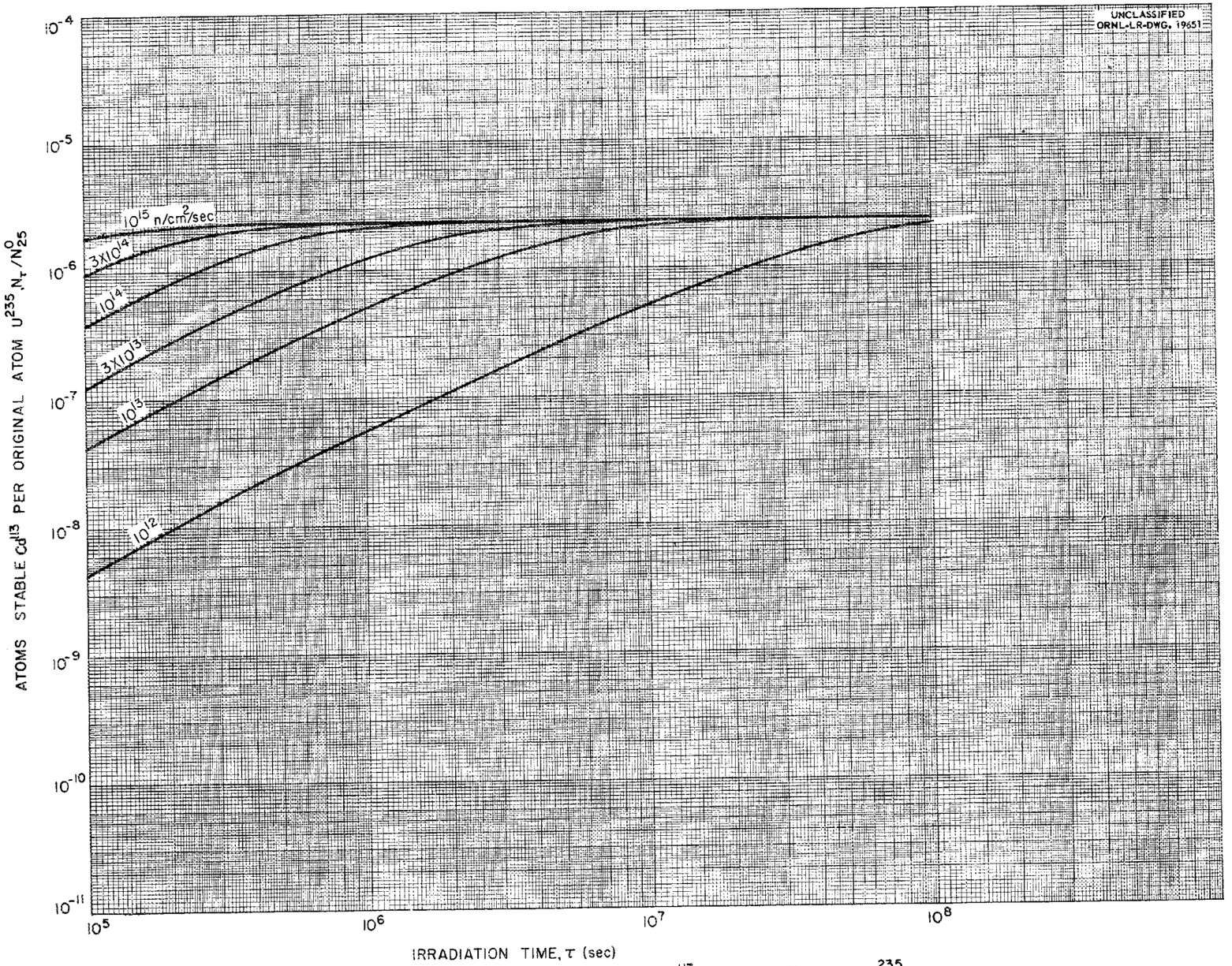


Fig. D-49. Effect of Irradiation Time and Flux on Amount of Stable $Cd^{113}$ Formed in Fission of $U^{235}$.

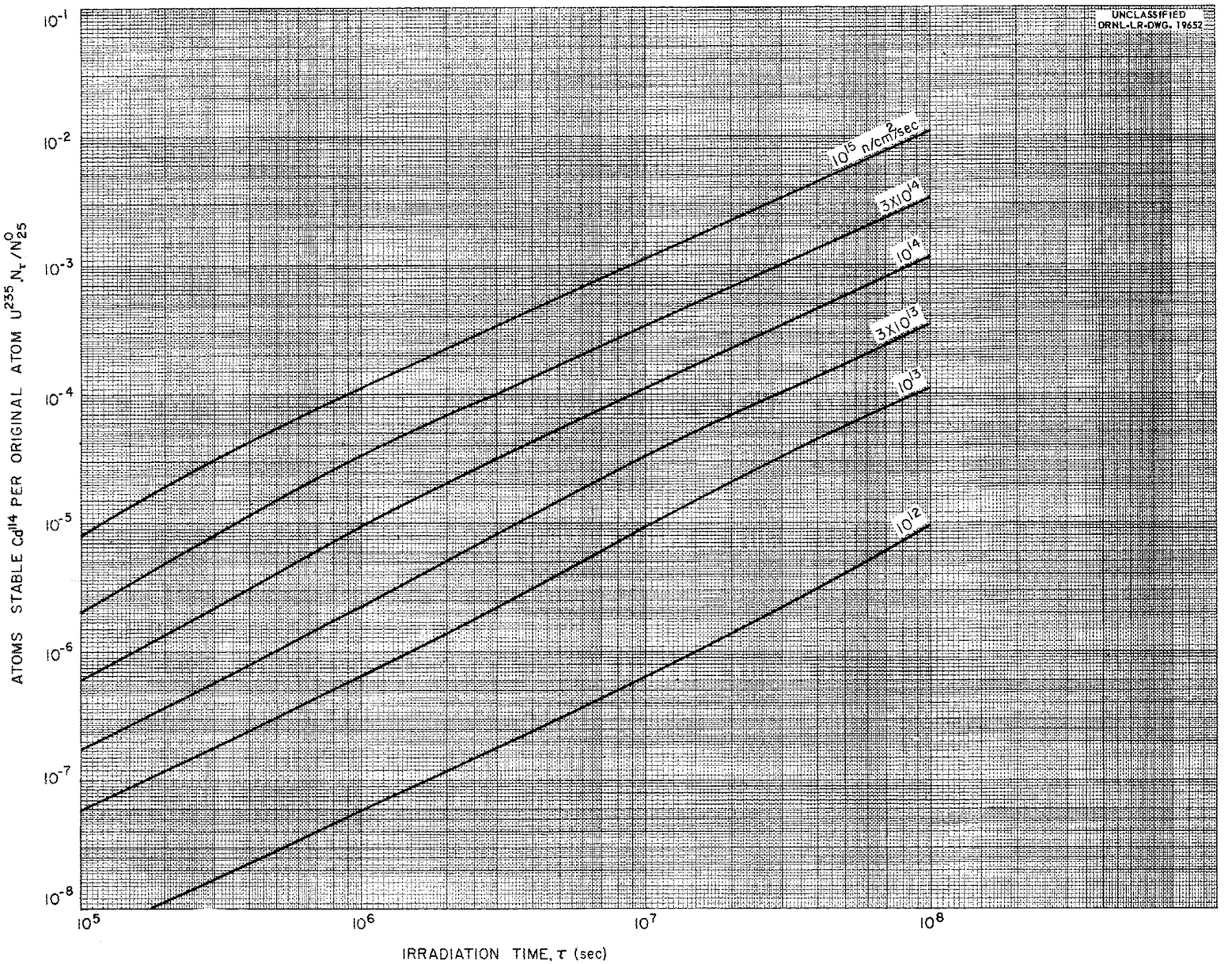


Fig. D-50. Effect of Irradiation Time and Flux on Amount of Stable $Cd^{114}$ Formed in Fission of $U^{235}$.

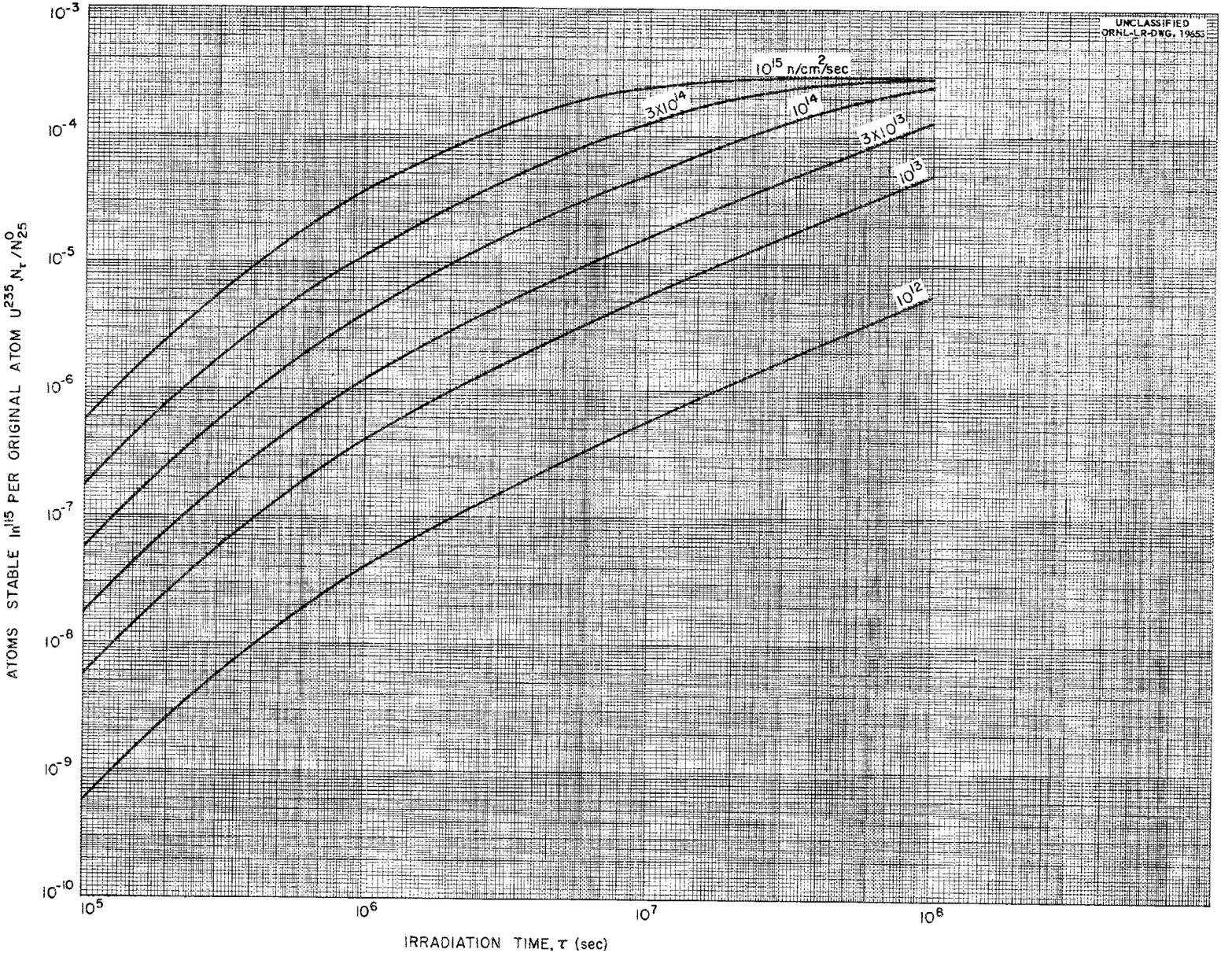


Fig. D-51. Effect of Irradiation Time and Flux on Amount of Stable $In^{115}$ Formed in Fission of $U^{235}$.

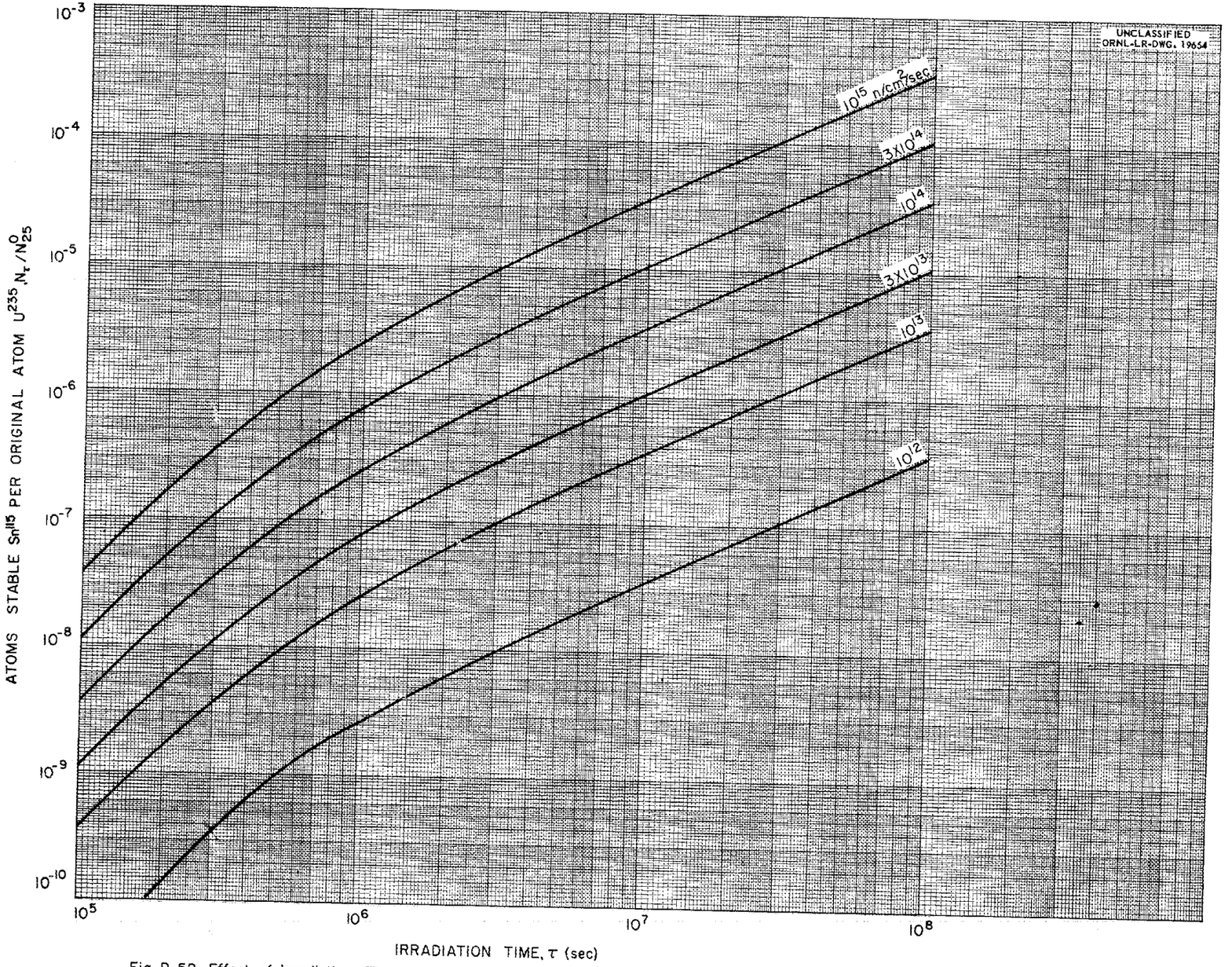


Fig. D-52. Effect of Irradiation Time and Flux on Amount of Stable $Sn^{115}$ Formed in Fission of $U^{235}$.

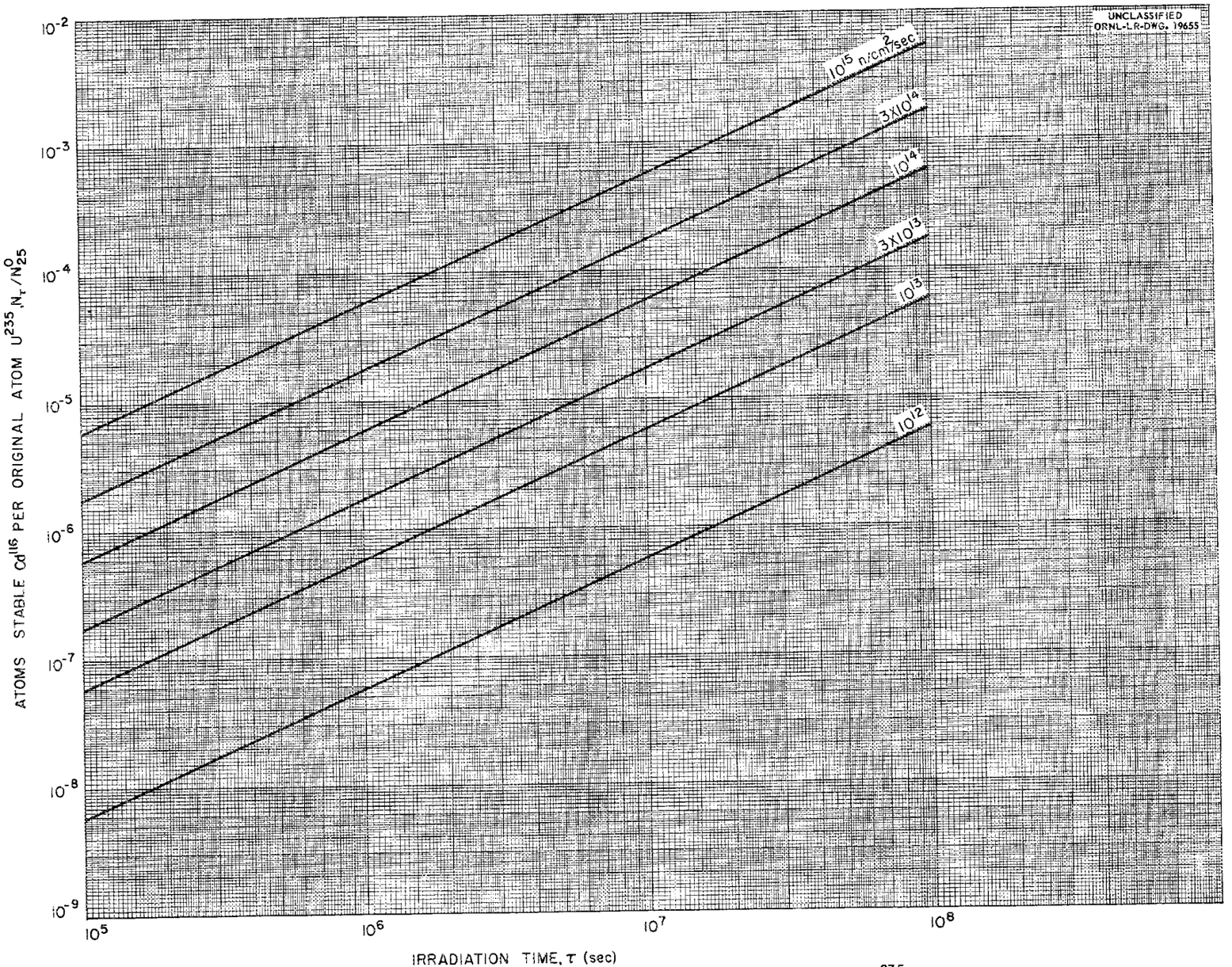


Fig. D-53. Effect of Irradiation Time and Flux on Amount of Stable $Cd^{116}$ Formed in Fission of $U^{235}$.

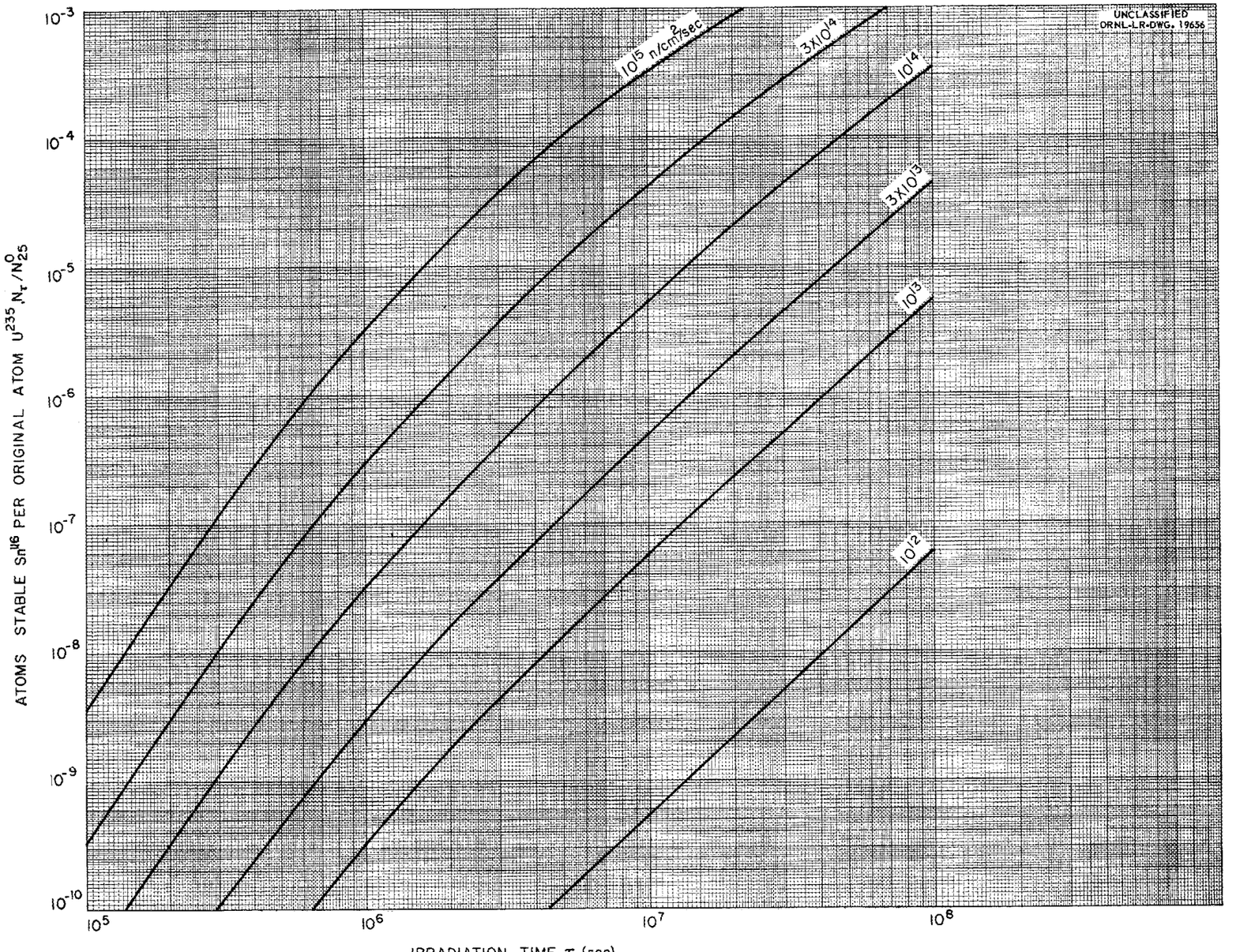


Fig. D-54. Effect of Irradiation Time and Flux on Amount of Stable $Sn^{116}$ Formed in Fission of $U^{235}$.

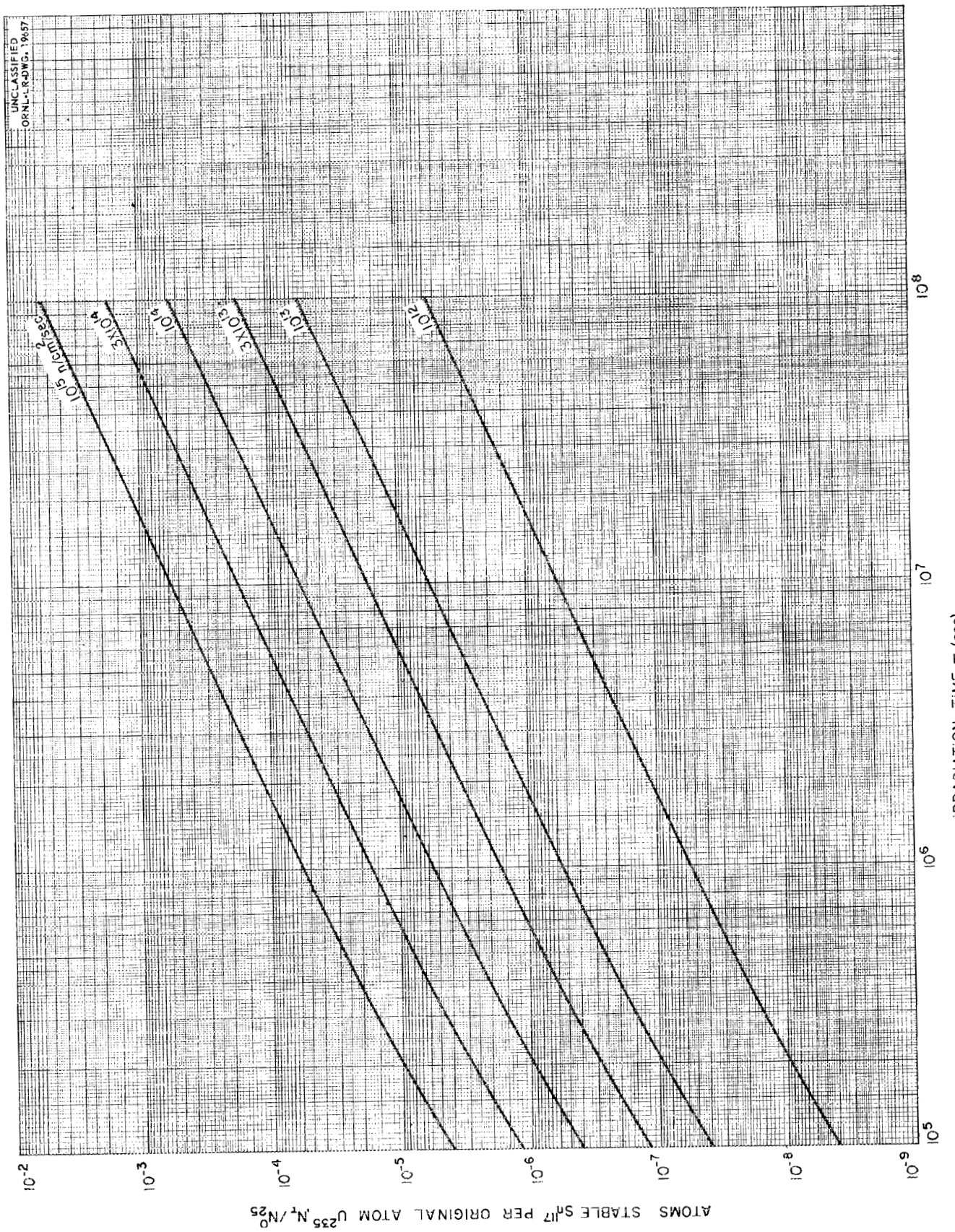


Fig. D-55. Effect of Irradiation Time and Flux on Amount of Stable $Sn^{117}$ Formed in Fission of $U^{235}$.

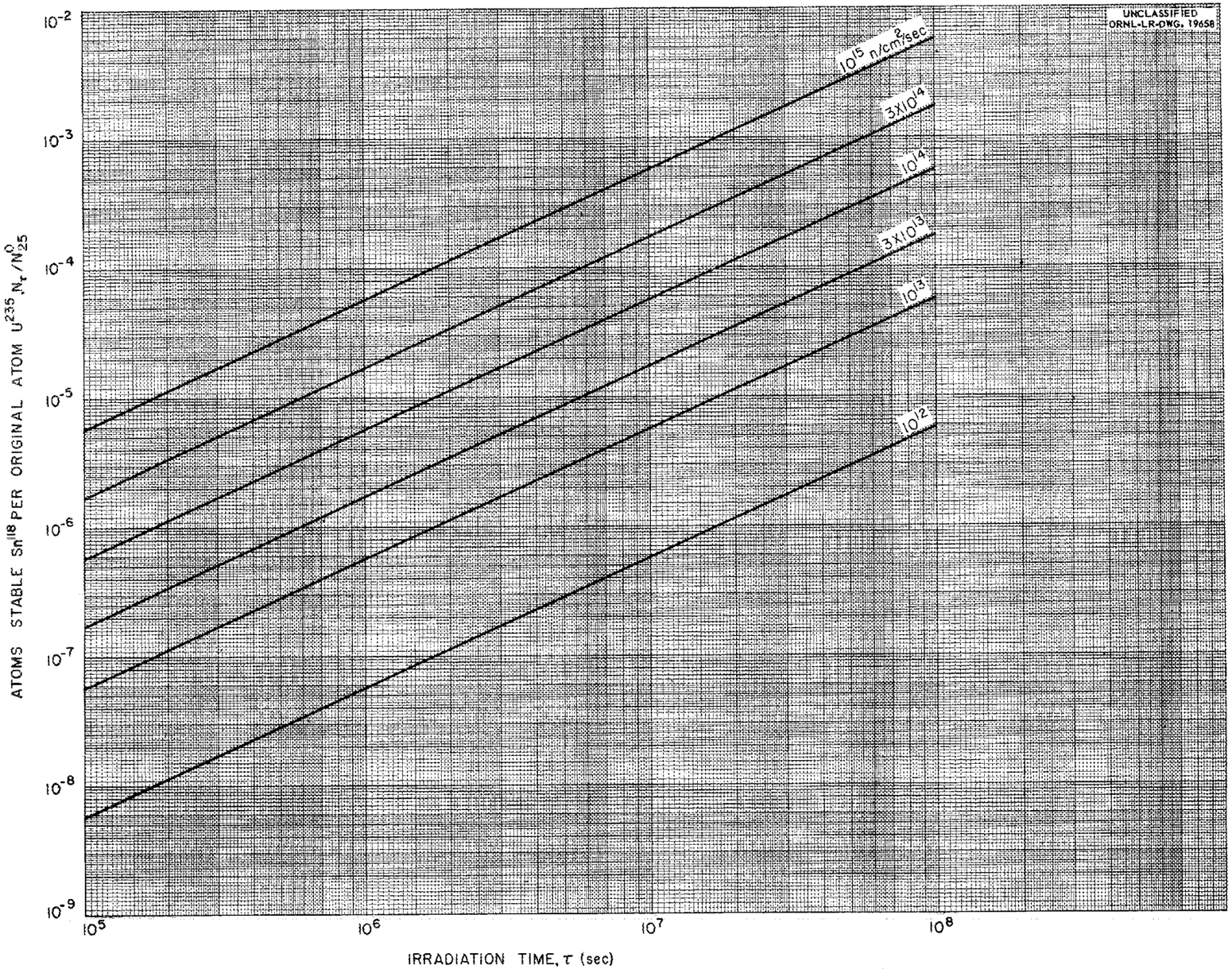


Fig. D-56. Effect of Irradiation Time and Flux on Amount of Stable $Sn^{118}$ Formed in Fission of $U^{235}$.

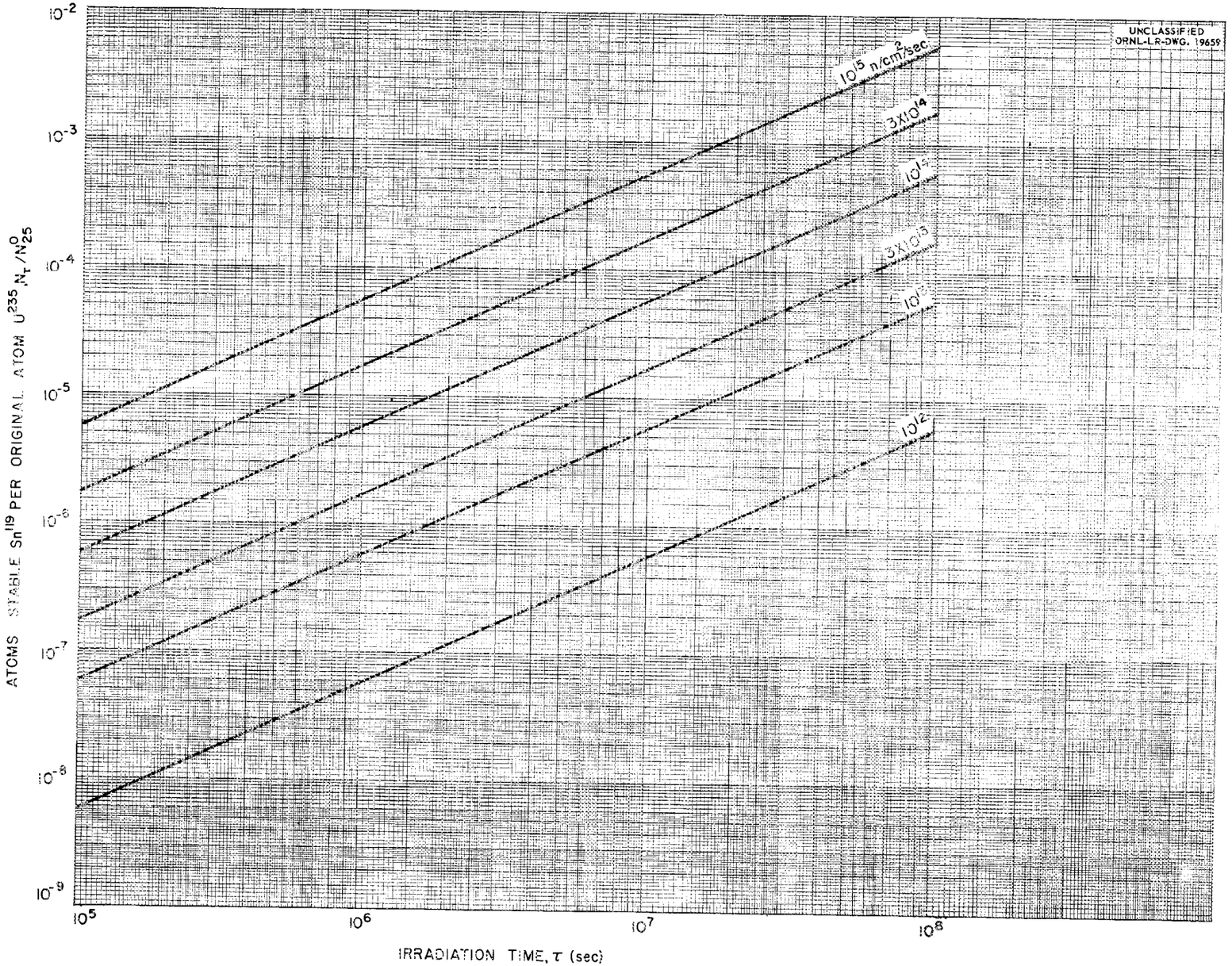


Fig. D-57. Effect of Irradiation Time and Flux on Amount of Stable $Sn^{119}$ Formed in Fission of $U^{235}$.

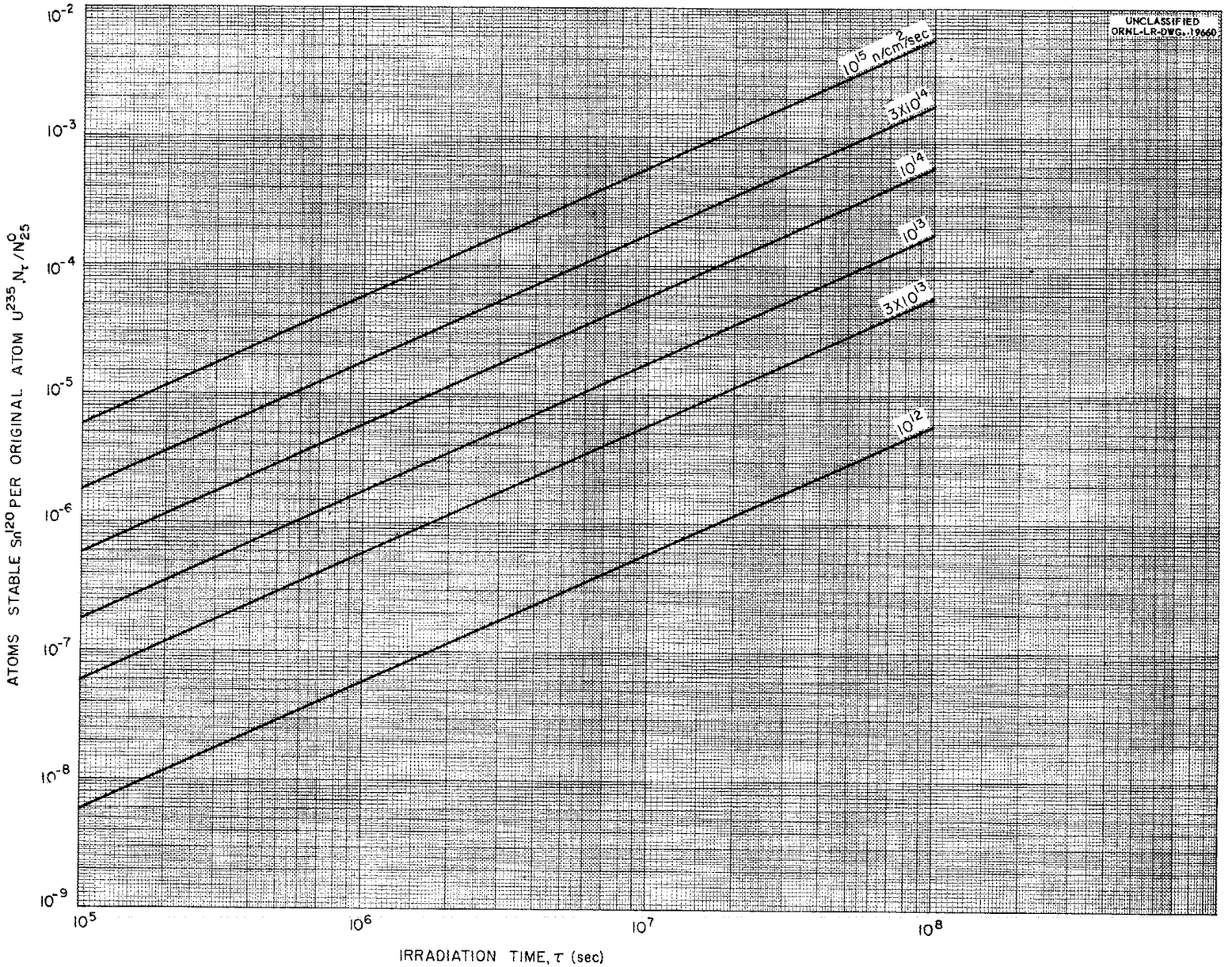


Fig. D-58. Effect of Irradiation Time and Flux on Amount of Stable $Sn^{120}$ Formed in Fission of $U^{235}$.

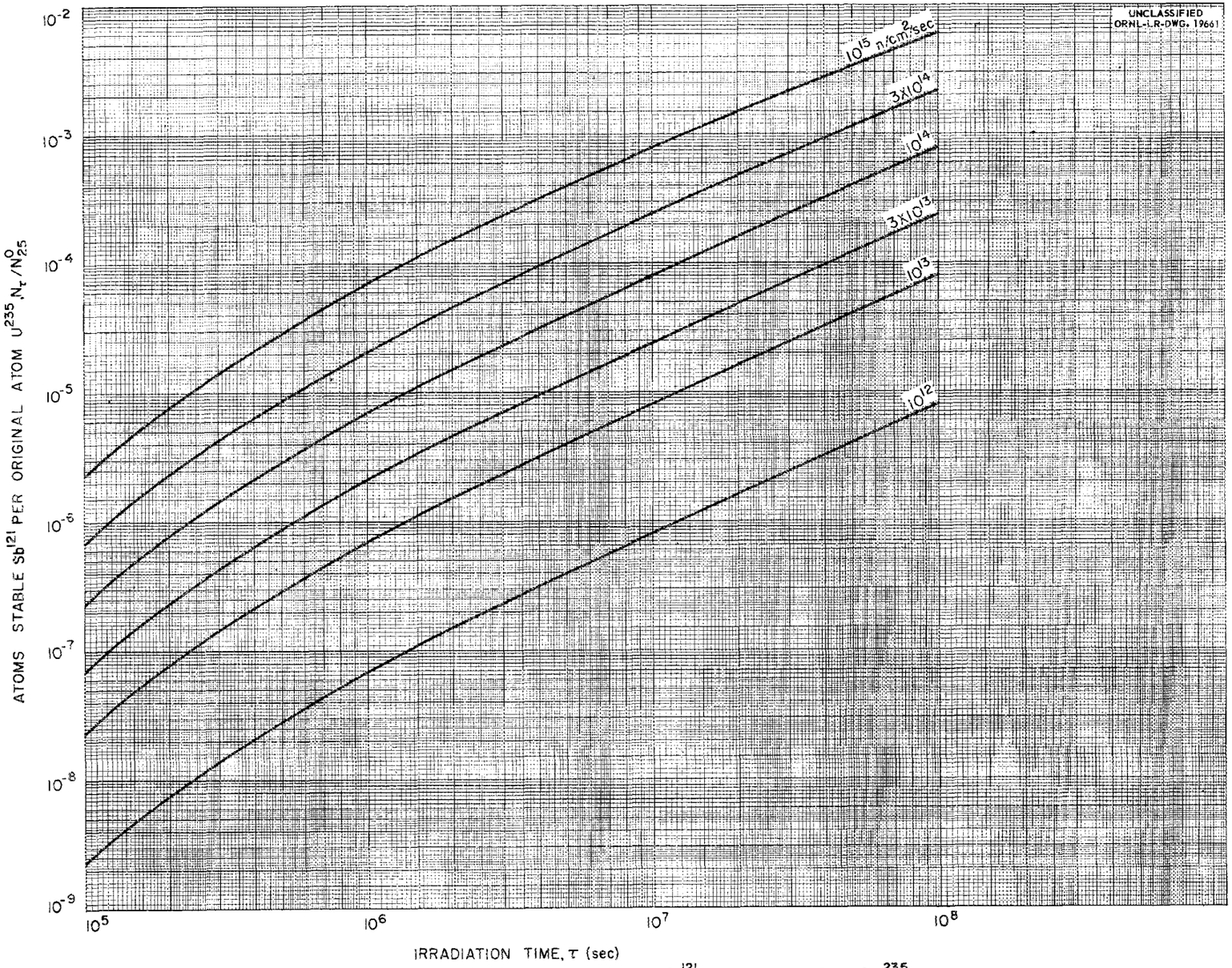


Fig. D-59. Effect of Irradiation Time and Flux on Amount of Stable $Sb^{121}$ Formed in Fission of $U^{235}$.

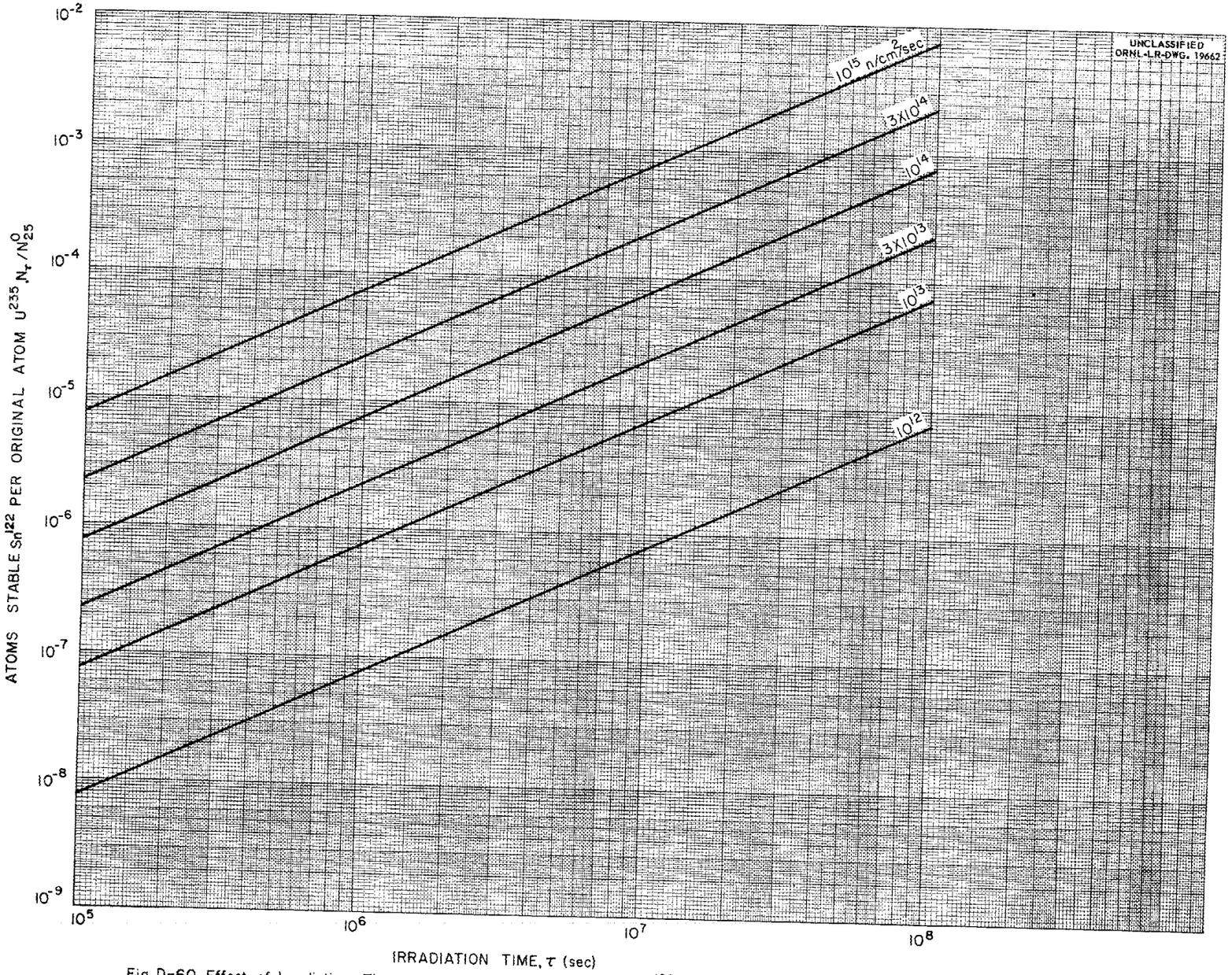


Fig. D-60. Effect of Irradiation Time and Flux on Amount of Stable $Sn^{122}$ Formed in Fission of $U^{235}$.

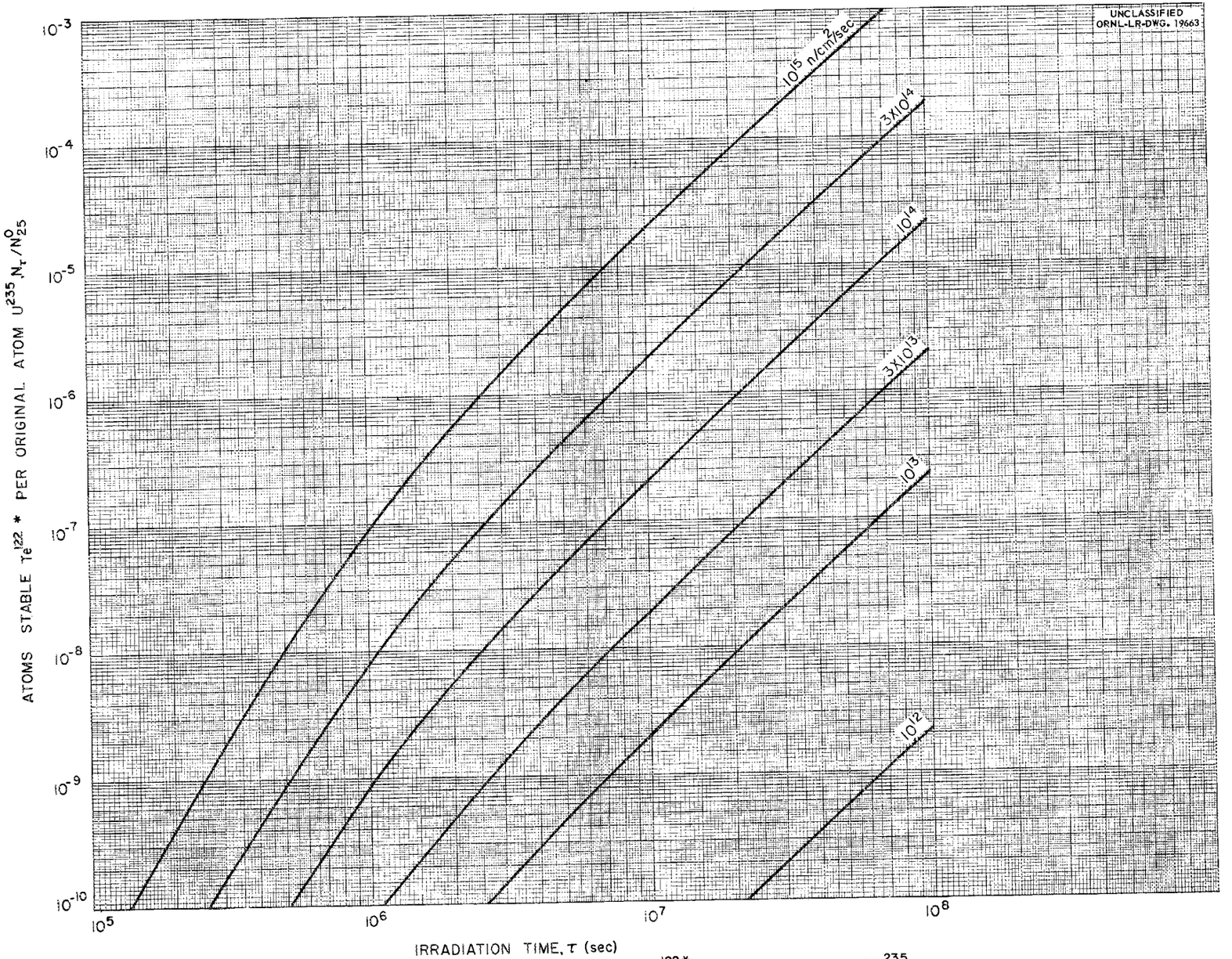


Fig. D-61. Effect of Irradiation Time and Flux on Amount of Stable $Te^{122*}$ Formed in Fission of $U^{235}$.

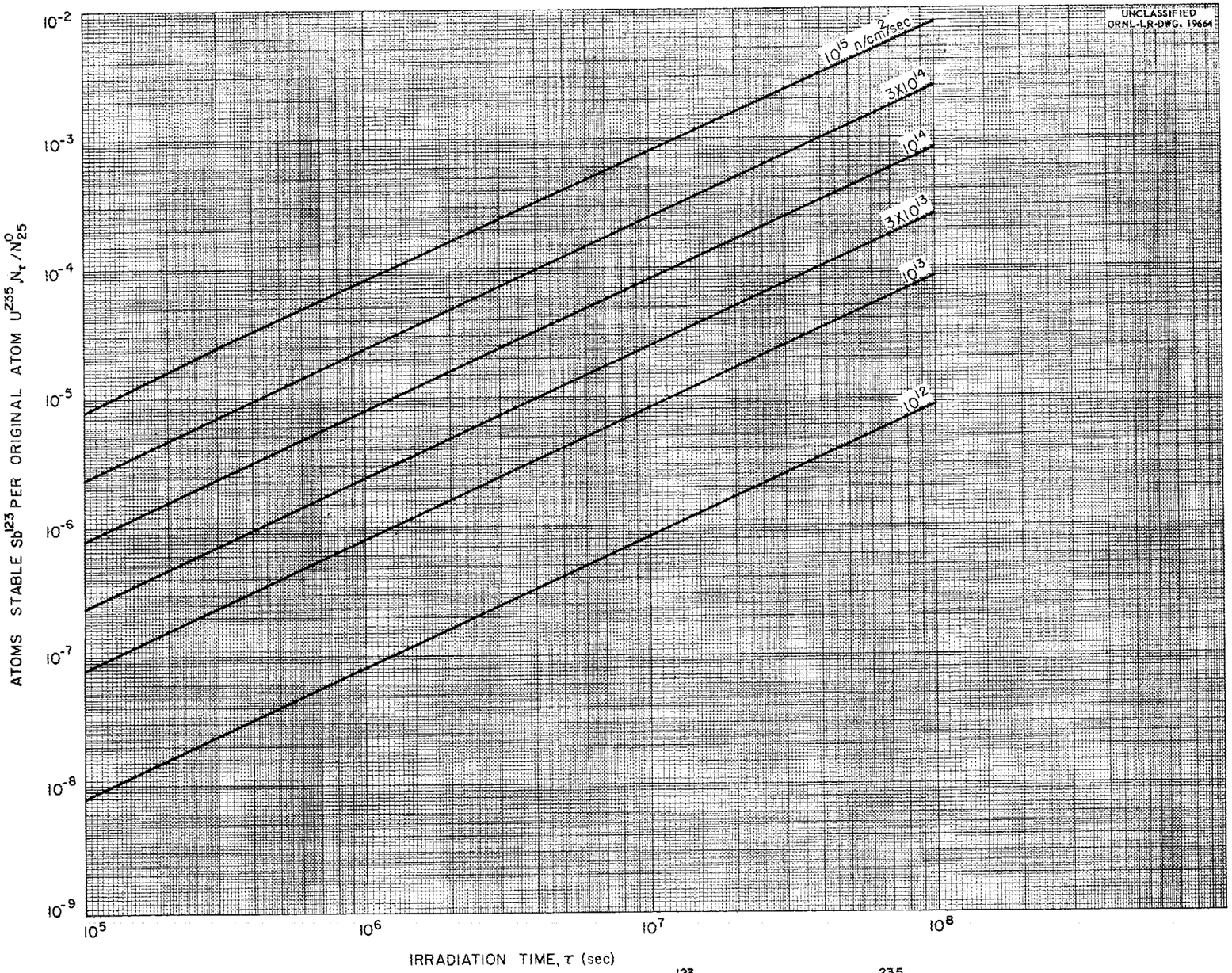


Fig. D-62. Effect of Irradiation Time and Flux on Amount of Stable $Sb^{123}$ Formed in Fission of $U^{235}$.

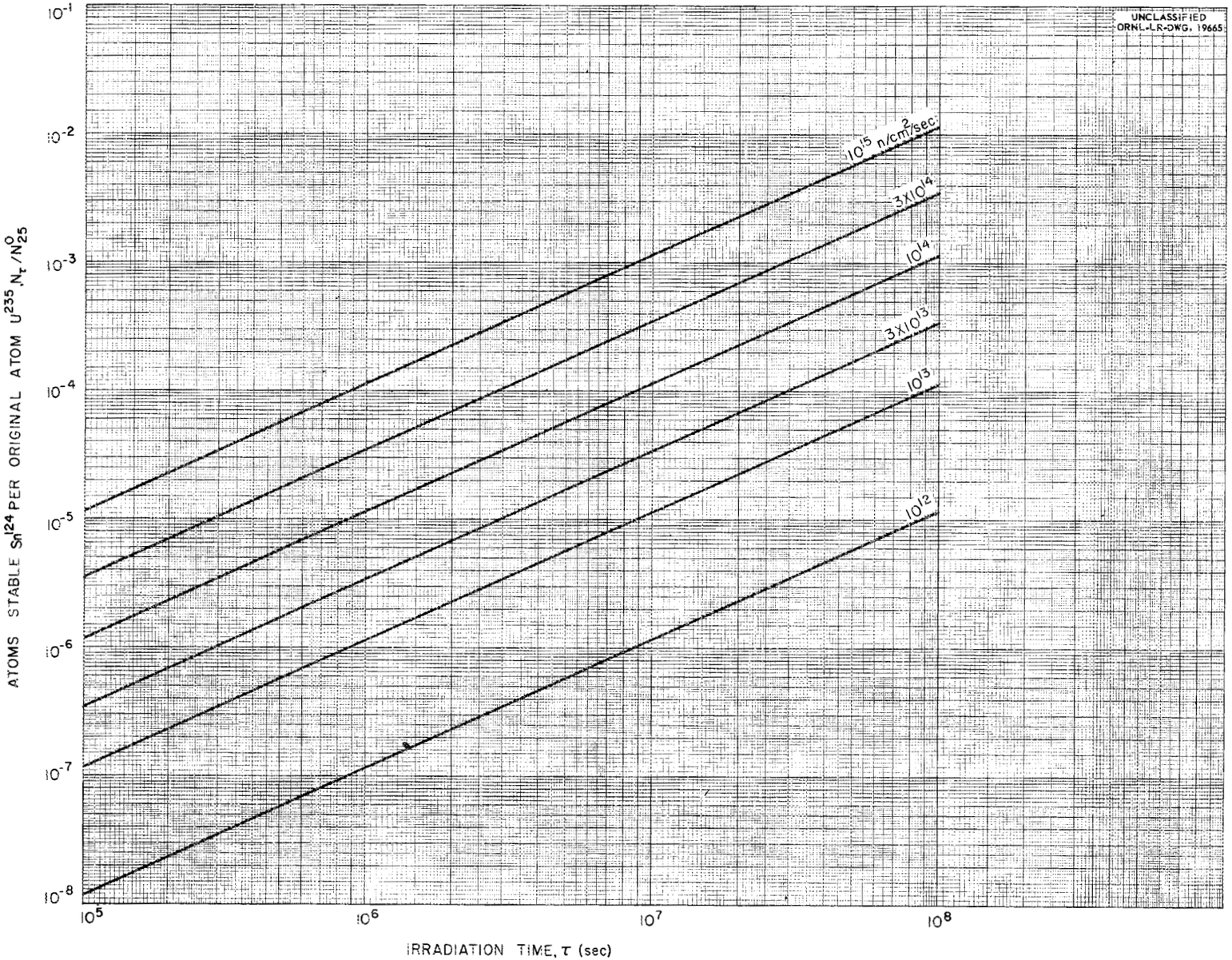


Fig. D-63. Effect of Irradiation Time and Flux on Amount of Stable $Sn^{124}$ Formed in Fission of $U^{235}$.

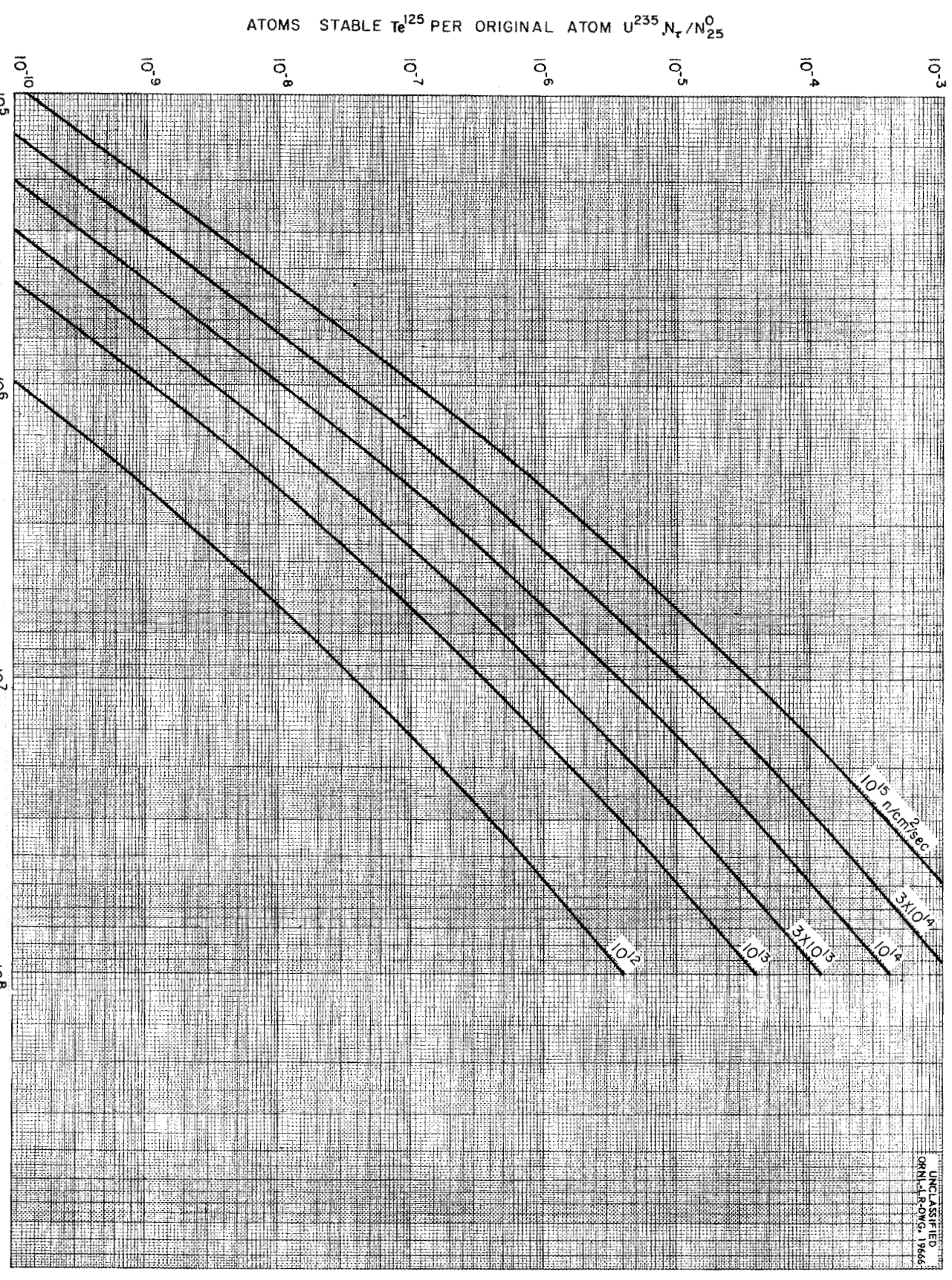


Fig. D-64. Effect of Irradiation Time and Flux on Amount of Stable $Te^{125}$ Formed in Fission of $U^{235}$.

Fig. D-65. Effect of Irradiation Time and Flux on Amount of Stable $Te^{126}$ Formed in Fission of $U^{235}$.

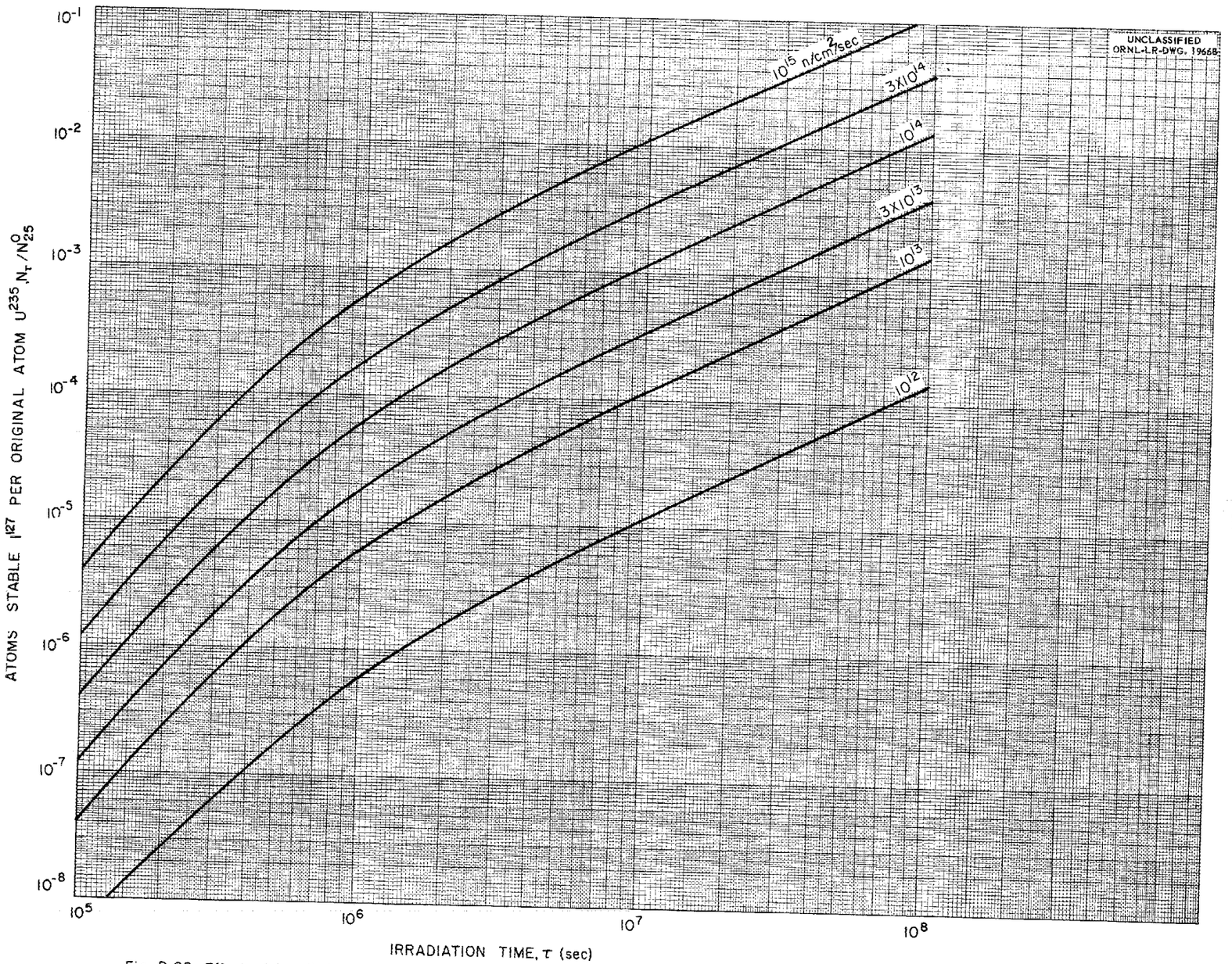


Fig. D-66. Effect of Irradiation Time and Flux on Amount of Stable $I^{127}$ Formed in Fission of $U^{235}$.

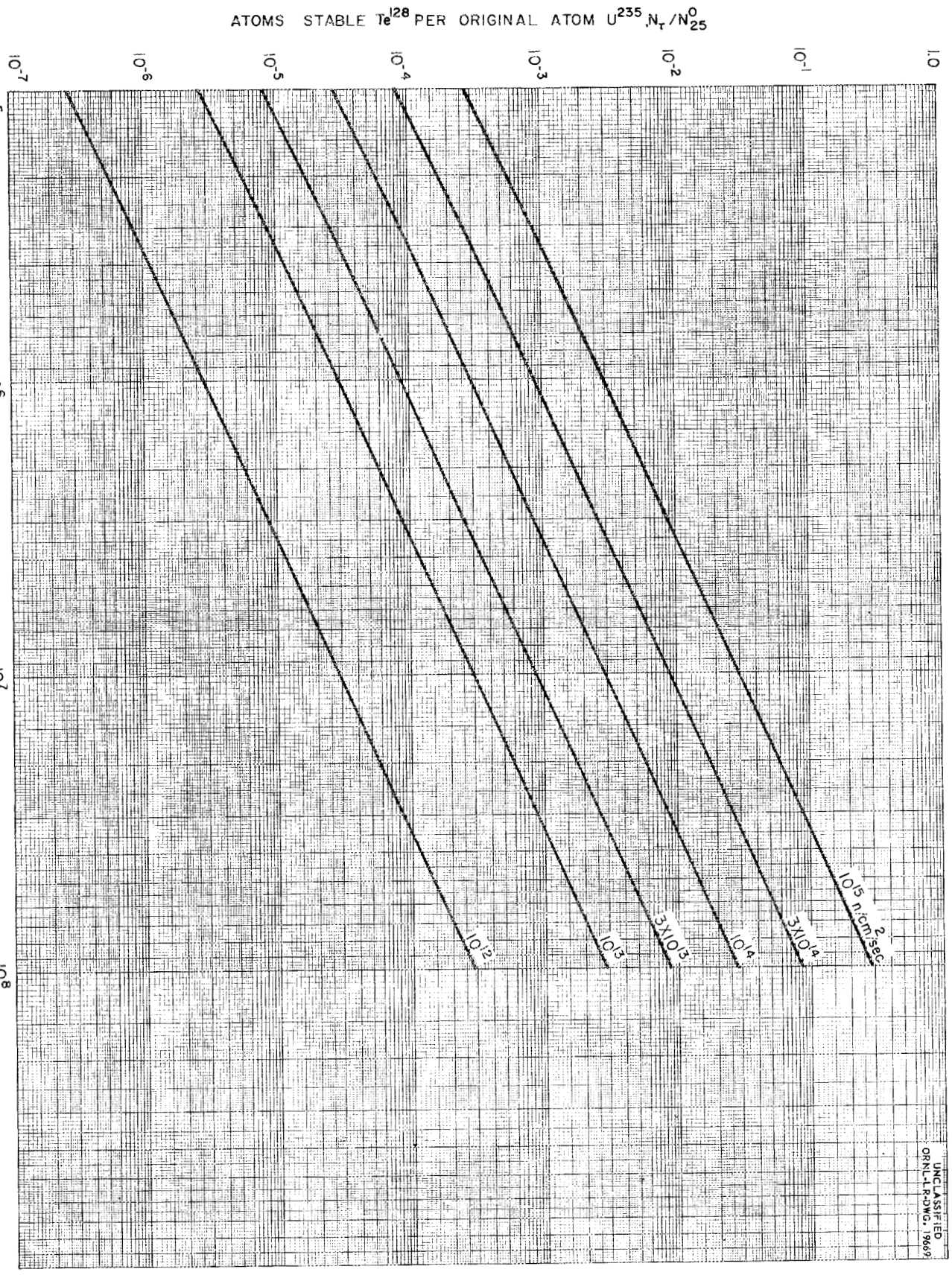


Fig. D-67. Effect of Irradiation Time and Flux on Amount of Stable $Te^{128}$ Formed in Fission of $U^{235}$.

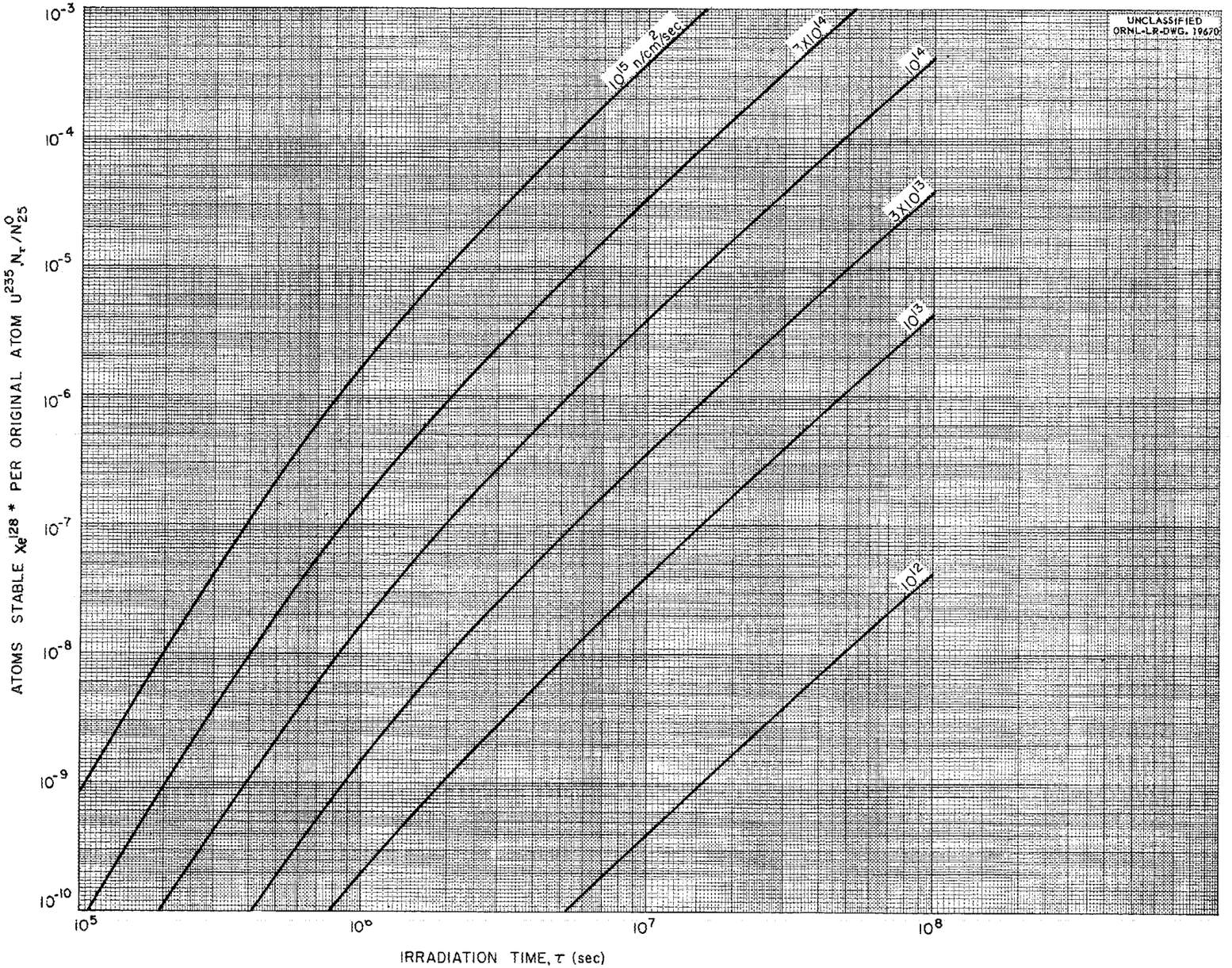


Fig. D-68. Effect of Irradiation Time and Flux on Amount of Stable $Xe^{128*}$ Formed in Fission of $U^{235}$.

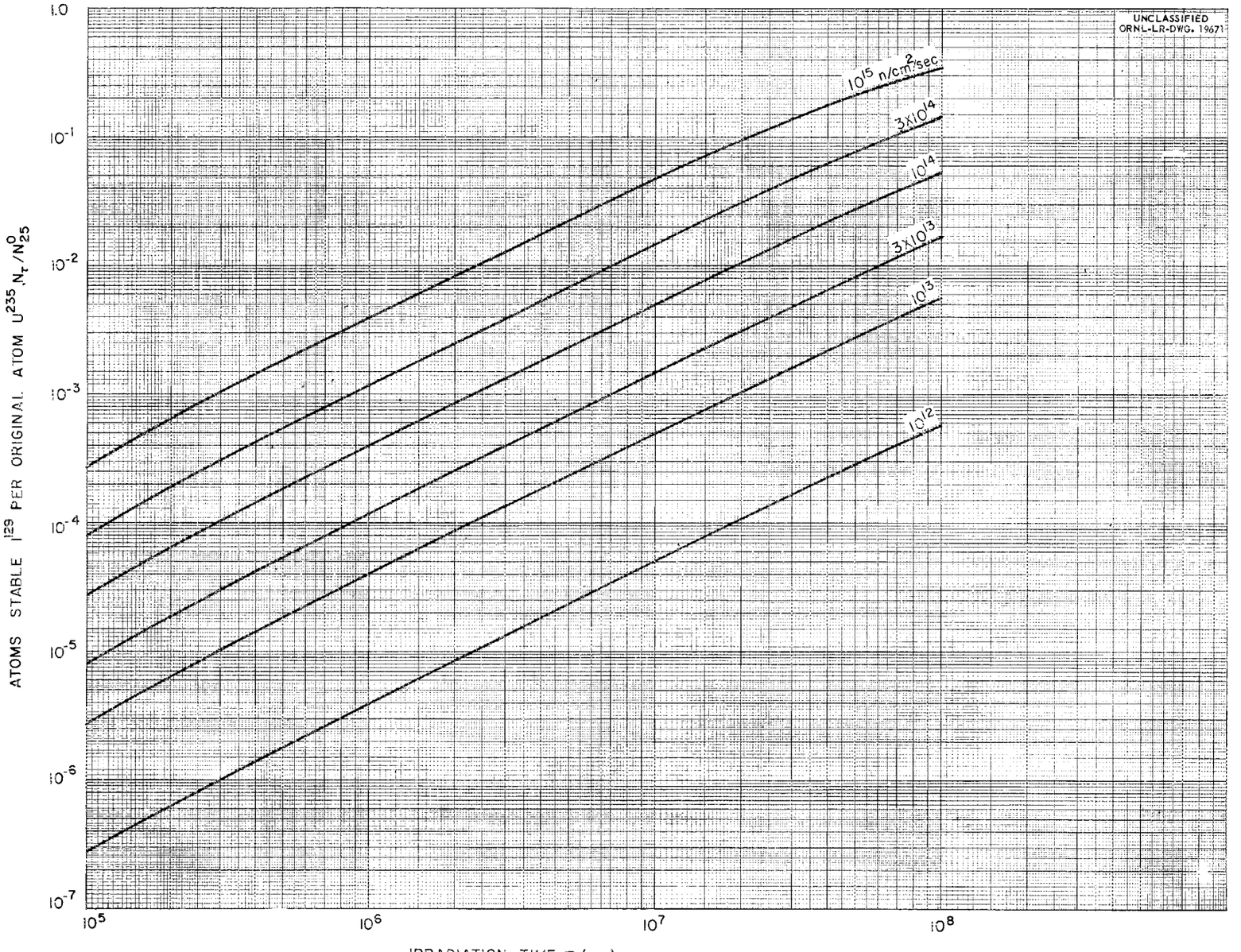


Fig. D-69. Effect of Irradiation Time and Flux on Amount of Stable $I^{129}$ Formed in Fission of $U^{235}$.

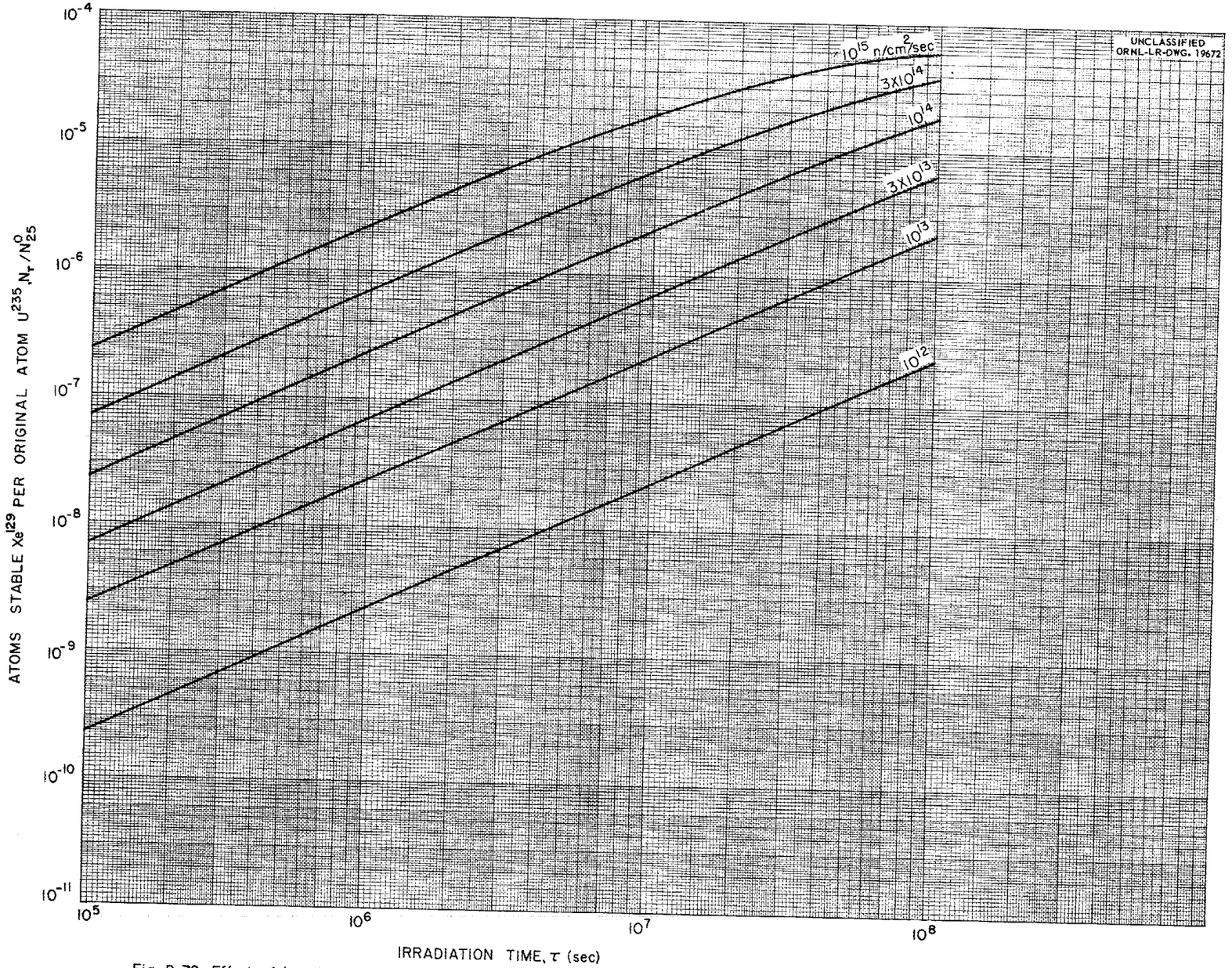


Fig. D-70. Effect of Irradiation Time and Flux on Amount of Stable $Xe^{129}$ Formed in Fission of $U^{235}$.

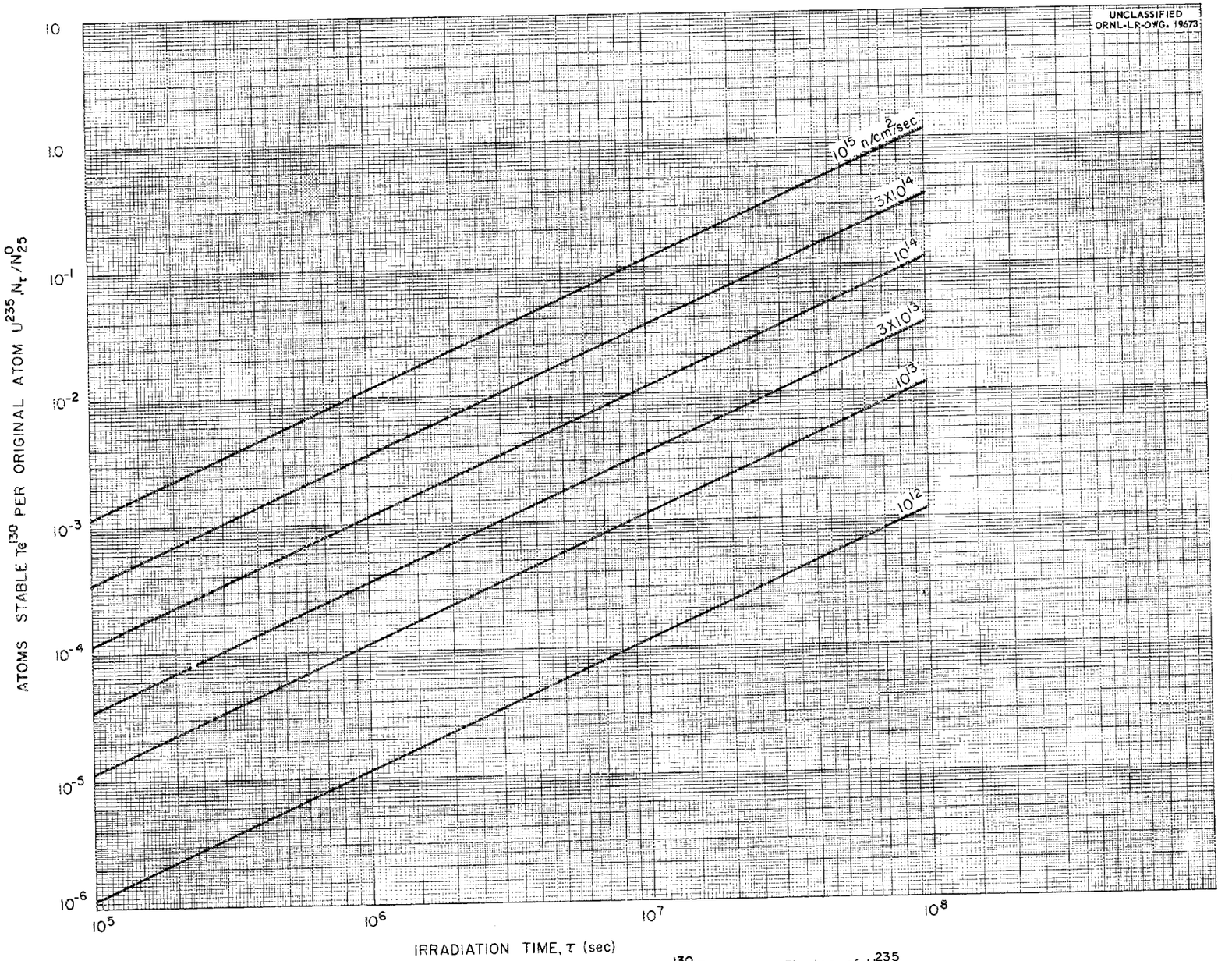


Fig. D-7i. Effect of Irradiation Time and Flux on Amount of Stable $Te^{130}$ Formed in Fission of $U^{235}$.

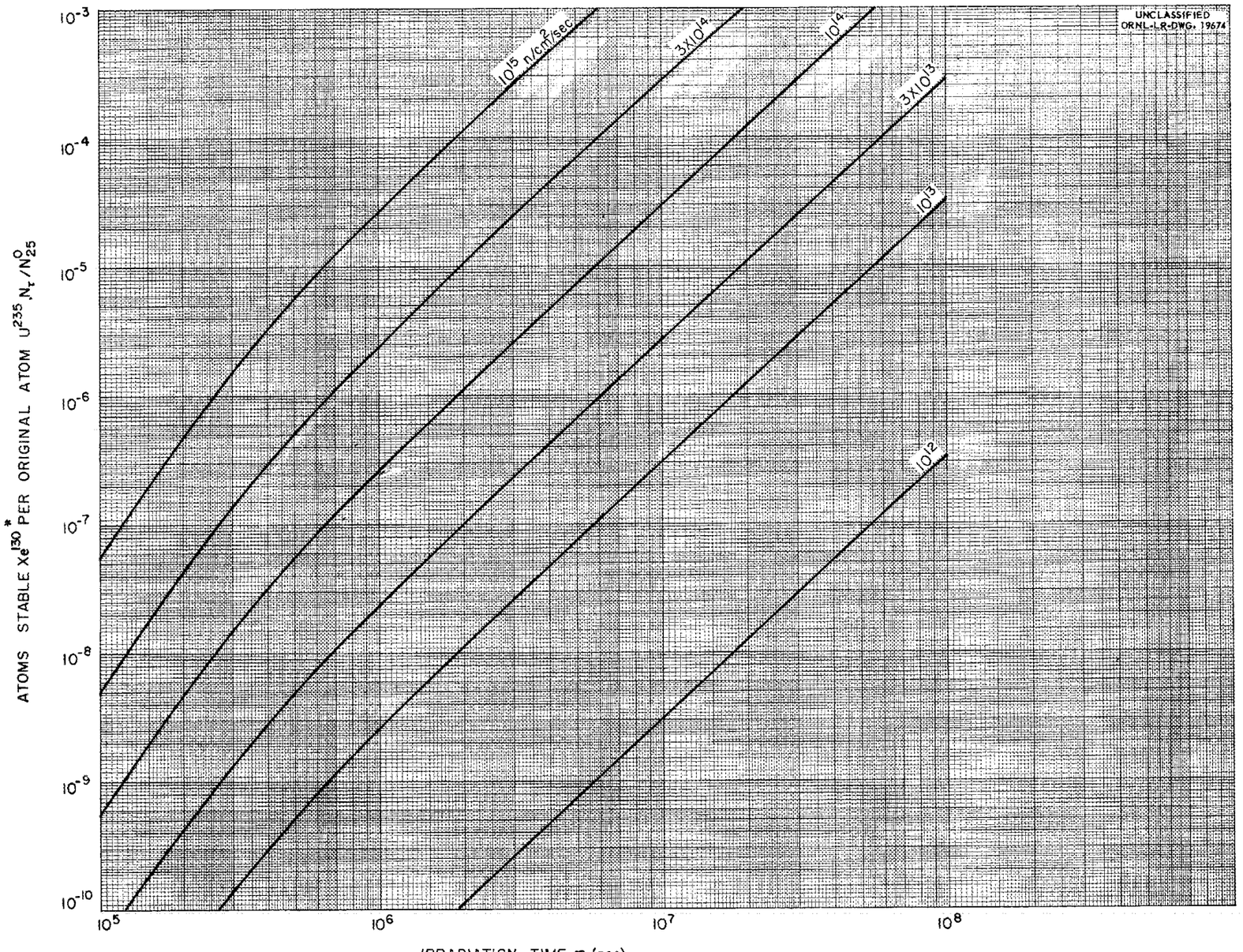


Fig. D-72. Effect of Irradiation Time and Flux on Amount of Stable $Xe^{130*}$ Formed in Fission of $U^{235}$.

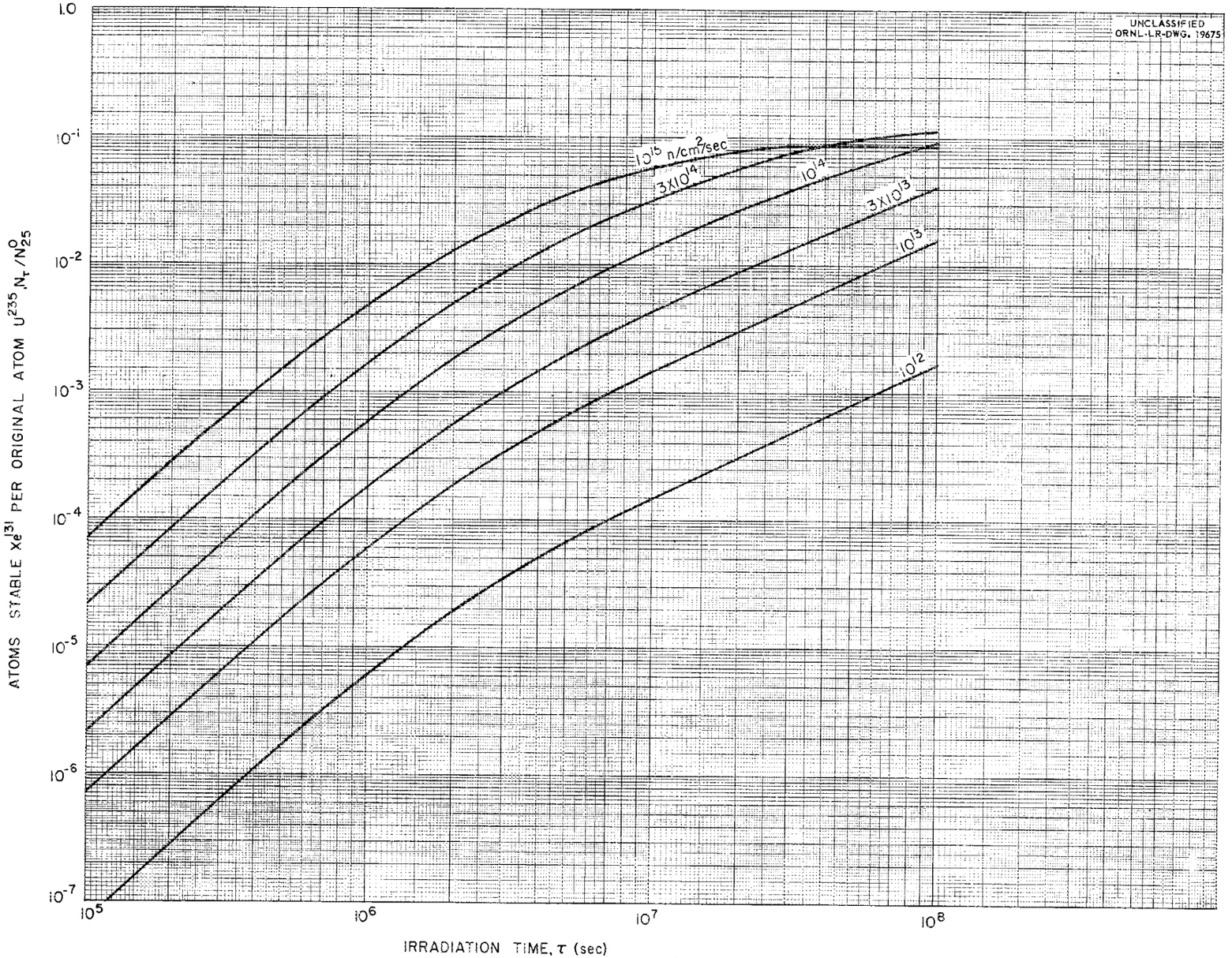


Fig. D-73. Effect of Irradiation Time and Flux on Amount of Stable $Xe^{131}$ Formed in Fission of $U^{235}$.

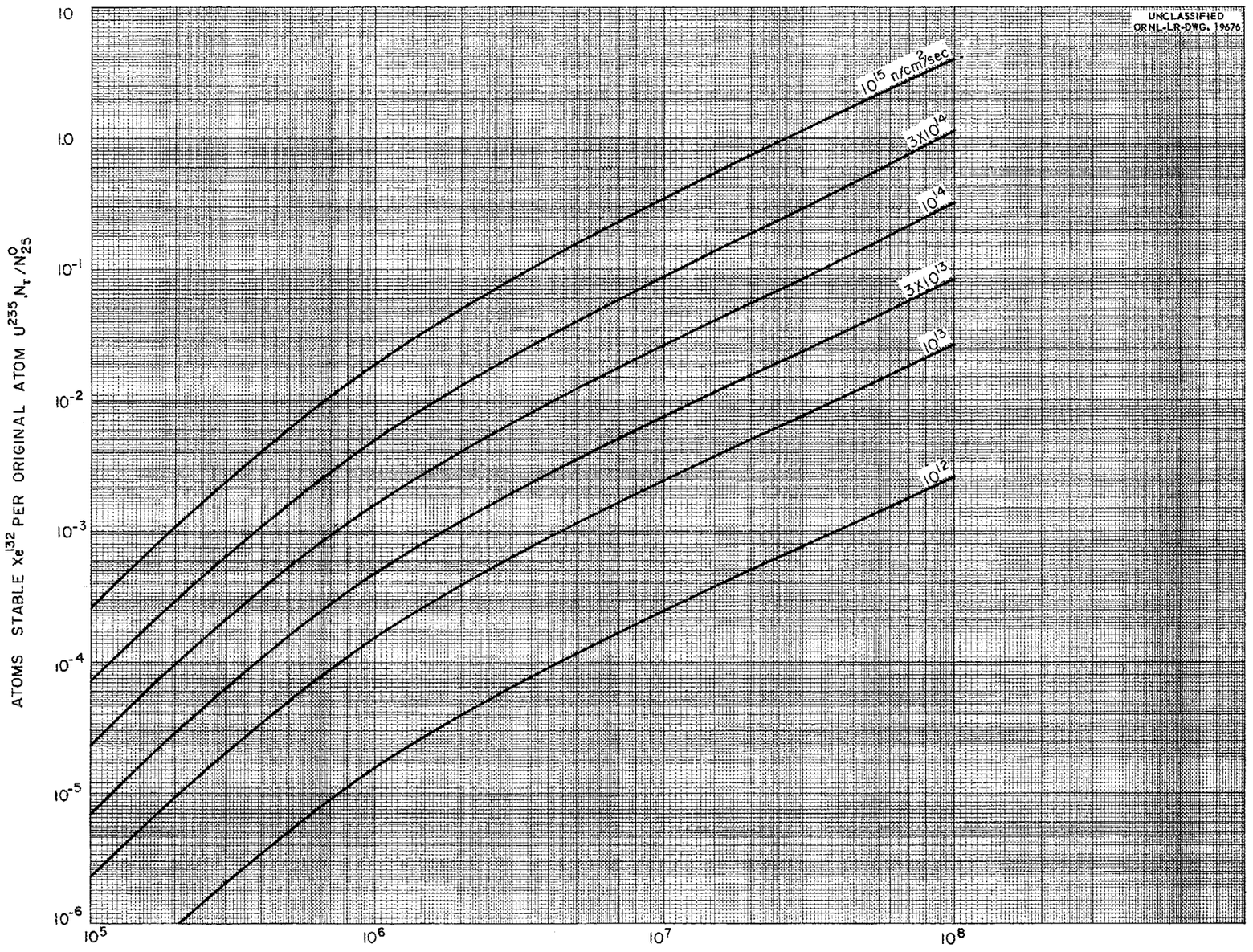


Fig. D-74. Effect of Irradiation Time and Flux on Amount of Stable $Xe^{132}$ Formed in Fission of $U^{235}$.

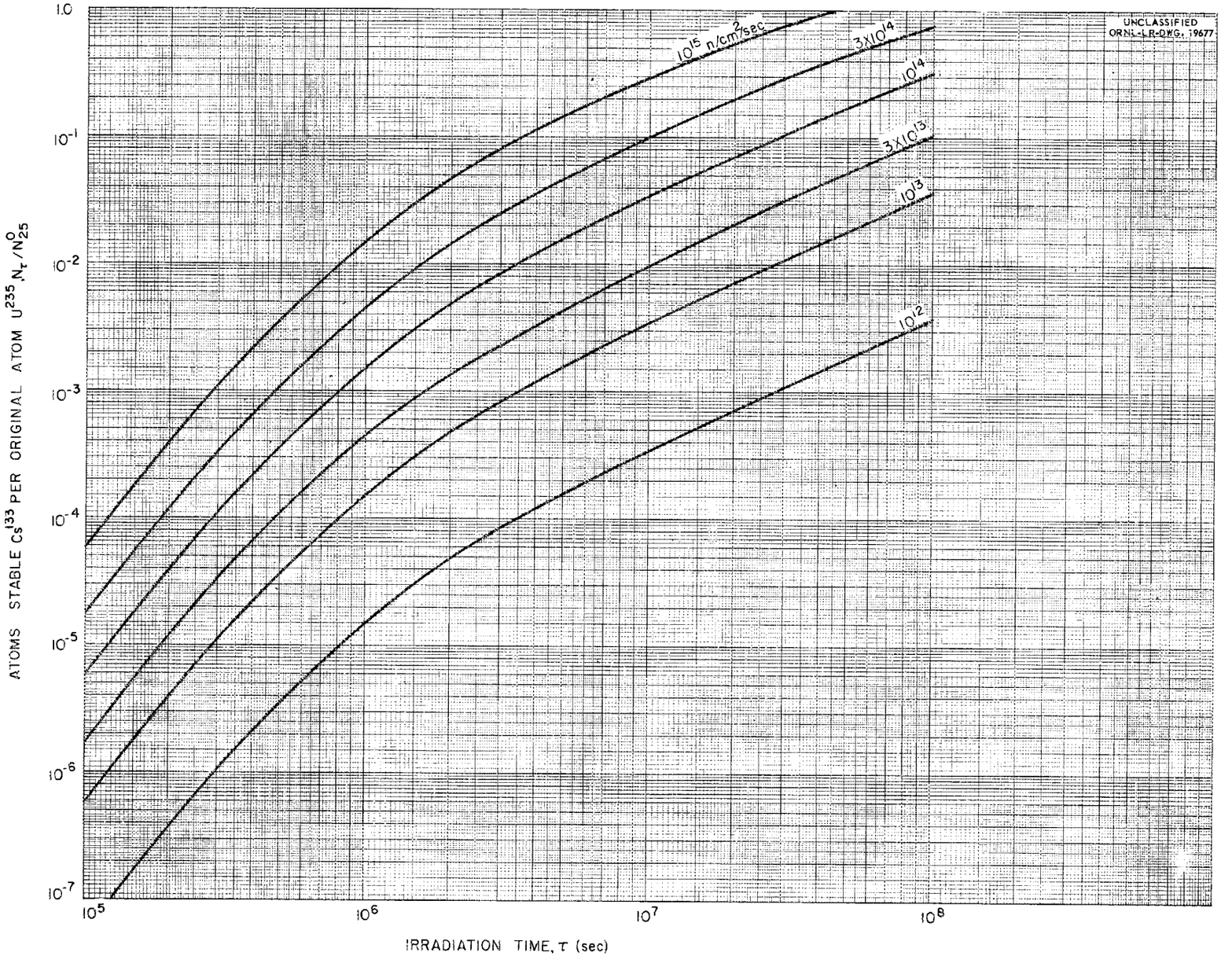


Fig. D-75. Effect of Irradiation Time and Flux on Amount of Stable $Cs^{133}$ Formed in Fission of $U^{235}$.

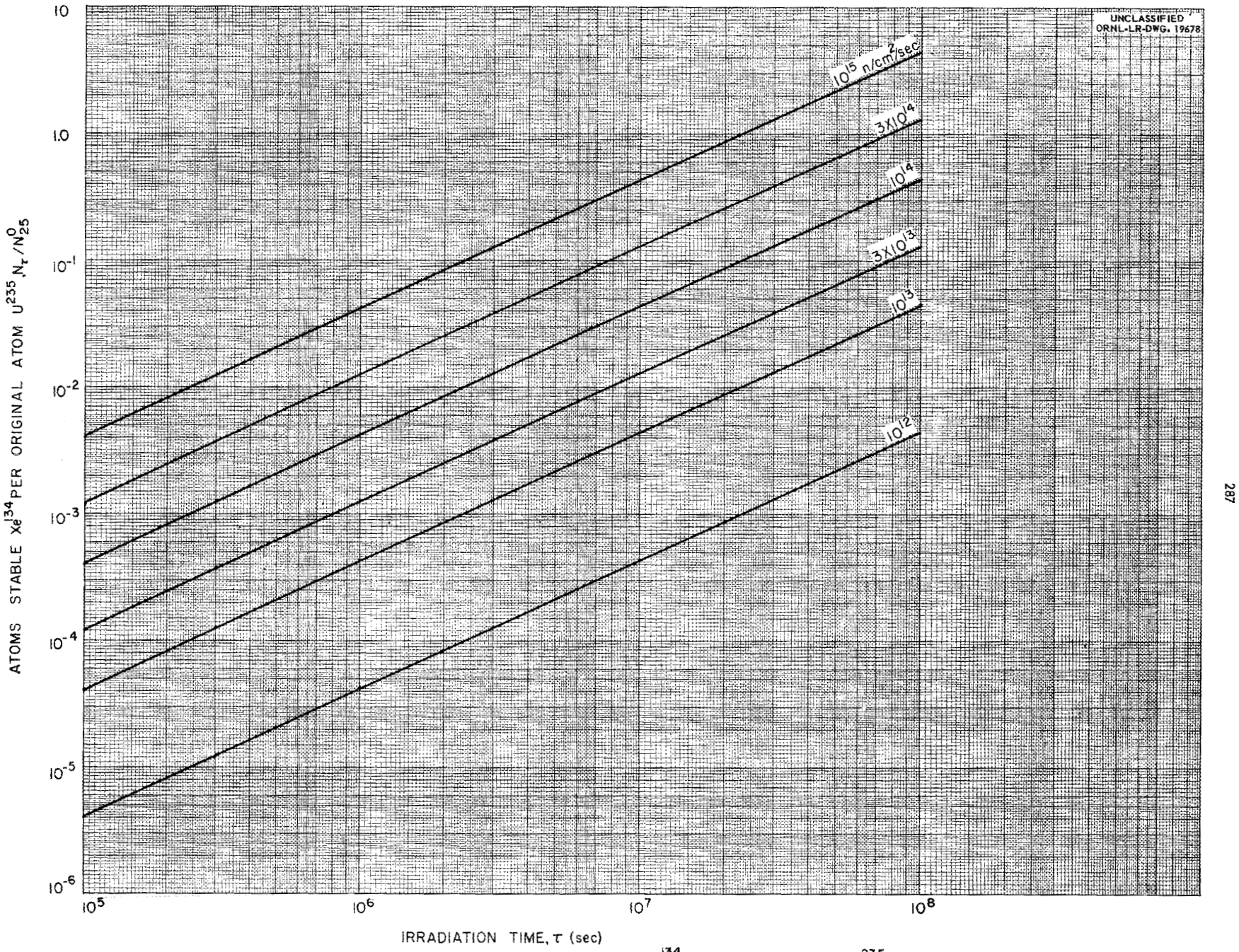


Fig. D-76. Effect of Irradiation Time and Flux on Amount of Stable $Xe^{134}$ Formed in Fission of $U^{235}$.

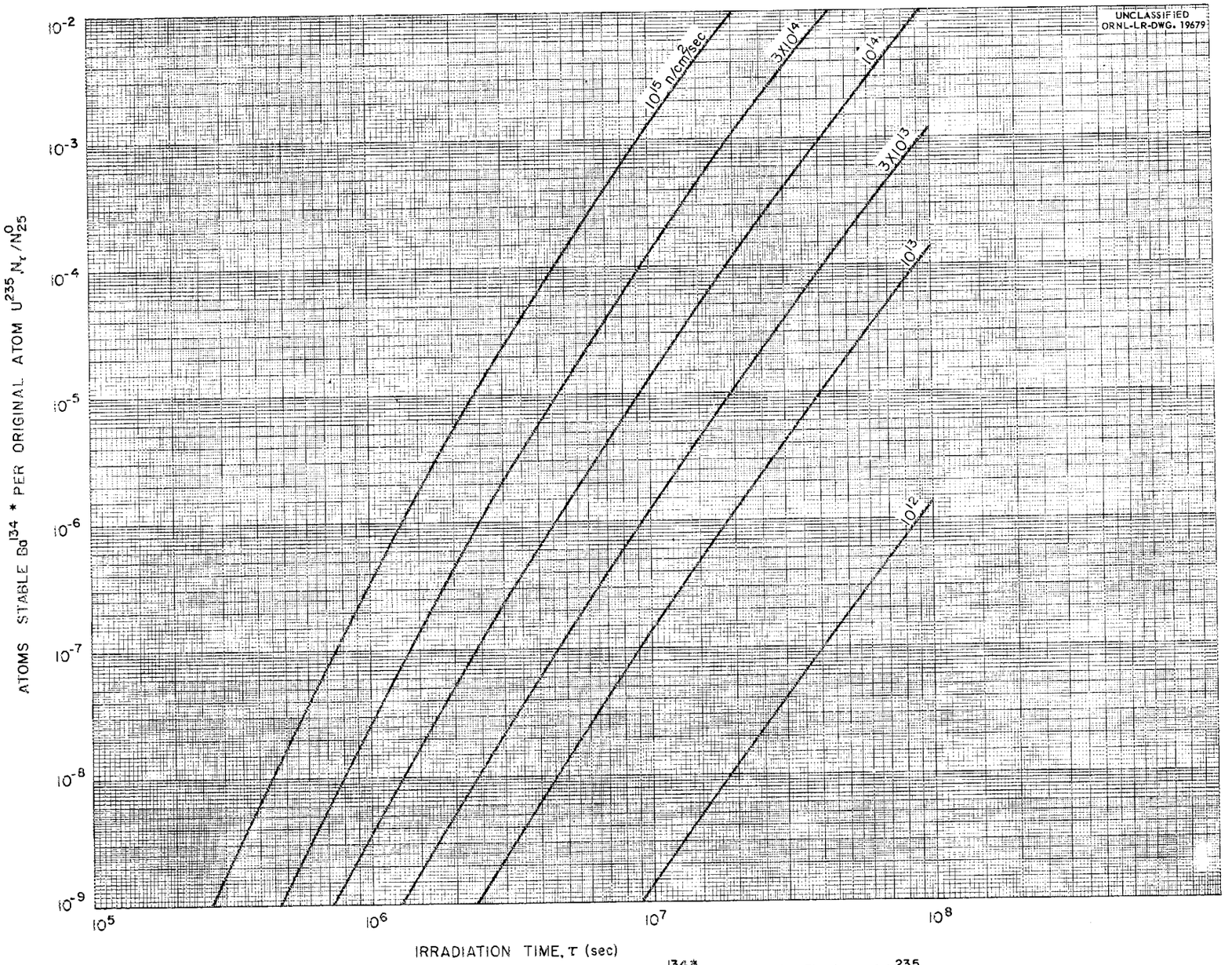


Fig. D-77. Effect of Irradiation Time and Flux on Amount of Stable $Ba^{134*}$ Formed in Fission of $U^{235}$.

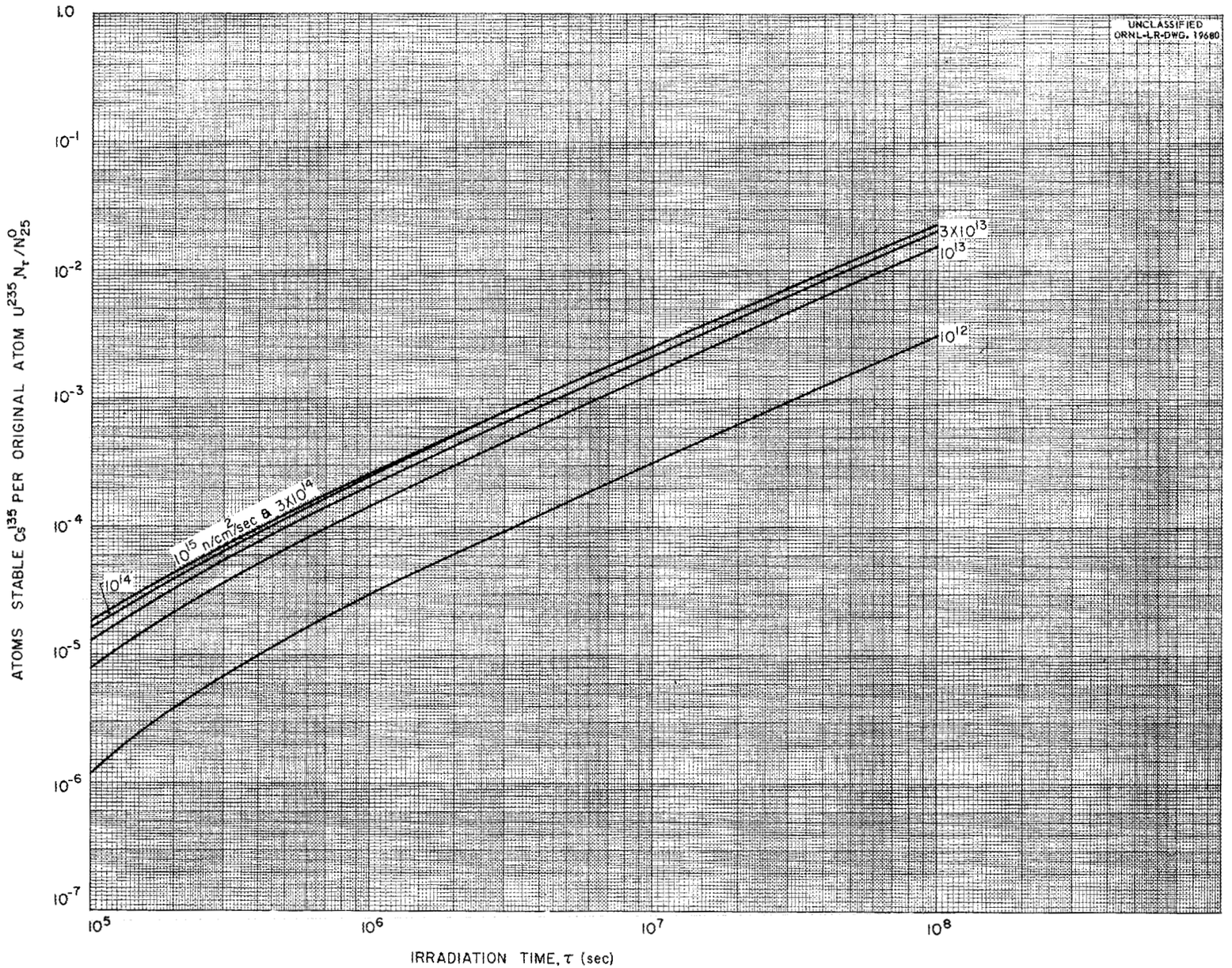


Fig. D-78. Effect of Irradiation Time and Flux on Amount of Stable $Cs^{135}$ Formed in Fission of $U^{235}$.

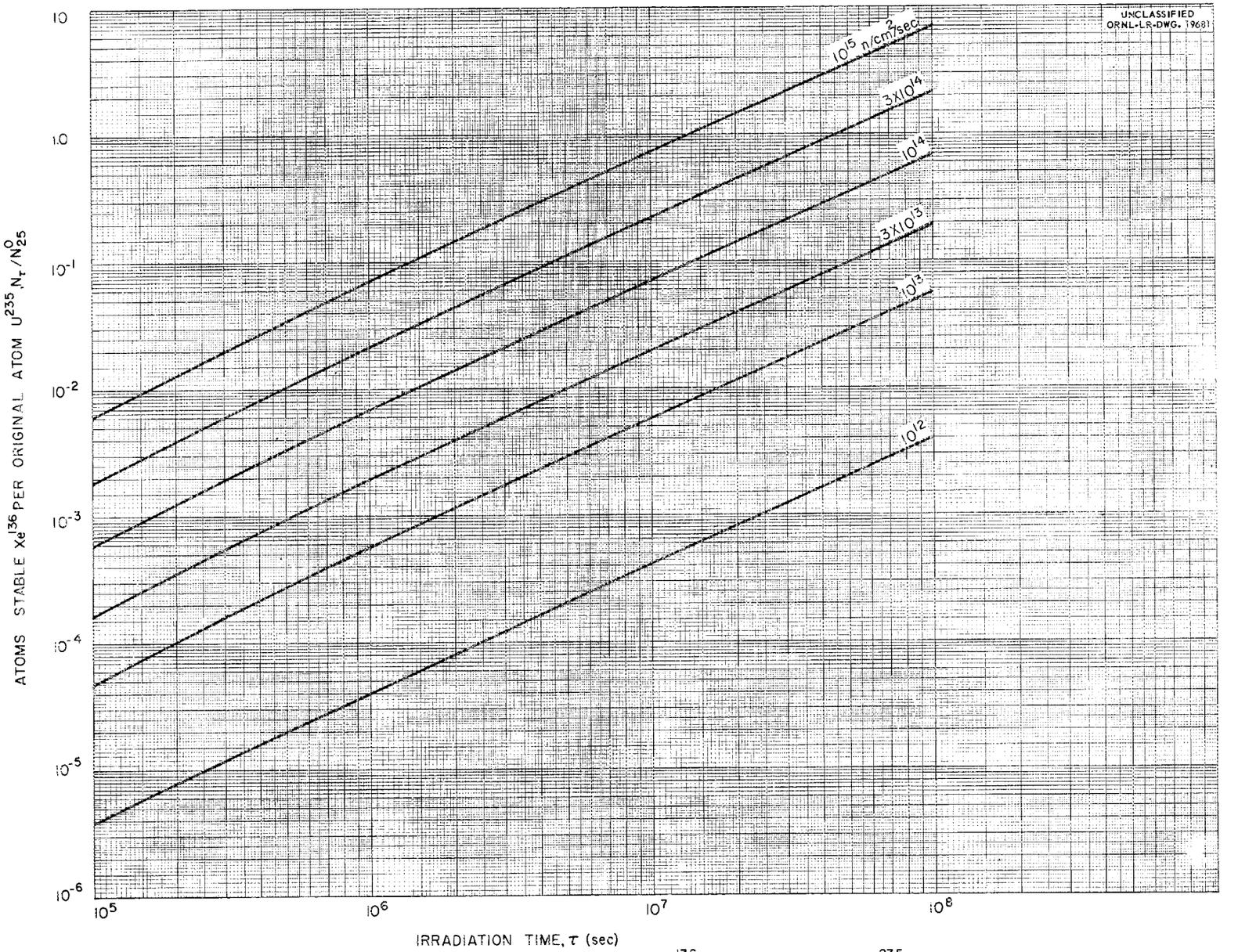


Fig. D-79. Effect of Irradiation Time and Flux on Amount of Stable $Xe^{136}$ Formed in Fission of $U^{235}$.

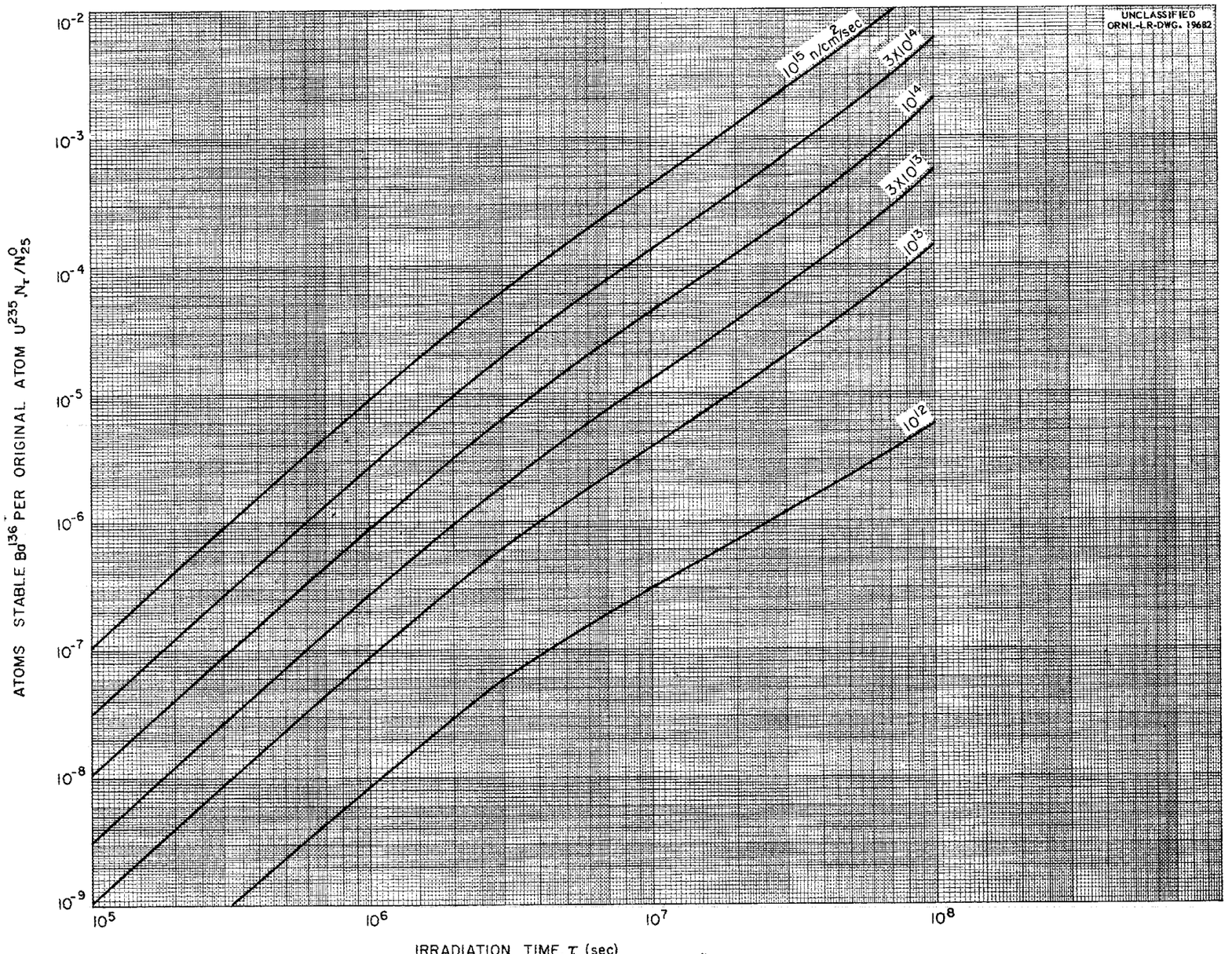


Fig. D-80. Effect of Irradiation Time and Flux on Amount of Stable $Ba^{136}$* Formed in Fission of $U^{235}$.

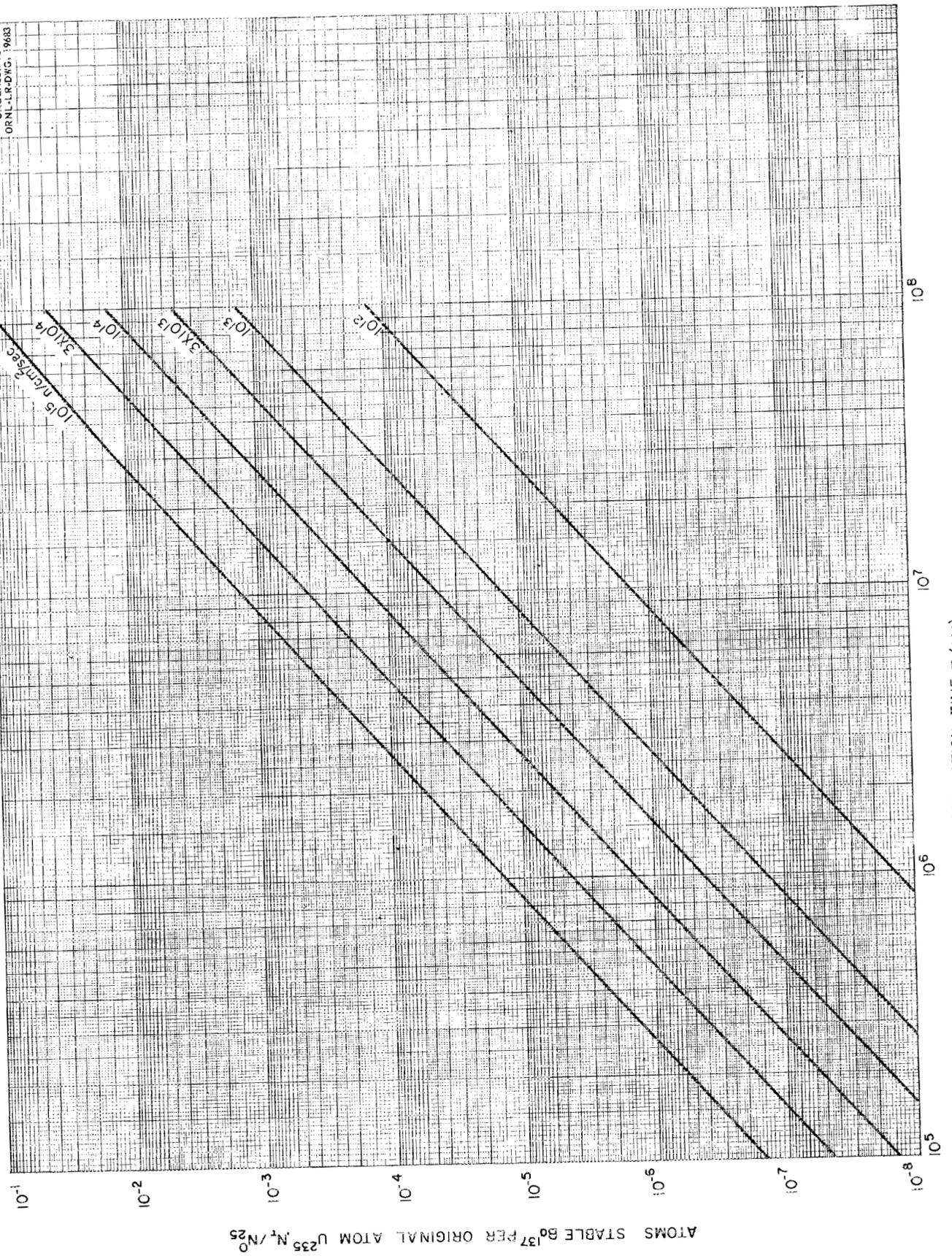


Fig. D-81. Effect of Irradiation Time and Flux on Amount of Stable $Ba^{137}$ Formed in Fission of $U^{235}$.

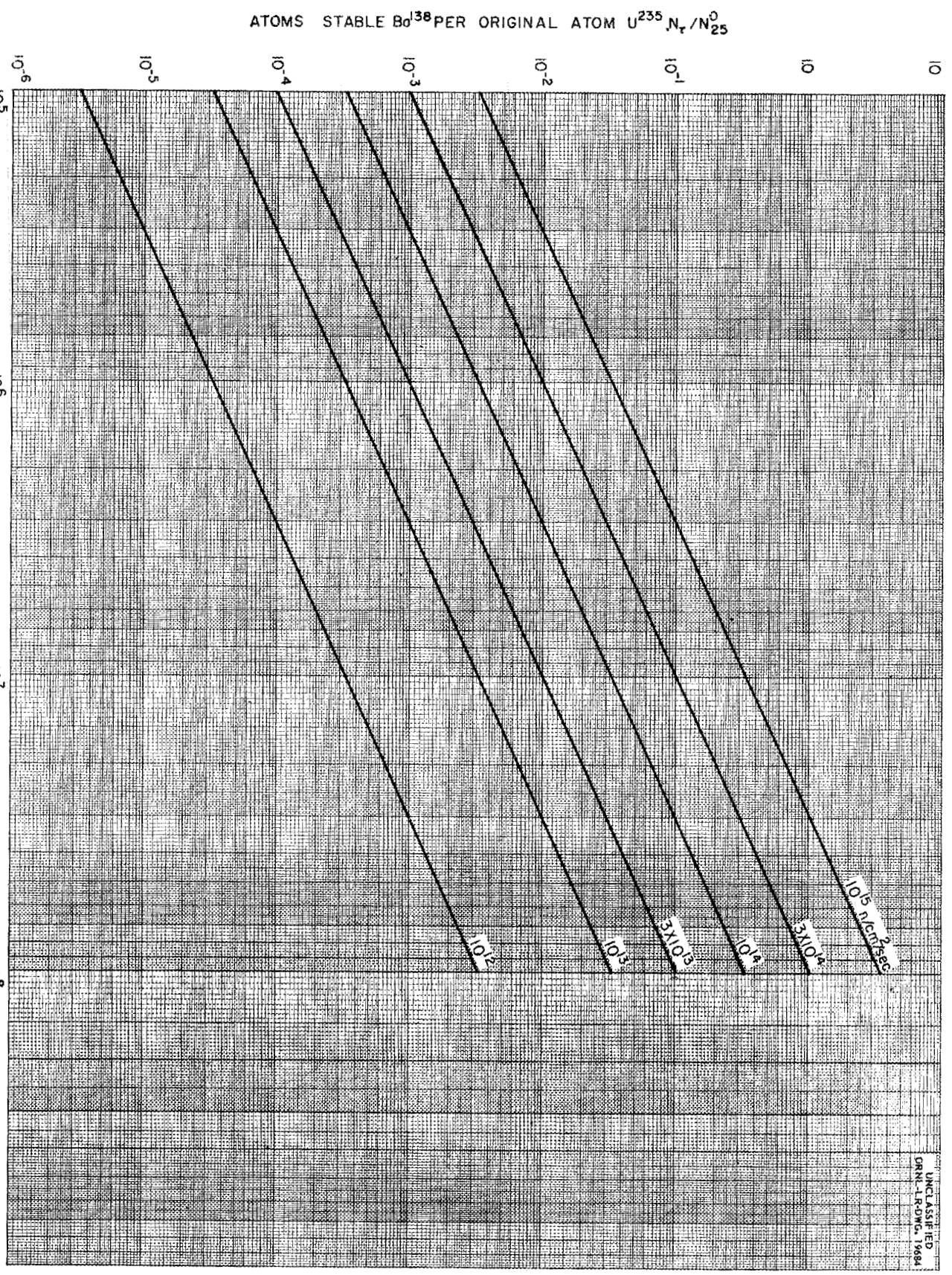


Fig. D-82 Effect of Irradiation Time and Flux on Amount of Stable Bα$^{138}$ Formed in Fission of U$^{235}$.

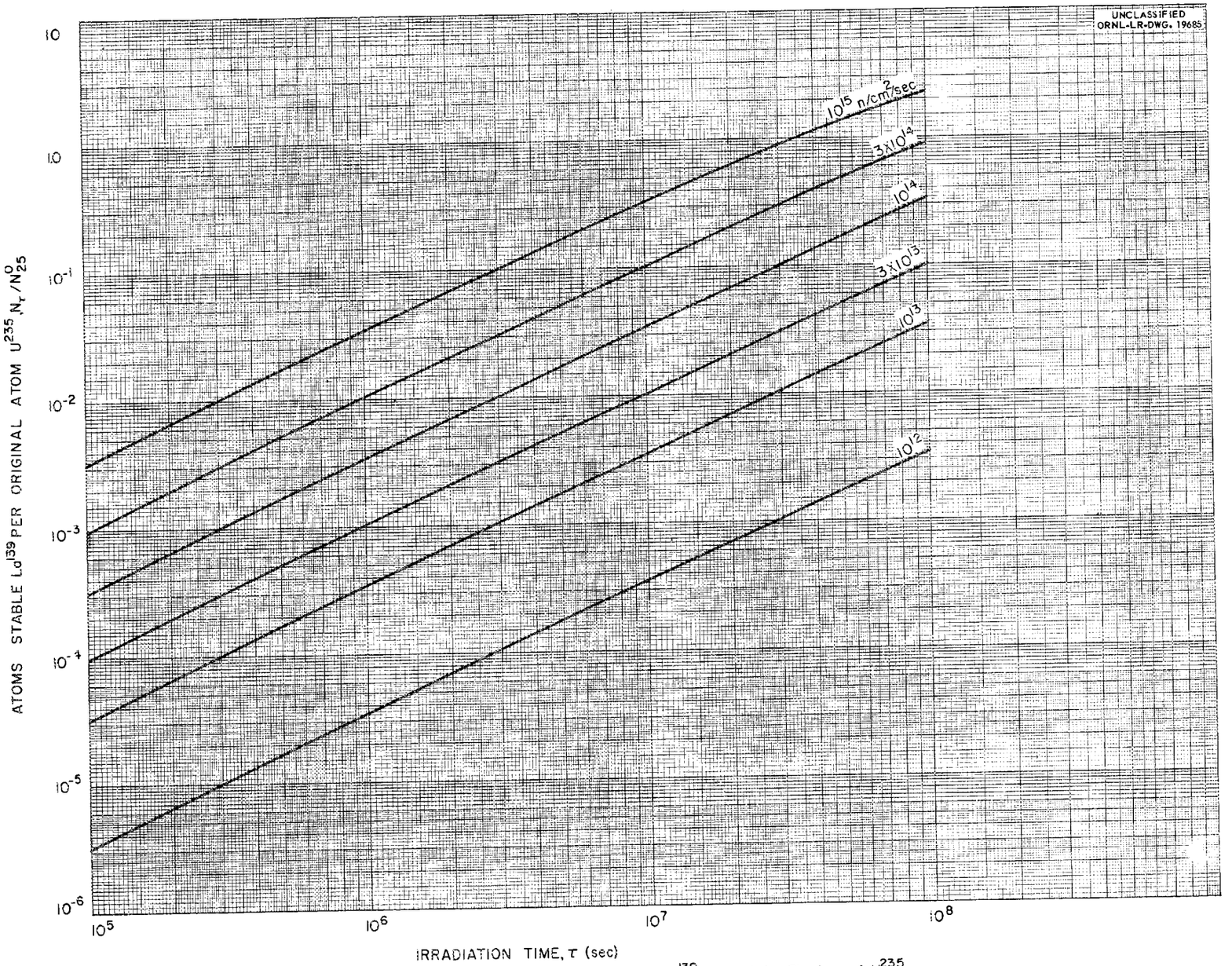


Fig. D-83. Effect of Irradiation Time and Flux on Amount of Stable $La^{139}$ Formed in Fission of $U^{235}$.

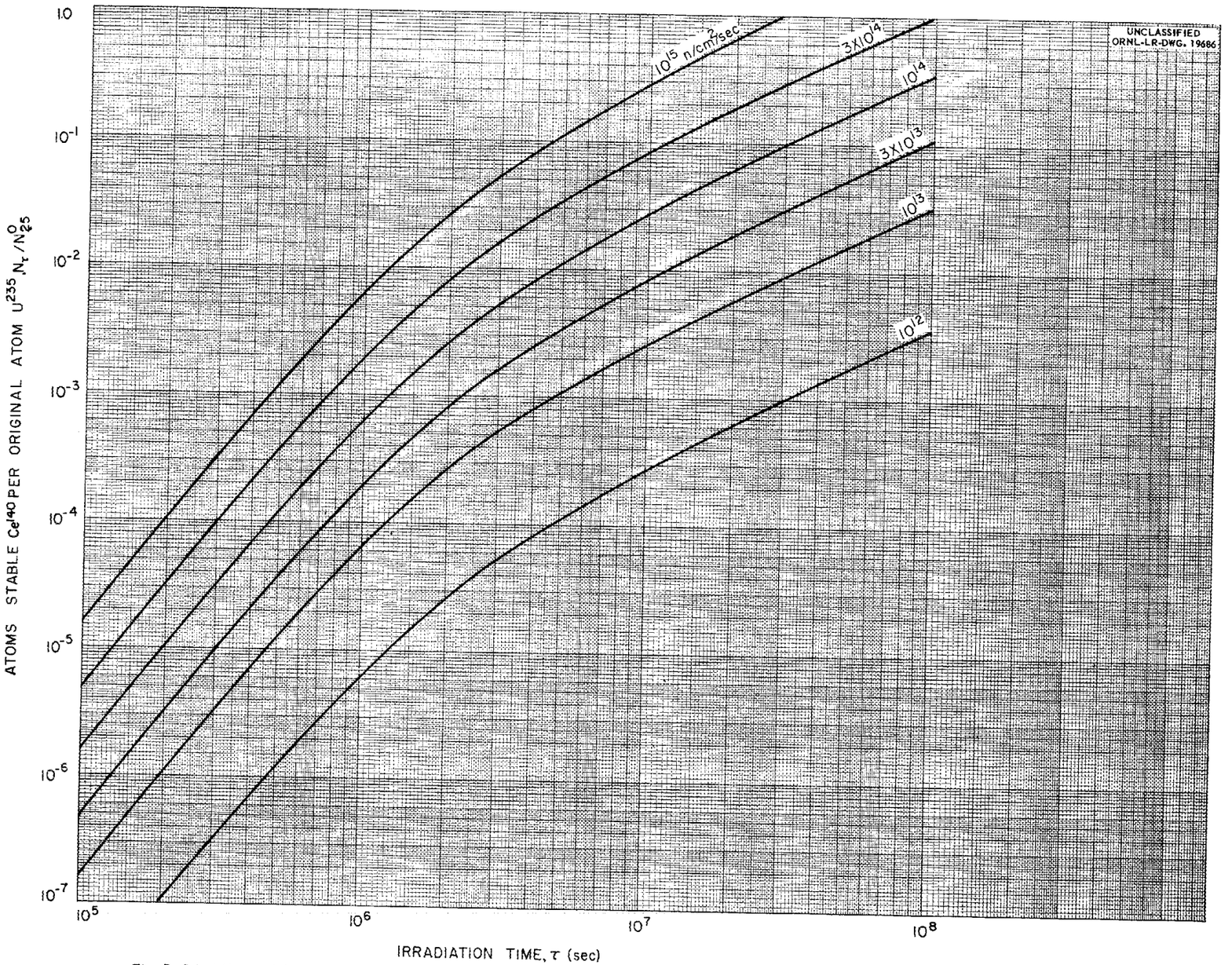


Fig. D-84. Effect of Irradiation Time and Flux on Amount of Stable $Ce^{140}$ Formed in Fission of $U^{235}$.

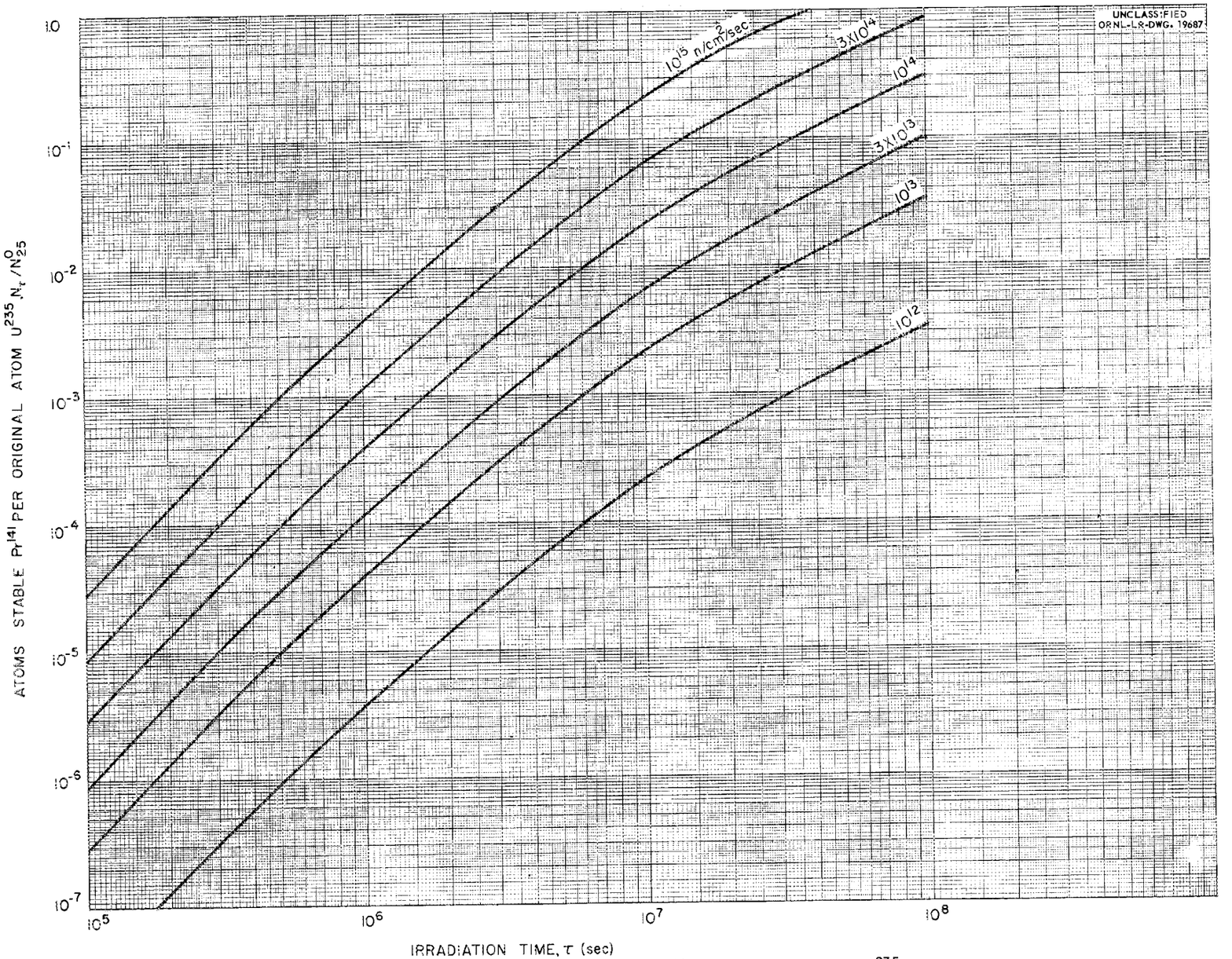


Fig. D-85. Effect of Irradiation Time and Flux on Amount of Stable $Pr^{141}$ Formed in Fission of $U^{235}$.

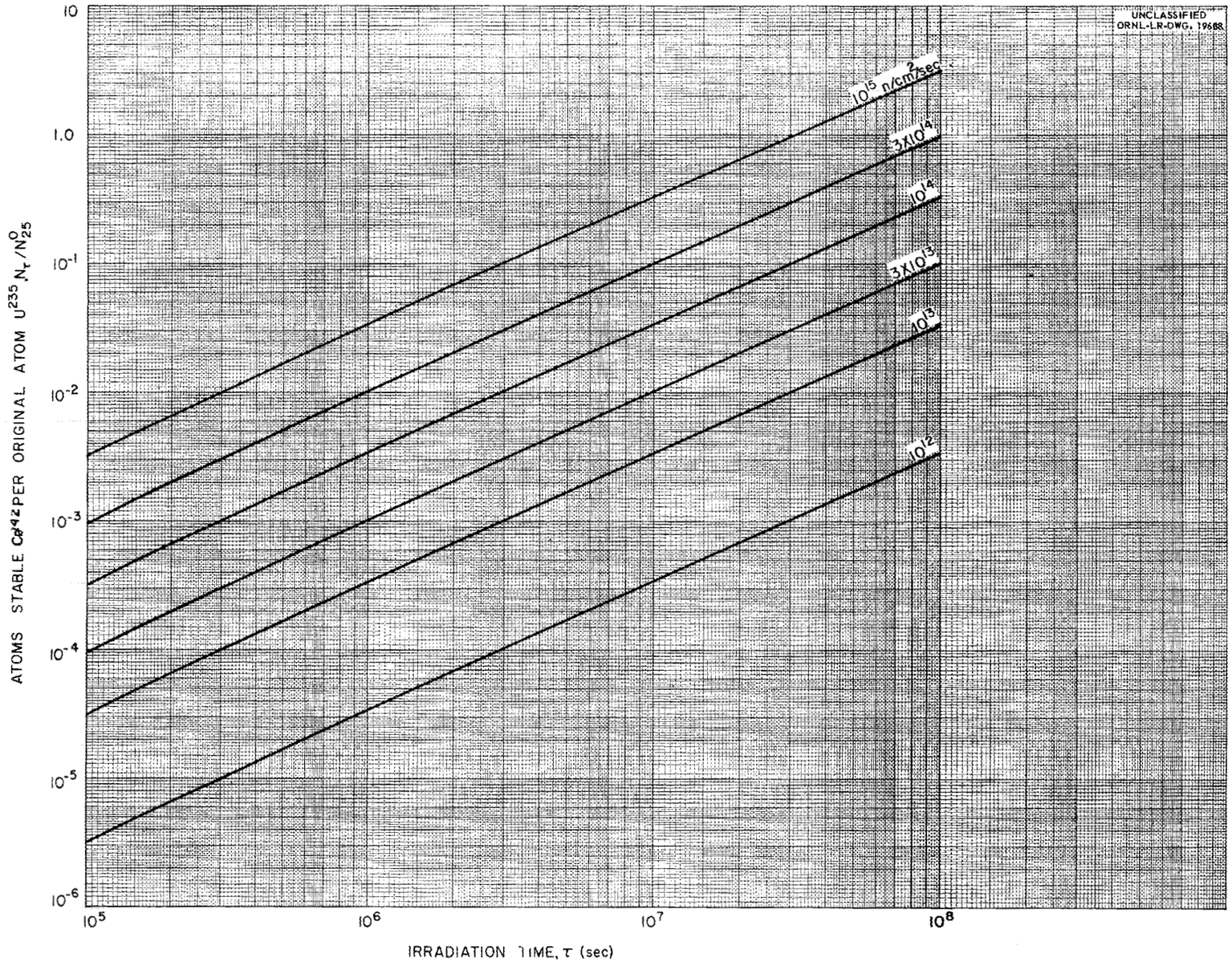


Fig. D-86. Effect of Irradiation Time and Flux on Amount of Stable $Ce^{142}$ Formed in Fission of $U^{235}$.

Fig. D-87. Effect of Irradiation Time and Flux on Amount of Stable $Nd^{142*}$ Formed in Fission of $U^{235}$.

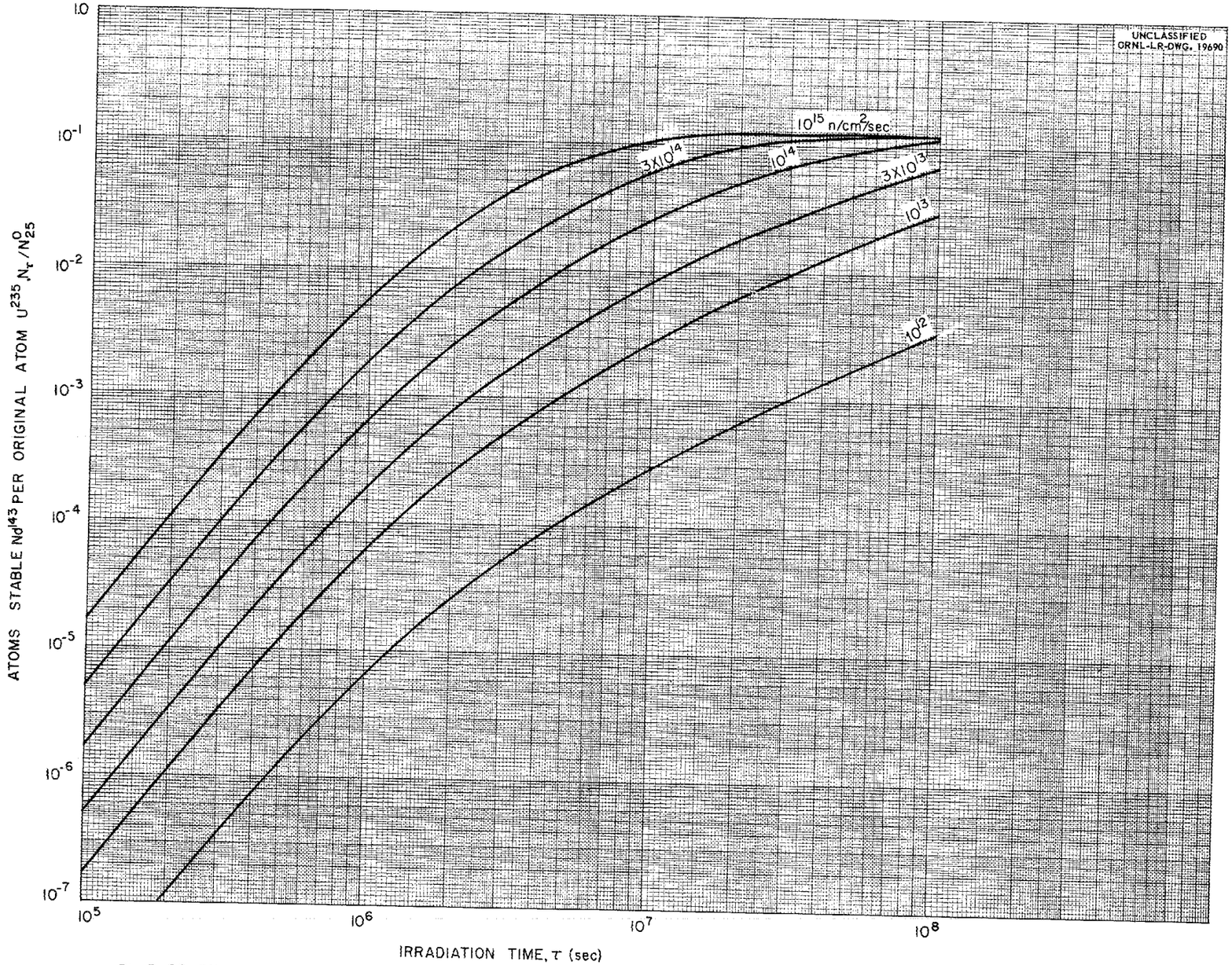


Fig. D-88. Effect of Irradiation Time and Flux on Amount of Stable $Nd^{143}$ Formed in Fission of $U^{235}$.

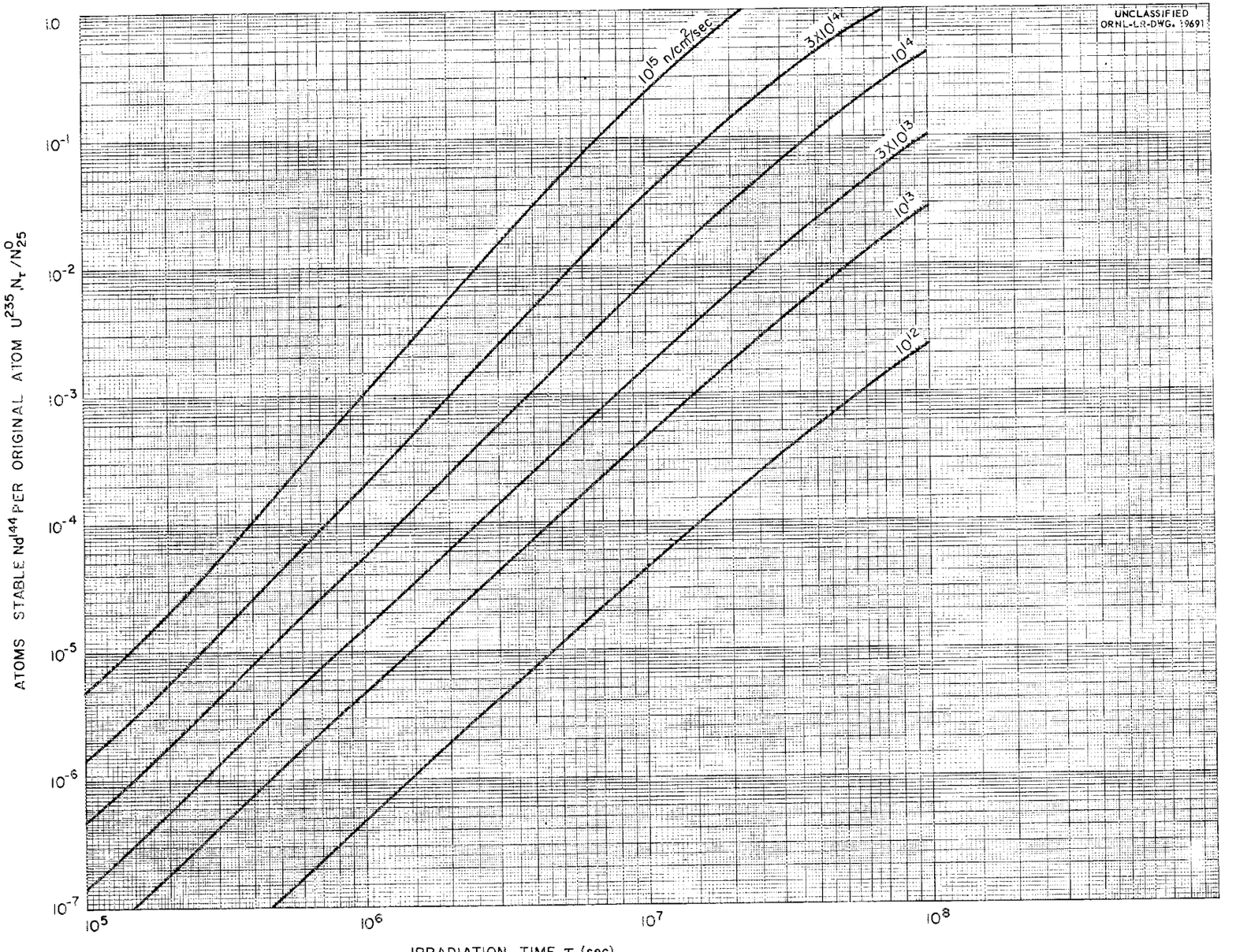


Fig. D-89. Effect of Irradiation Time and Flux on Amount of Stable $Nd^{144}$ Formed in Fission of $U^{235}$.

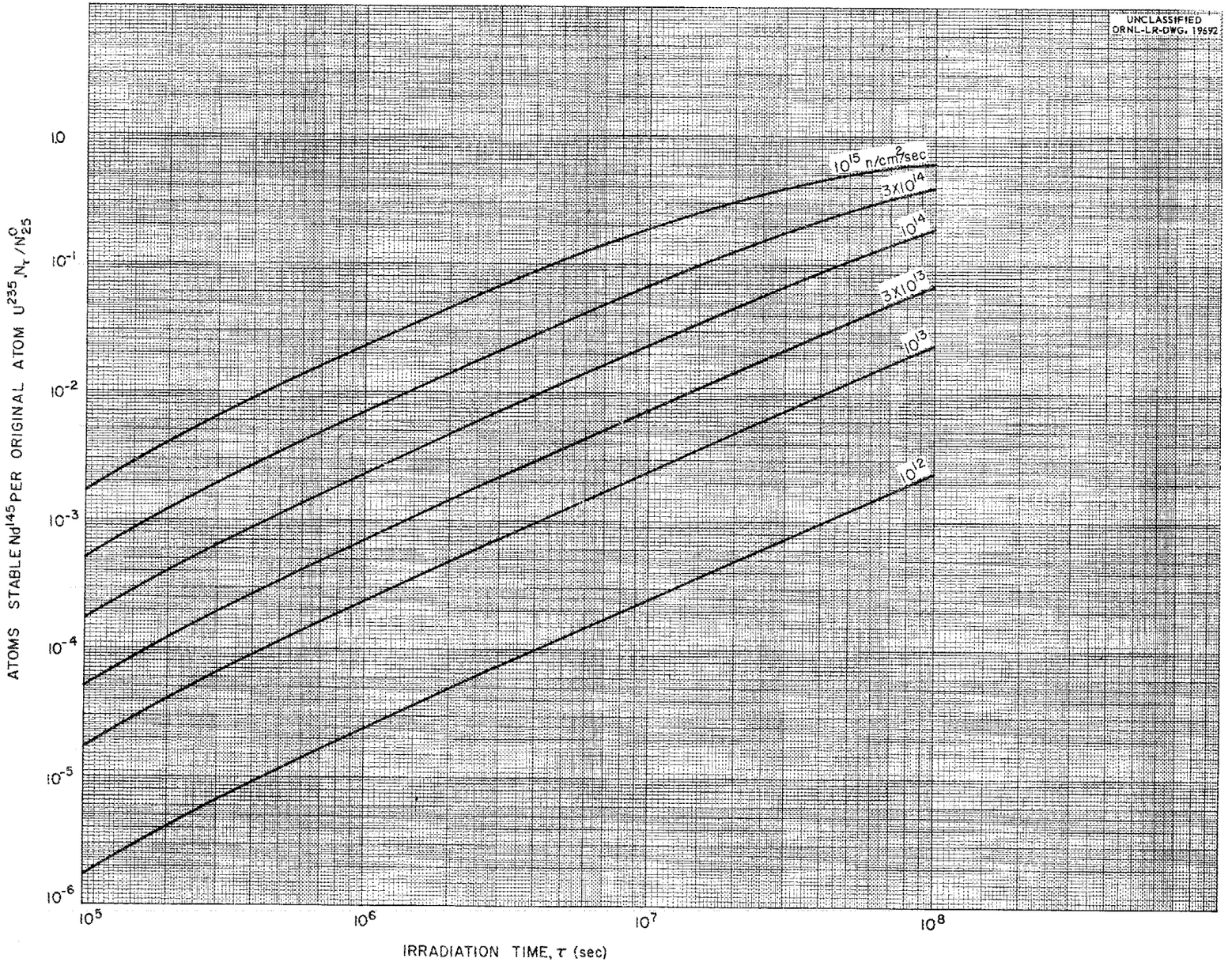


Fig. D-90. Effect of Irradiation Time and Flux on Amount of Stable $Nd^{145}$ Formed in Fission of $U^{235}$.

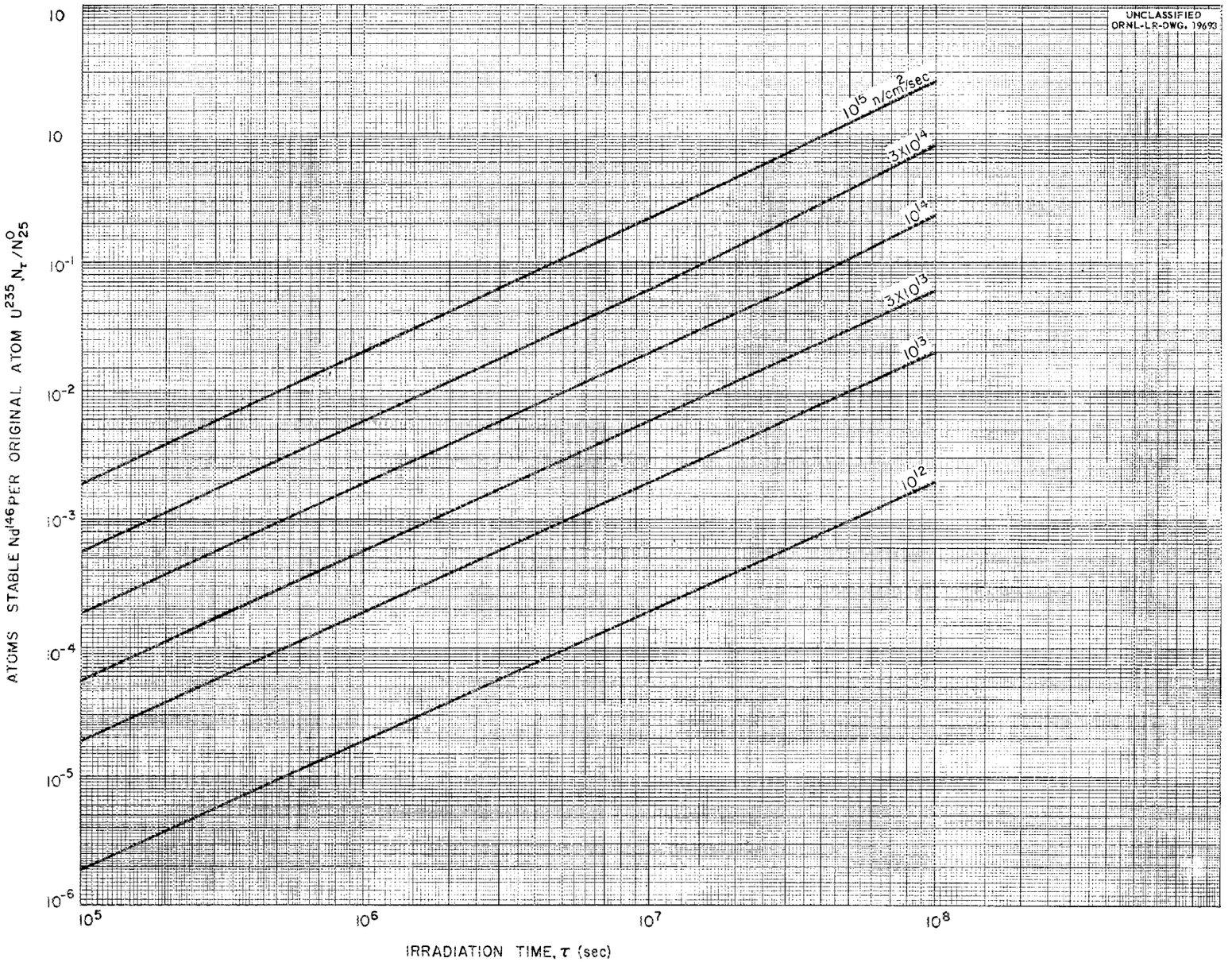


Fig. D-9t. Effect of Irradiation Time and Flux on Amount of Stable $Nd^{146}$ Formed in Fission of $U^{235}$.

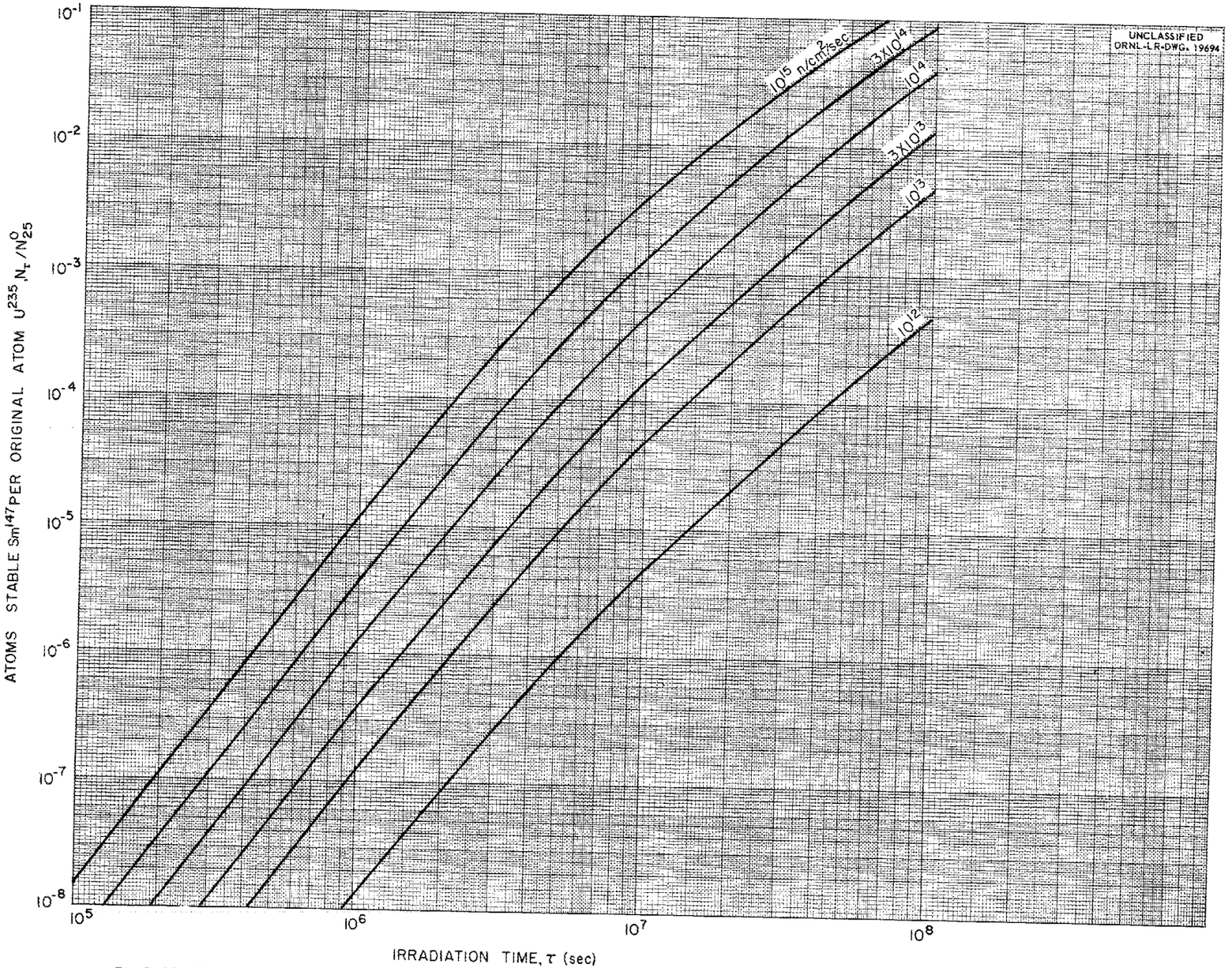


Fig. D-92. Effect of Irradiation Time and Flux on Amount of Stable $Sm^{147}$ Formed in Fission of $U^{235}$.

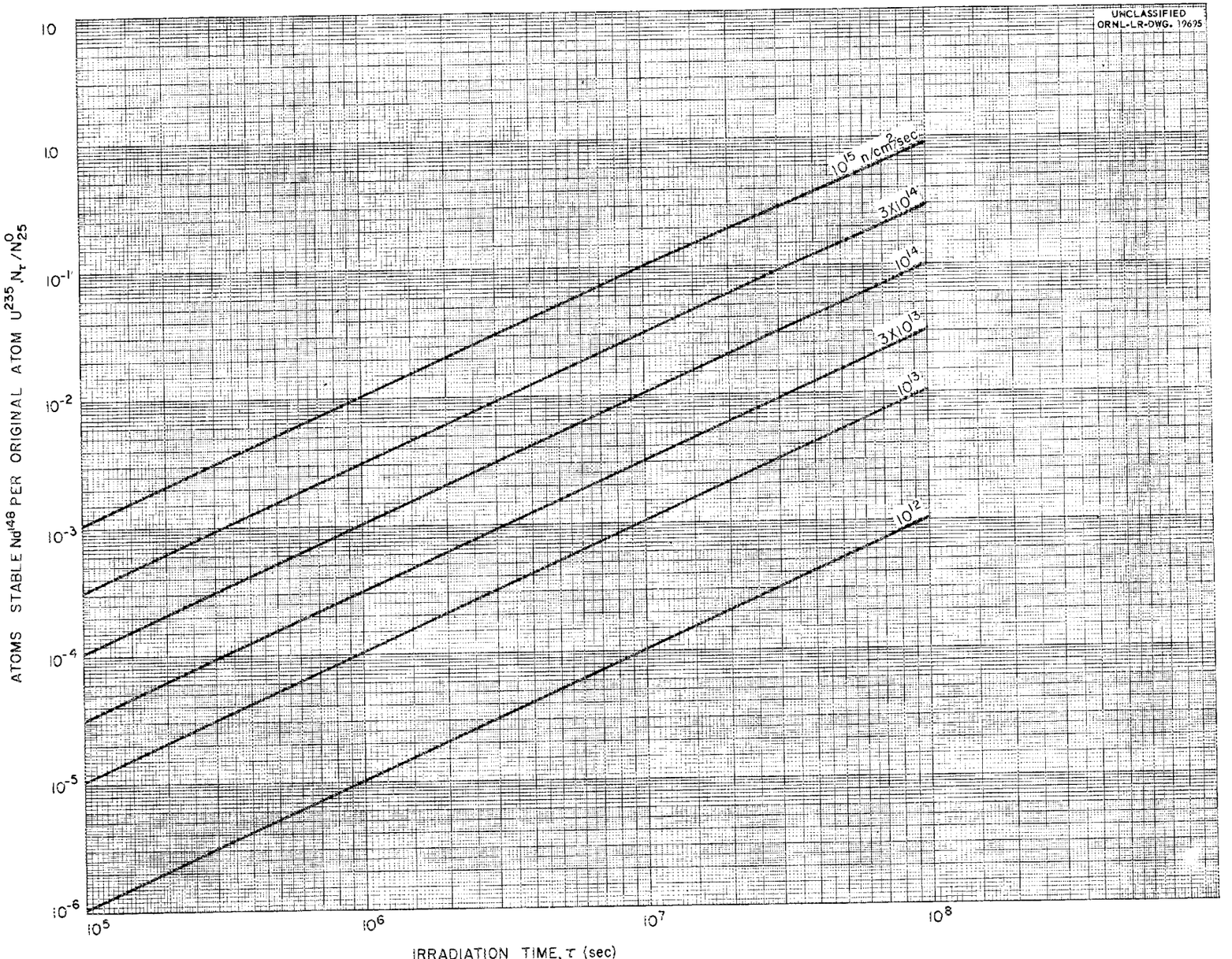


Fig. D-93. Effect of Irradiation Time and Flux on Amount of Stable $Nd^{148}$ Formed in Fission of $U^{235}$.

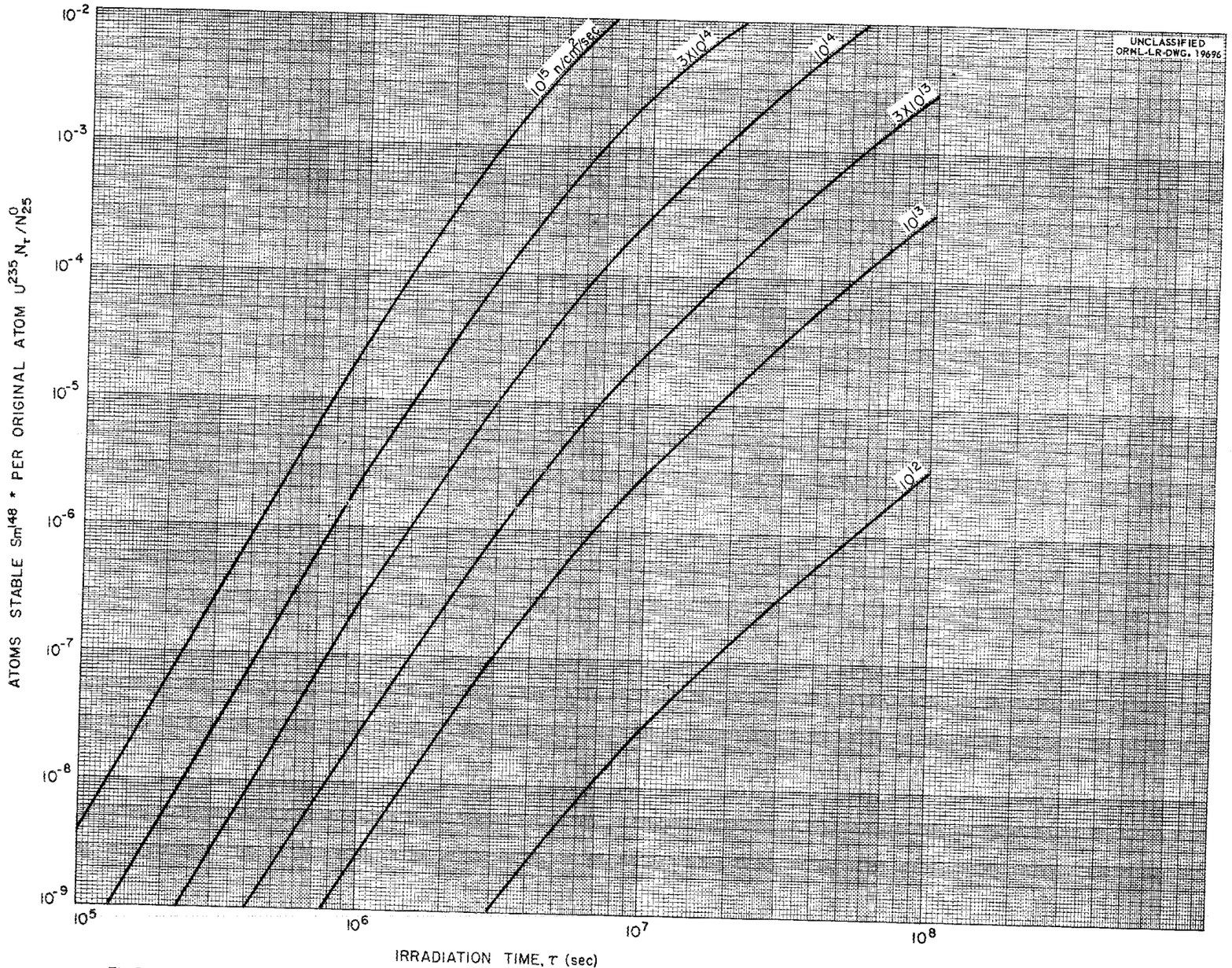


Fig. D-94. Effect of Irradiation Time and Flux on Amount of Stable $Sm^{148*}$ Formed in Fission of $U^{235}$.

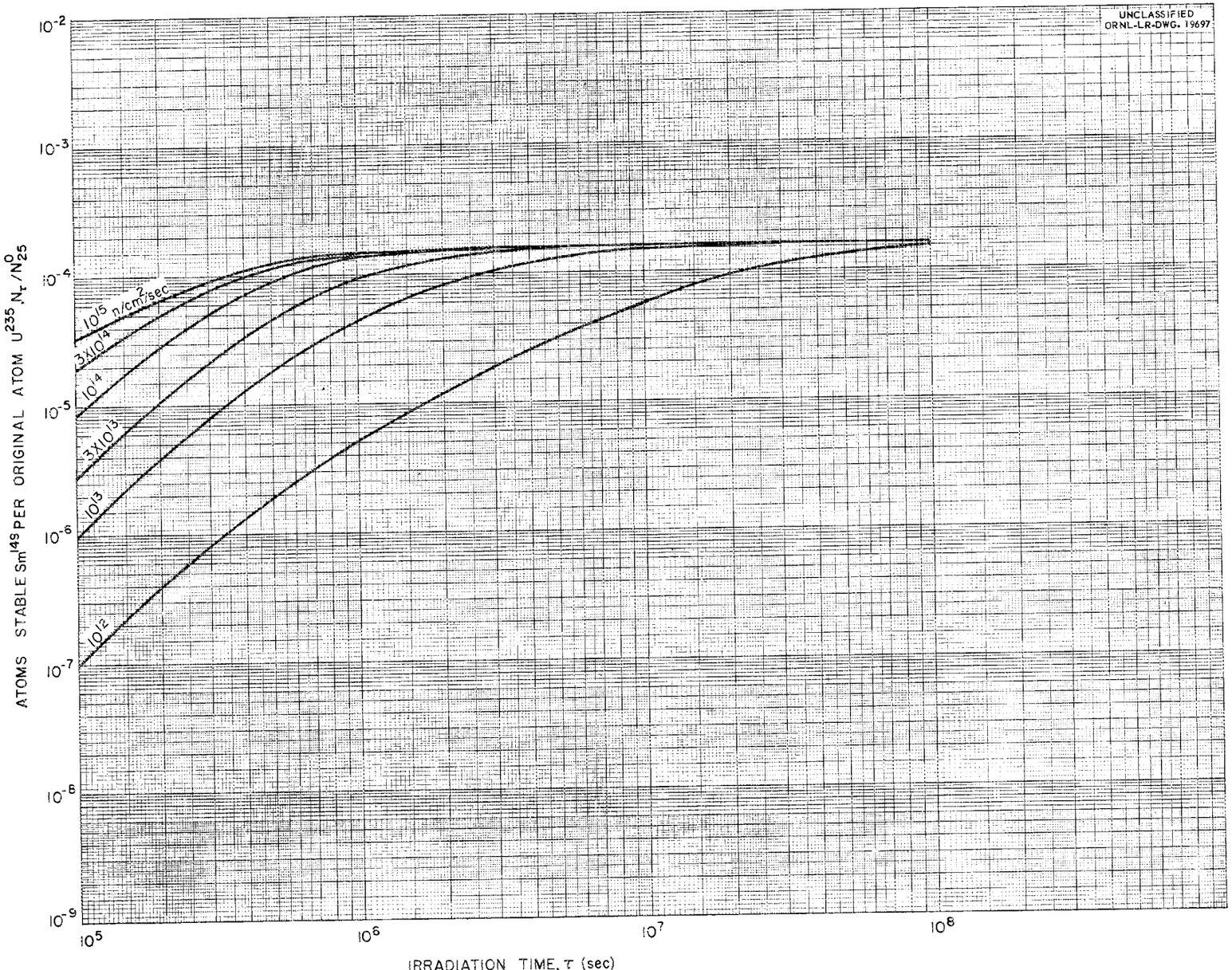


Fig. D-95. Effect of Irradiation Time and Flux on Amount of Stable $Sm^{149}$ Formed in Fission of $U^{235}$.

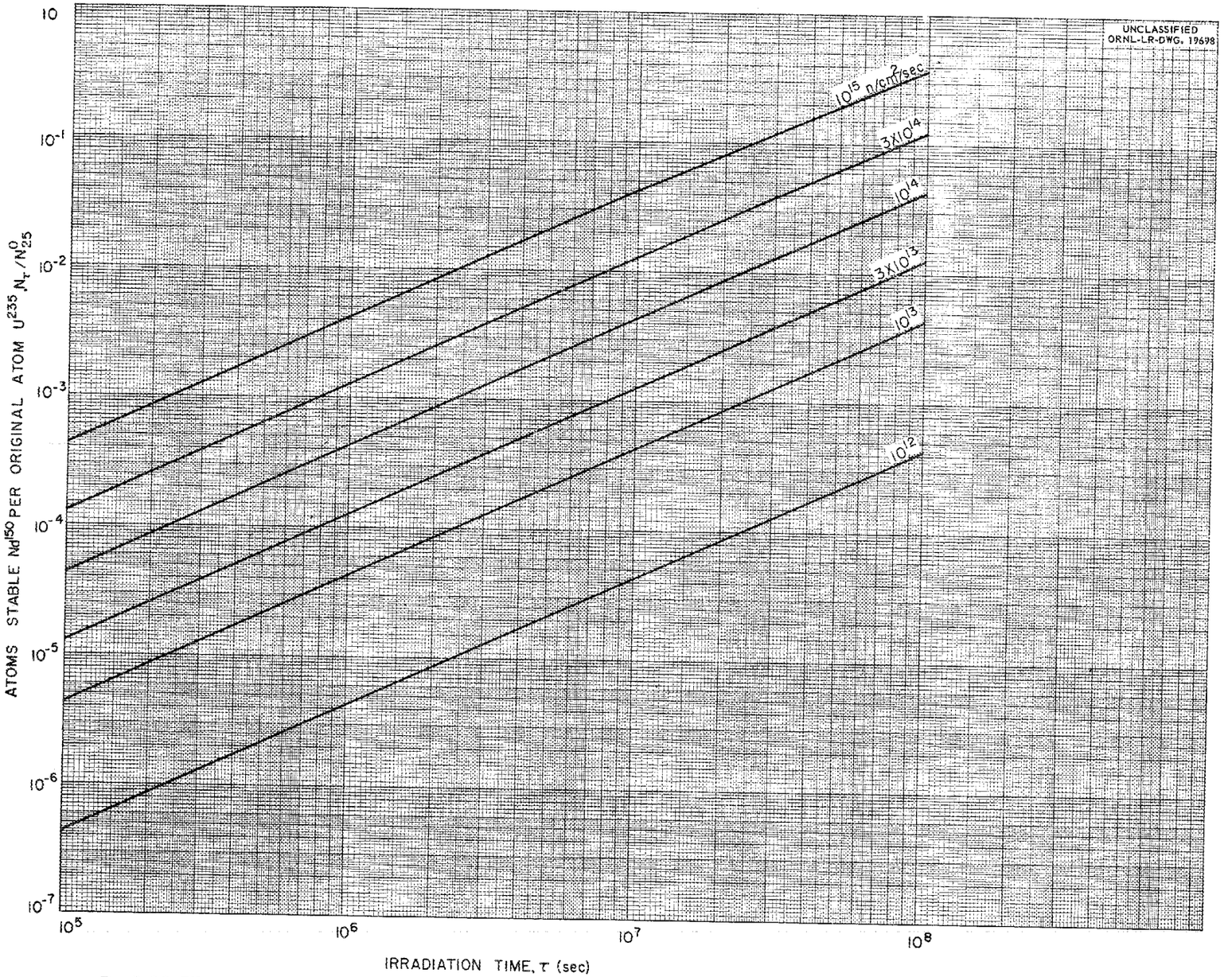


Fig. D-96. Effect of Irradiation Time and Flux on Amount of Stable $Nd^{150}$ Formed in Fission of $U^{235}$.

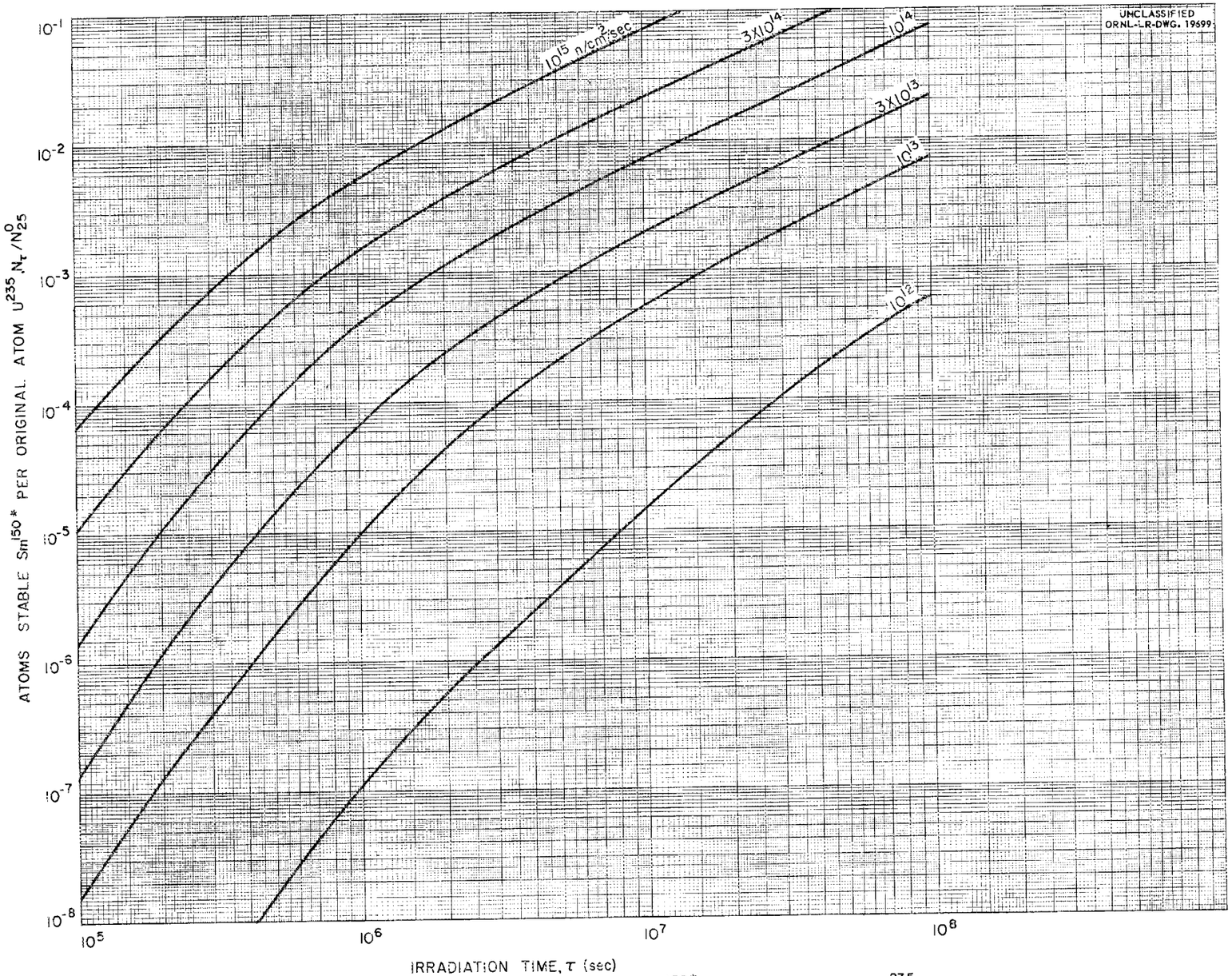


Fig. D-97. Effect of Irradiation Time and Flux on Amount of Stable $Sm^{150*}$ Formed in Fission of $U^{235}$.

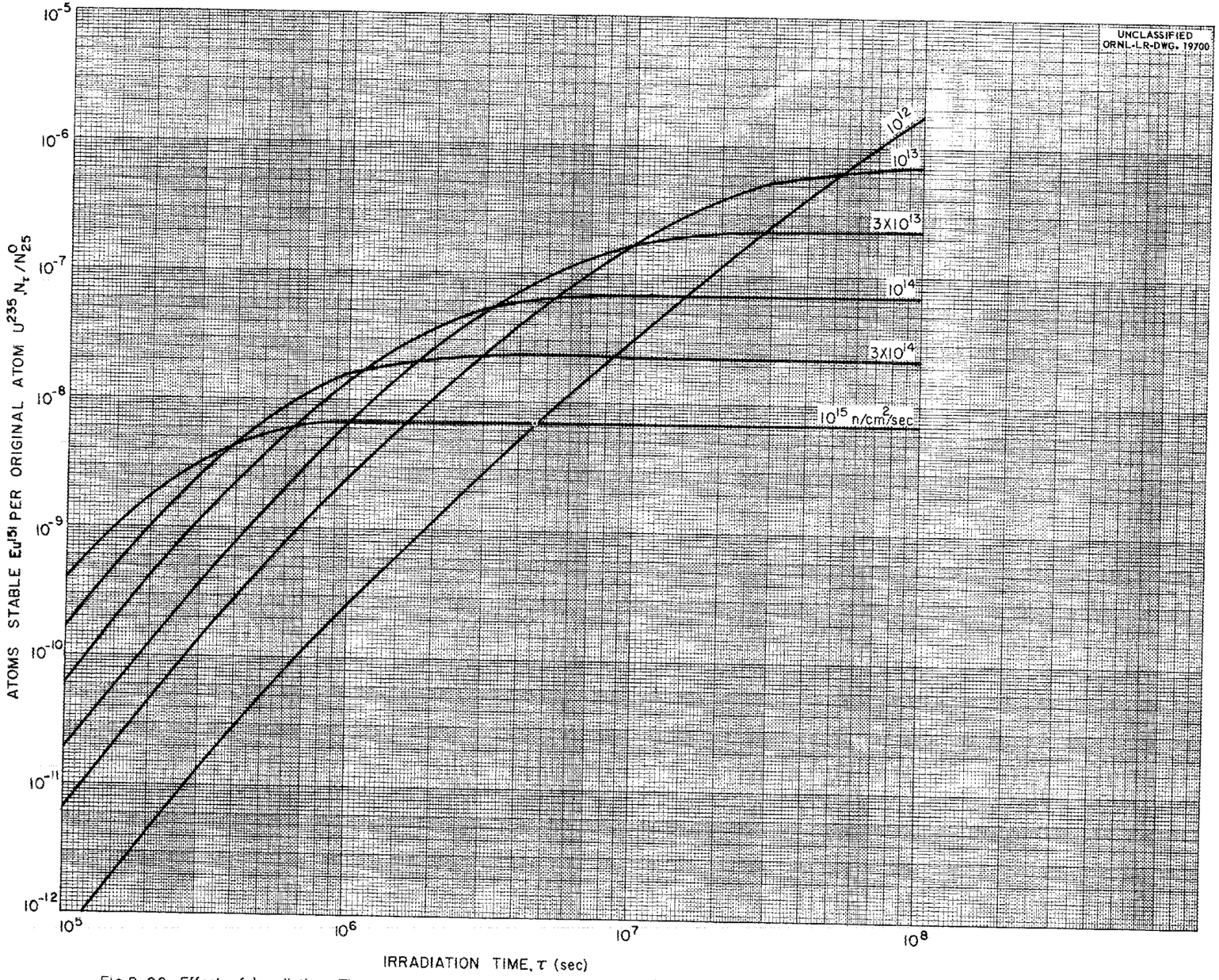


Fig. D-98. Effect of Irradiation Time and Flux on Amount of Stable $Eu^{151}$ Formed in Fission of $U^{235}$.

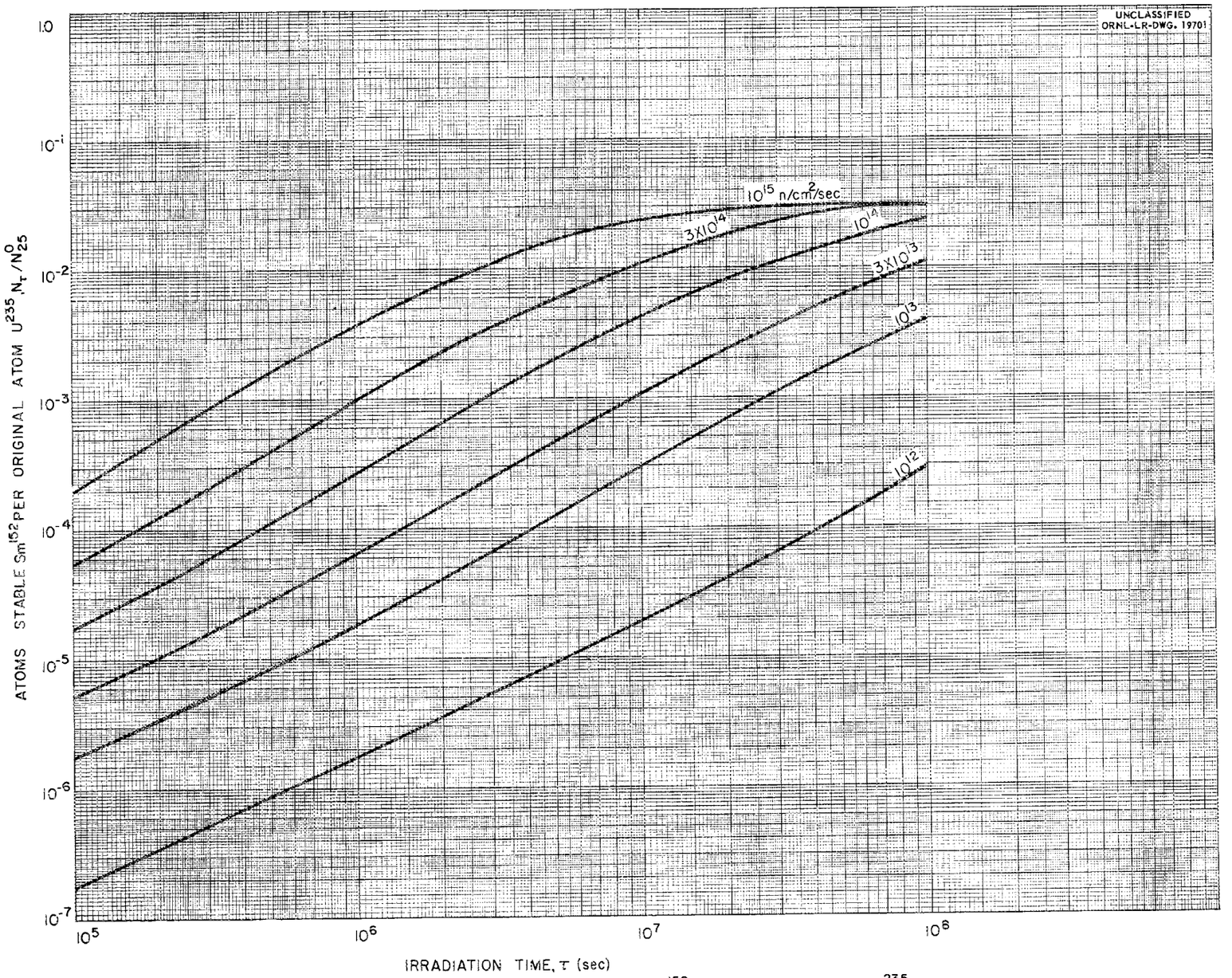


Fig. D-99. Effect of Irradiation Time and Flux on Amount of Stable $Sm^{152}$ Formed in Fission of $U^{235}$.

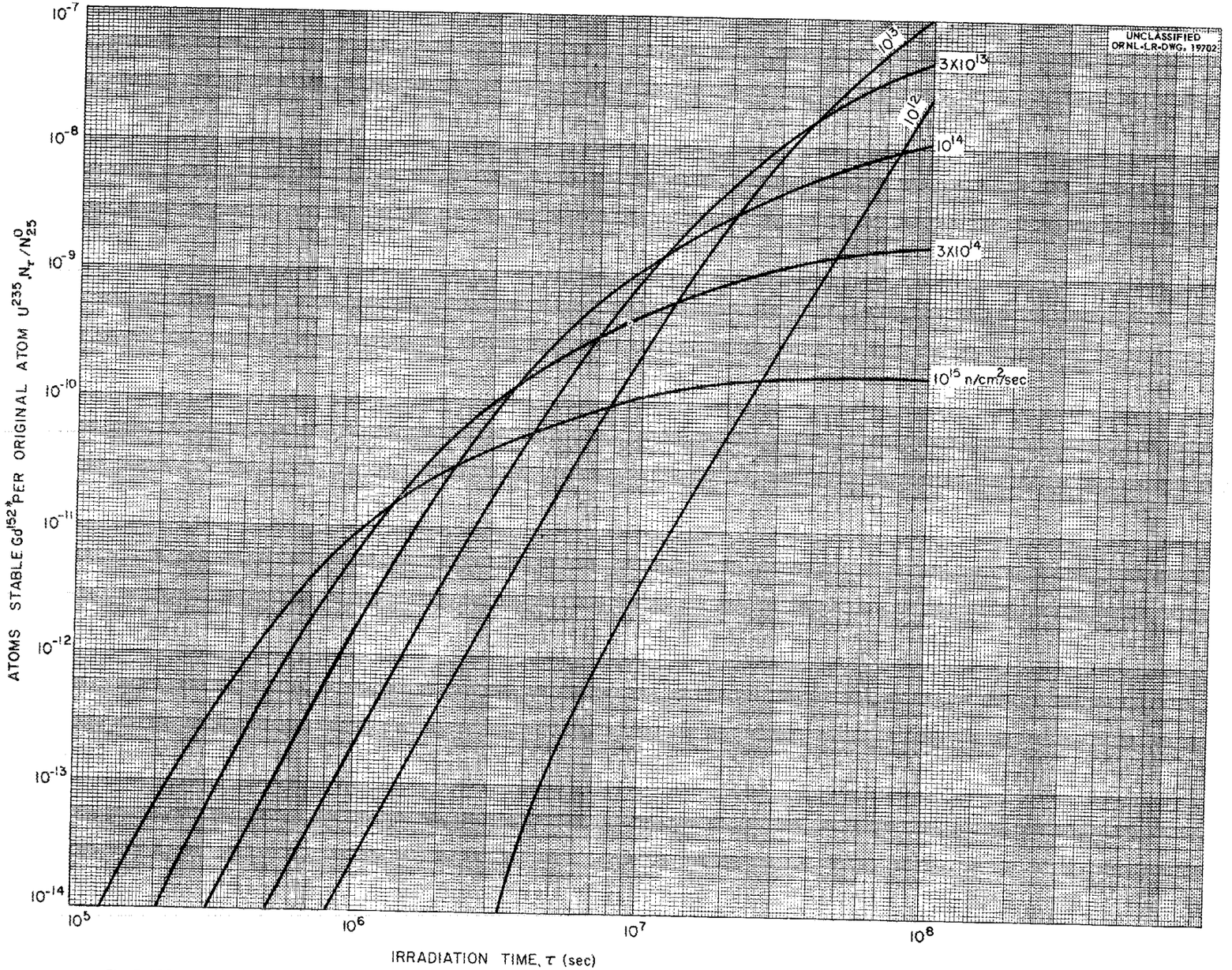


Fig. D-100. Effect of Irradiation Time and Flux on Amount of Stable $Gd^{152*}$ Formed in Fission of $U^{235}$.

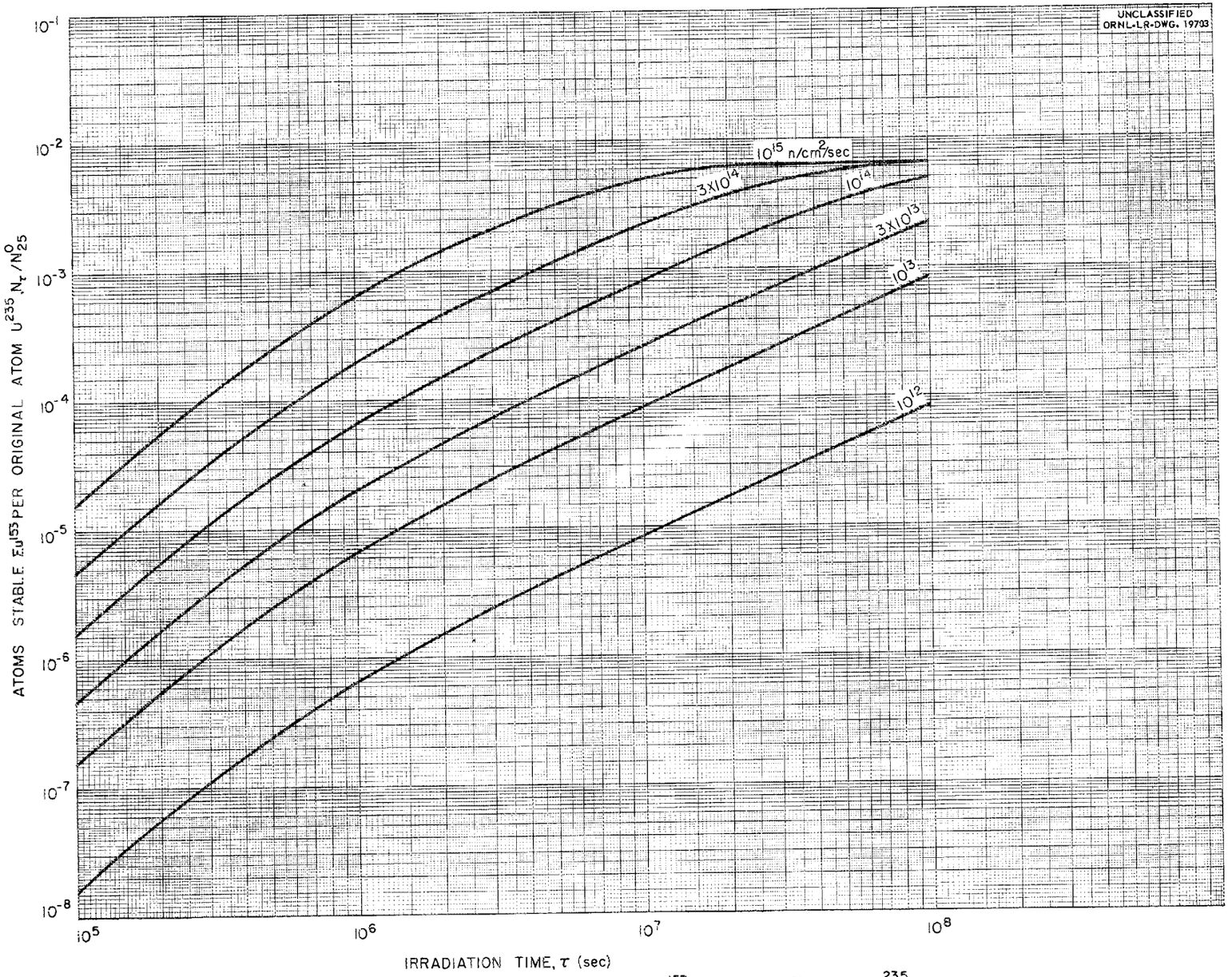


Fig. D-101. Effect of Irradiation Time and Flux on Amount of Stable $Eu^{153}$ Formed in Fission of $U^{235}$.

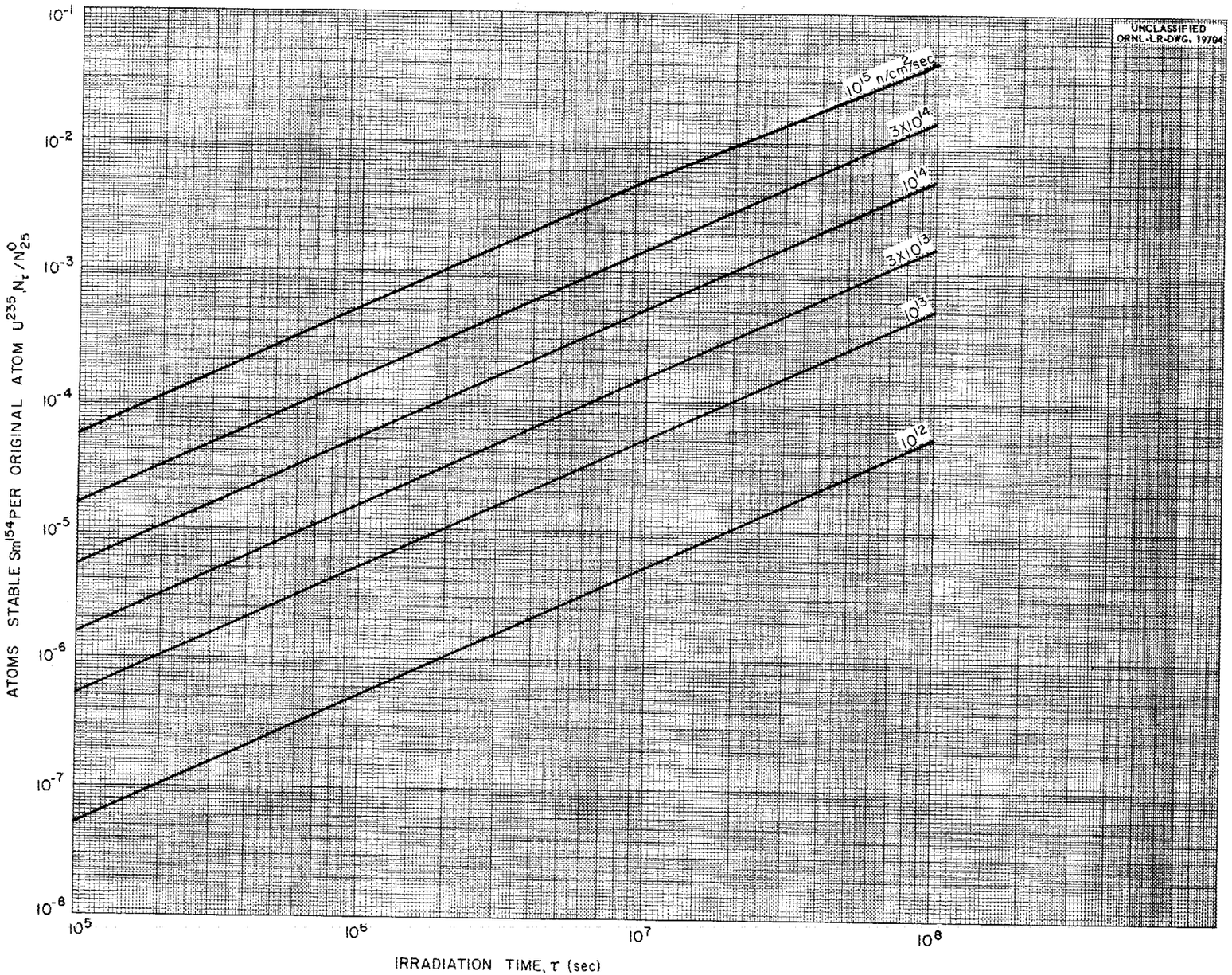


Fig. D-102. Effect of Irradiation Time and Flux on Amount of Stable $Sm^{154}$ Formed in Fission of $U^{235}$.

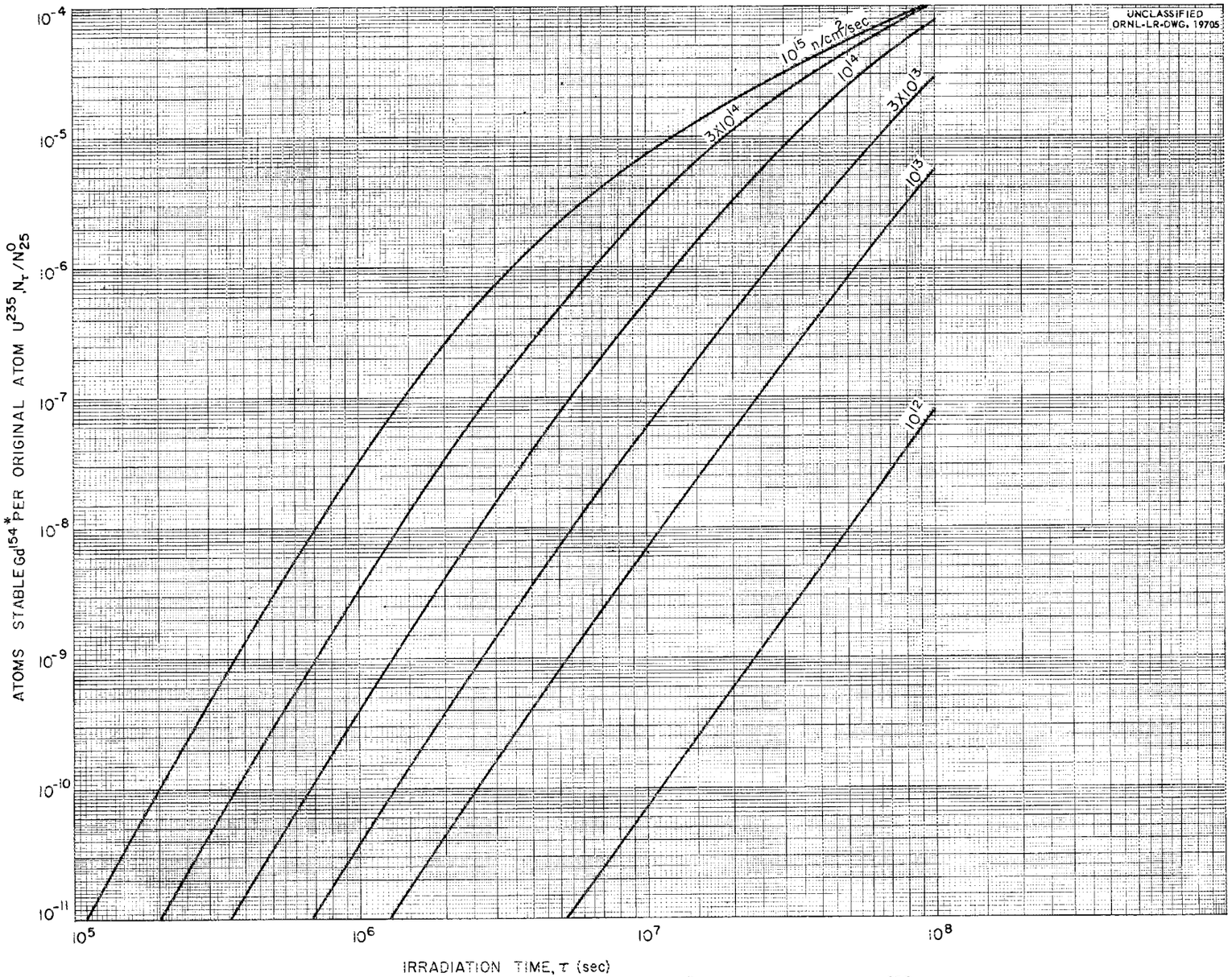


Fig. D-103. Effect of Irradiation Time and Flux on Amount of Stable $Gd^{154*}$ Formed in Fission of $U^{235}$

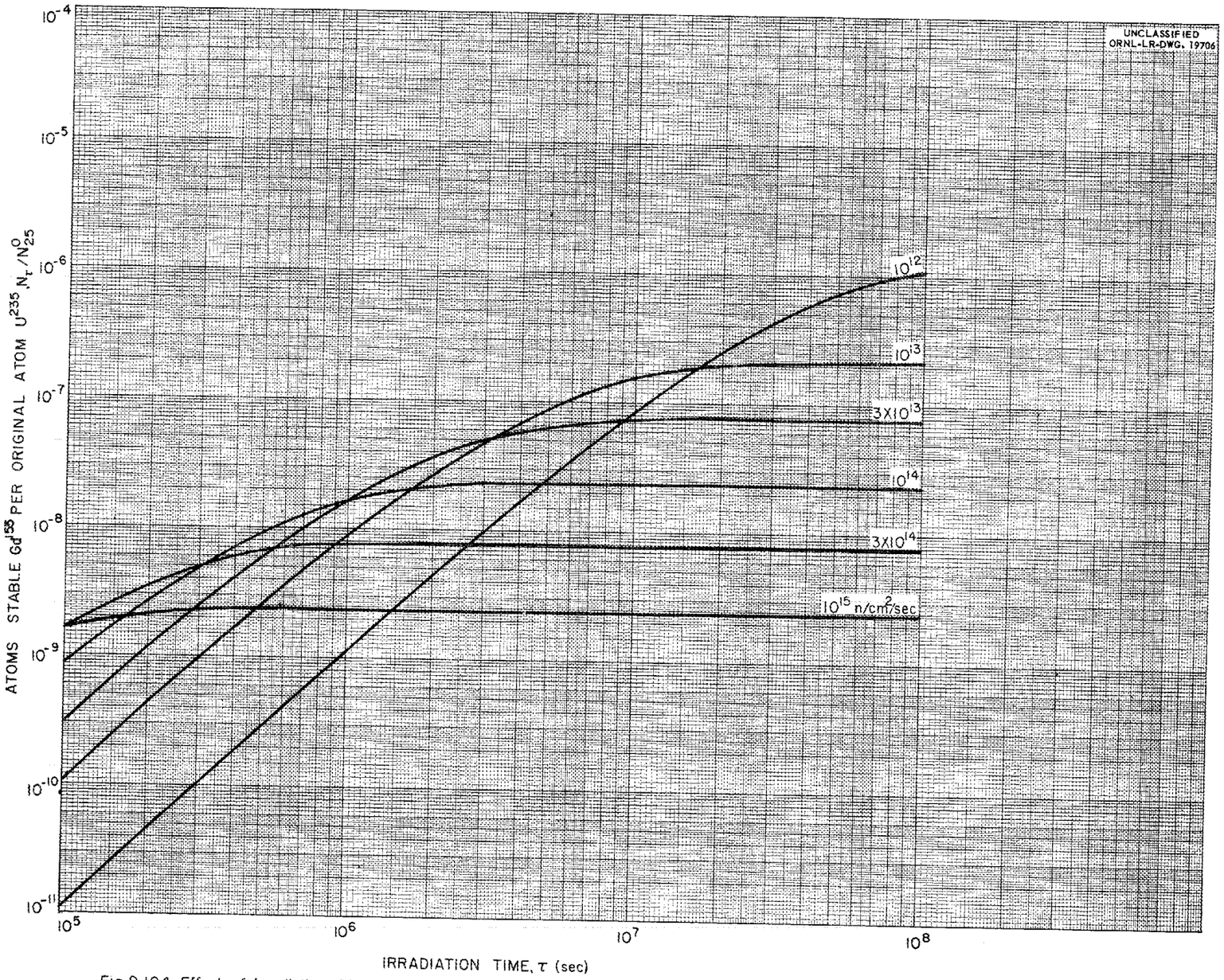


Fig. D-104. Effect of Irradiation Time and Flux on Amount of Stable $Gd^{155}$ Formed in Fission of $U^{235}$.

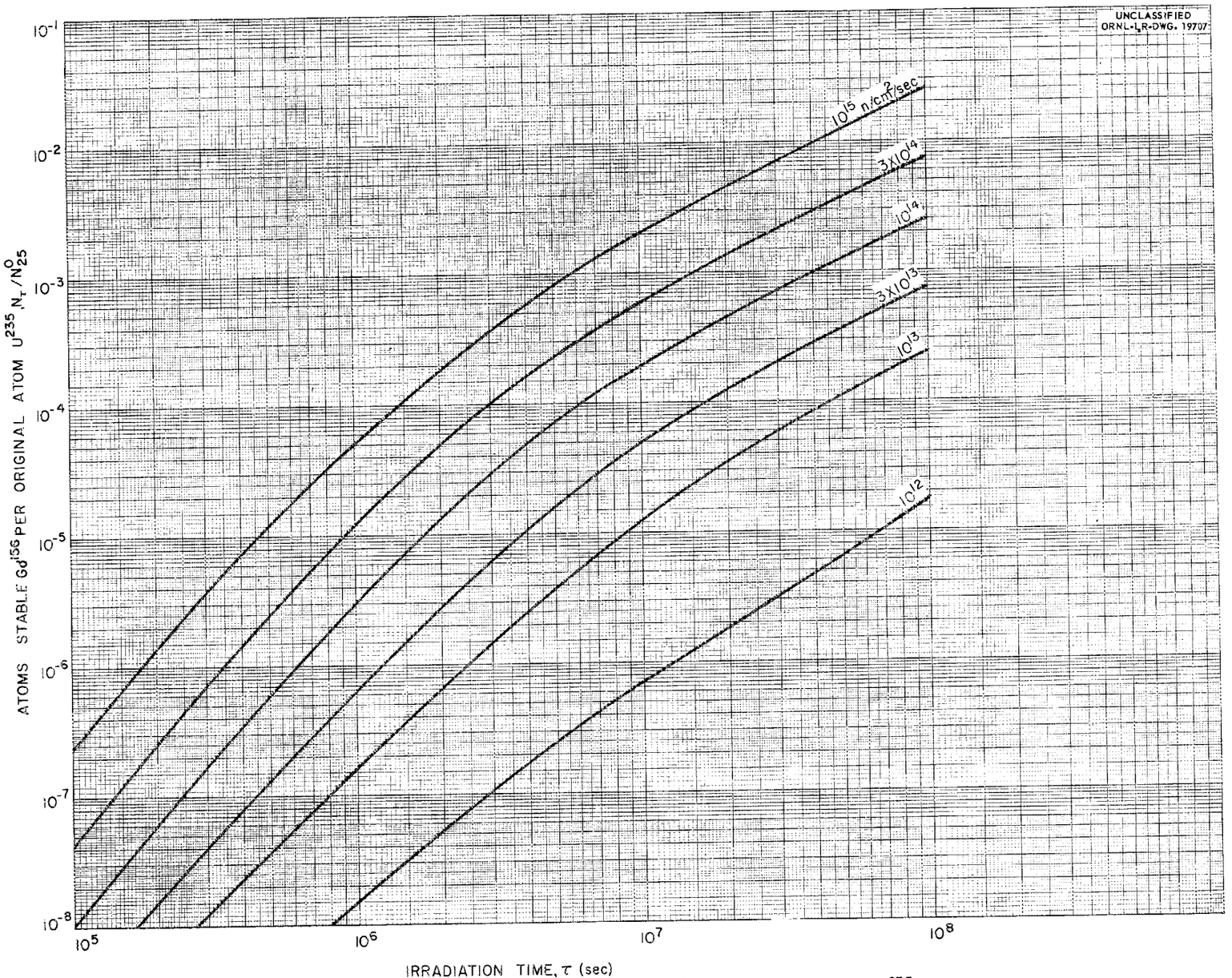


Fig. D-105. Effect of Irradiation Time and Flux on Amount of Stable $Gd^{156}$ Formed in Fission of $U^{235}$.

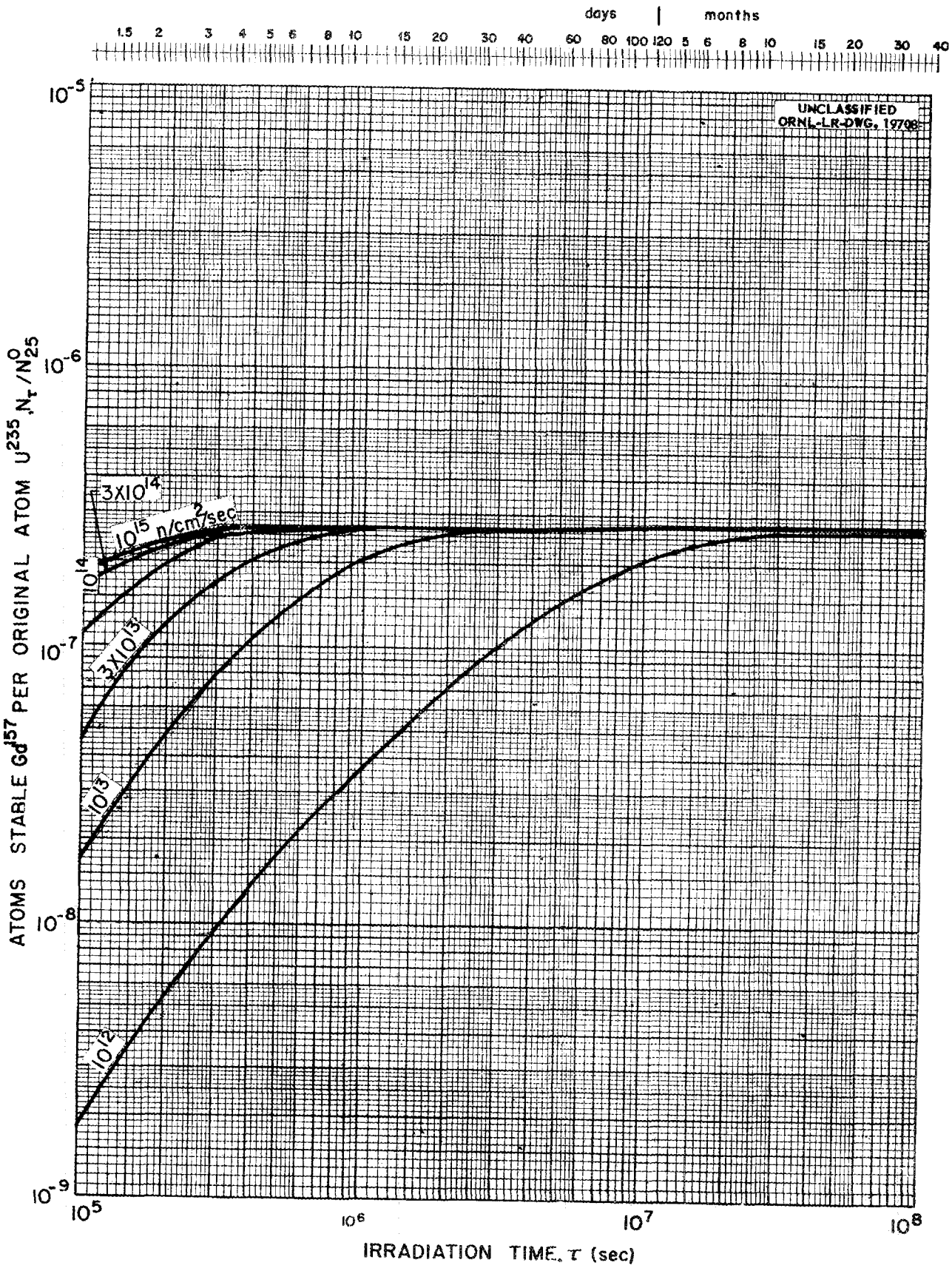


Fig. D-106. Effect of Irradiation Time and Flux on Amount of Stable $Gd^{157}$ Formed in Fission of $U^{235}$.

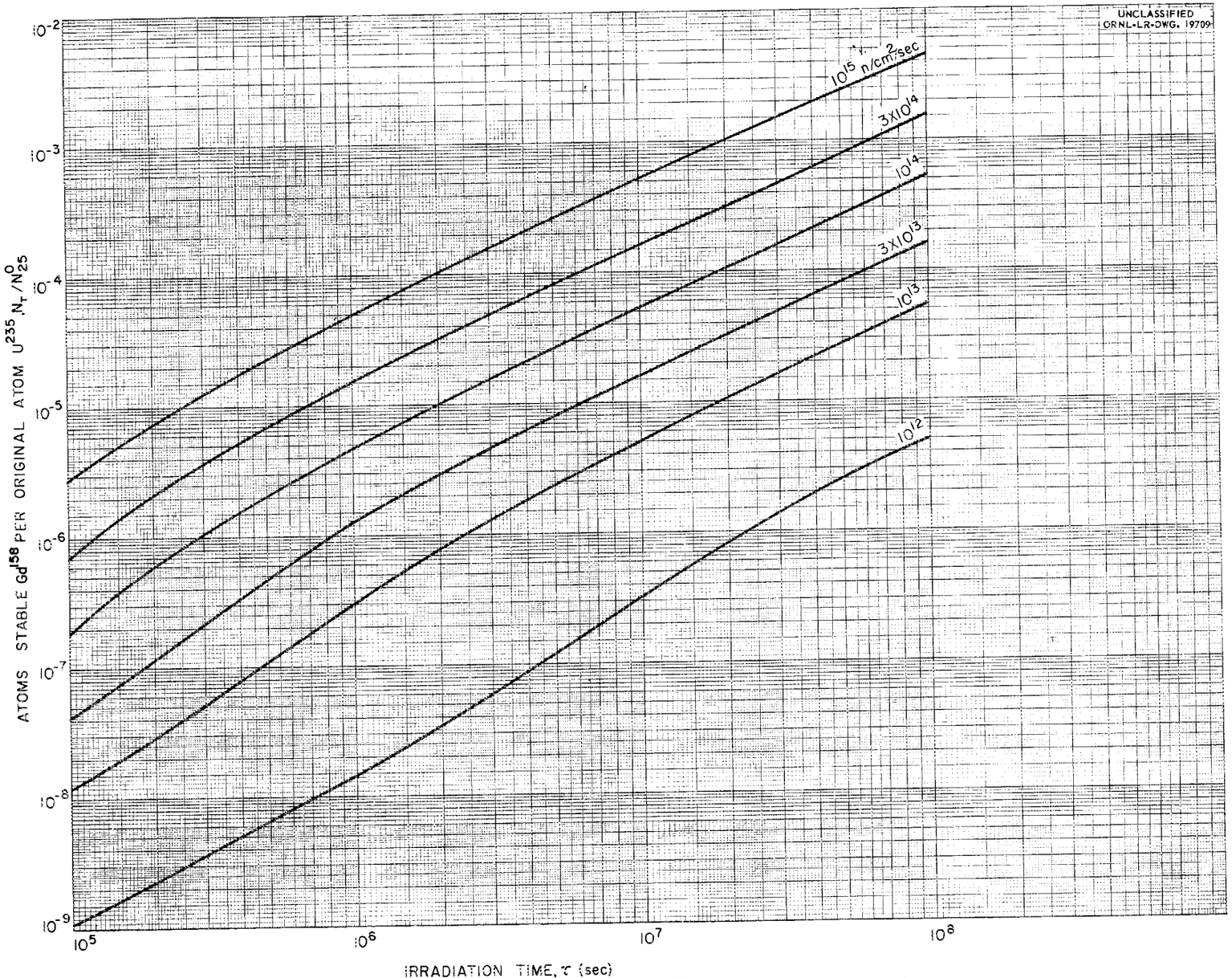


Fig. D-107 Effect of Irradiation Time and Flux on Amount of Stable $Gd^{158}$ Formed in Fission of $U^{235}$.

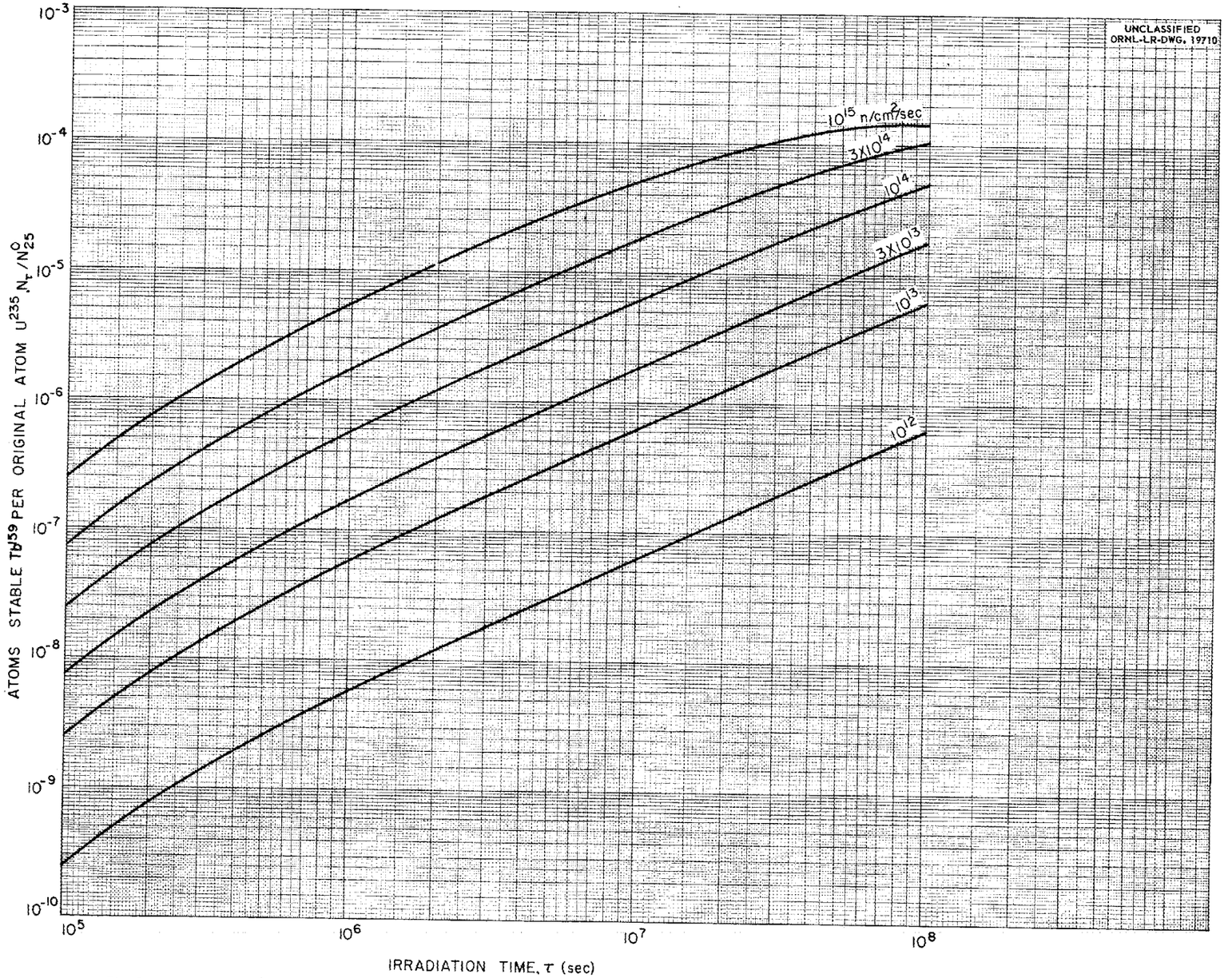


Fig. D-108. Effect of Irradiation Time and Flux on Amount of Stable $Tb^{159}$ Formed in Fission of $U^{235}$.

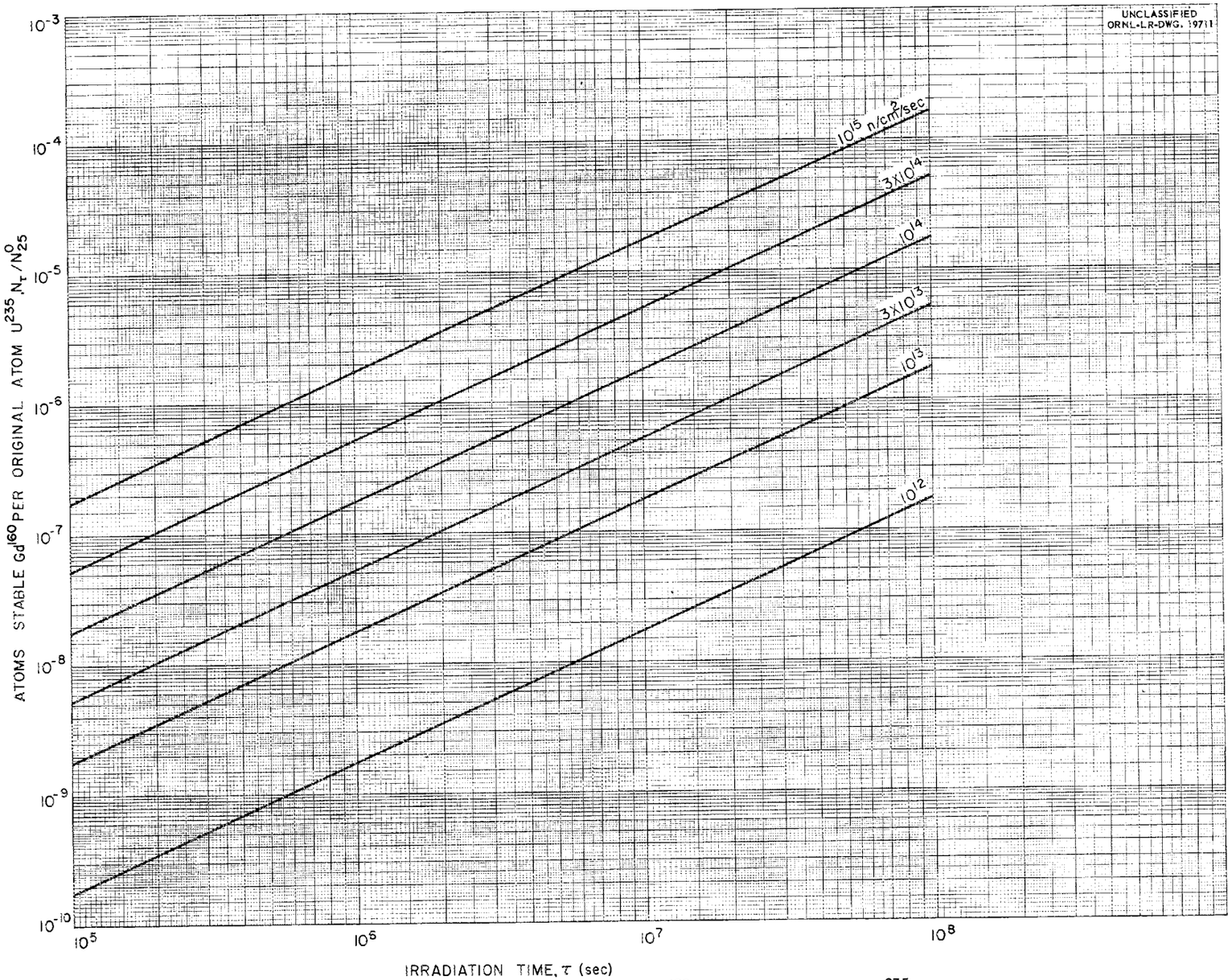


Fig. D-109. Effect of Irradiation Time and Flux on Amount of Stable $Gd^{160}$ Formed in Fission of $U^{235}$.

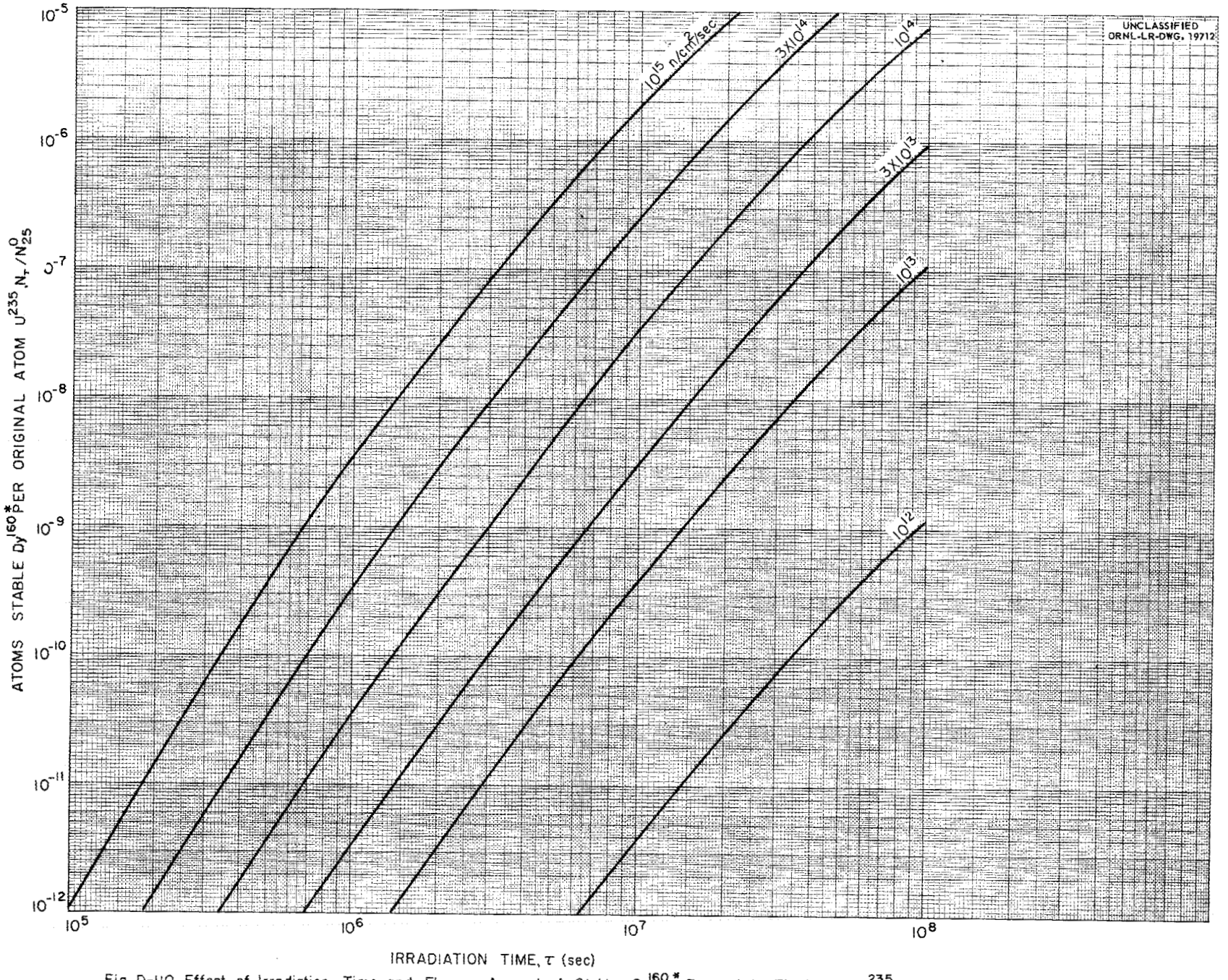


Fig D-110. Effect of Irradiation Time and Flux on Amount of Stable $Dy^{160*}$ Formed in Fission of $U^{235}$.

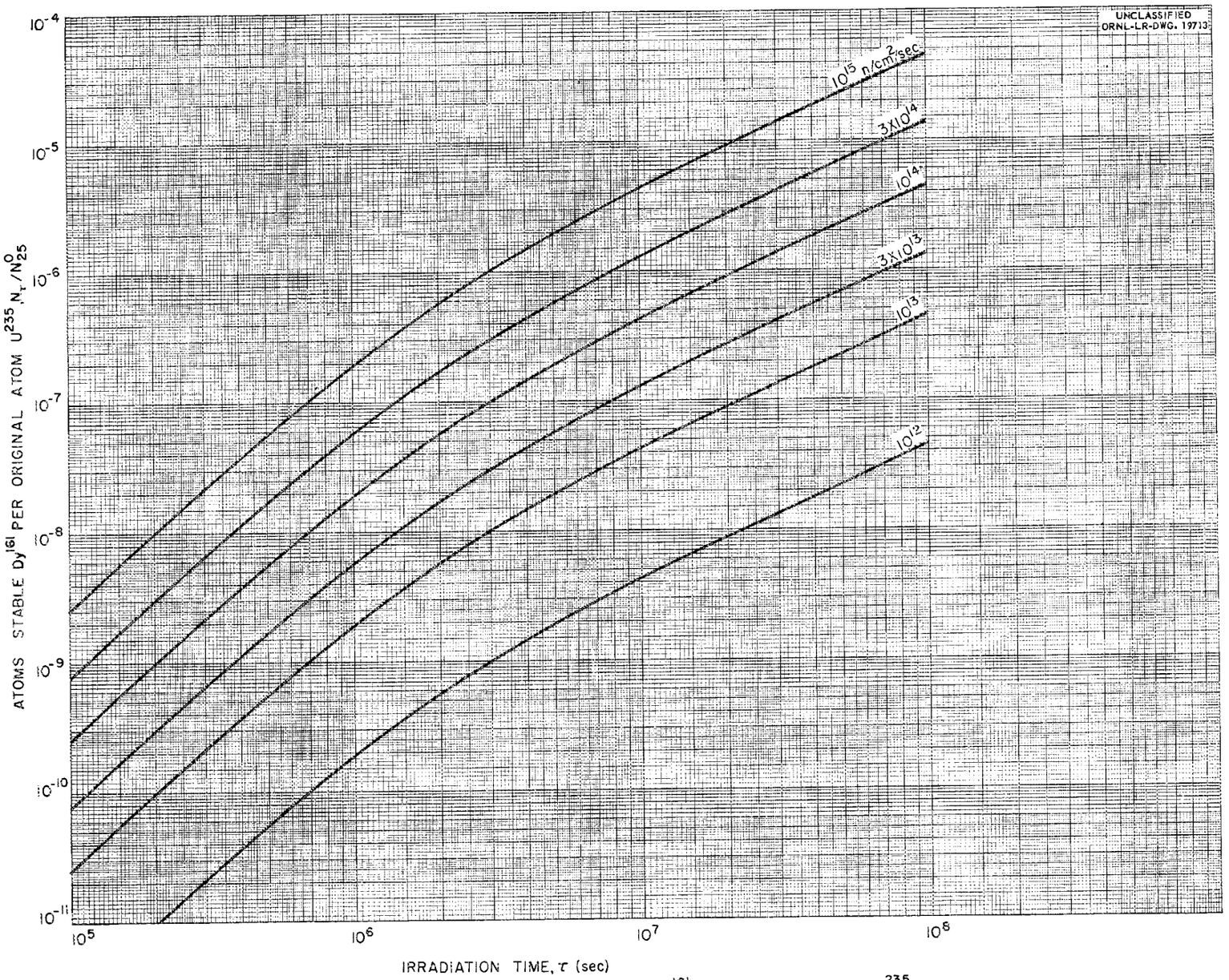


Fig. D-III. Effect of Irradiation Time and Flux on Amount of Stable $Dy^{161}$ Formed in Fission of $U^{235}$

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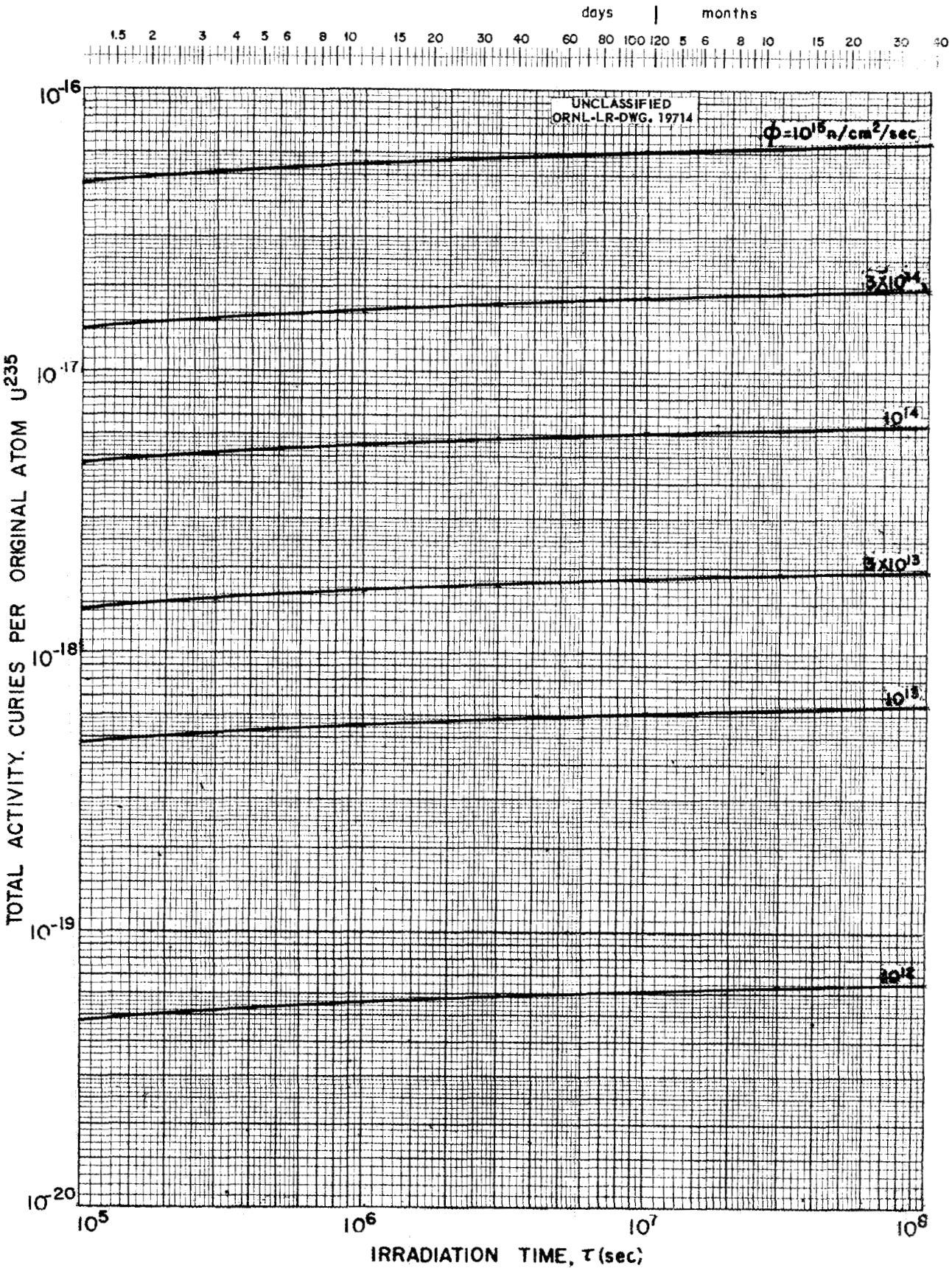


Fig. T-L Buildup of Total Fisson Product Activity with Irradiation Time and Thermal Neutron Flux.

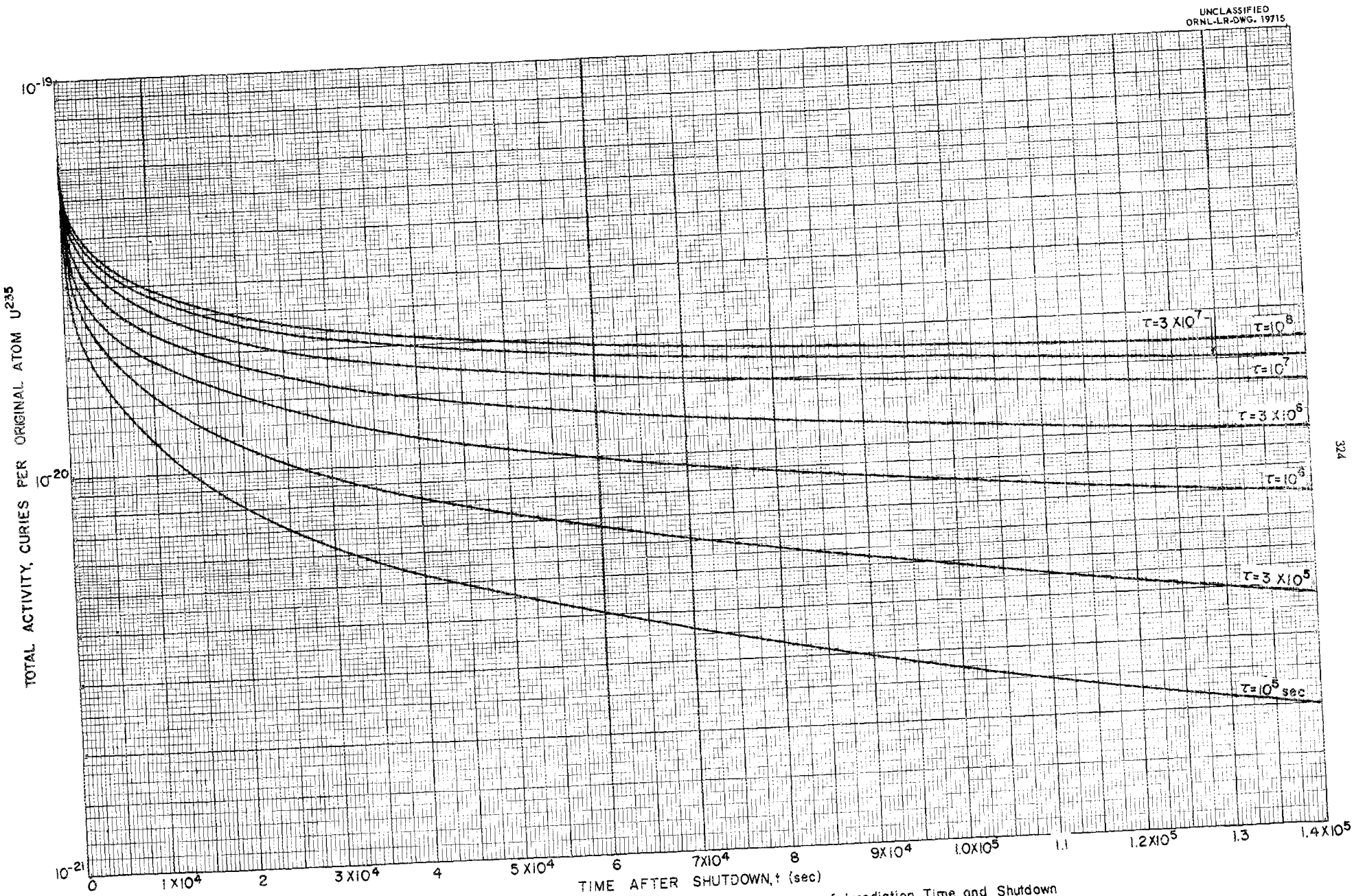


Fig. T-2. Total Fission Product Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{12}$ n/cm$^2$/sec.

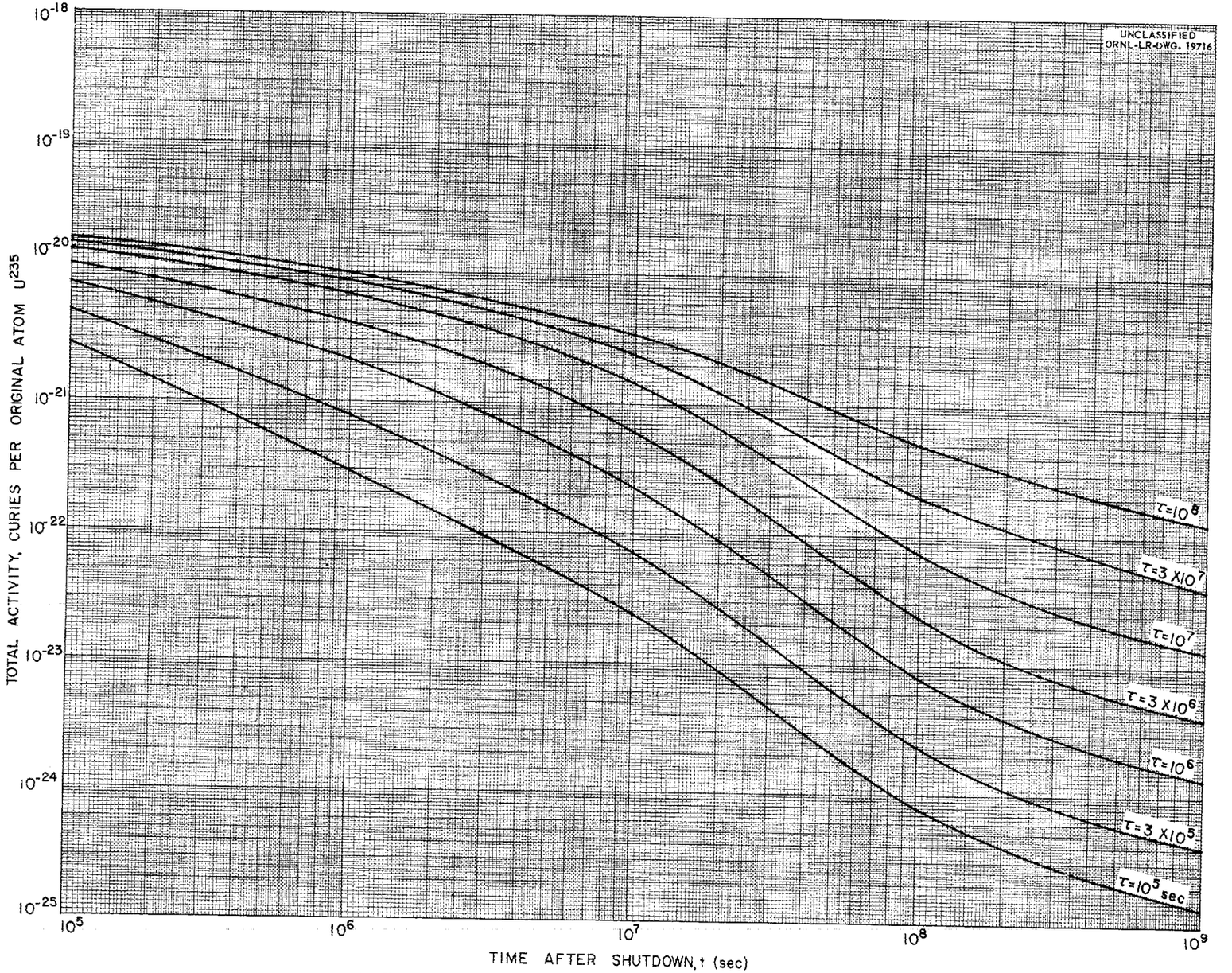


Fig. T-2a. Total Fission Product Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{12}$ n/cm$^2$/sec.

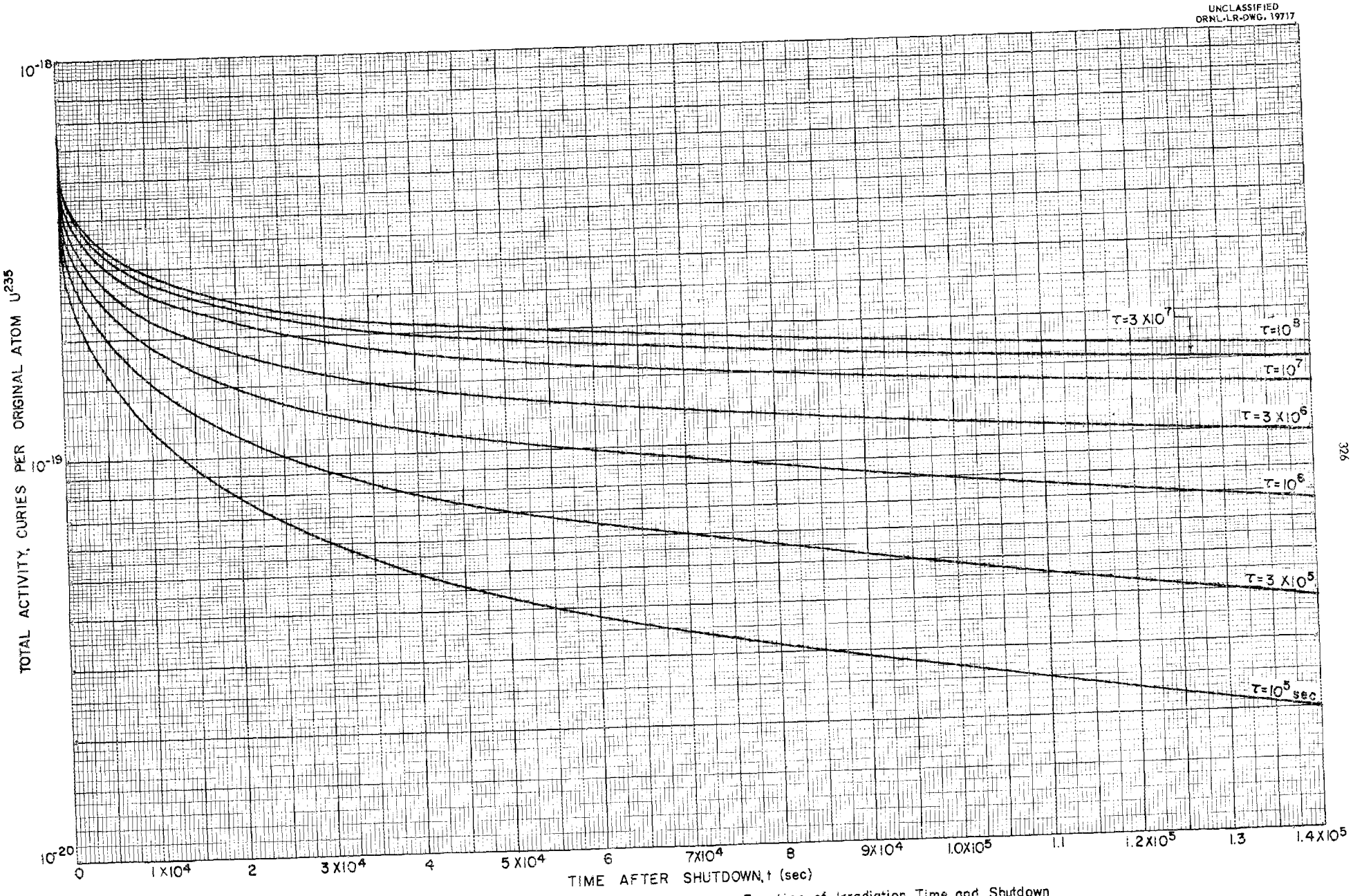


Fig. T-3. Total Fission Product Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{13}$ n/cm$^2$/sec.

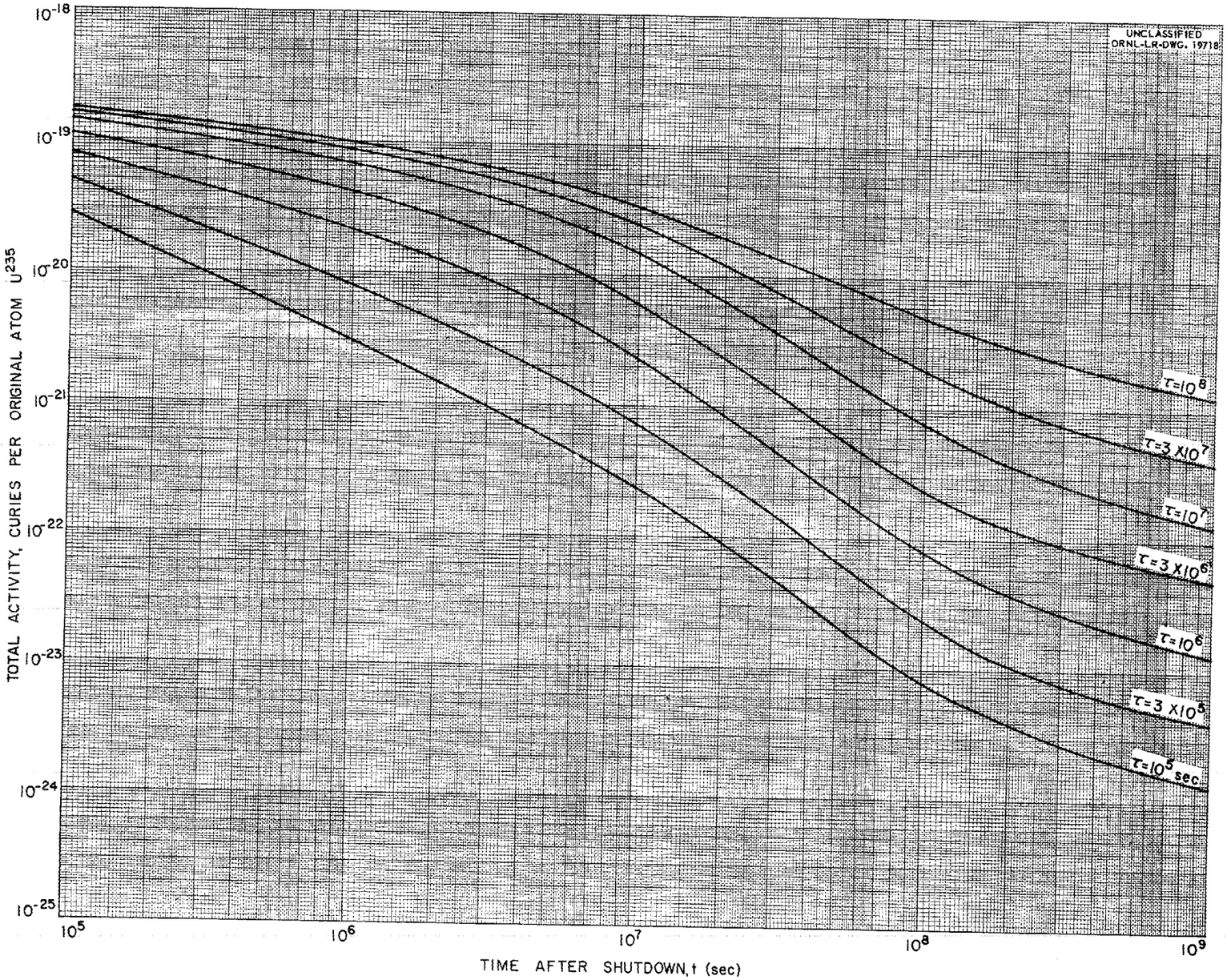


Fig. T-3a. Total Fission Product Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{13}$ n/cm$^2$/sec.

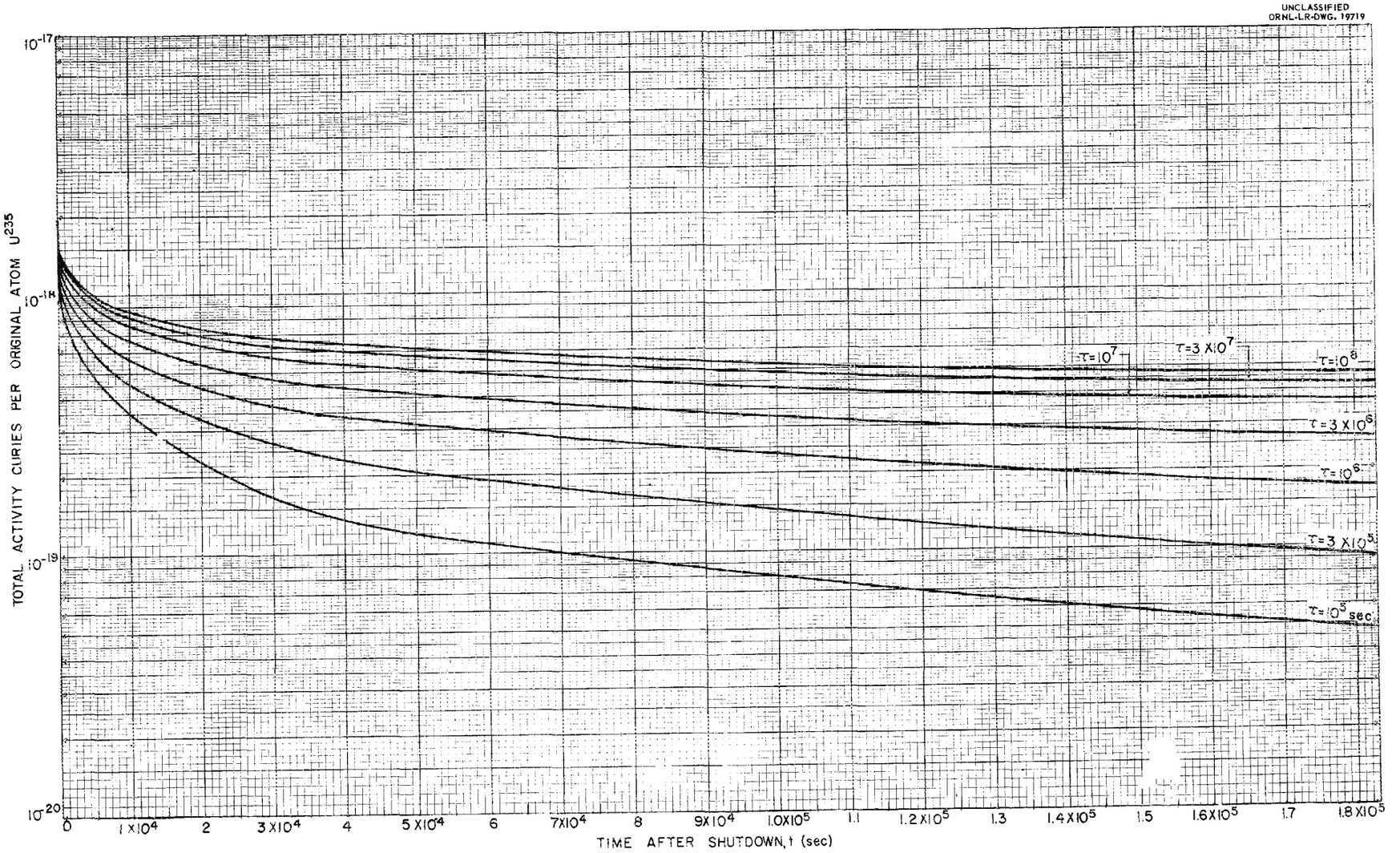


Fig. T-4 Total Fission Product Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{13}$ n/cm$^2$/sec.

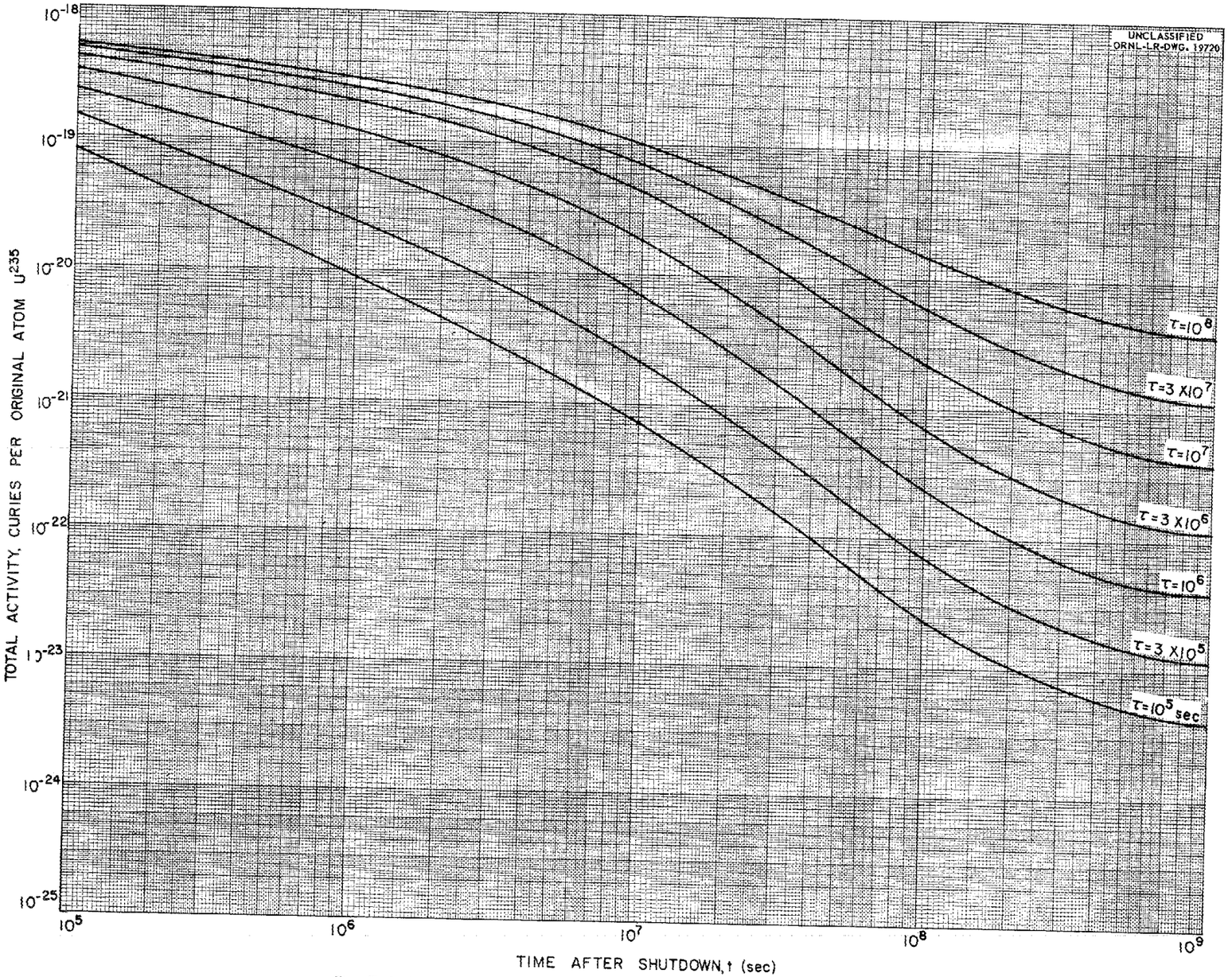


Fig. T-4a. Total Fission Product Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{13}$ n/cm$^2$/sec.

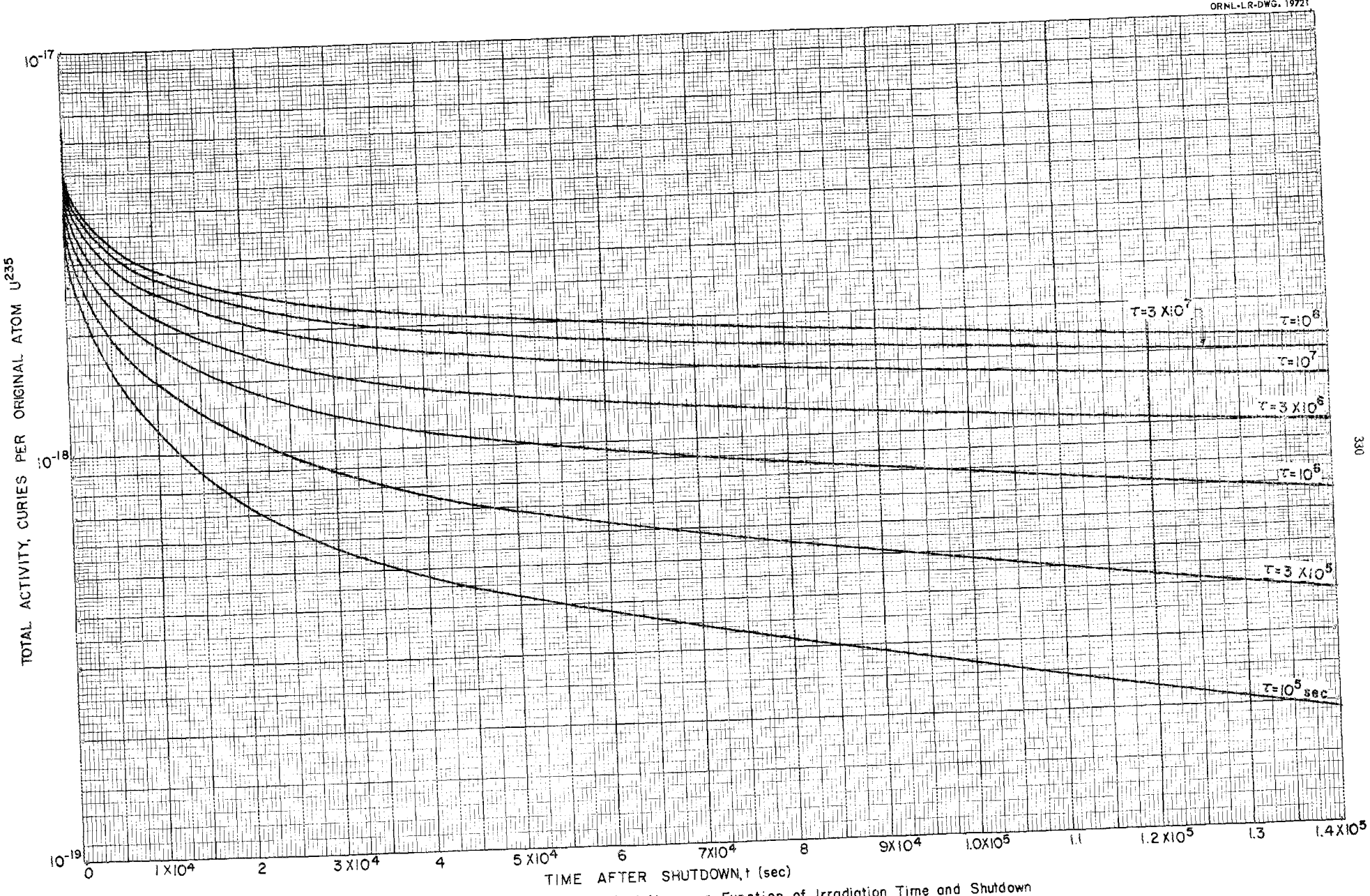


Fig. T-5. Total Fission Product Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{14}$ n/cm$^2$/sec.

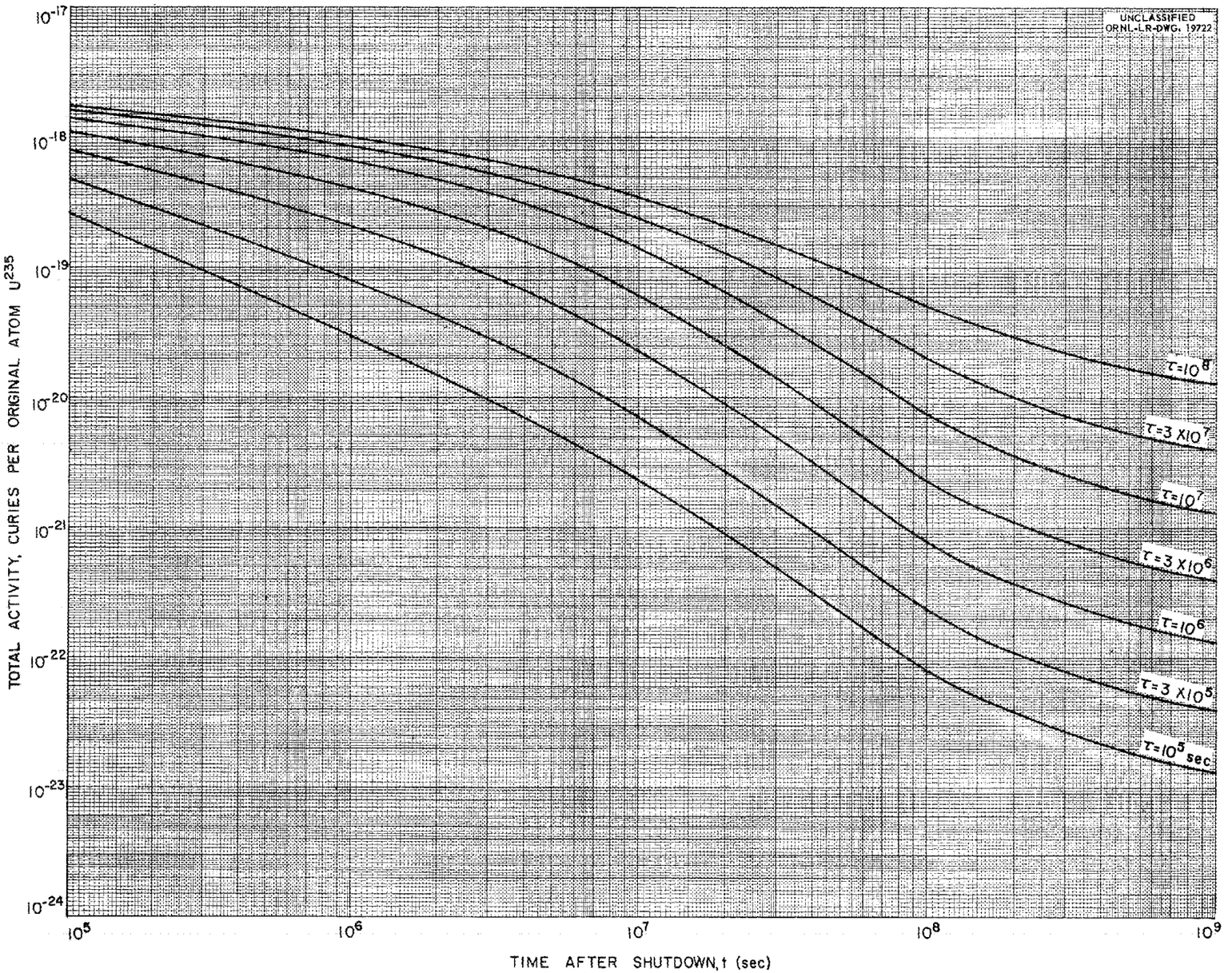


Fig. T-5a. Total Fission Product Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{14}$ n/cm$^2$/sec.

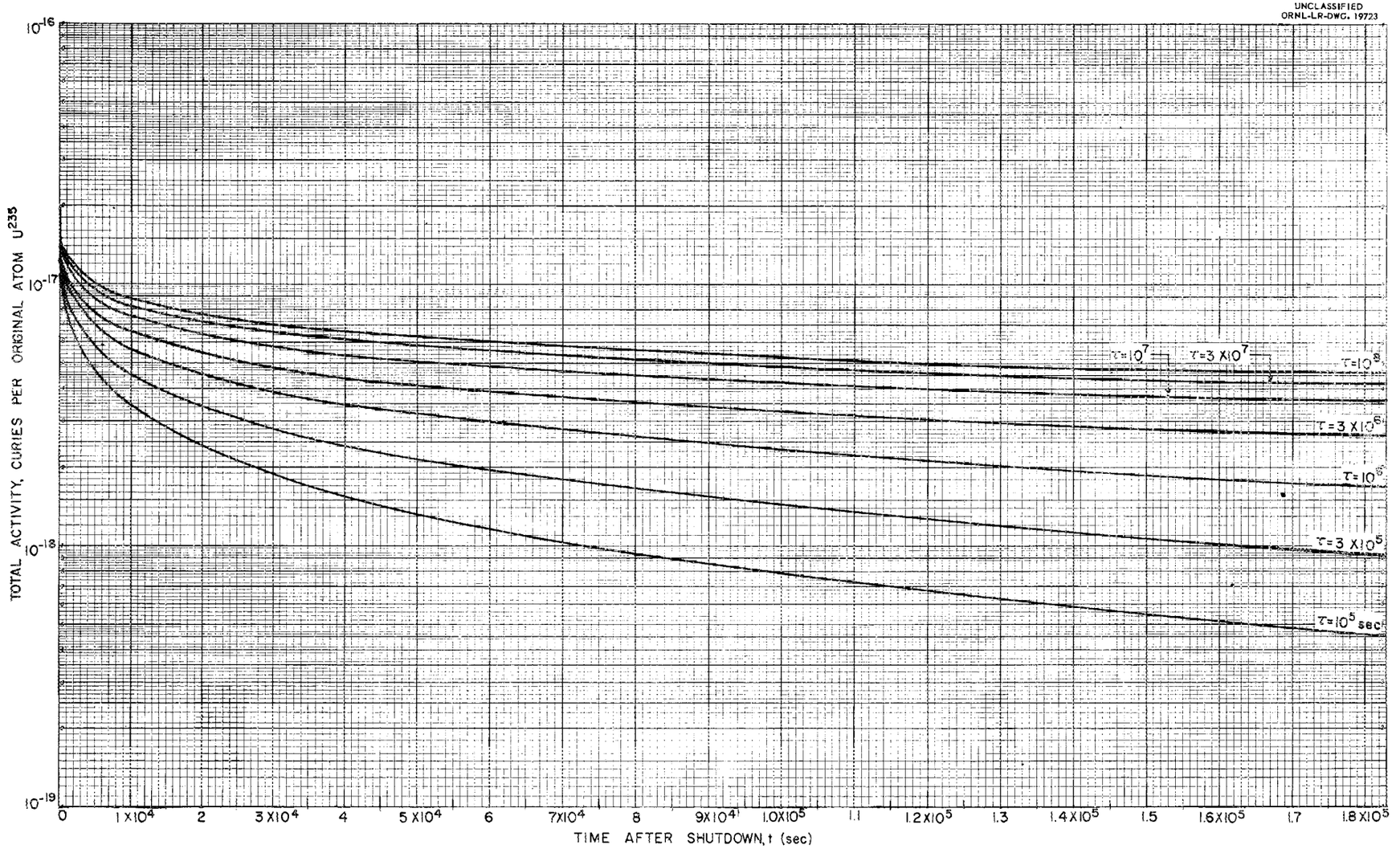


Fig. T-6. Total Fission Product Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{14}$ n/cm$^2$/sec.

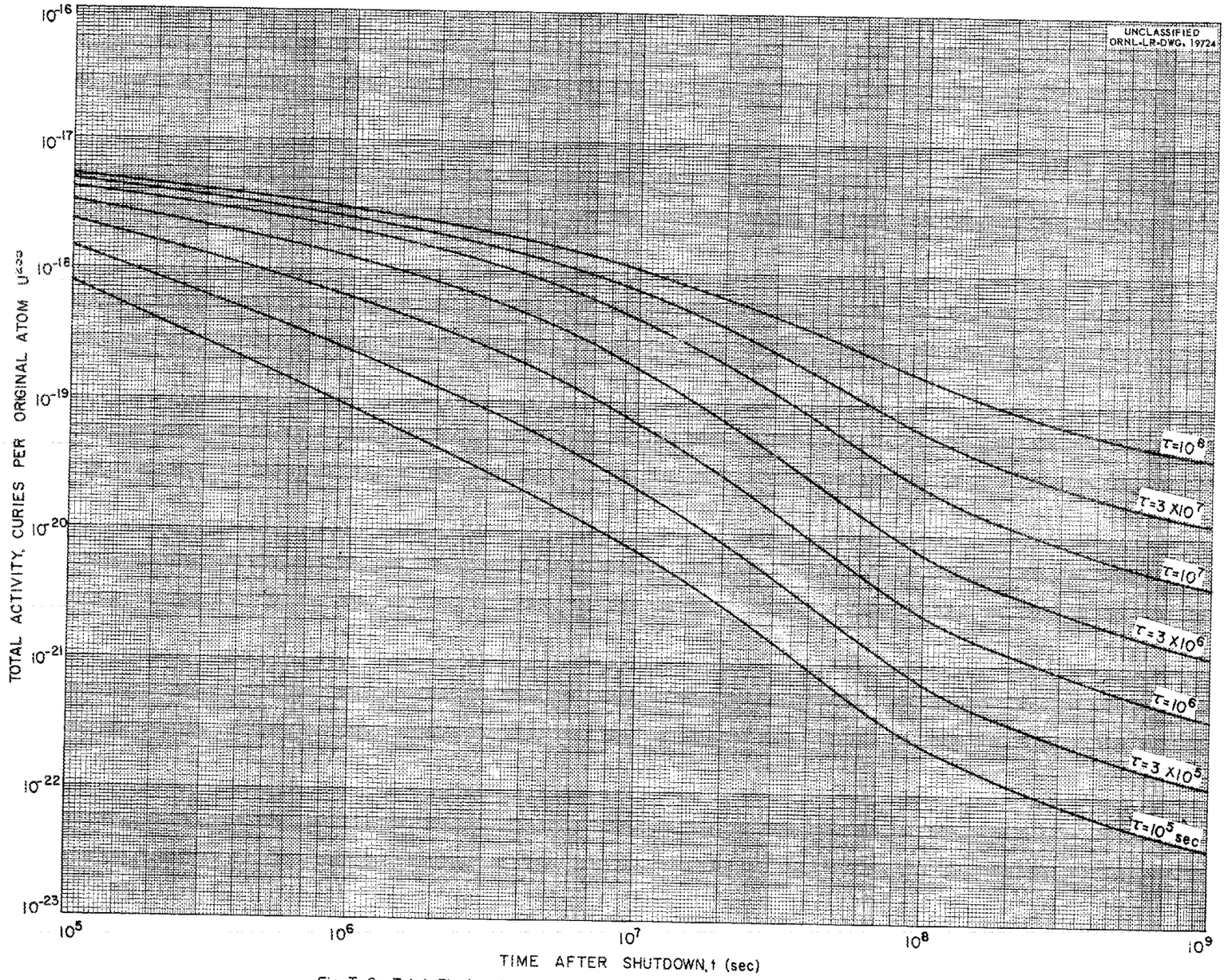


Fig. T-6a. Total Fission Product Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{14}$ n/cm²/sec.

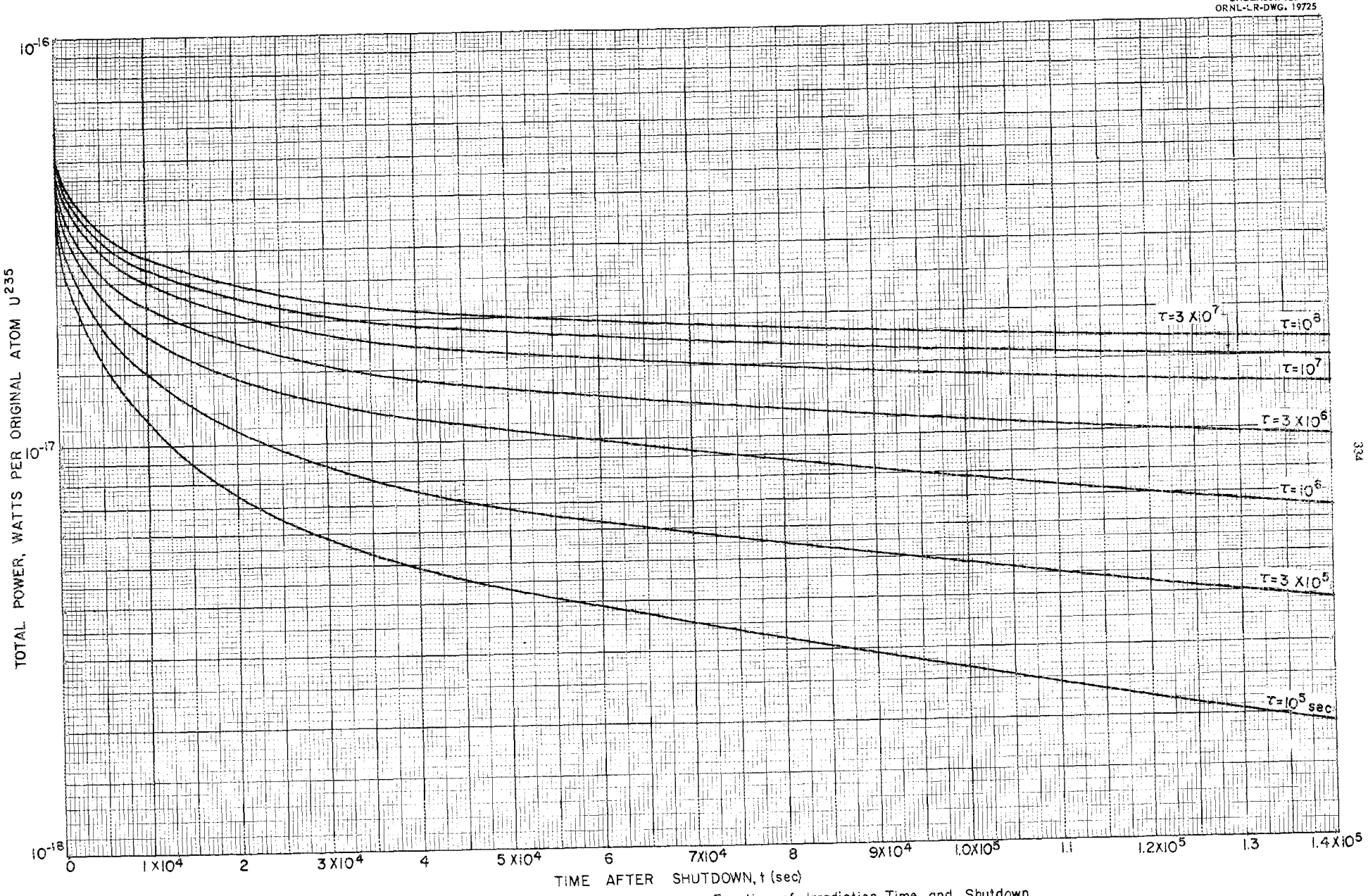


Fig. T-7. Total Fission Product Power as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm$^2$/sec.

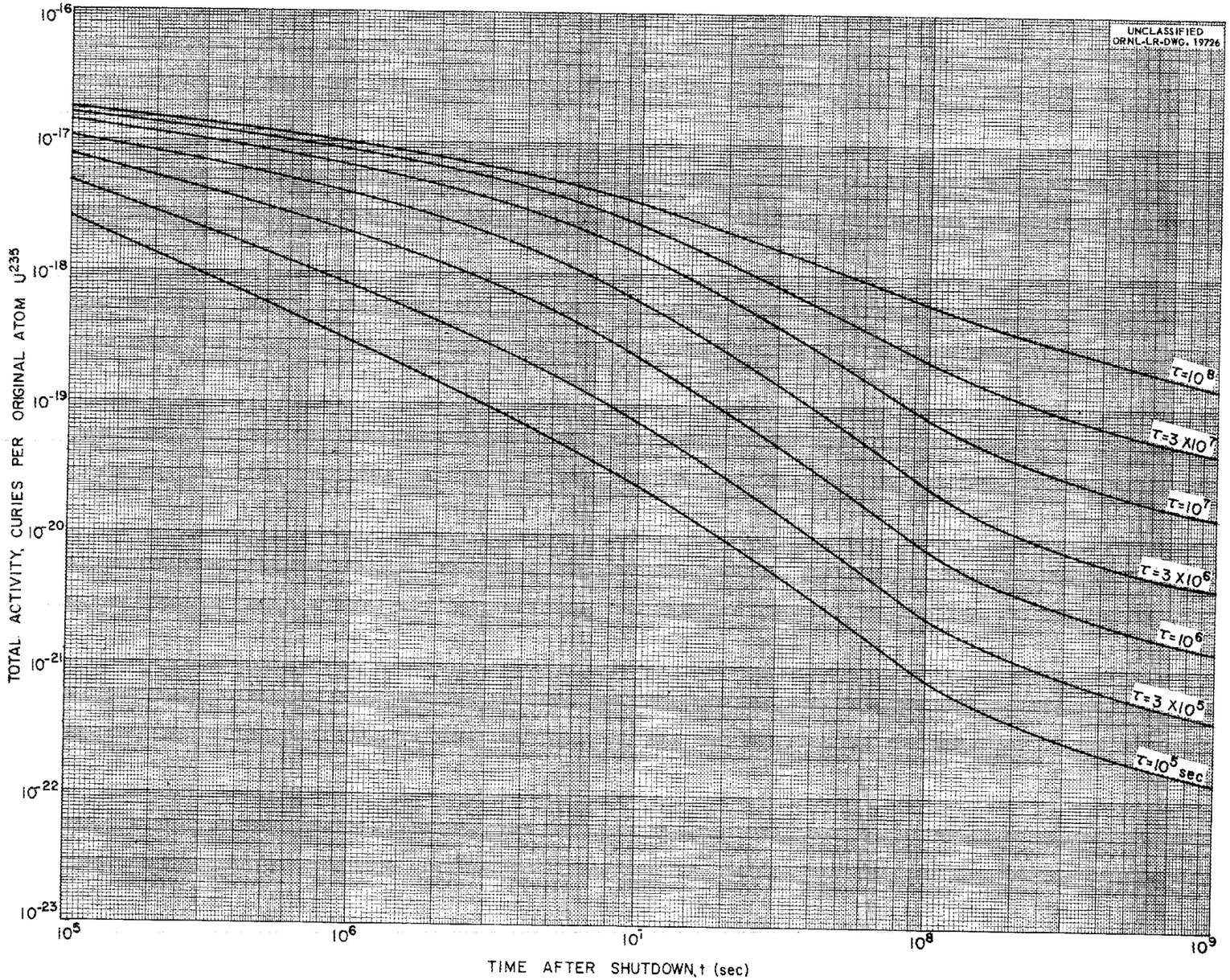


Fig. T-7a. Total Fission Product Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm$^2$/sec.

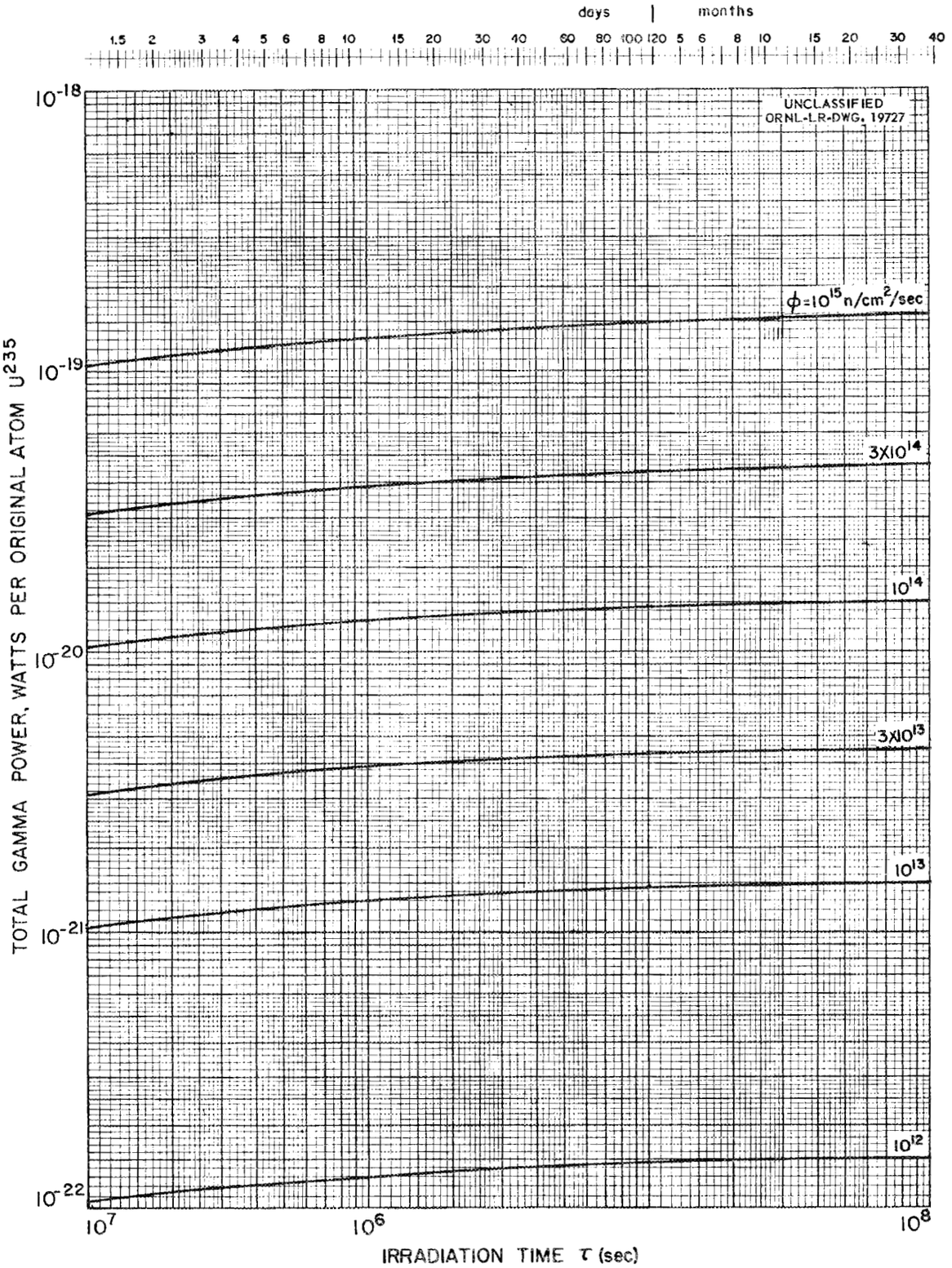


Fig. T-8. Buildup of Gamma Power with Irradiation Time and Thermal Neutron Flux.

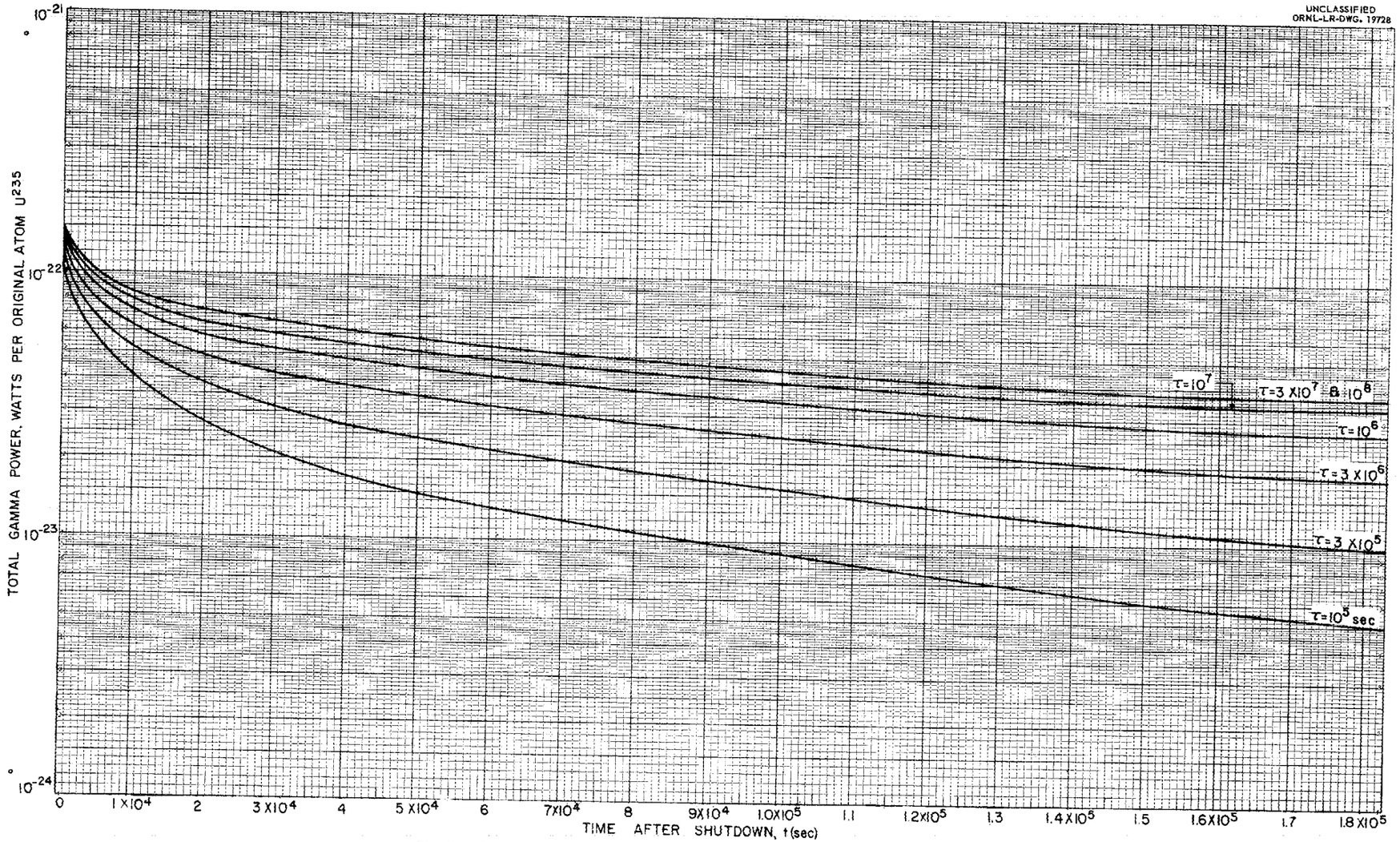


Fig. T-9. Total Fission Product Gamma Power as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{12}$ n/cm$^2$/sec.

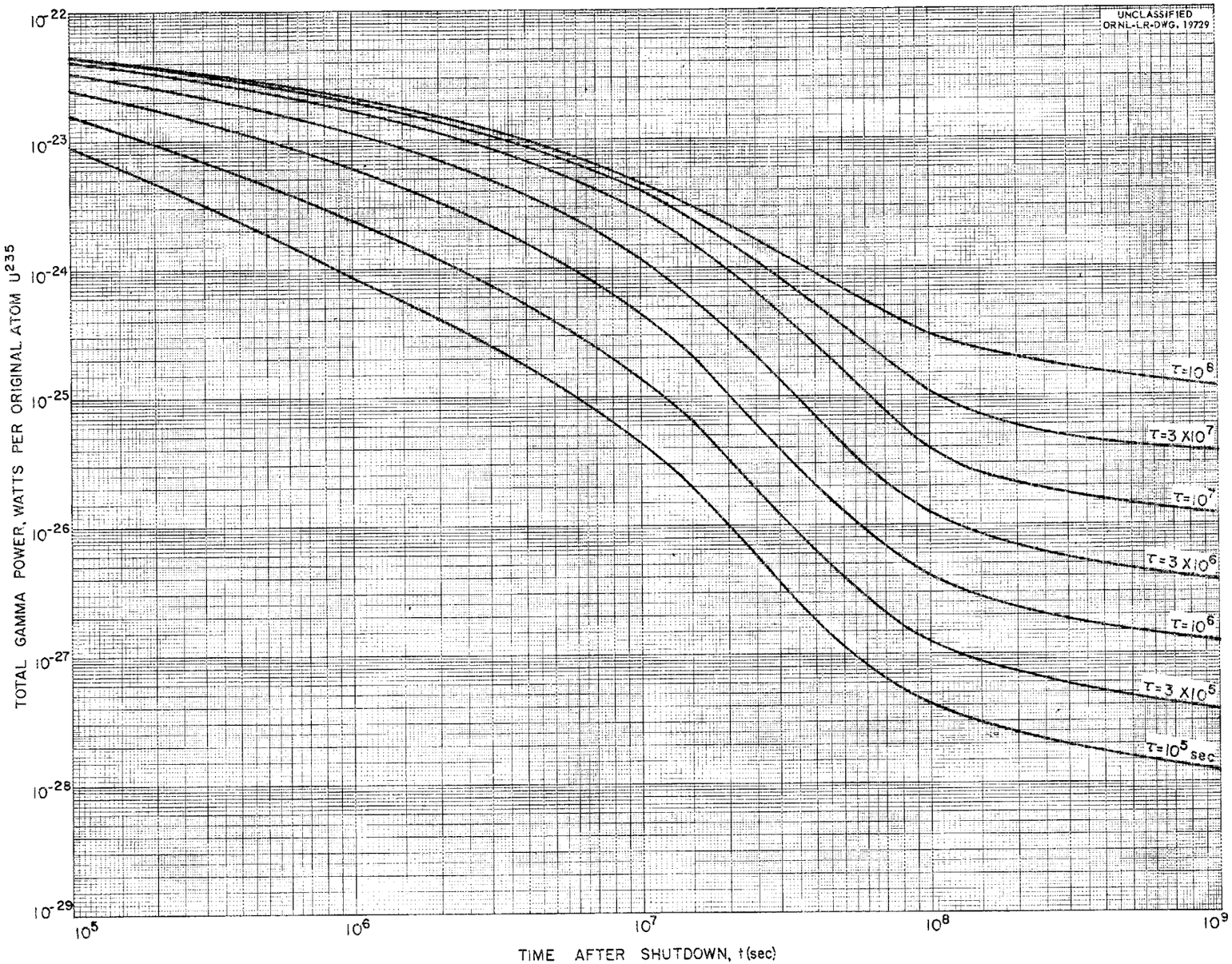


Fig. T-9a. Total Fission Product Gamma Power as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{12}$ n/cm$^2$/sec.

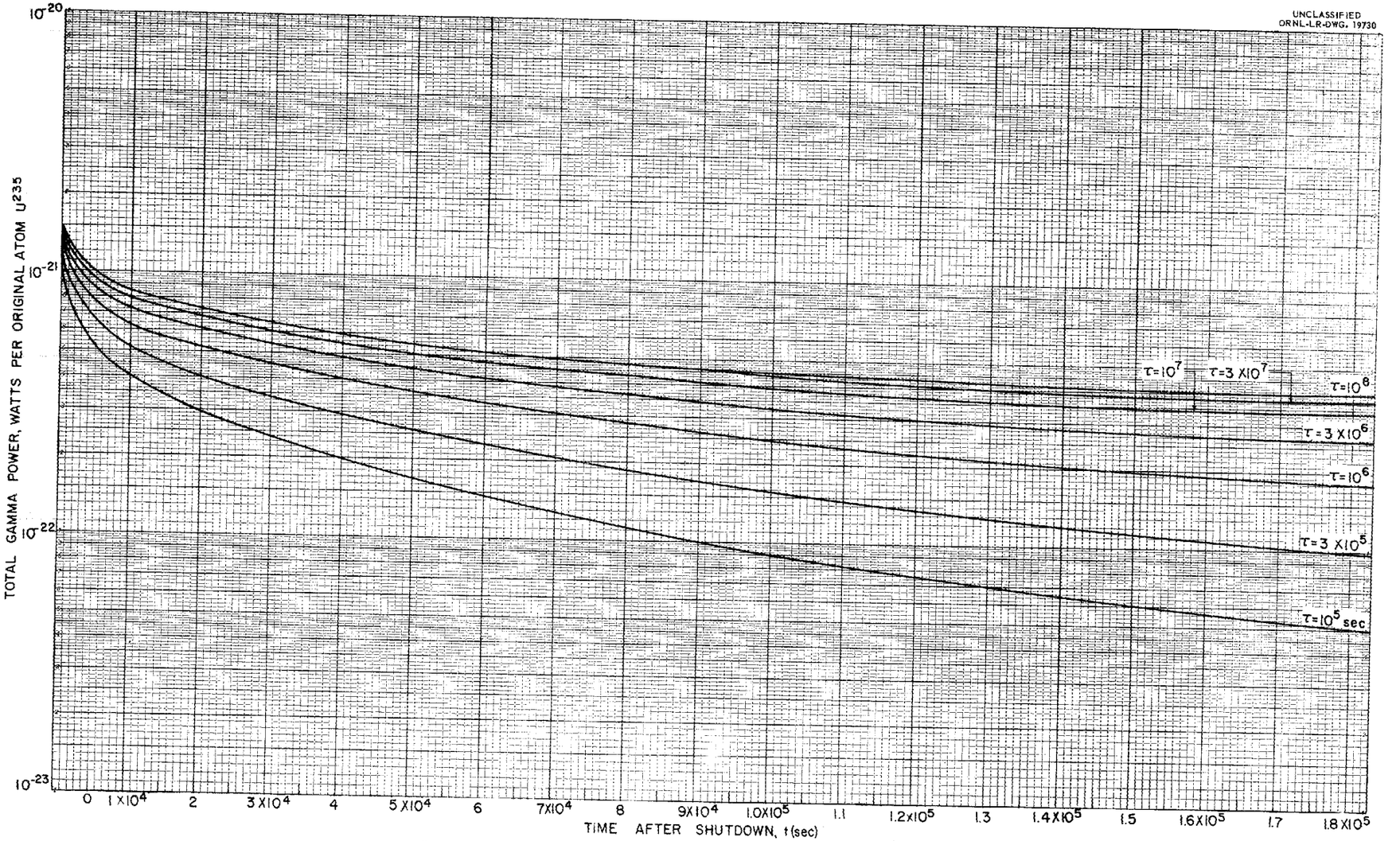


Fig. T-10 Total Fission Product Gamma Power as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{13}$ n/cm$^2$/sec.

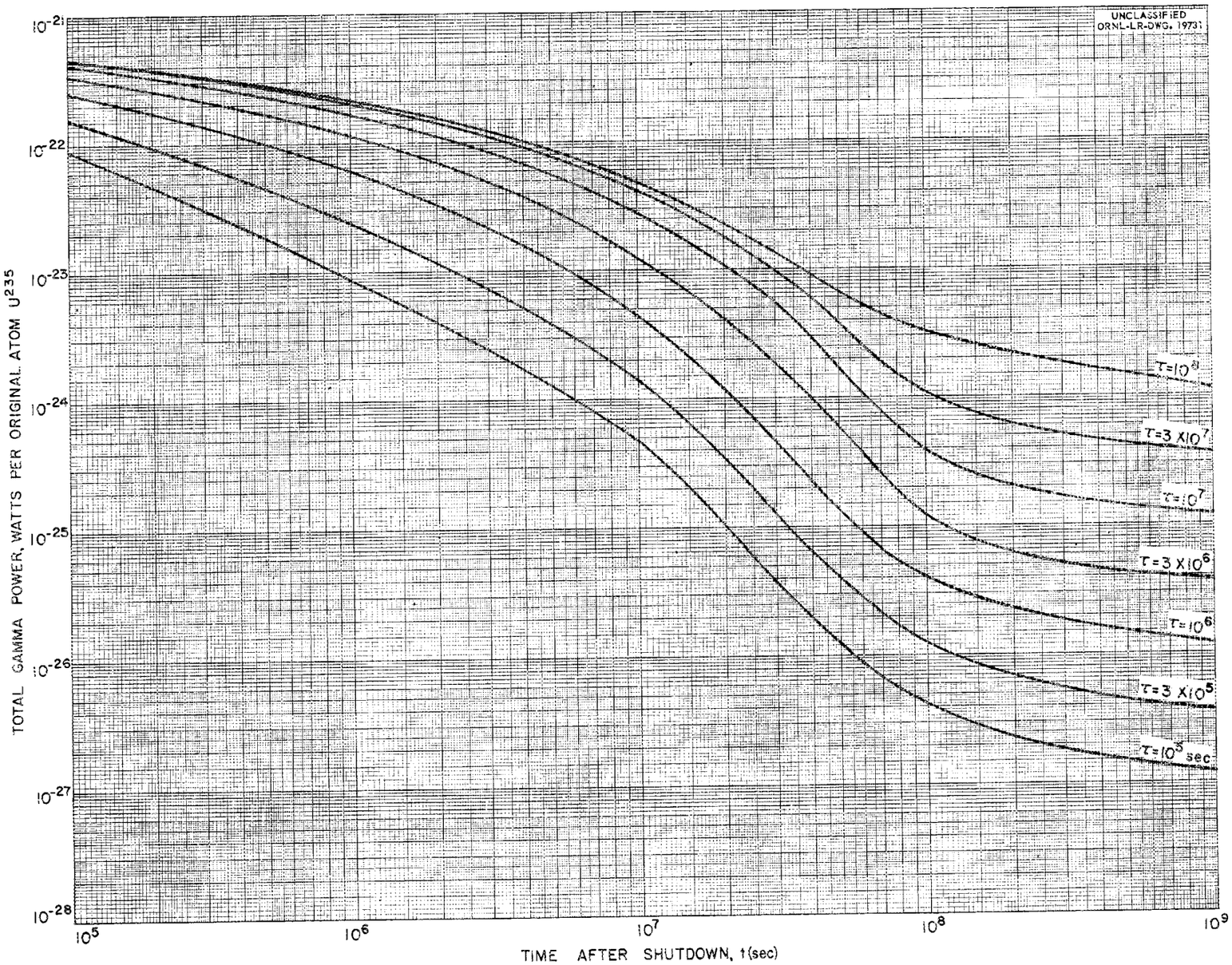


Fig. T-10a. Total Fission Product Gamma Power as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{13}$ n/cm$^2$/sec.

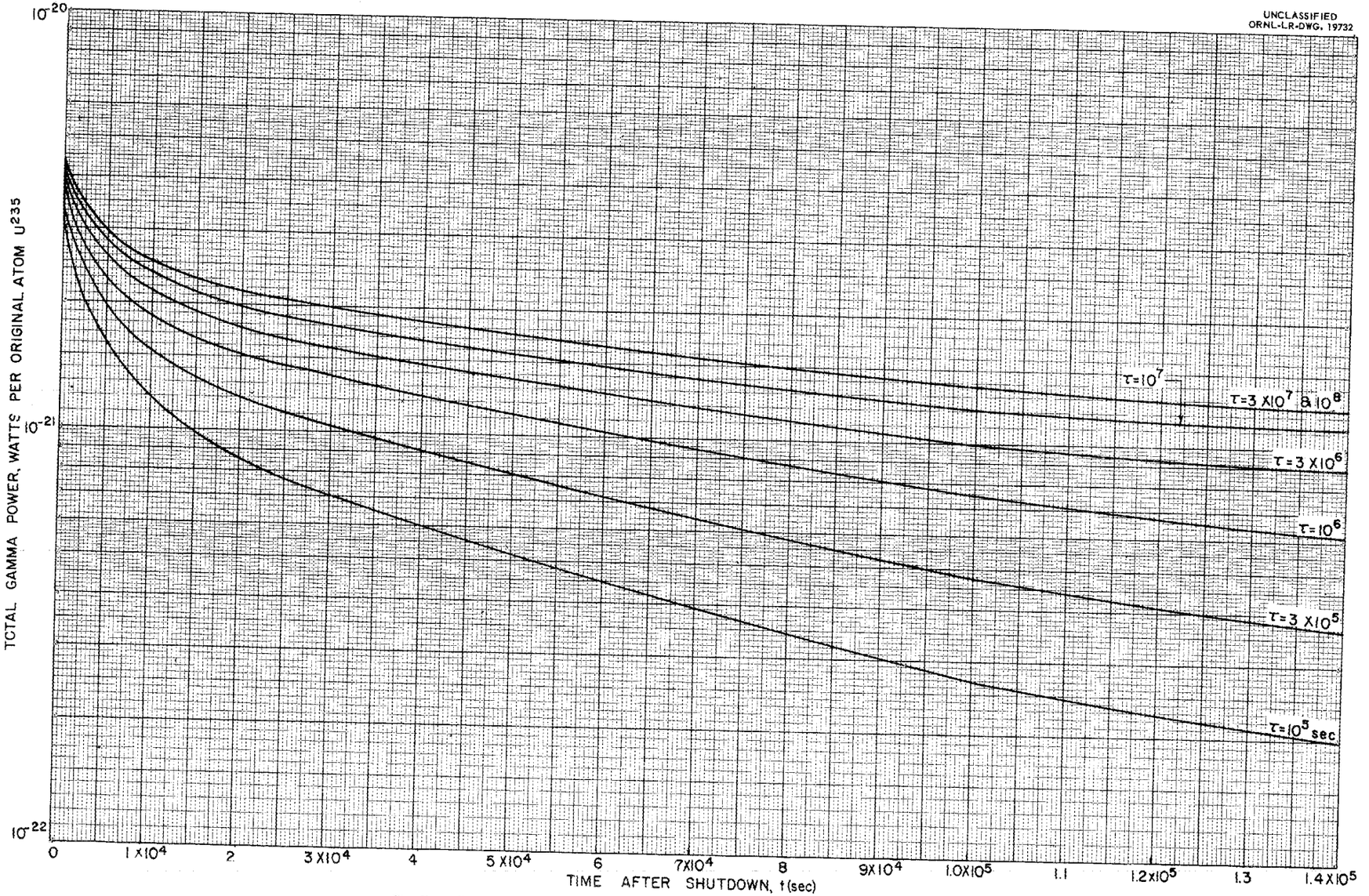


Fig. T-II. Total Fission Product Gamma Power as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{13}$ n/cm$^2$/sec.

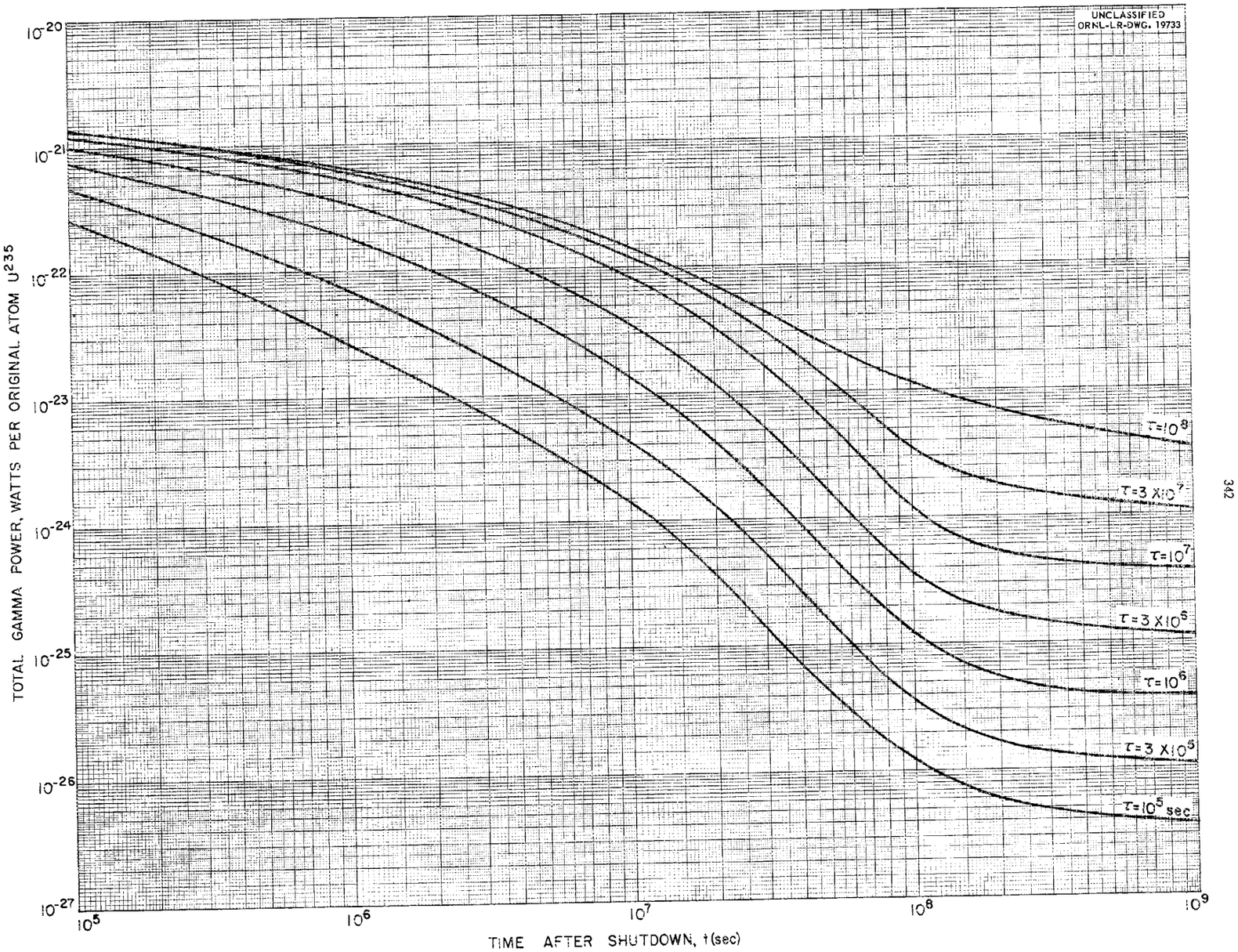


Fig. T-11a Total Fission Product Gamma Power as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{13}$ n/cm$^2$/sec.

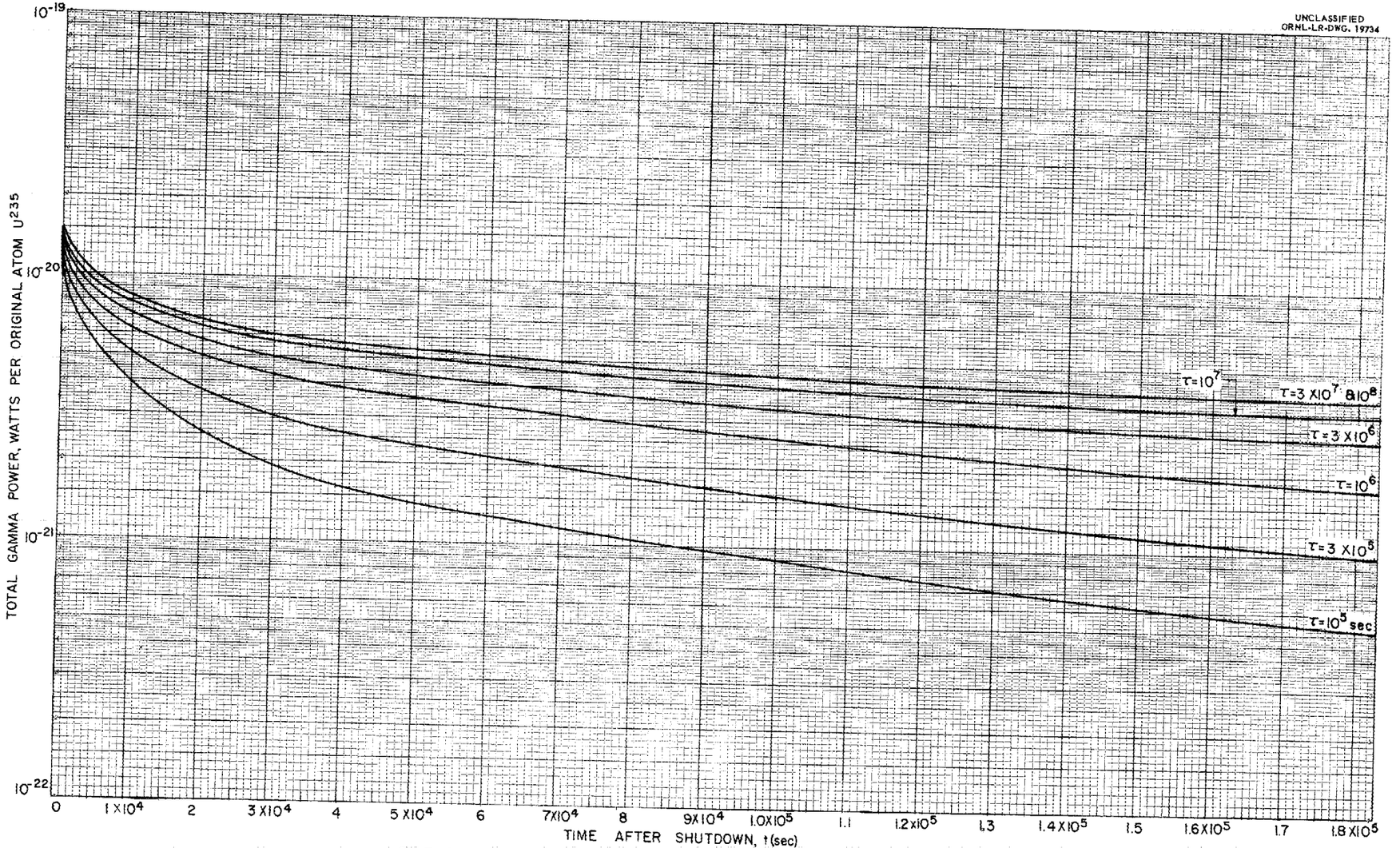


Fig. T-12. Total Fission Product Gamma Power as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{14}$ n/cm$^2$/sec.

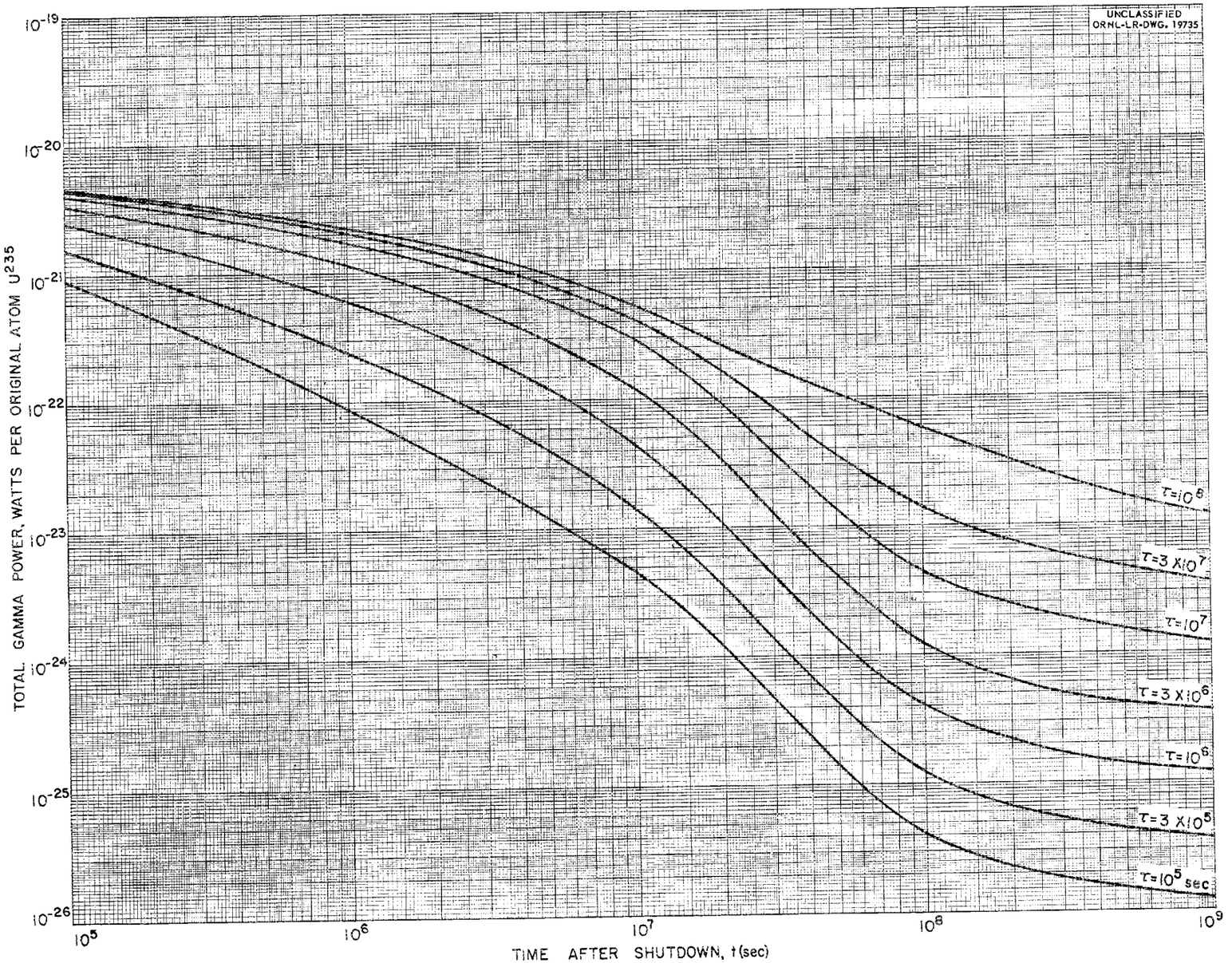


Fig. T-12a Total Fission Product Gamma Power as a Function of Irradiation Time and Shutdown Time for $\Phi = 10^{14}$ n/cm$^2$/sec.

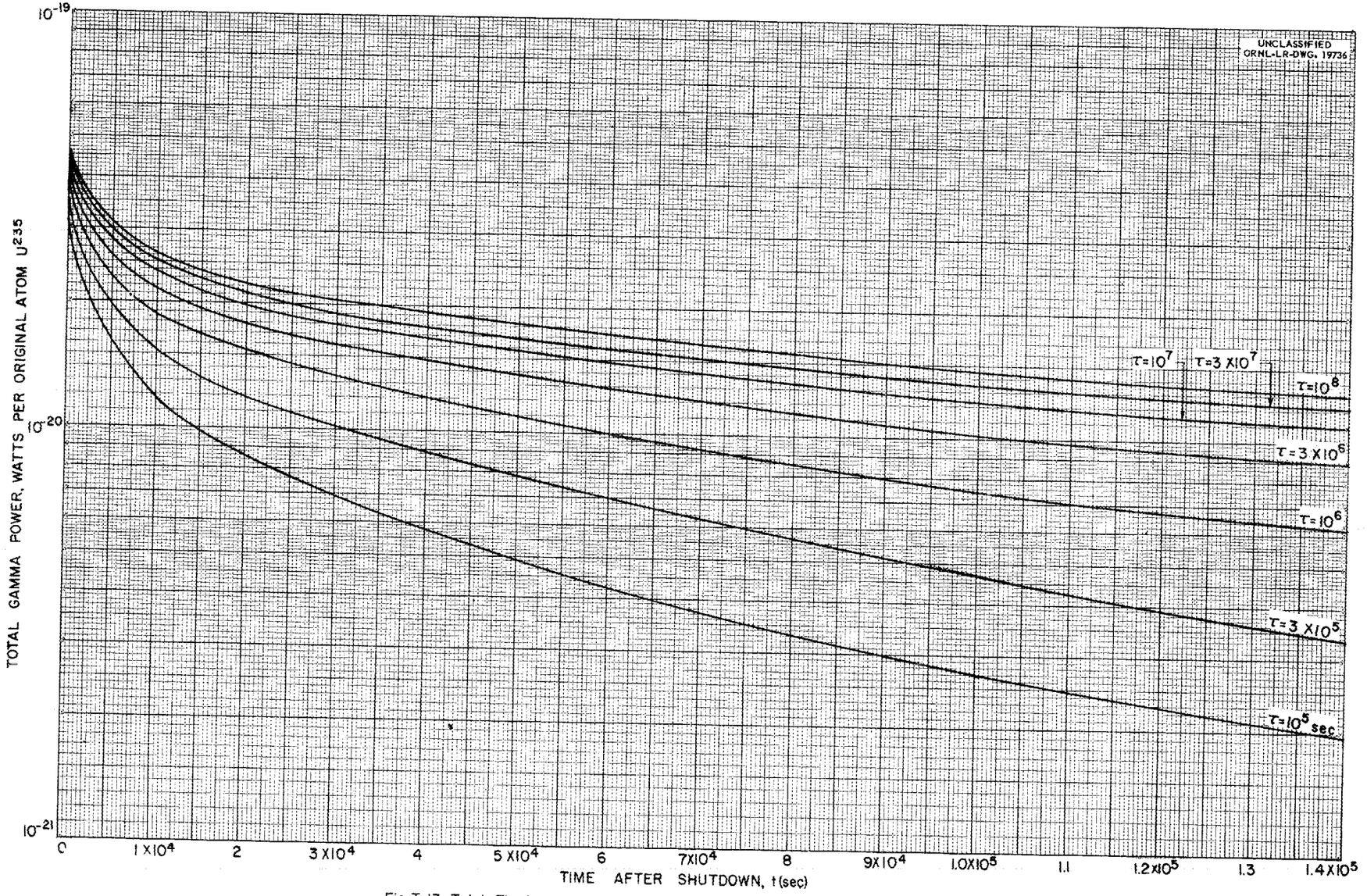


Fig. T-13. Total Fission Product Gamma Power as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{14}$ n/cm$^2$/sec.

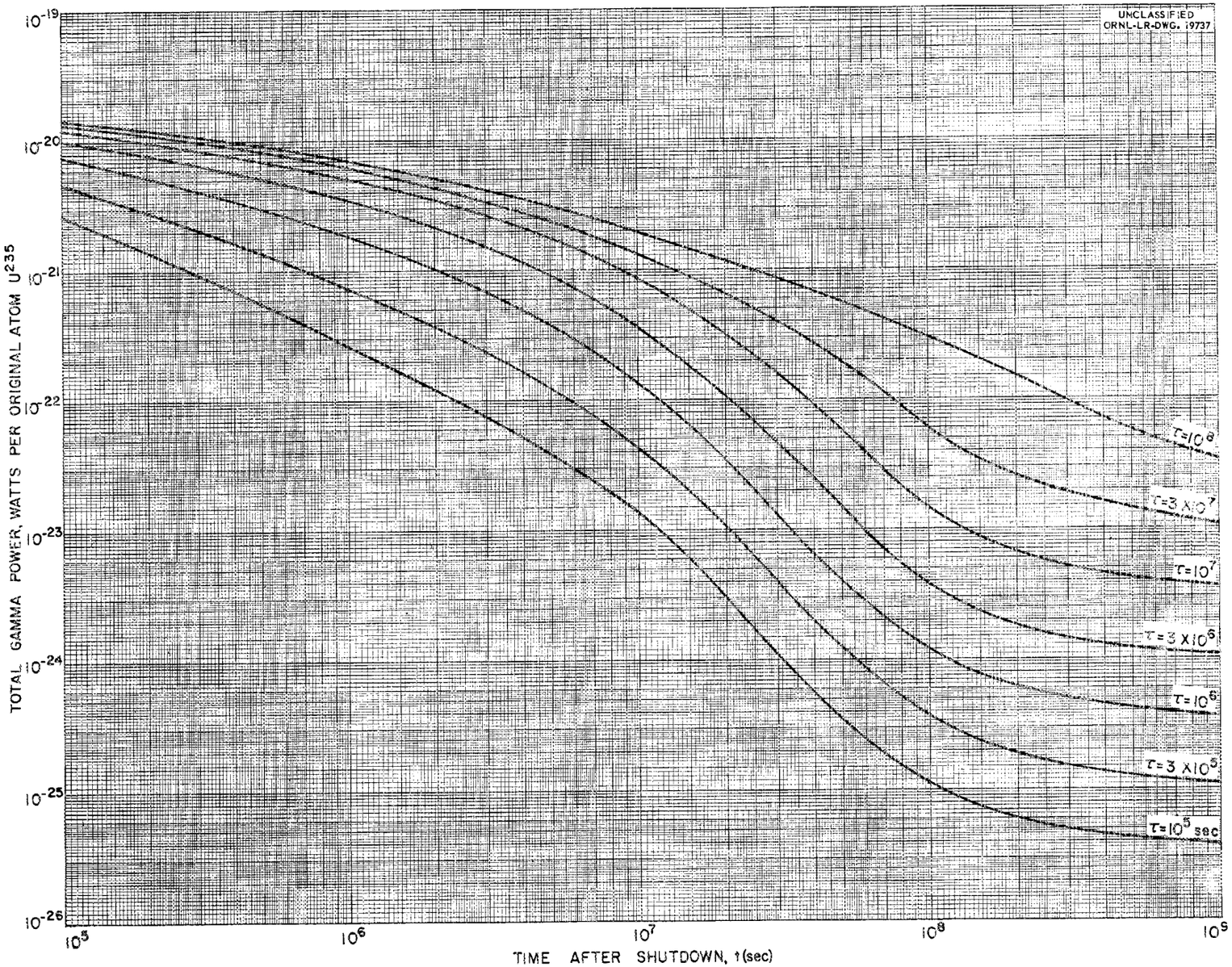


Fig. T-13a Total Fission Product Gamma Power as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{14}$ n/cm$^2$/sec.

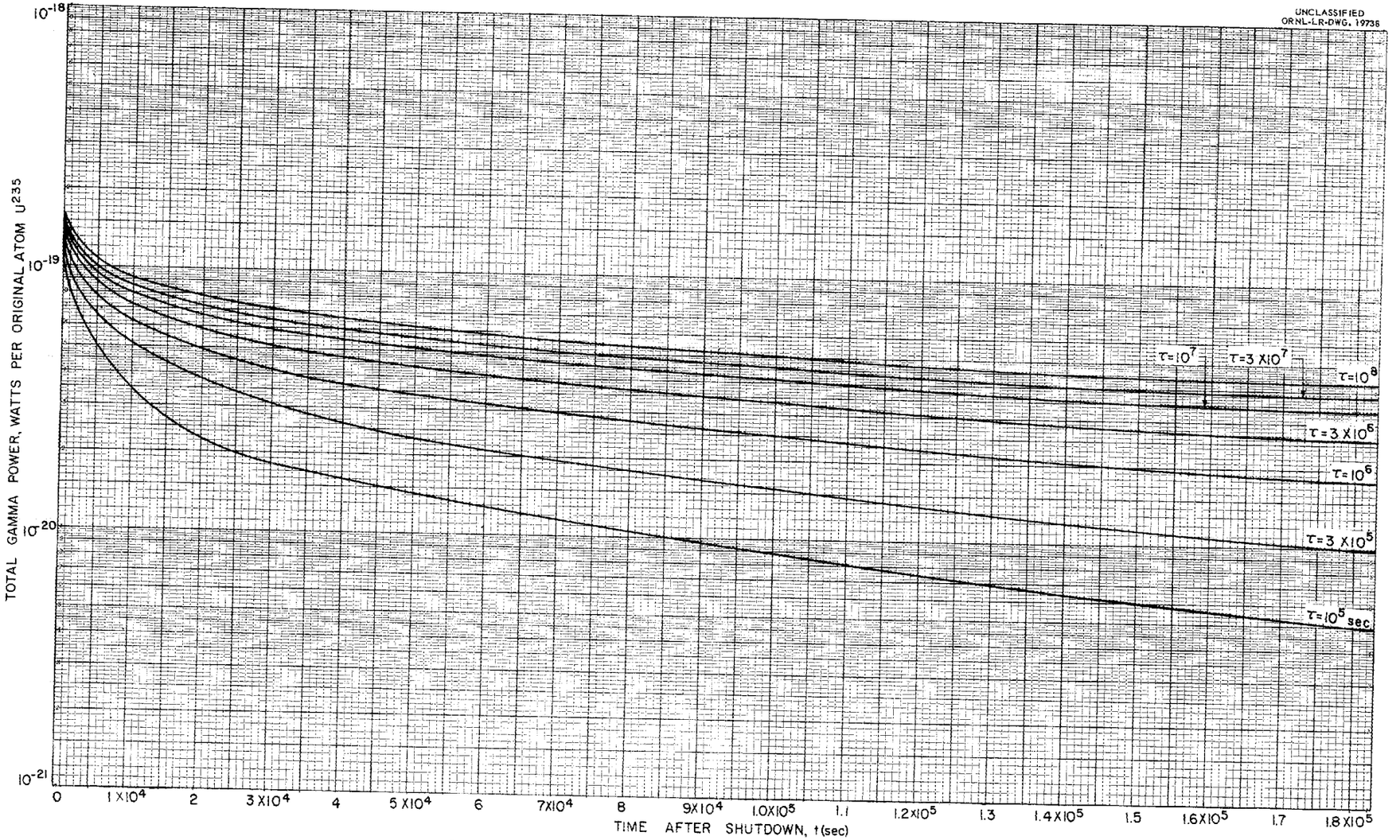


Fig. T-14. Total Fission Product Gamma Power as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm$^2$/sec.

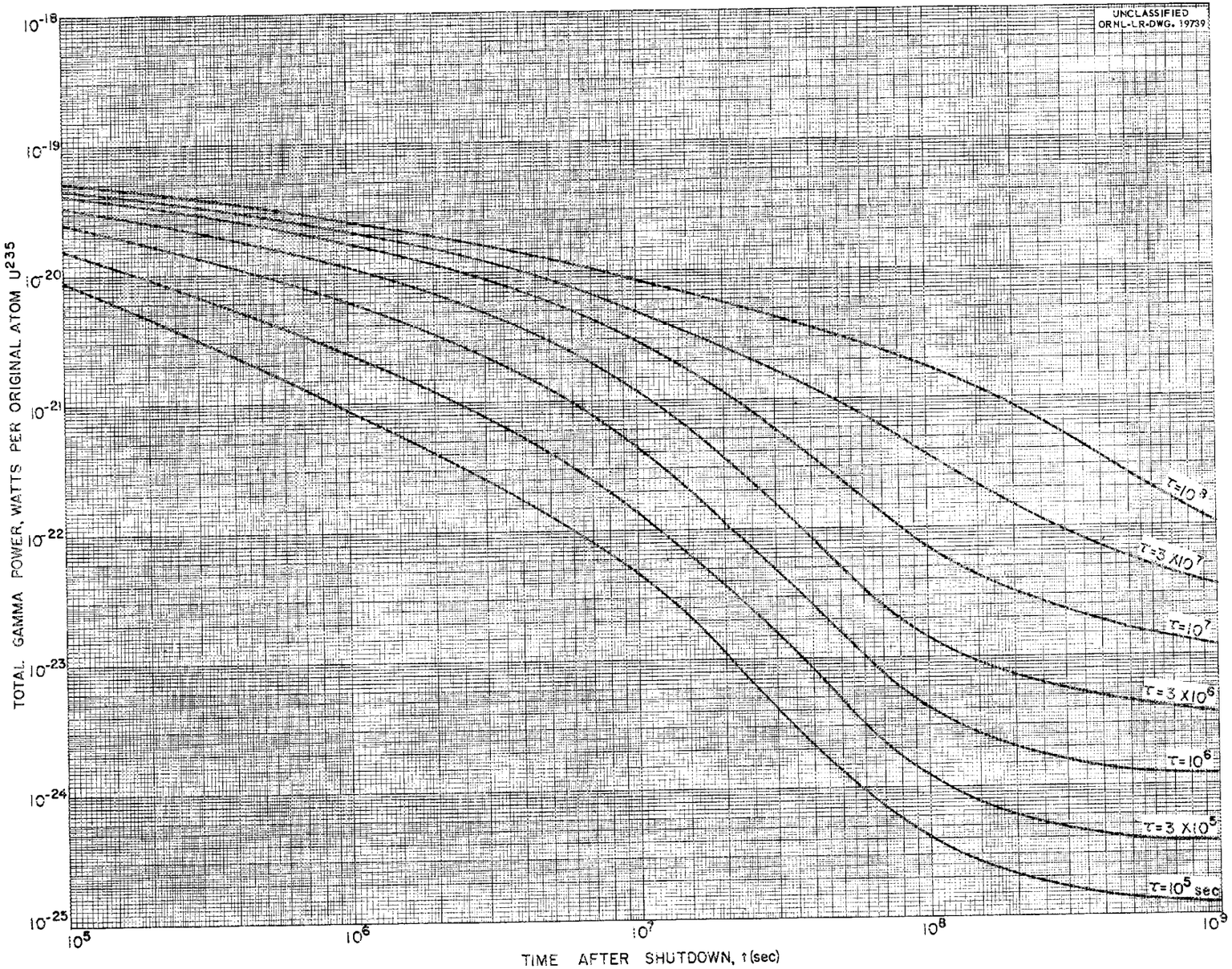


Fig. T-14a. Total Fission Product Gamma Power as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm$^2$/sec.

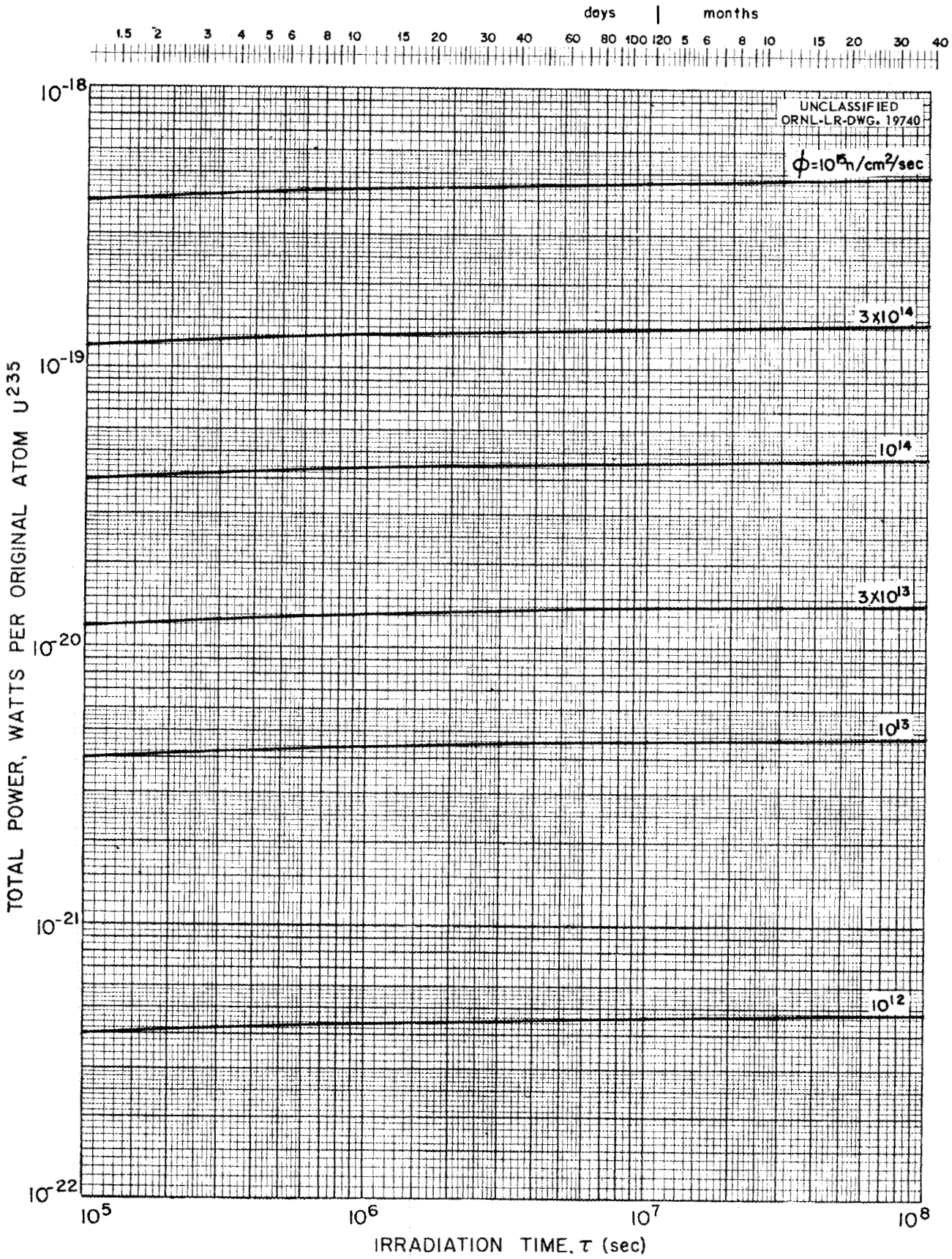


Fig. T-15. Buildup of Total Fission Product Power with Irradiation Time and Thermal Neutron Flux.

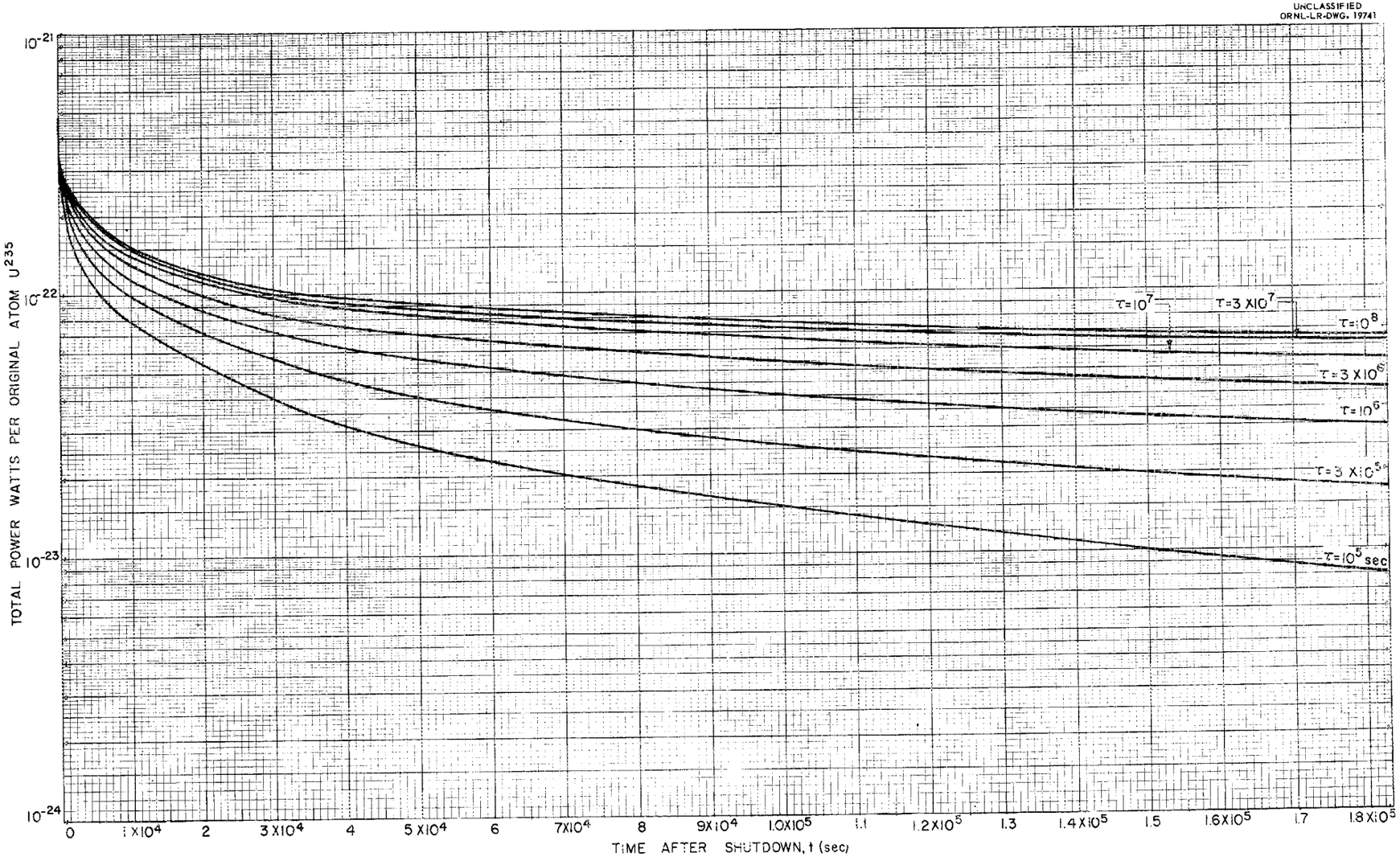


Fig. T-16. Total Fission Product Power as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{12}$ n/cm$^2$/sec.

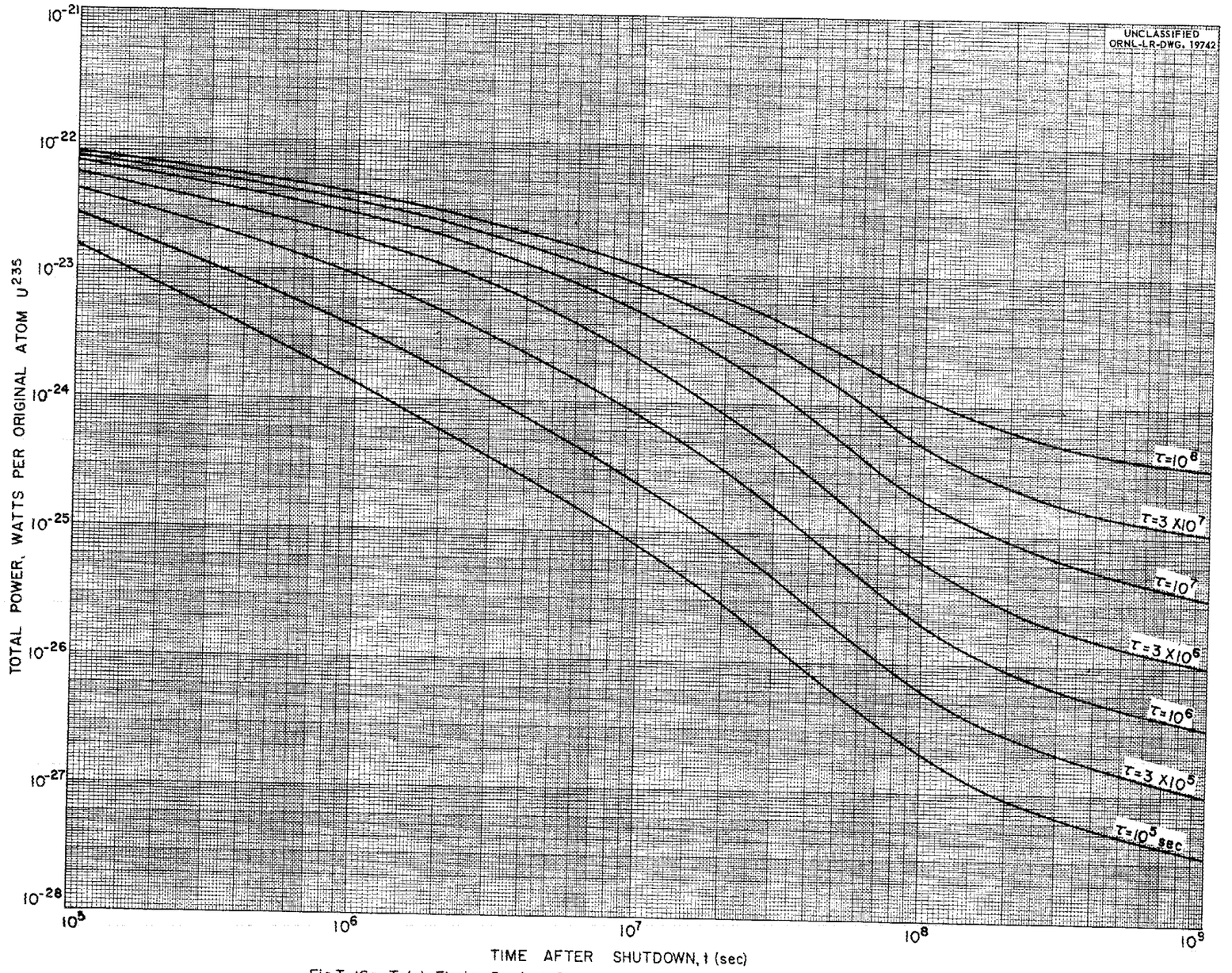


Fig. T-16a. Total Fission Product Power as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{12}$ n/cm$^2$/sec.

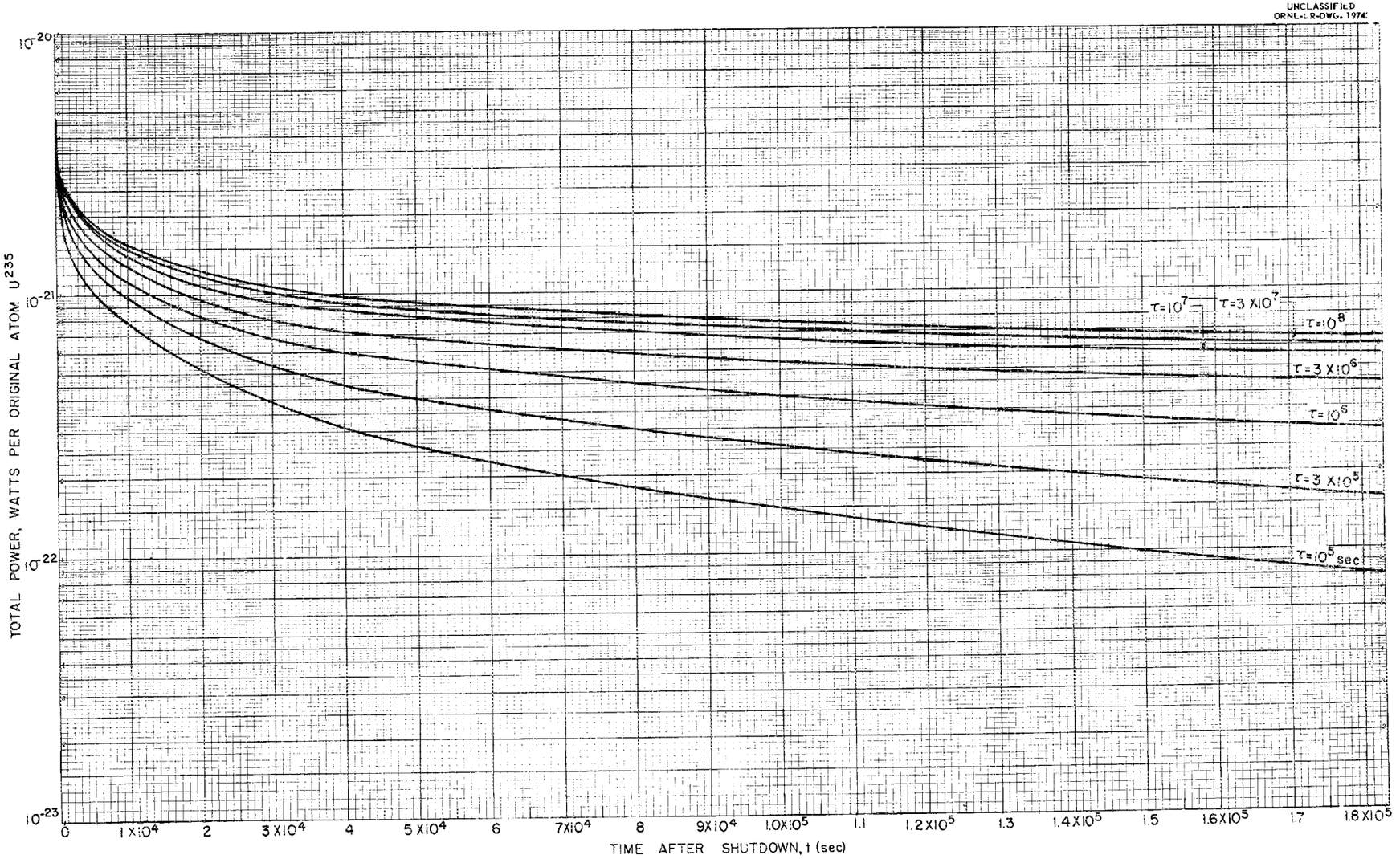


Fig. T-17 Total Fission Product Power as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{13}$ n/cm$^2$/sec.

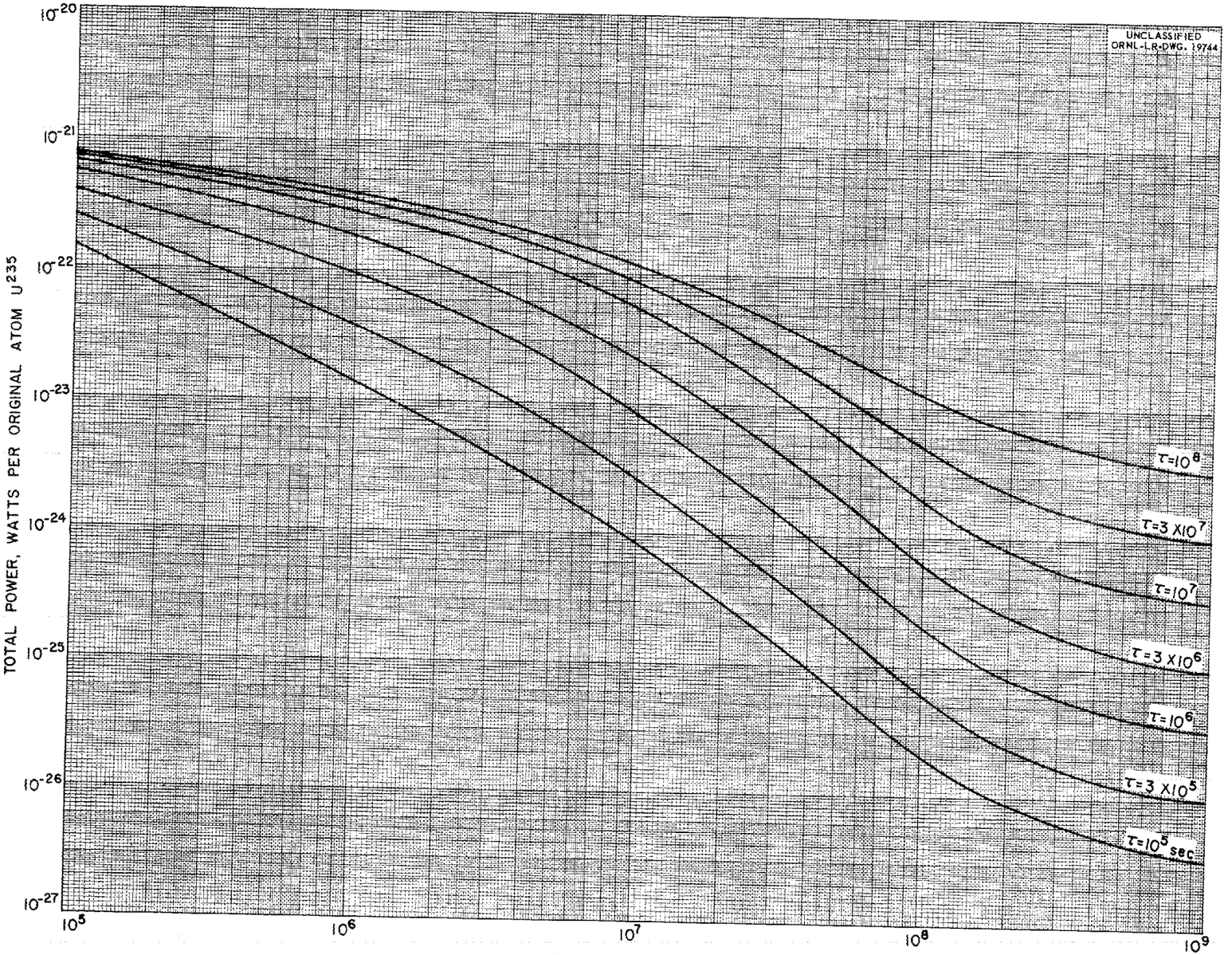


Fig. T-17a. Total Fission Product Power as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{13}$ n/cm$^2$/sec.

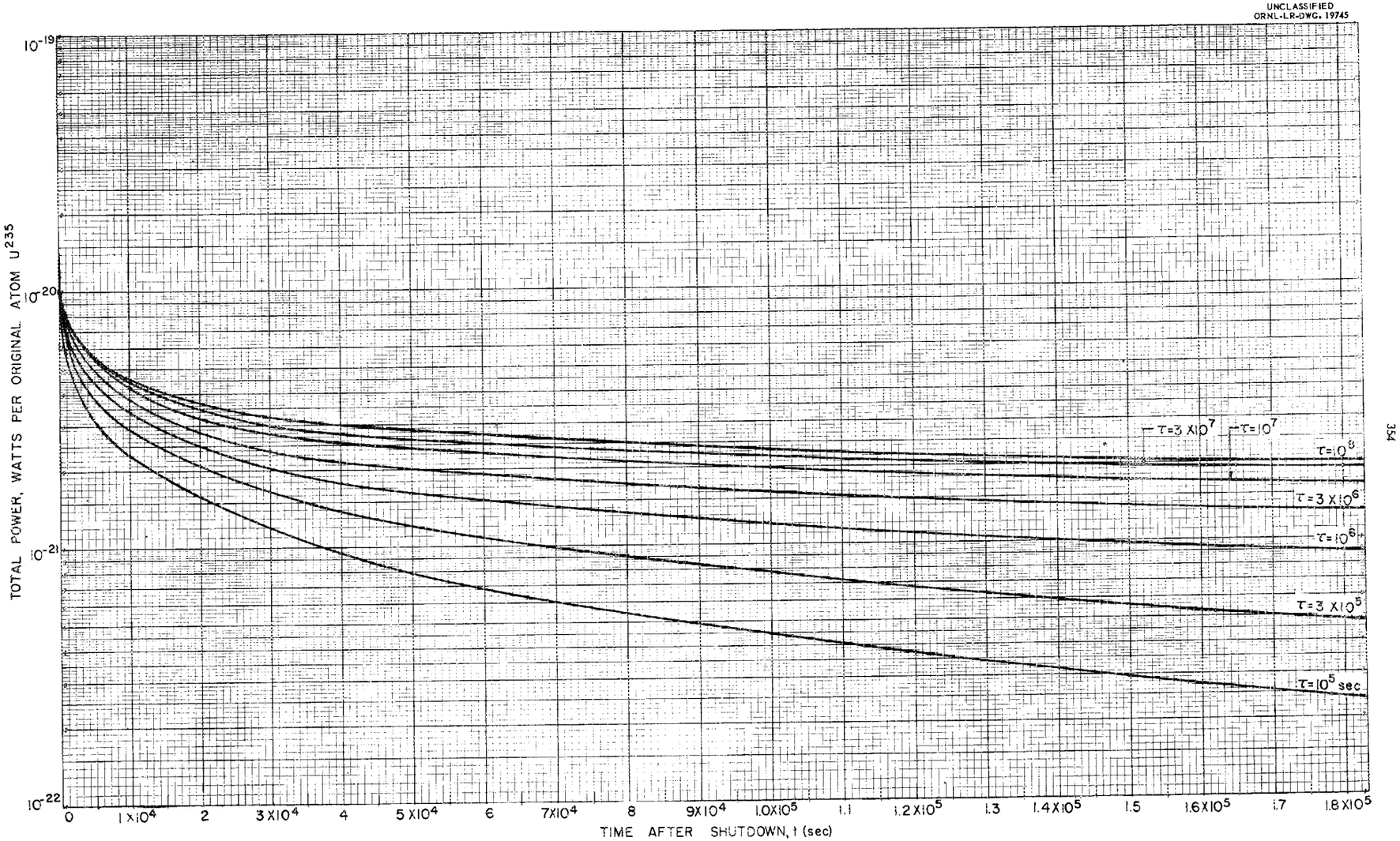


Fig. T-18. Total Fission Product Power as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{13}$ n/cm$^2$/sec.

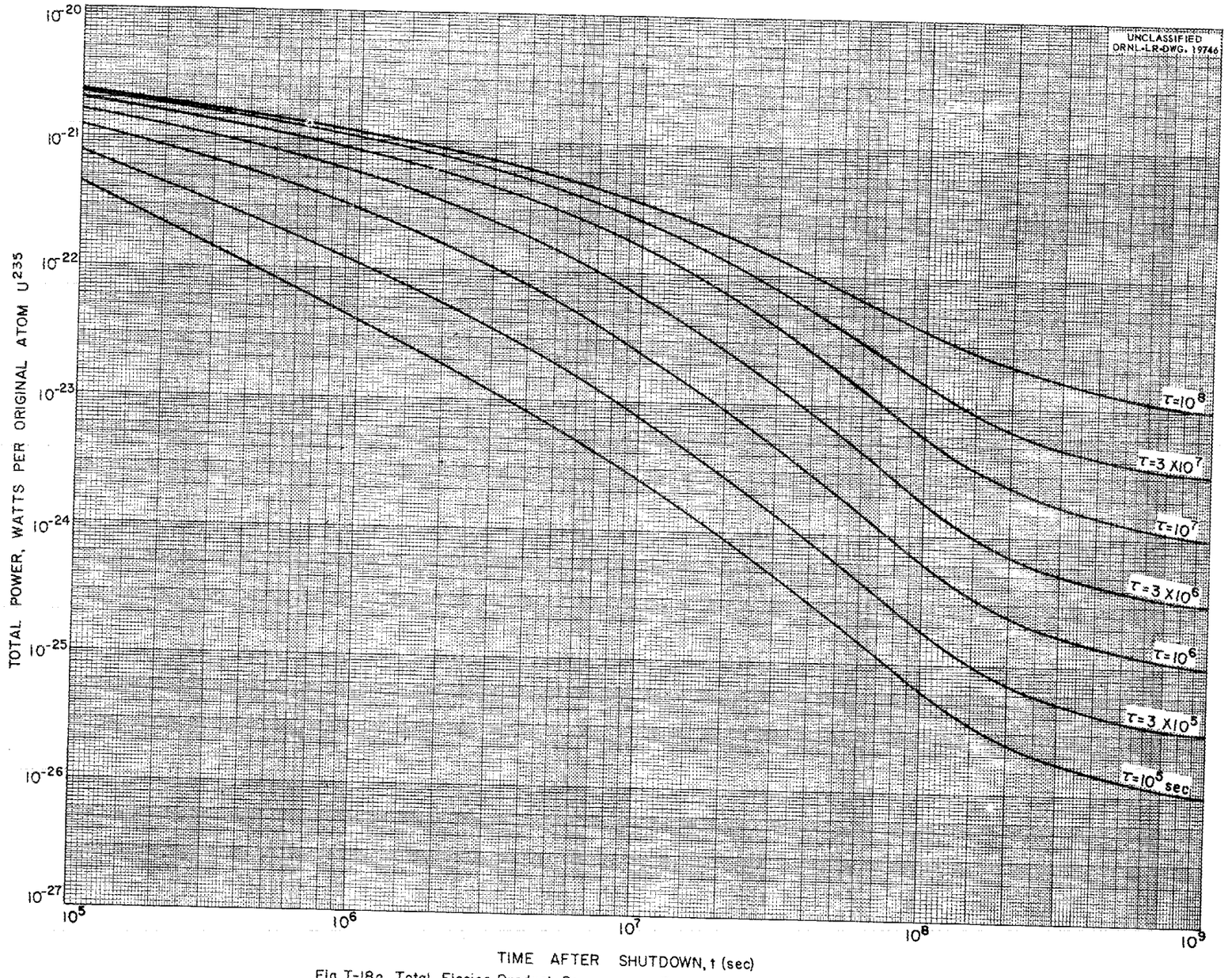


Fig. T-18a. Total Fission Product Power as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{13}$ n/cm$^2$/sec.

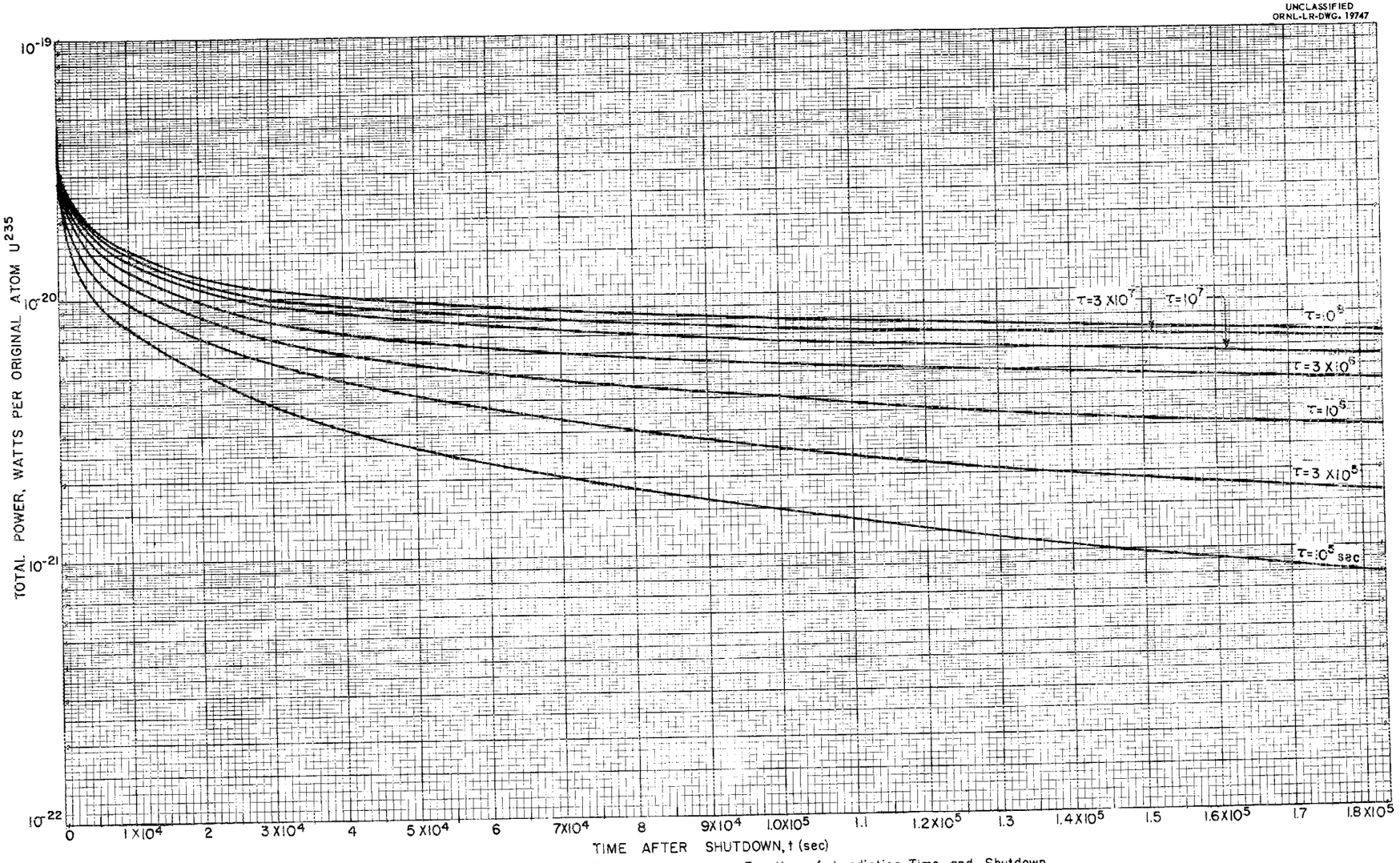


Fig. T-19. Total Fission Product Power as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{14}$ n/cm$^2$/sec.

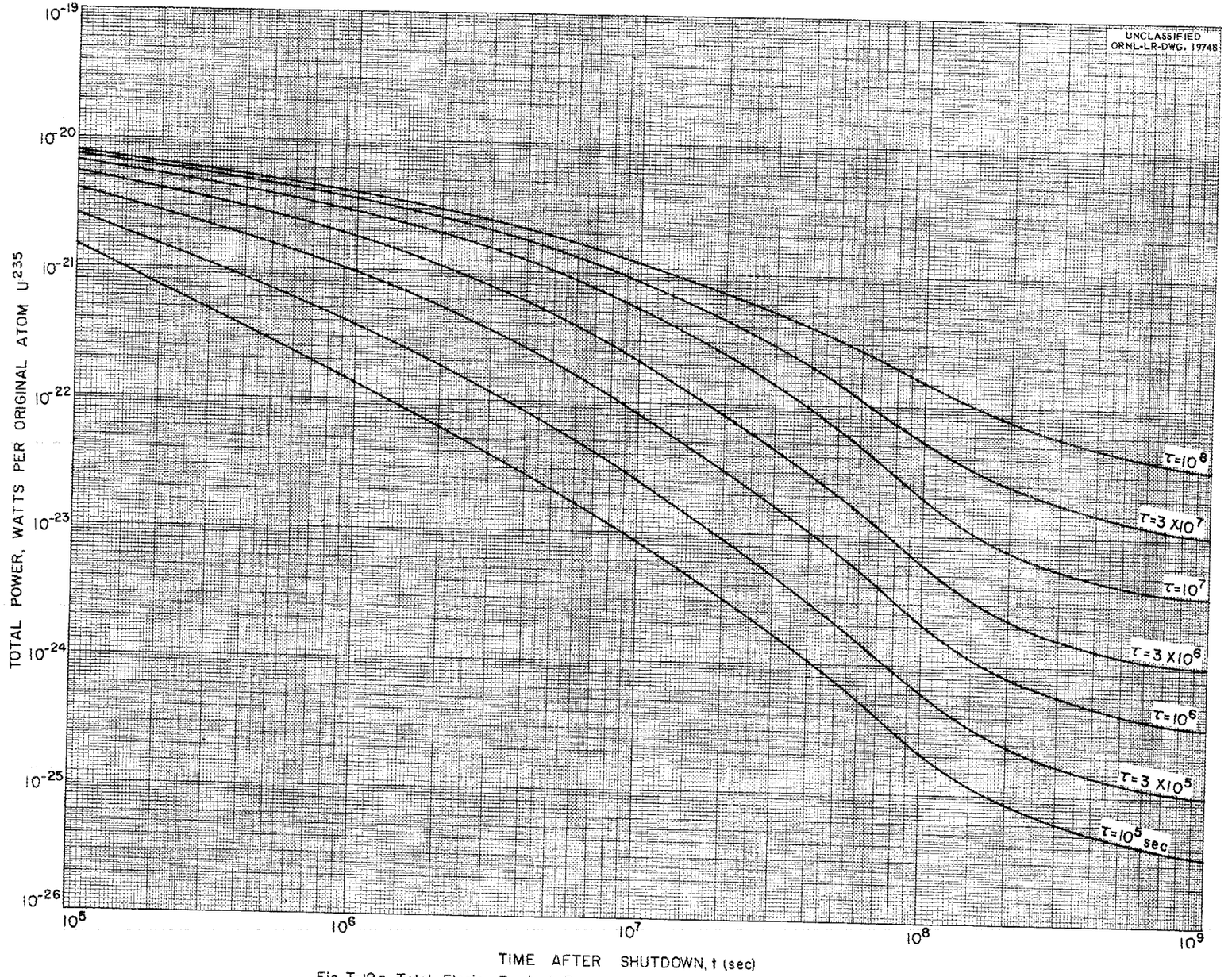


Fig. T-19a. Total Fission Product Power as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{14}$ n/cm$^2$/sec.

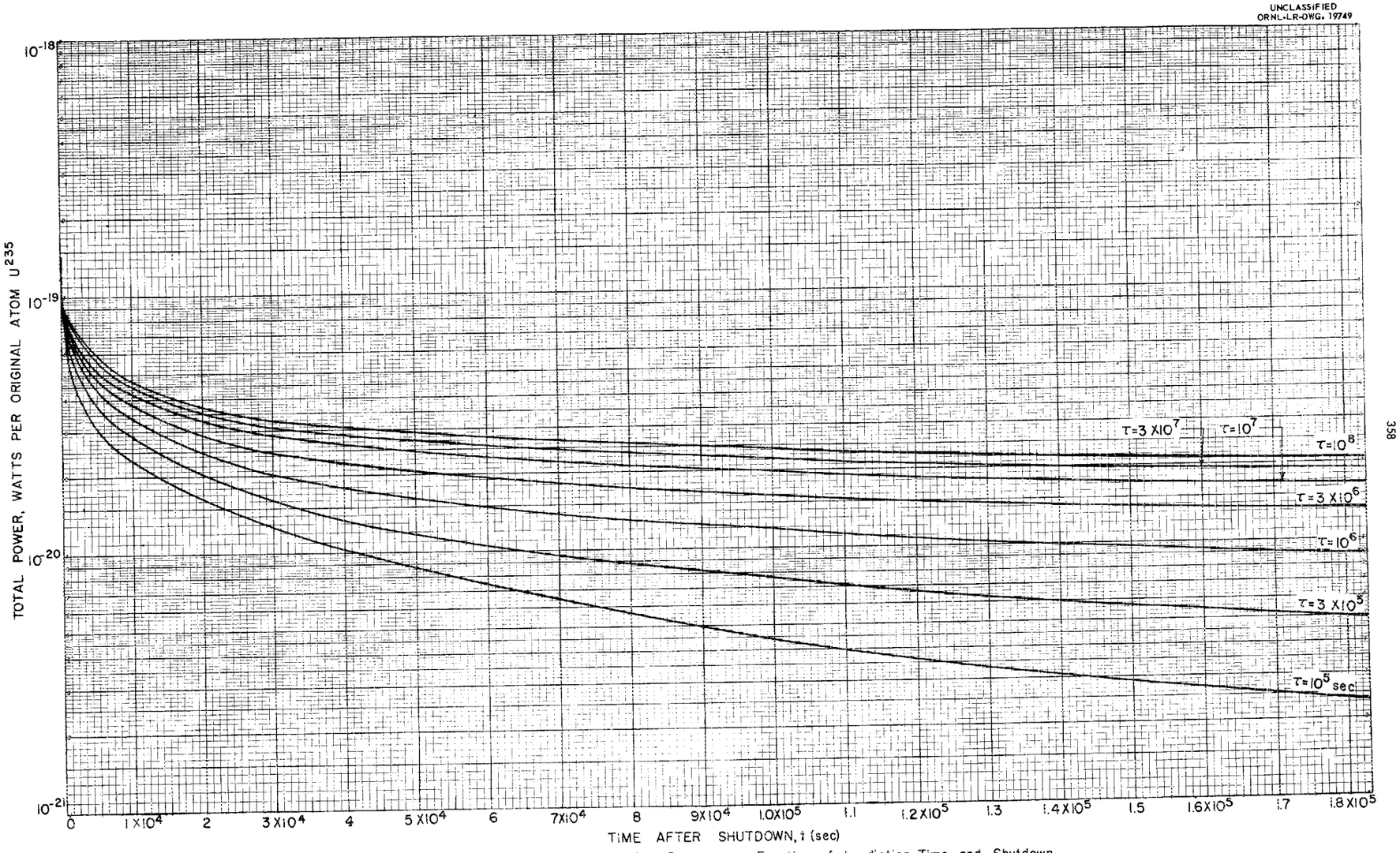


Fig. T-20. Total Fission Product Power as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{14}$ n/cm$^2$/sec.

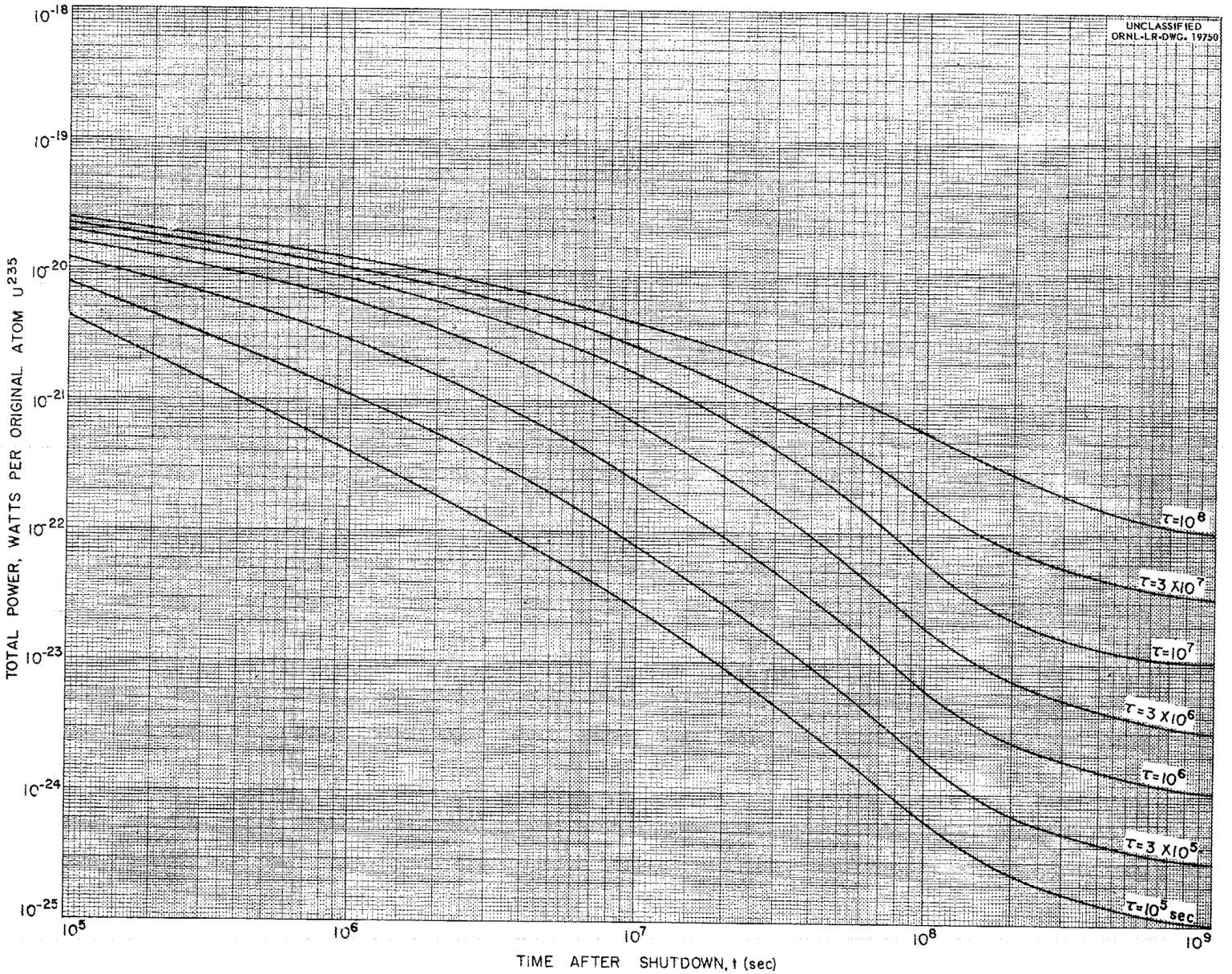


Fig. T-20a. Total Fission Product Power as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{14}$ n/cm$^2$/sec.

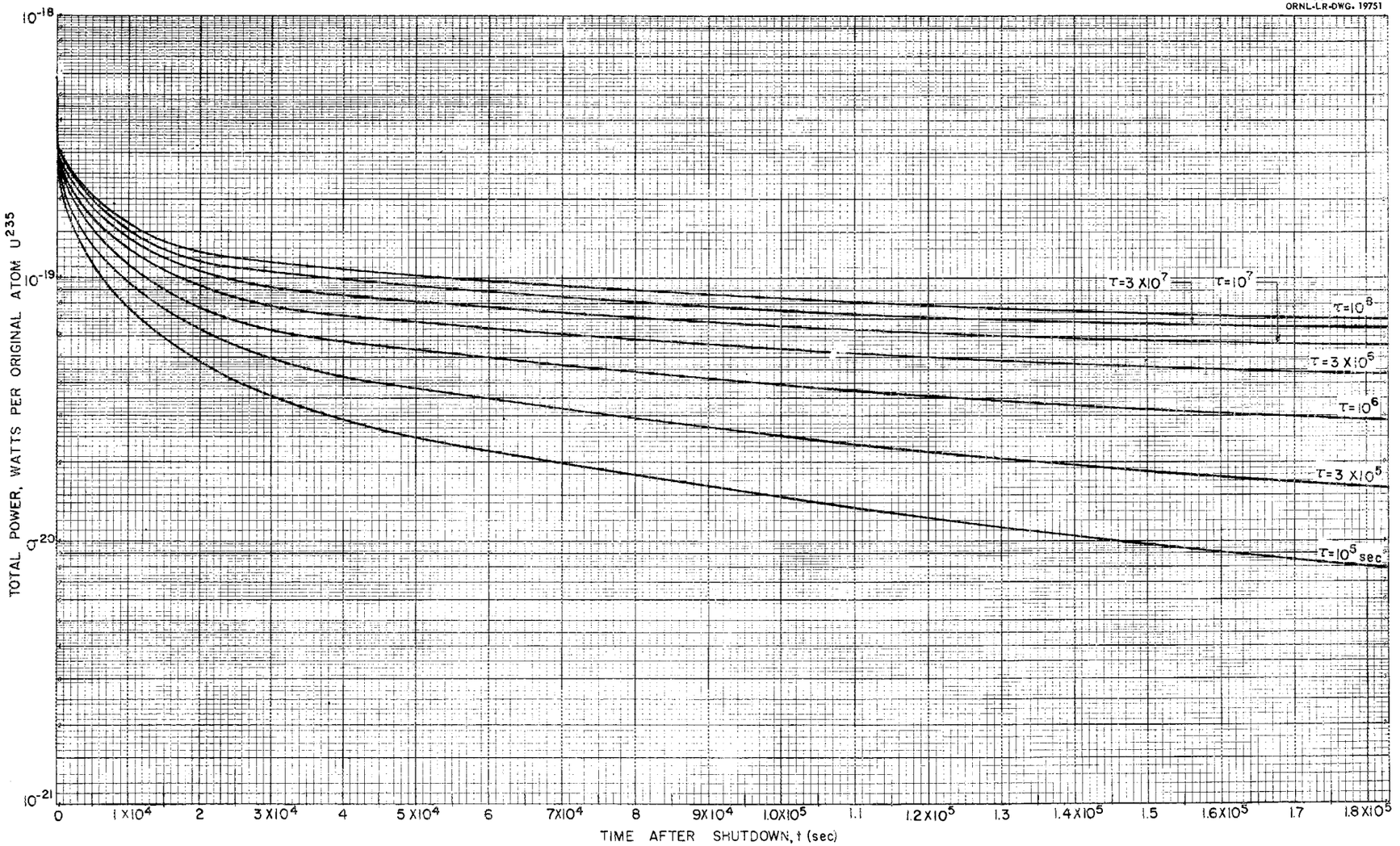


Fig. T-21. Total Fission Product Power as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm$^2$/sec.

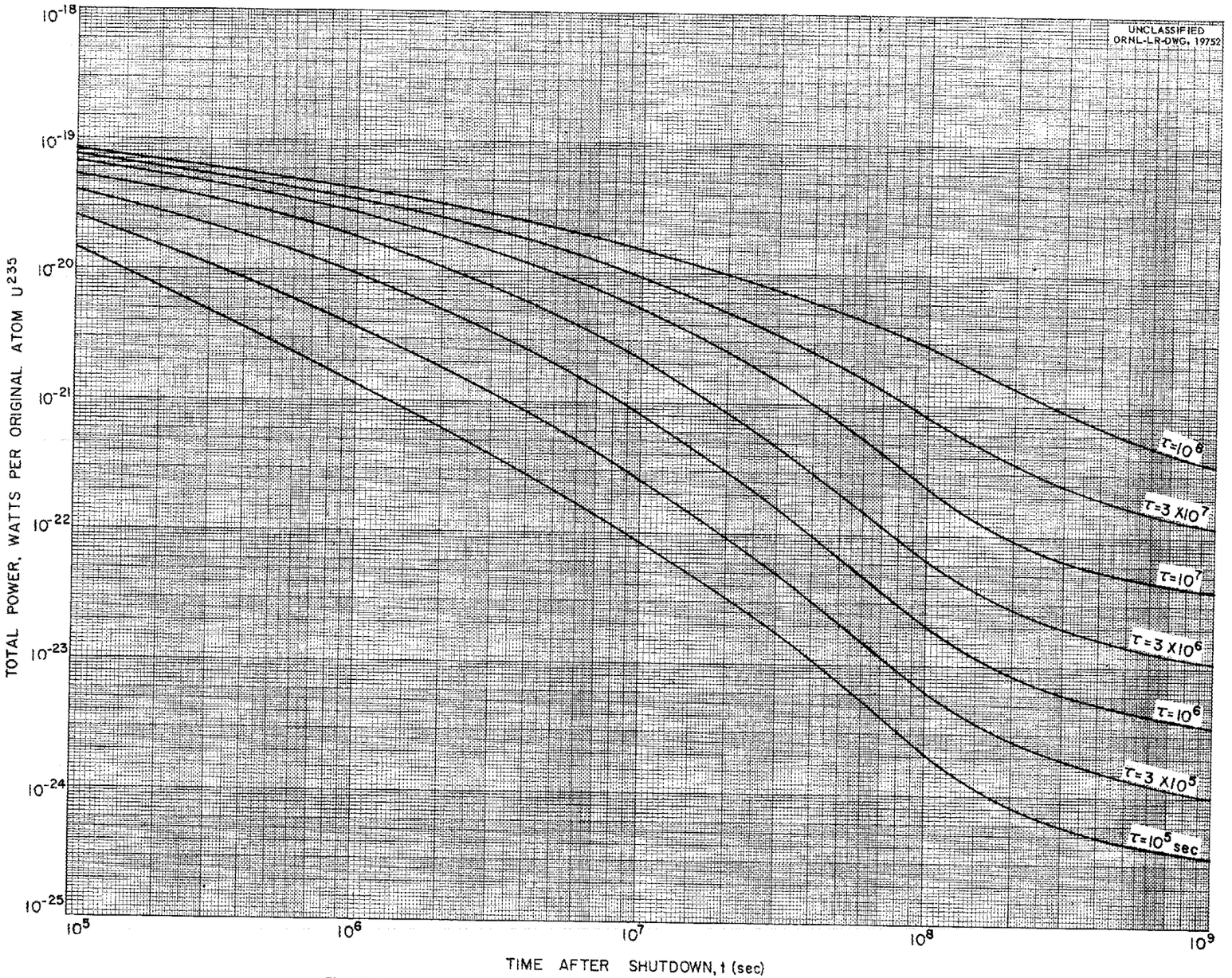


Fig. T-21a. Total Fission Product Power as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm$^2$/sec.

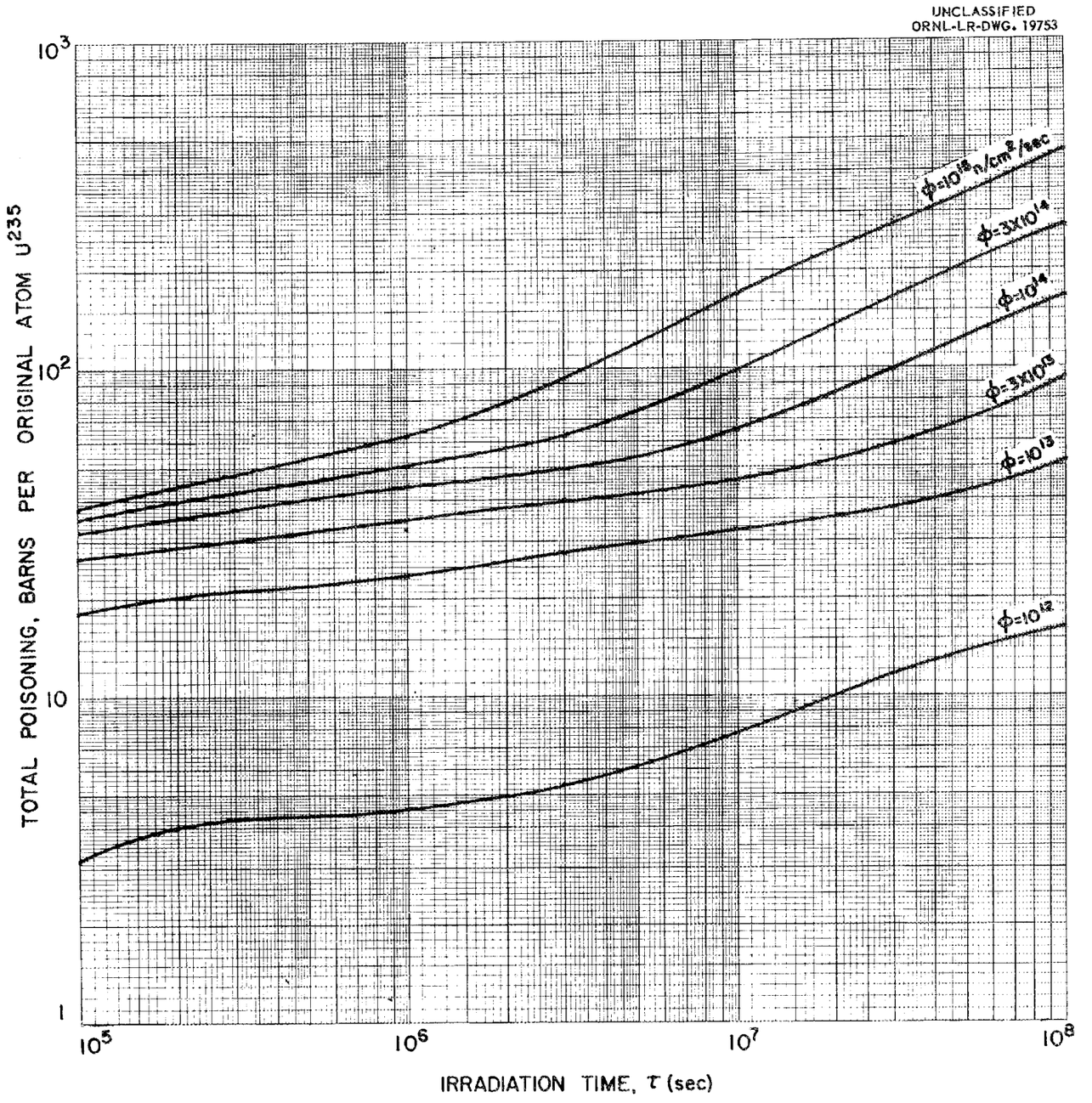


Fig. T-22. Buildup of Total Fission Product Poisoning with Irradiation Time and Thermal Neutron Flux.

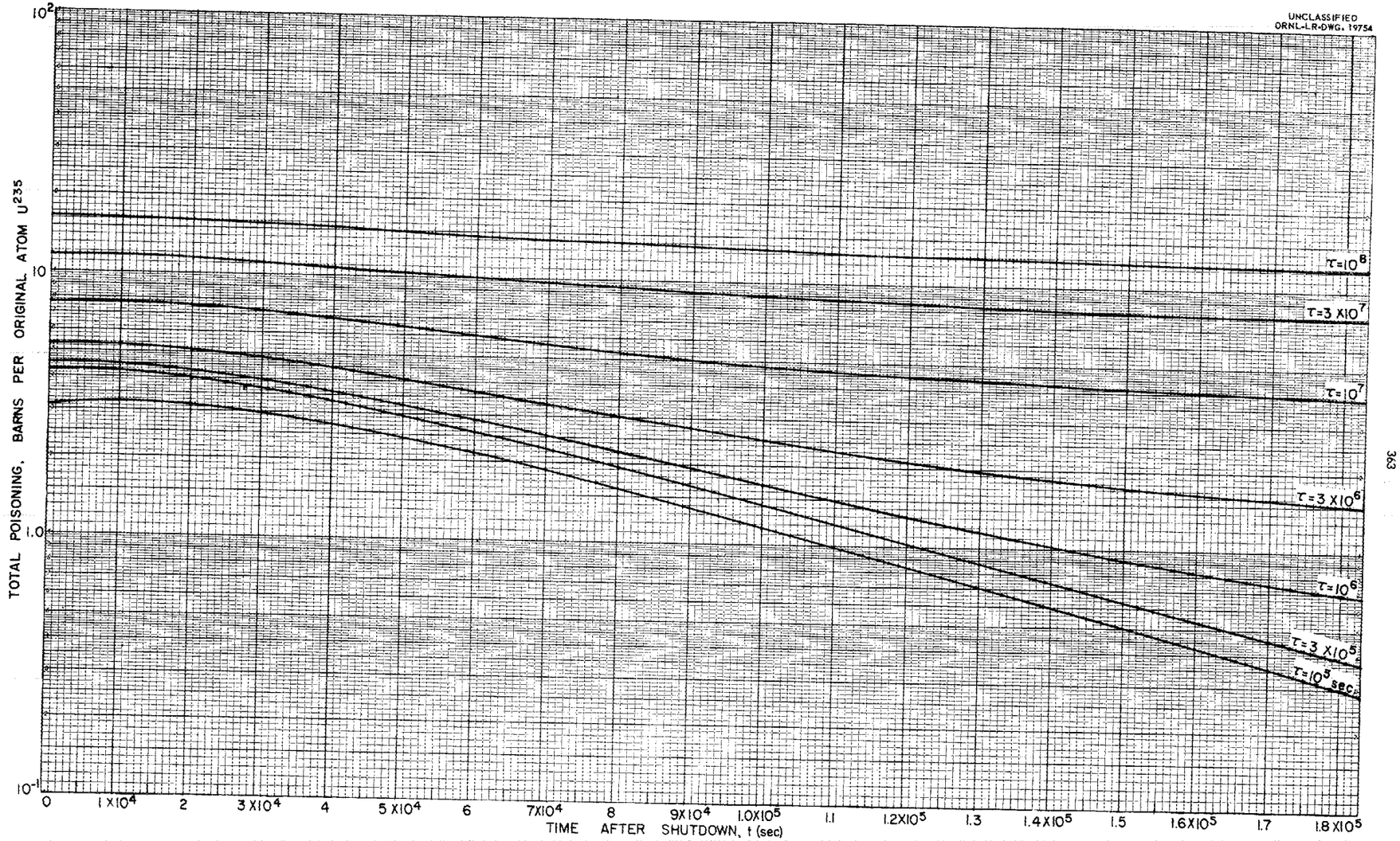


Fig. T-23. Total Fission Product Poisoning as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{12}$ n/cm²/sec.

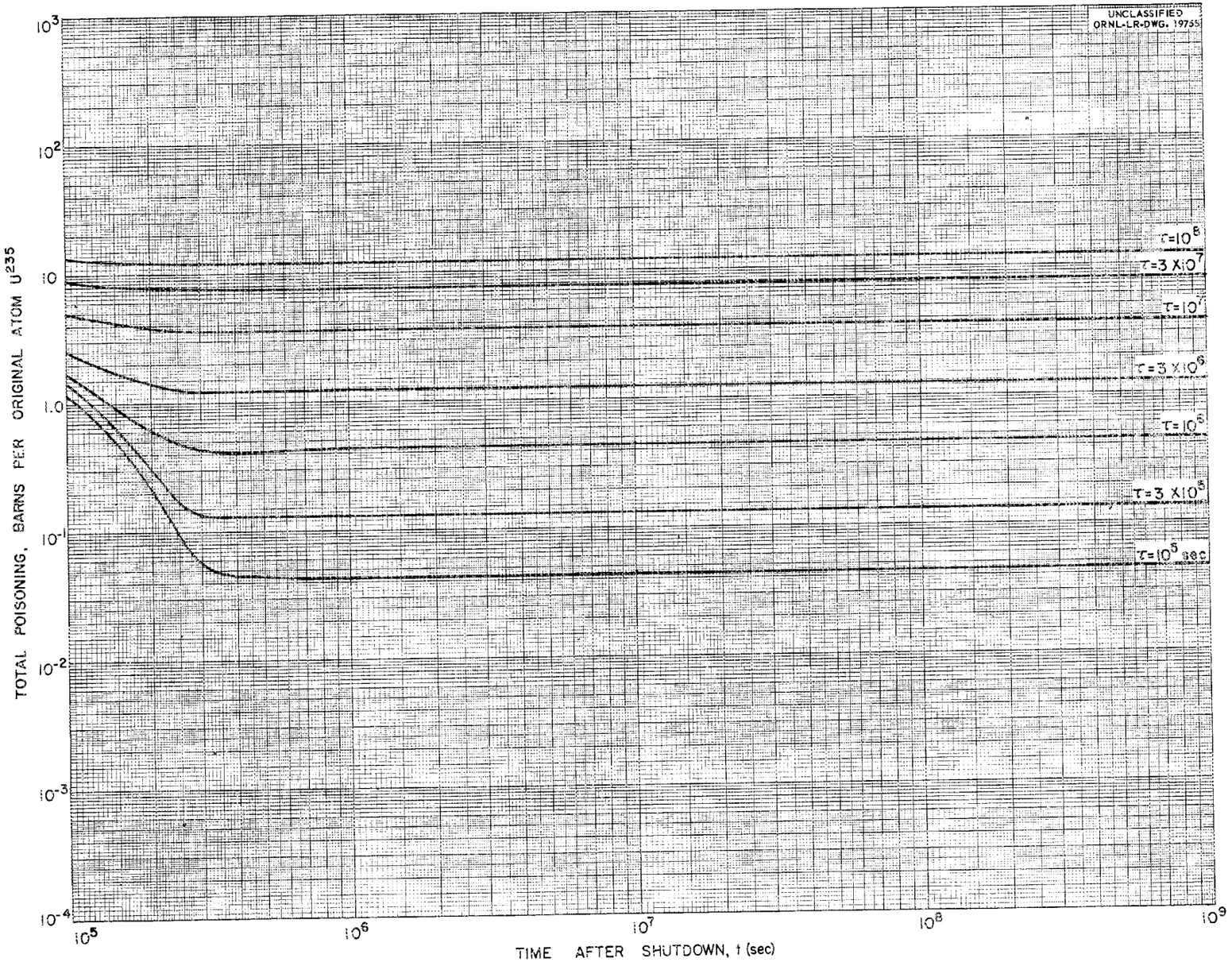


Fig. T-23a Total Fission Product Poisoning as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{12}$ n/cm$^2$/sec.

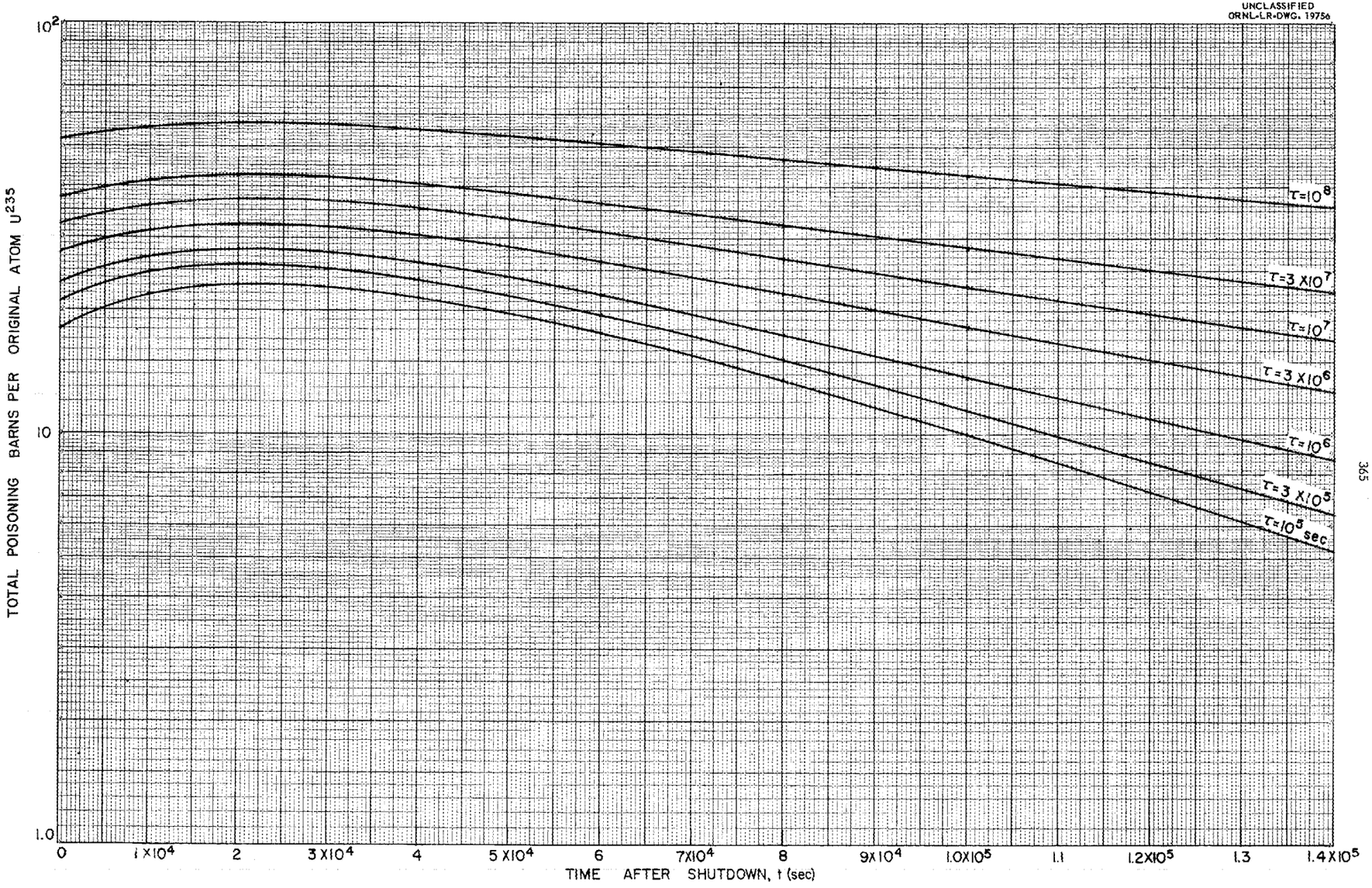


Fig. T-24. Total Fission Product Poisoning as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{13}$ n/cm²/sec.

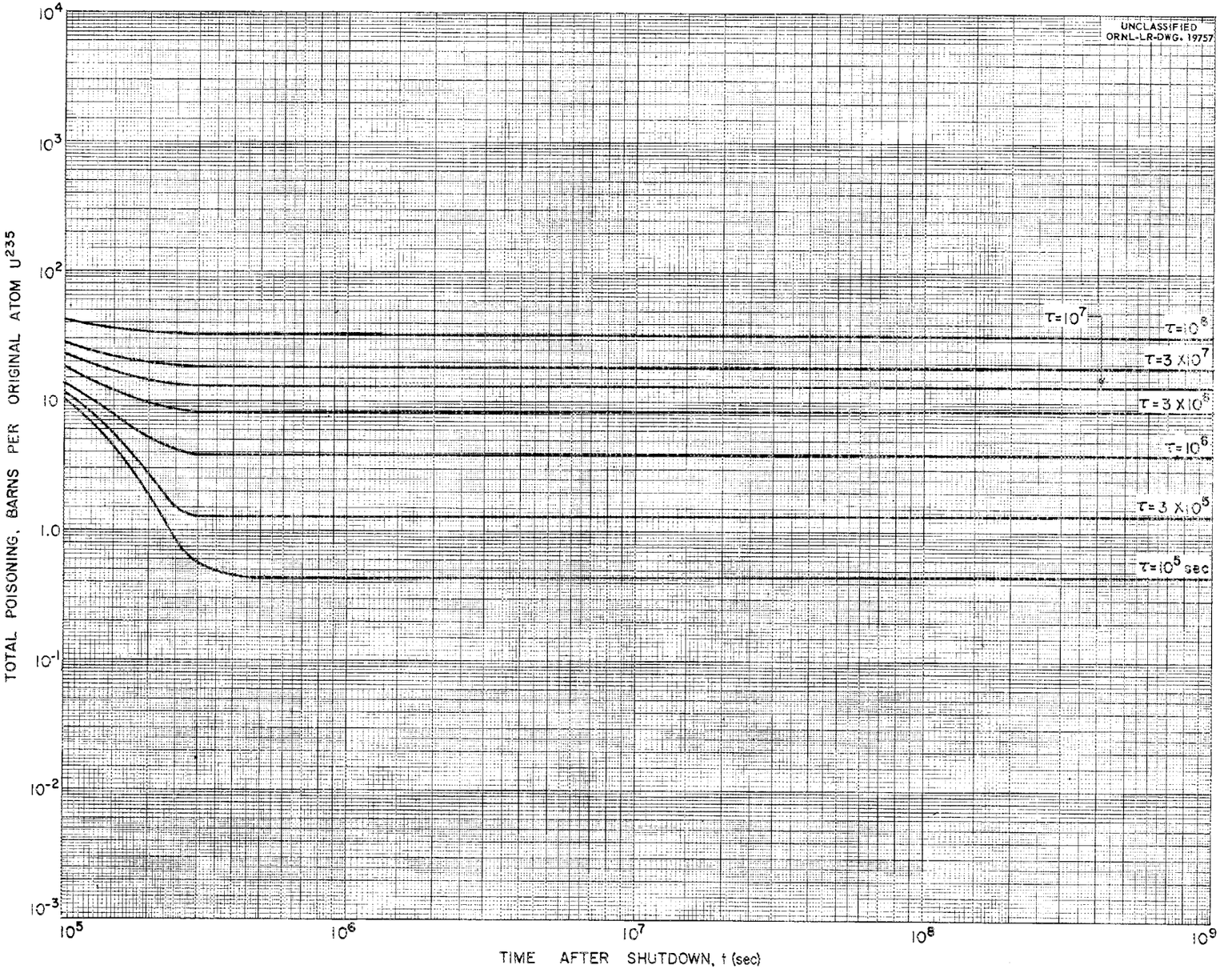


Fig. T-24a Total Fission Product Poisoning as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{13}$ n/cm$^2$/sec.

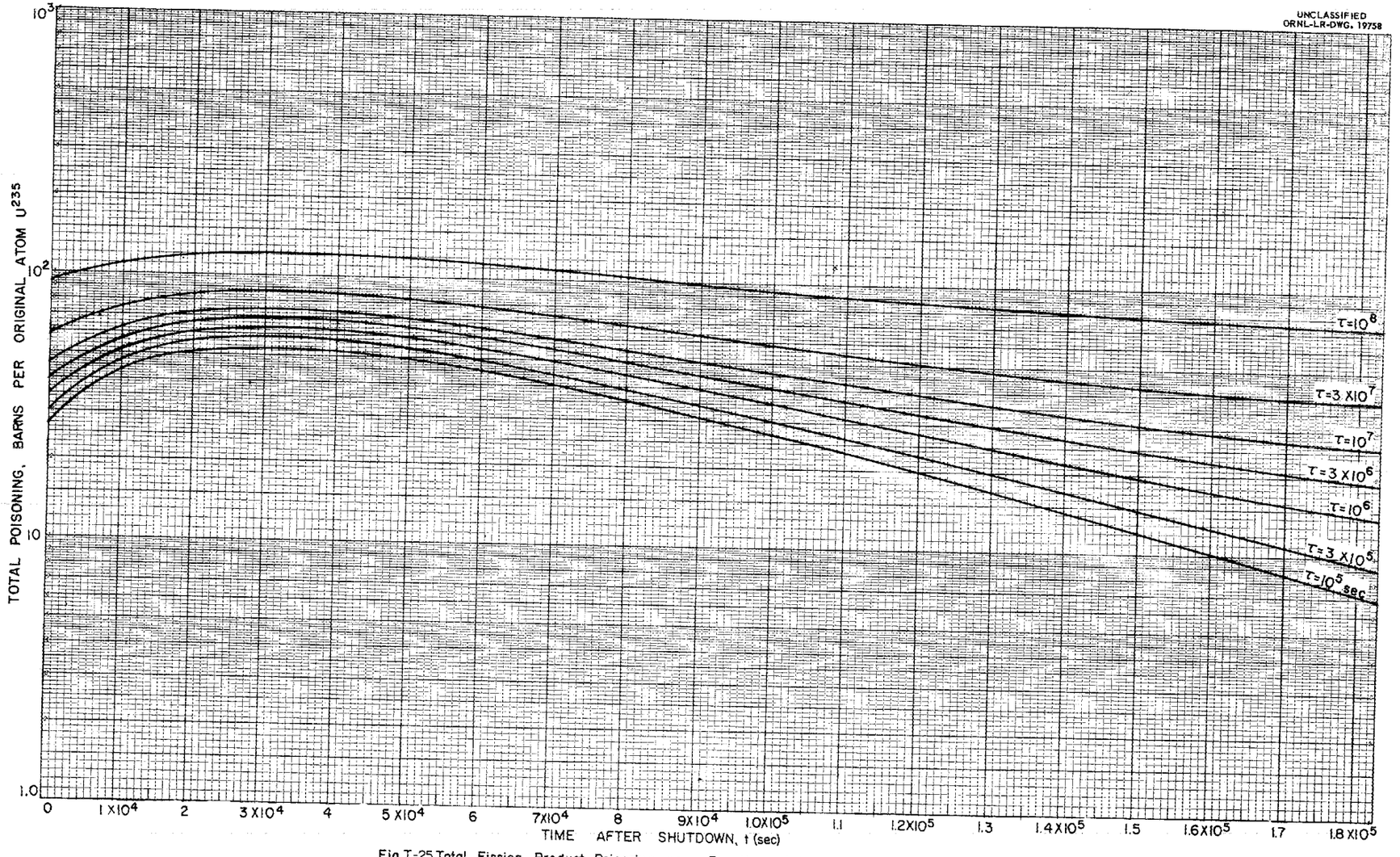


Fig. T-25. Total Fission Product Poisoning as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{13}$ n/cm²/sec.

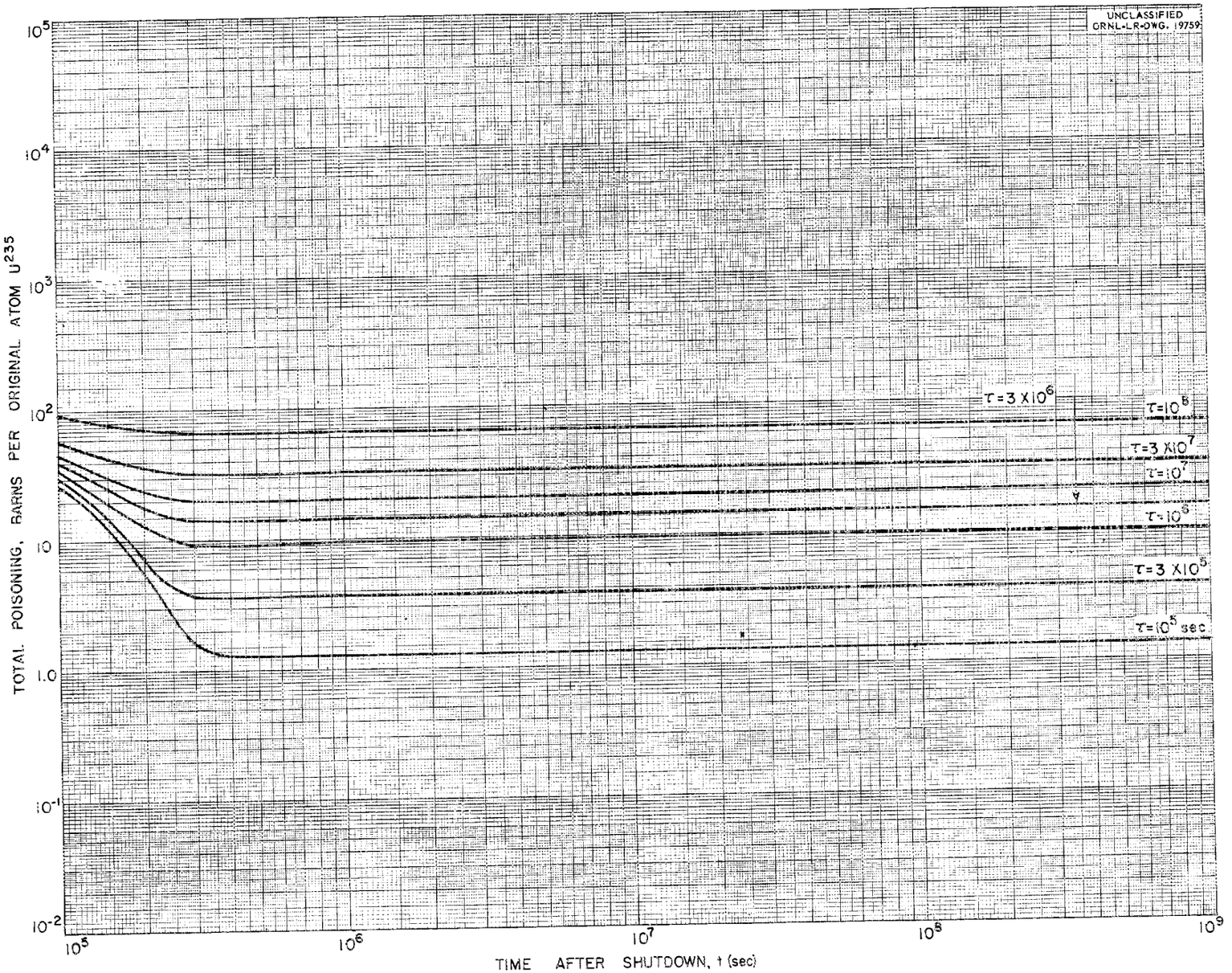


Fig. T-25a Total Fission Product Poisoning as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{13}$ n/cm$^2$/sec.

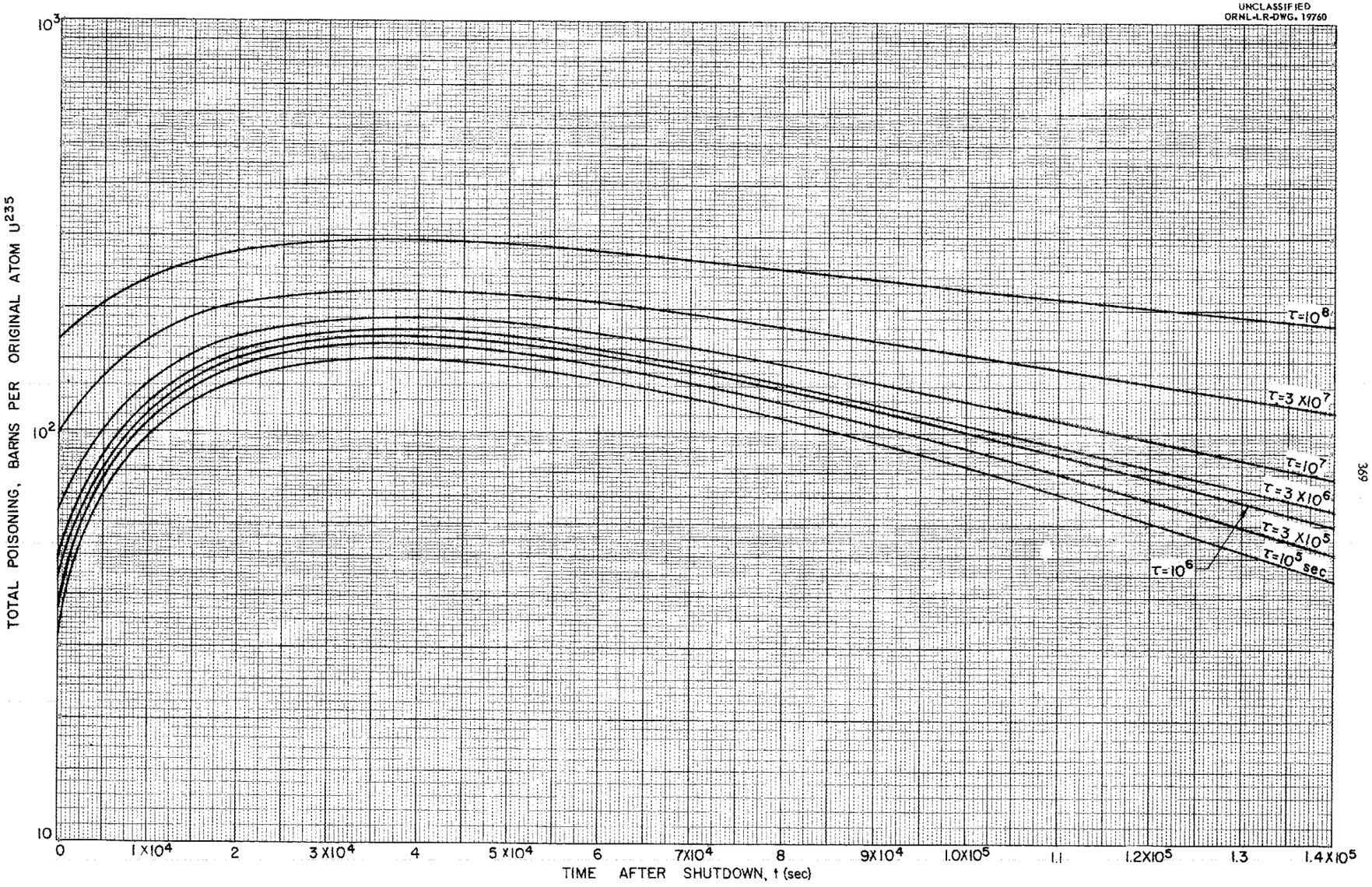


Fig. T-26 Total Fission Product Poisoning as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{14}$ n/cm$^2$/sec.

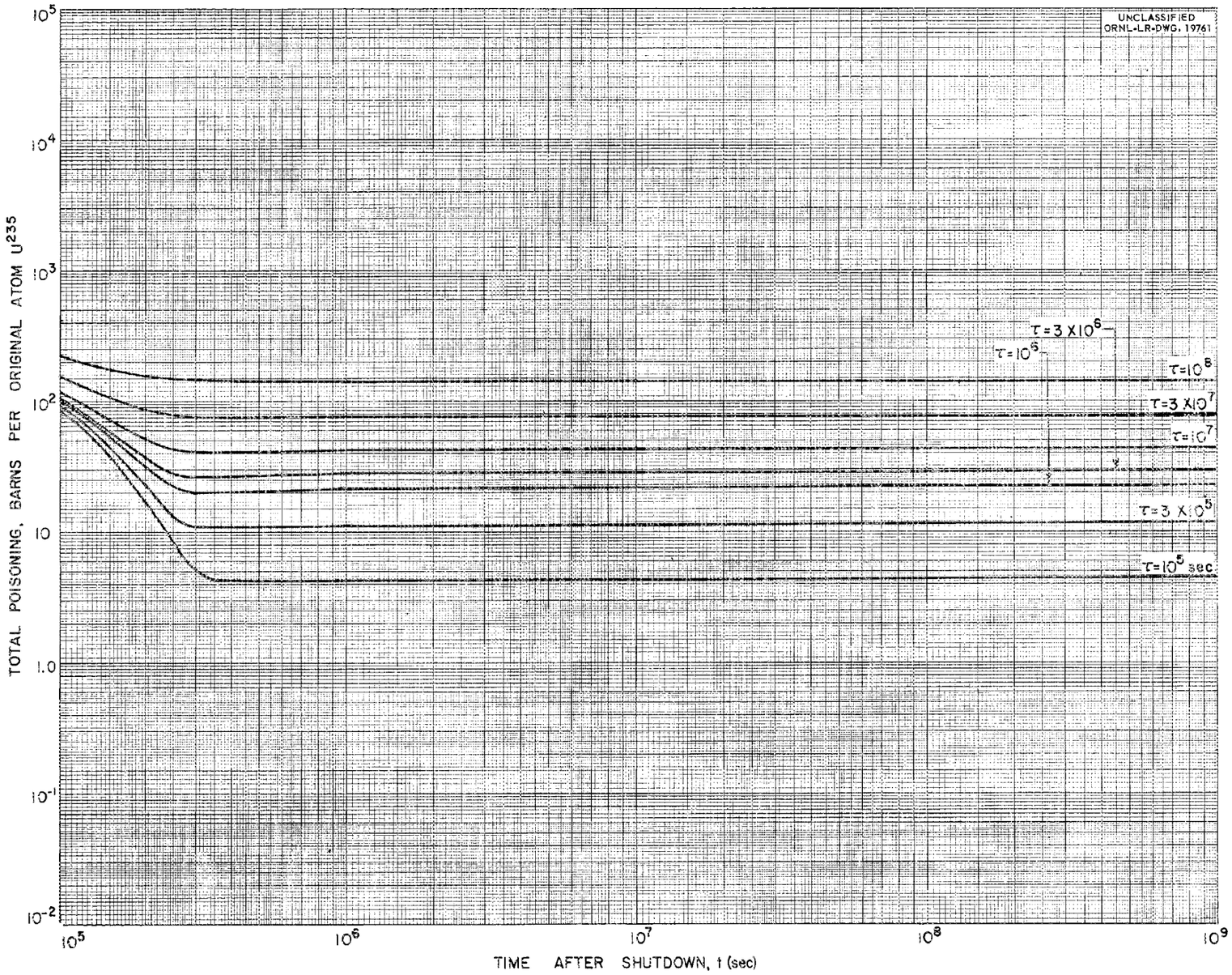


Fig. T-26a Total Fission Product Poisoning as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{14}$ n/cm$^2$/sec.

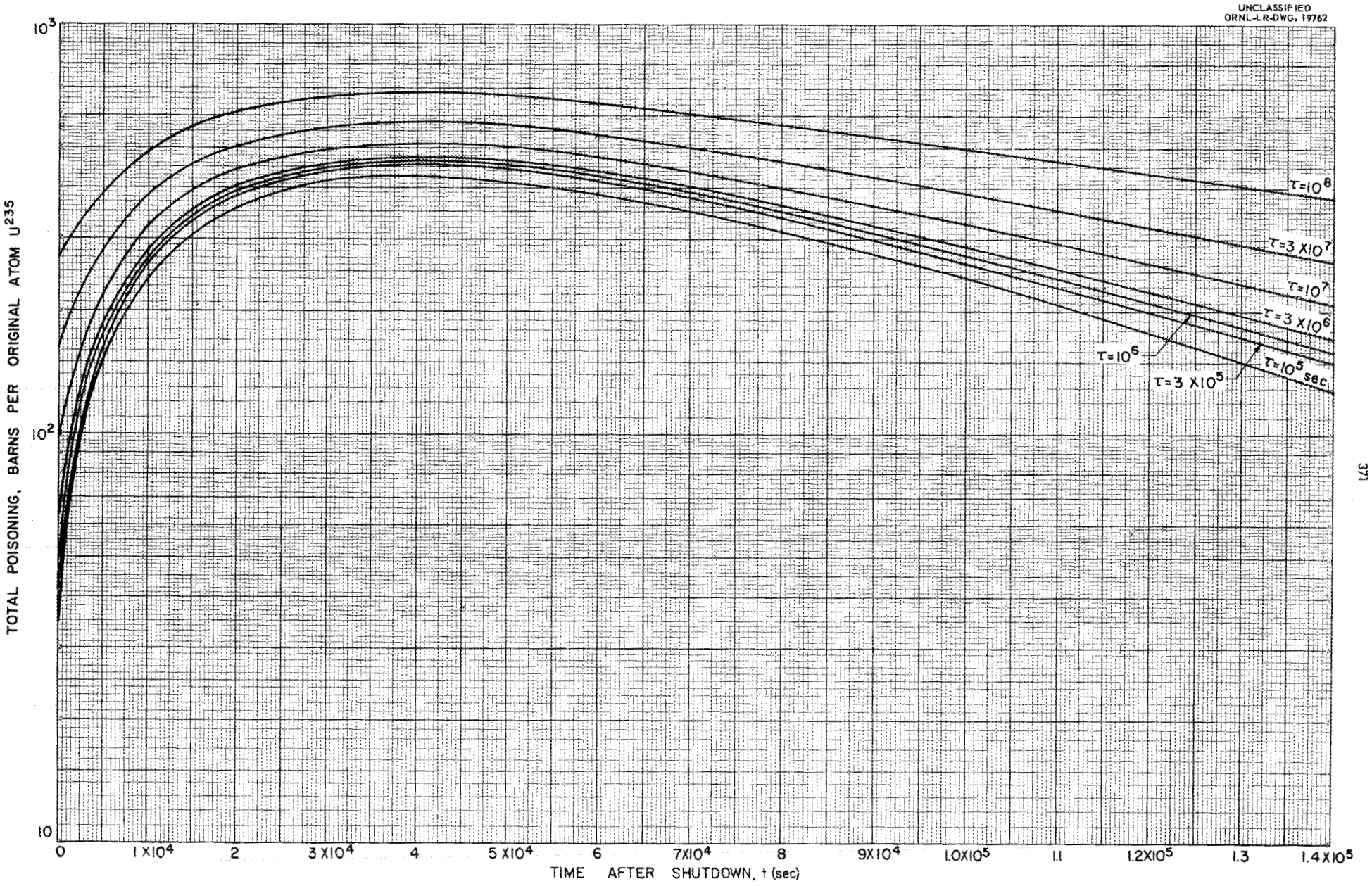


Fig. T-27 Total Fission Product Poisoning as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{14}$ n/cm²/sec.

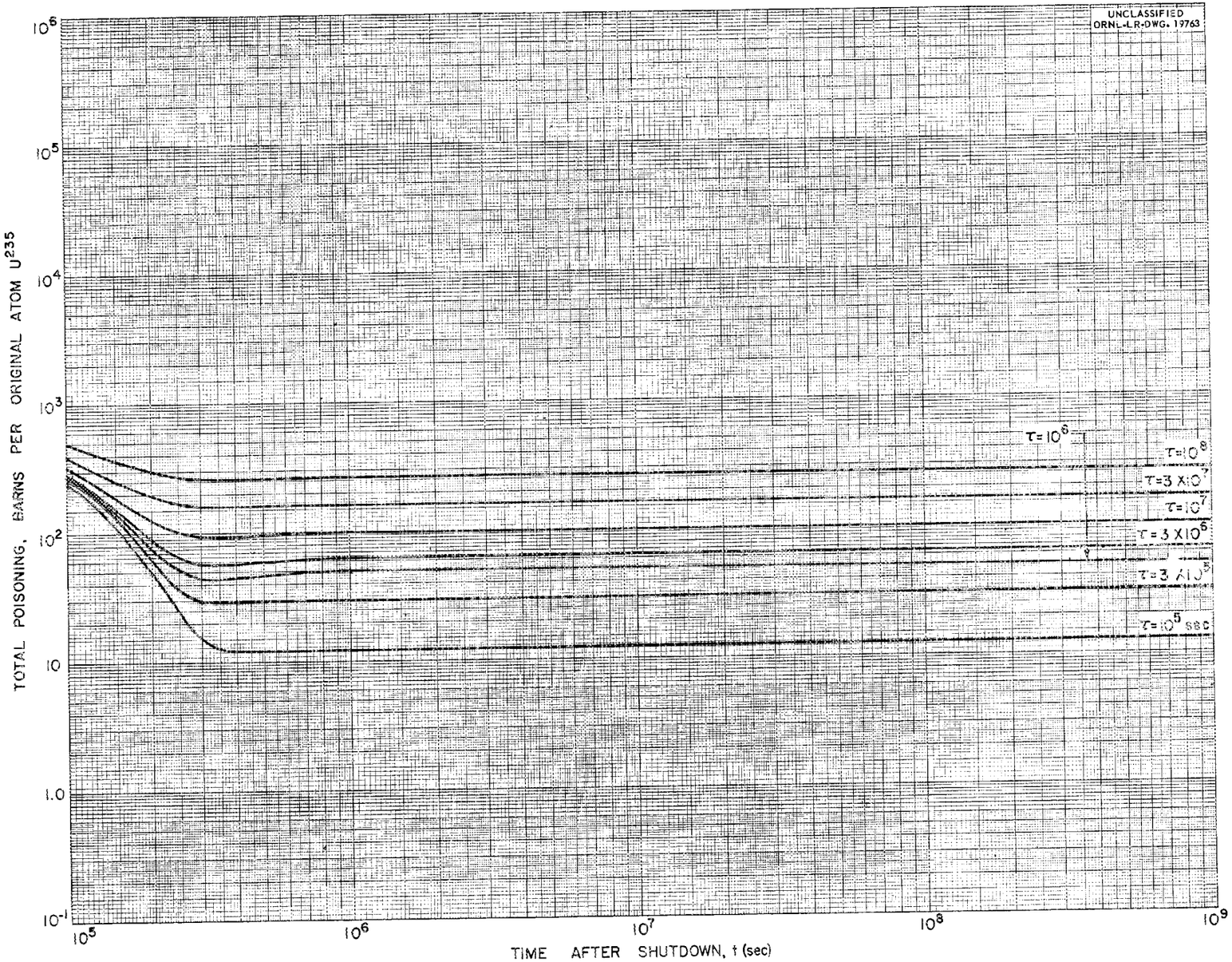


Fig.T-27a.Total Fission Product Poisoning as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{14} n/cm^2/sec.$

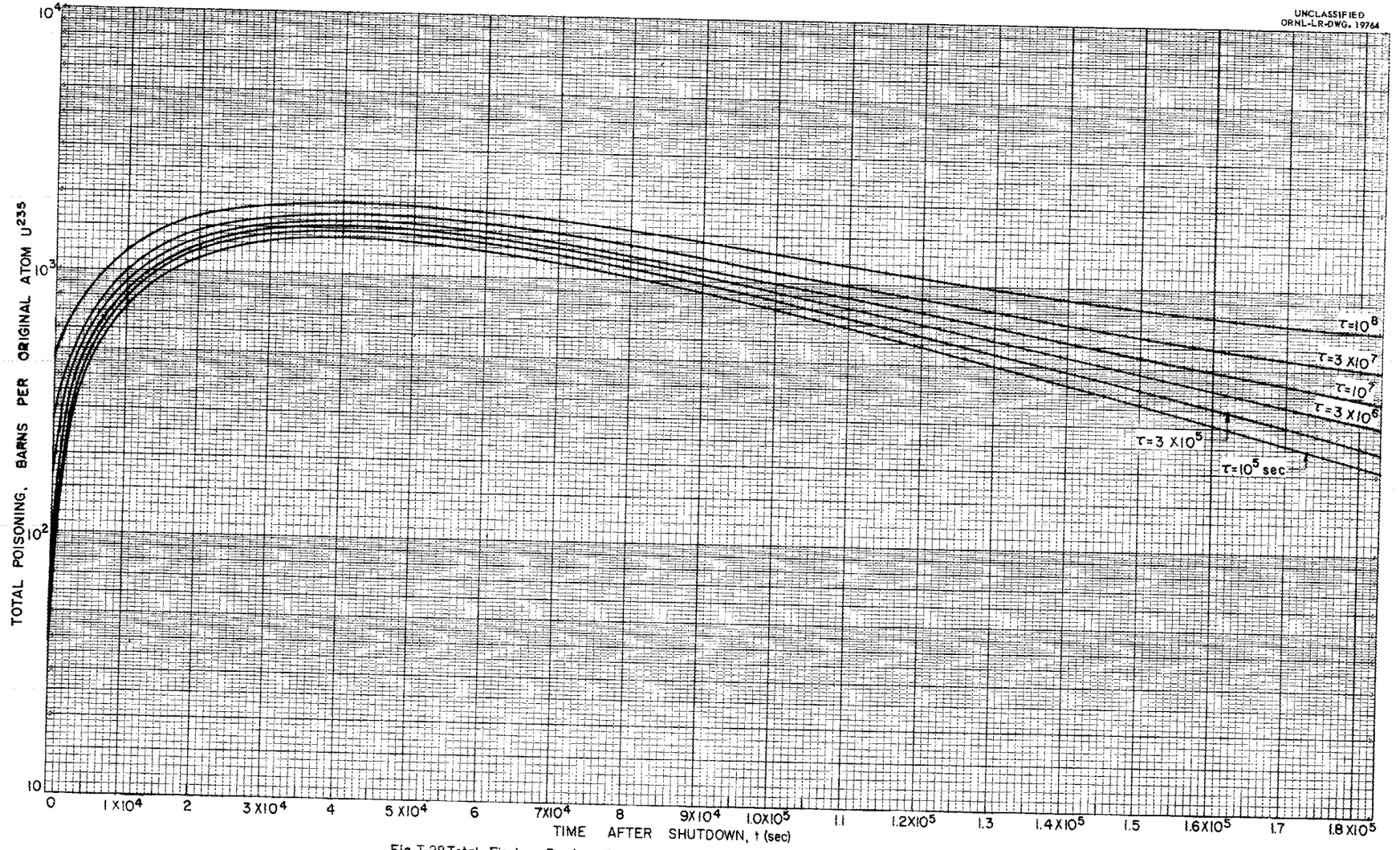


Fig. T-28. Total Fission Product Poisoning as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm$^2$/sec.

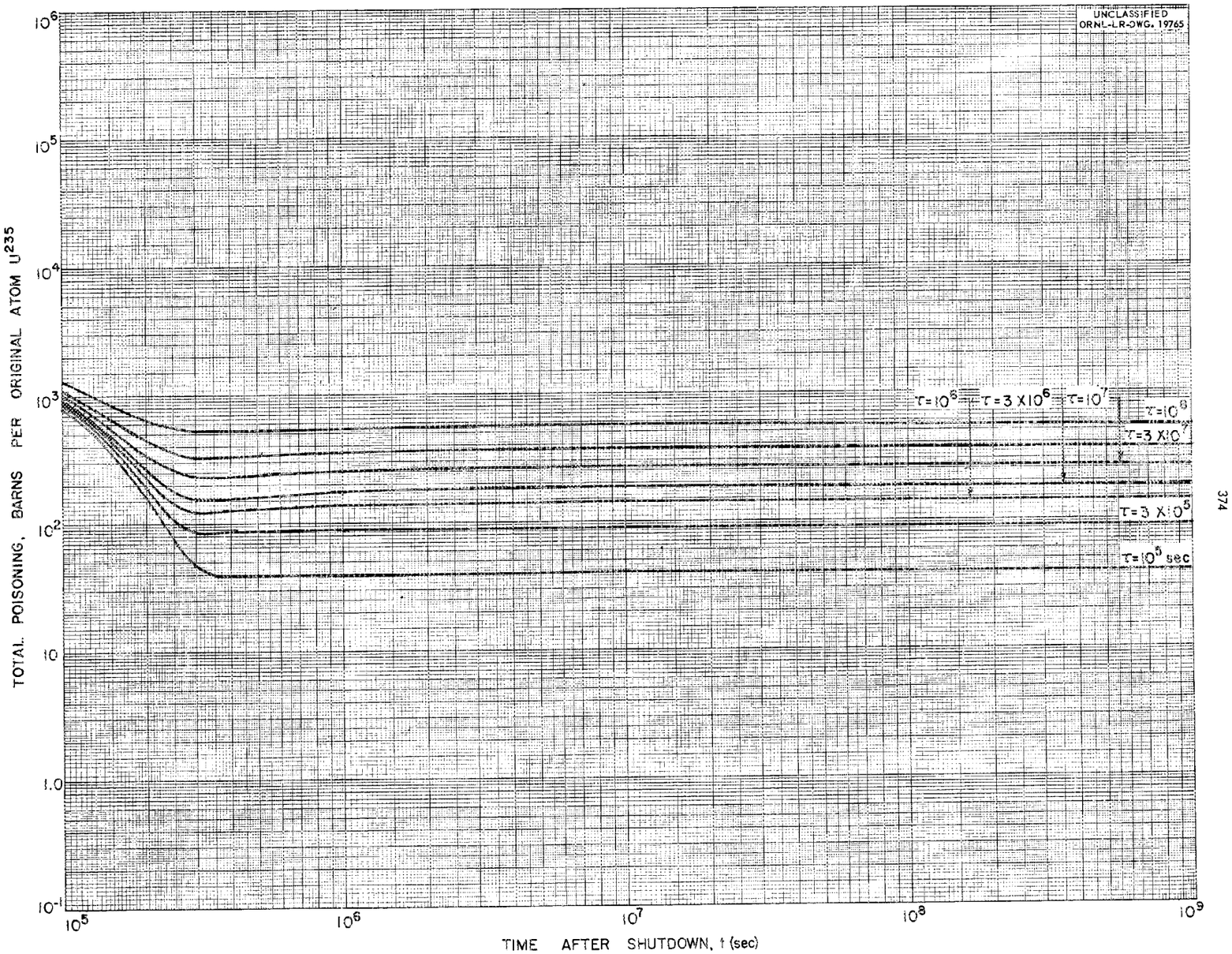


Fig. T-28a. Total Fission Product Poisoning as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm$^2$/sec.

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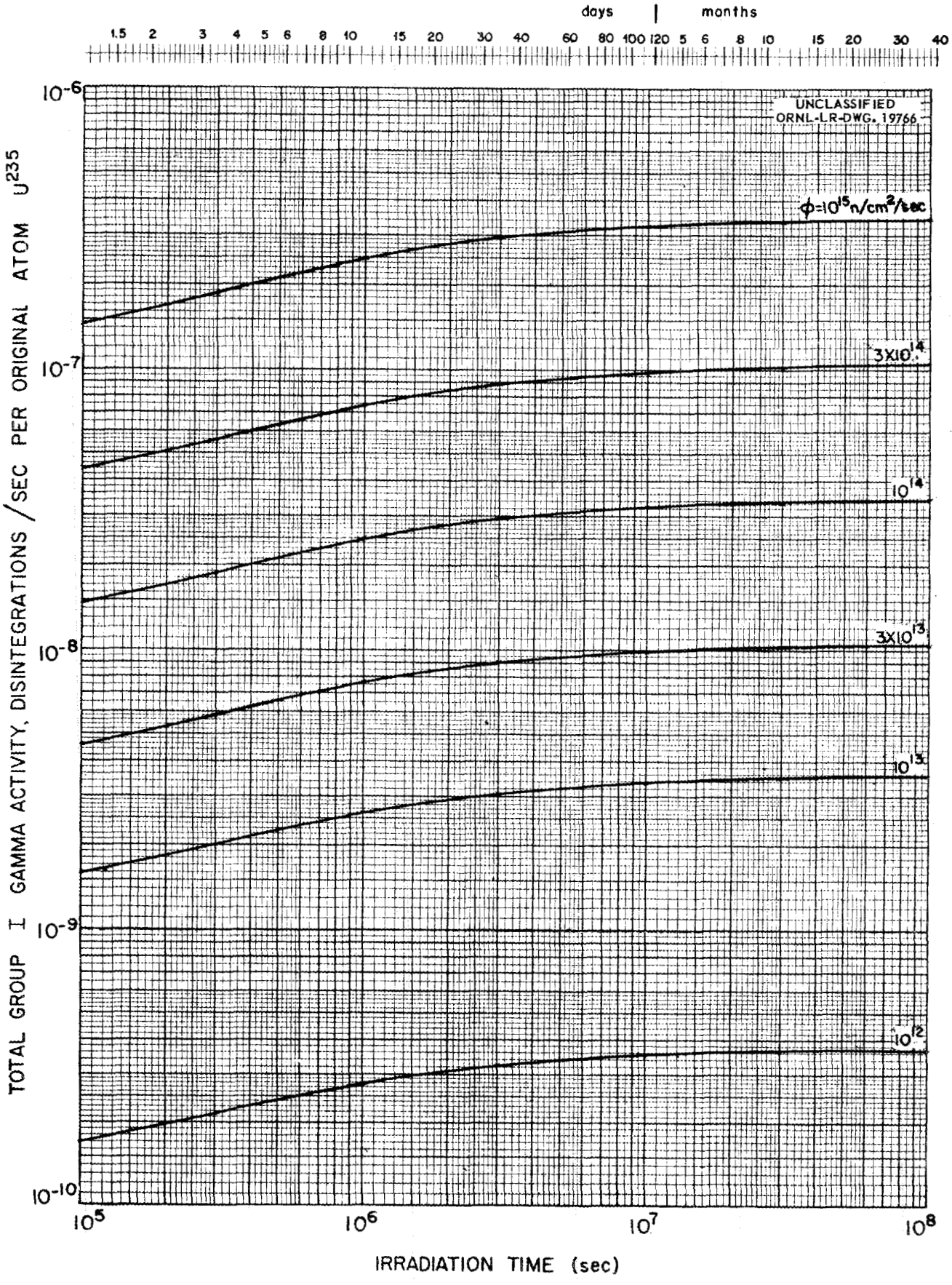


Fig. T-29. Buildup of Group I (0-0.25 Mev) Gamma Activity with Irradiation Time and Thermal Neutron Flux.

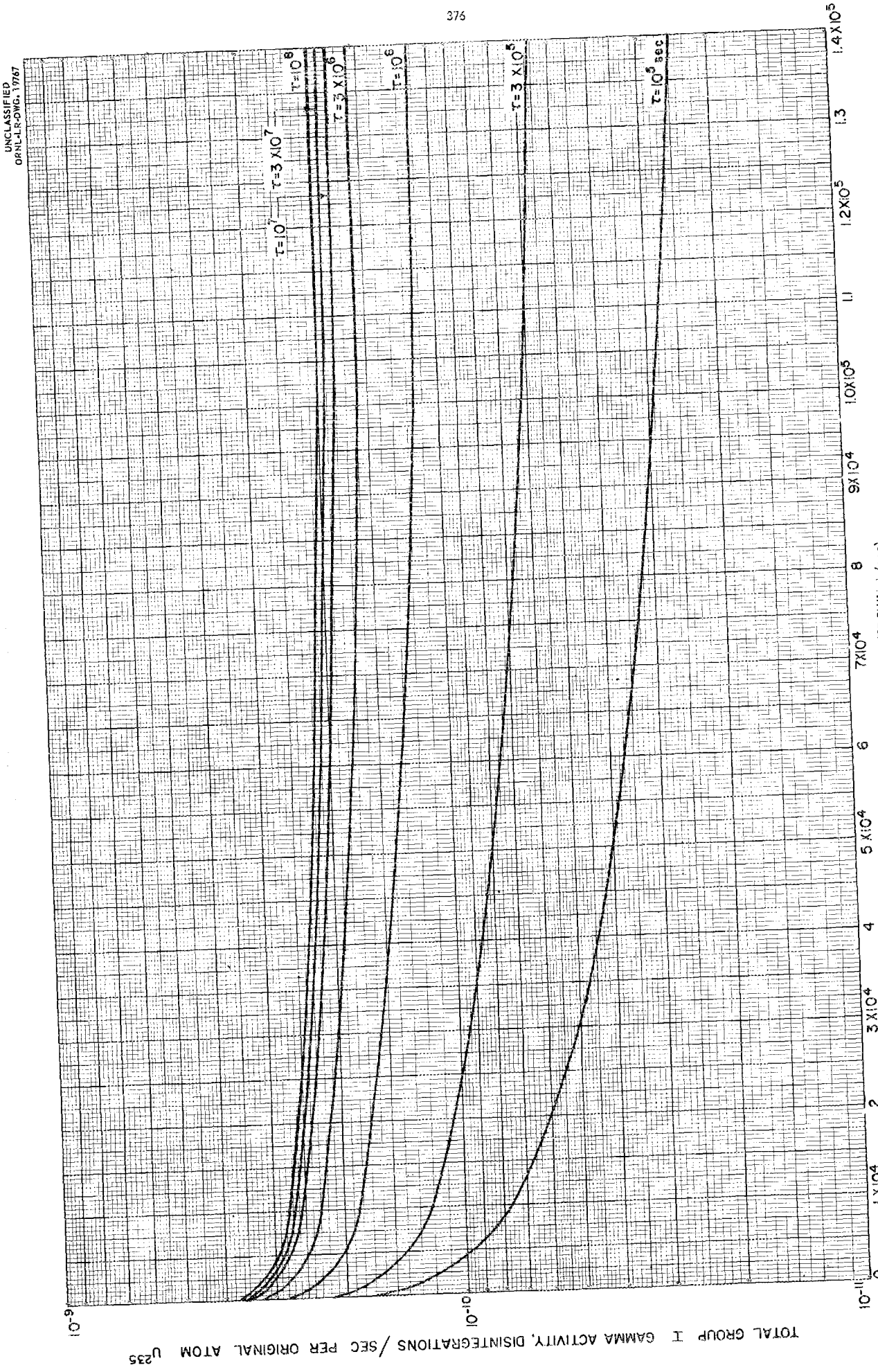


Fig. T-30. Total Group I (0-0.25 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{12}$ n/cm$^2$/sec.

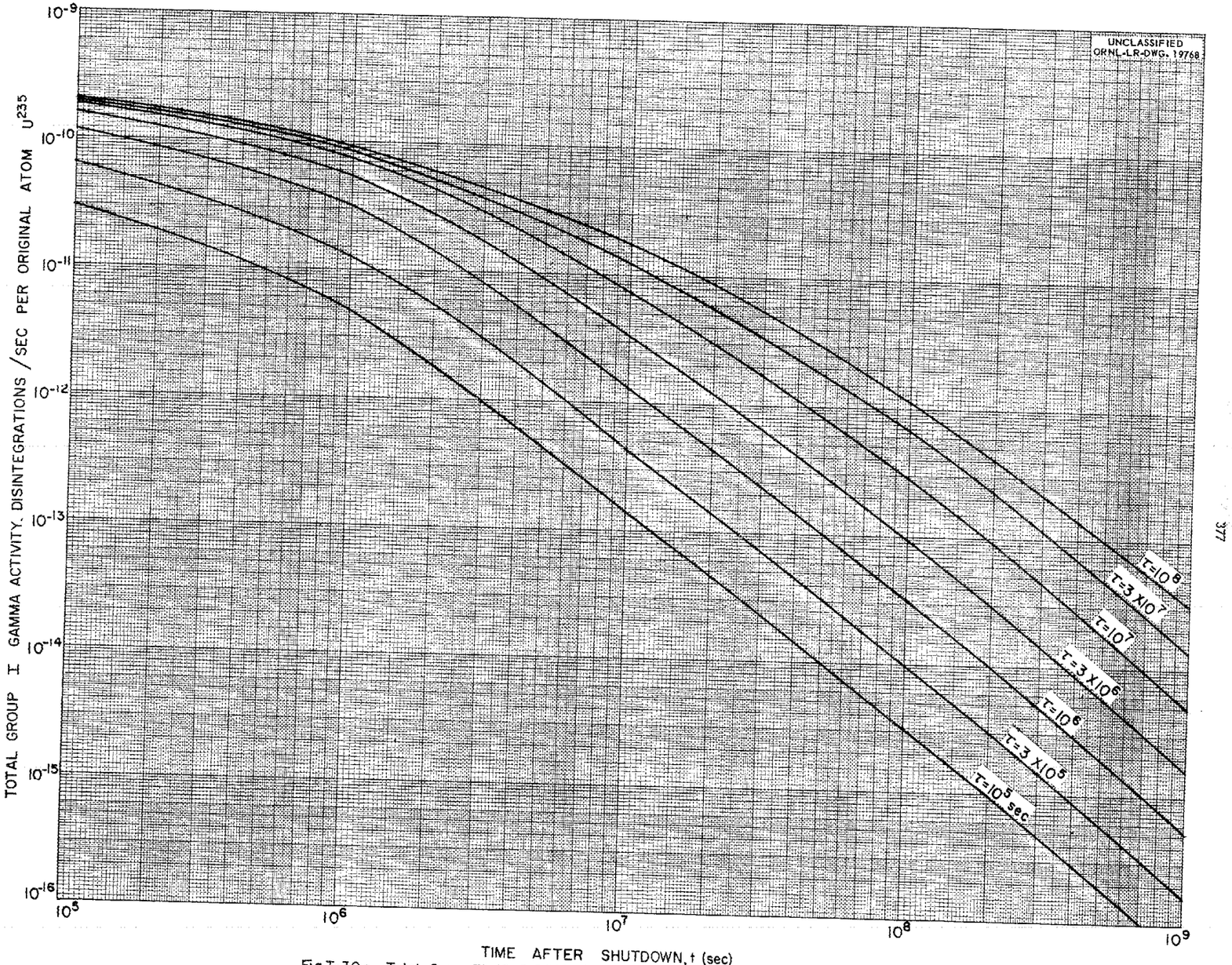


Fig. T-30a. Total Group I (0-0.25 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{12}$ n/cm$^2$/sec.

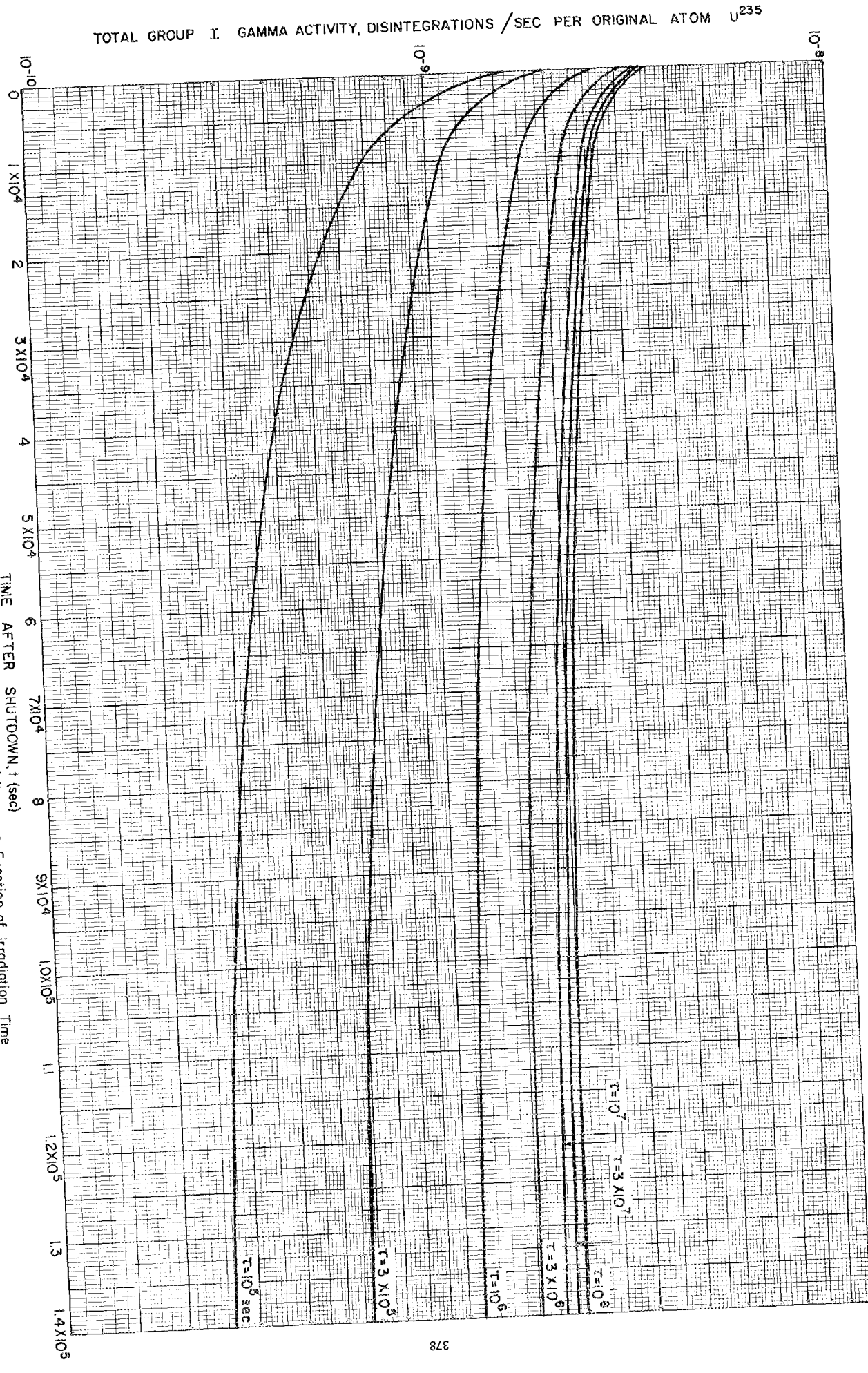


Fig. T-31. Total Group I (0-0.25 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{13}$ n/cm²/sec.

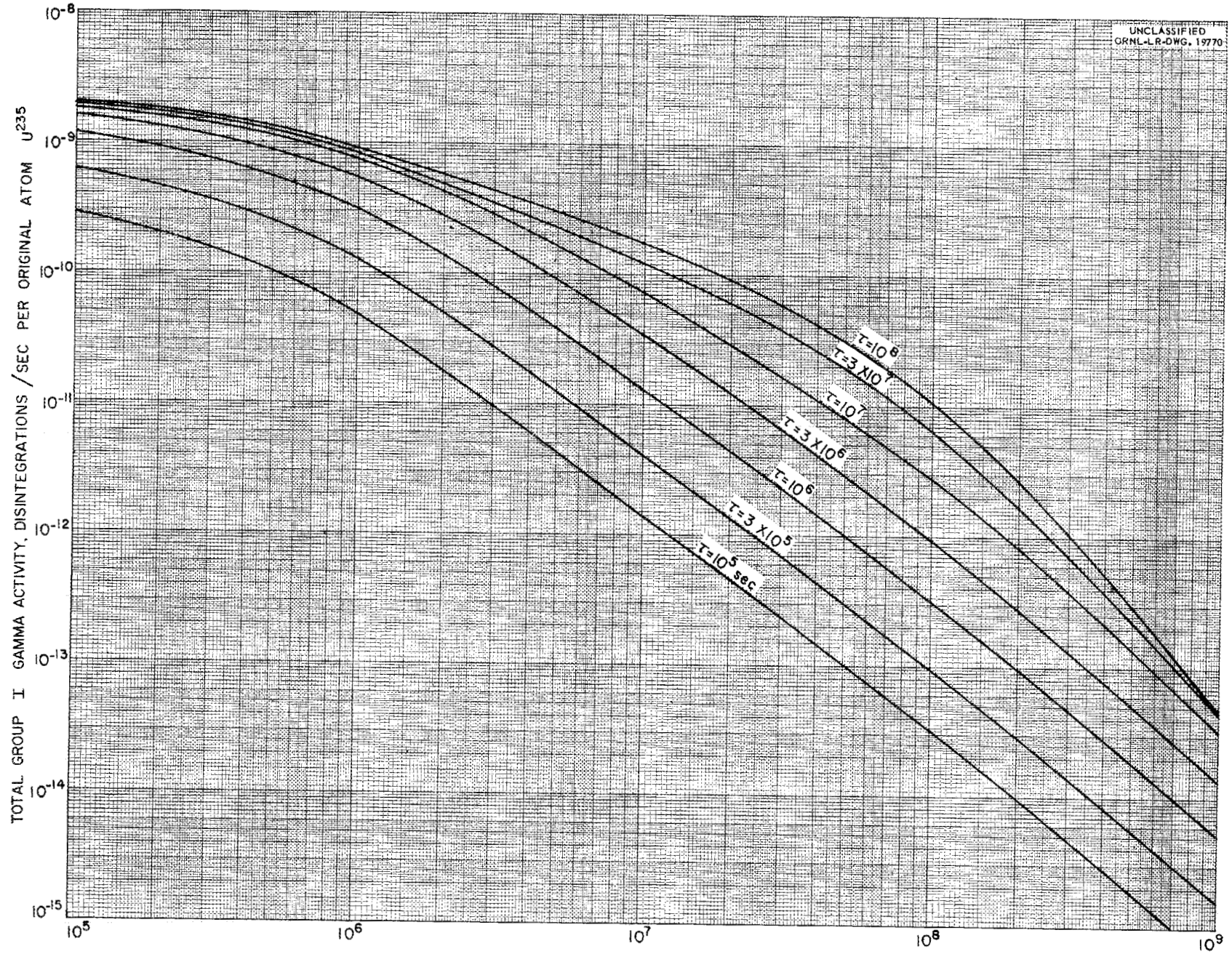


Fig. T-31a. Total Group I. (0-0.25 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{13}$ n/cm$^2$/sec.

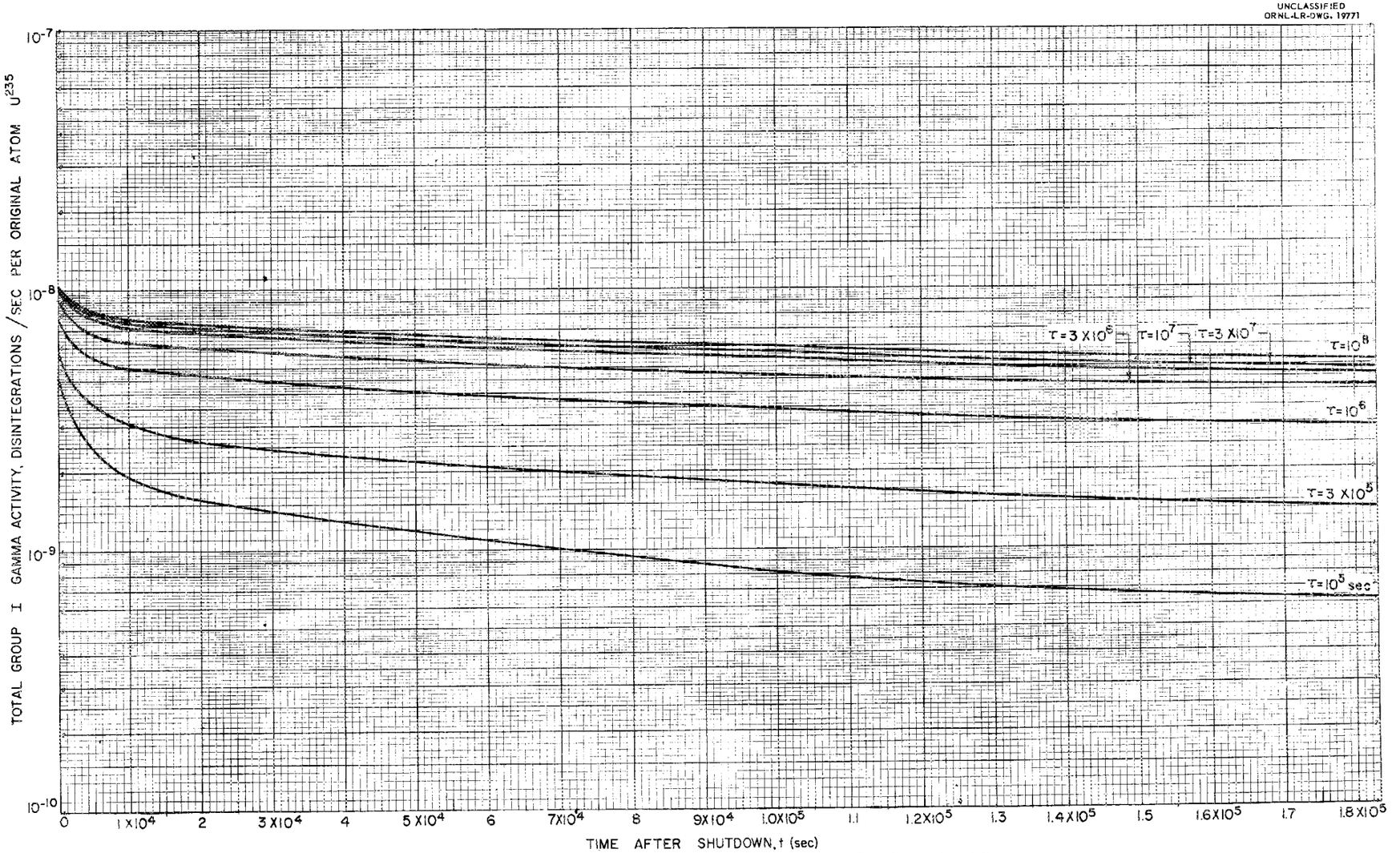


Fig. T-32. Total Group I (0-0.25 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{13}$ n/cm$^2$/sec.

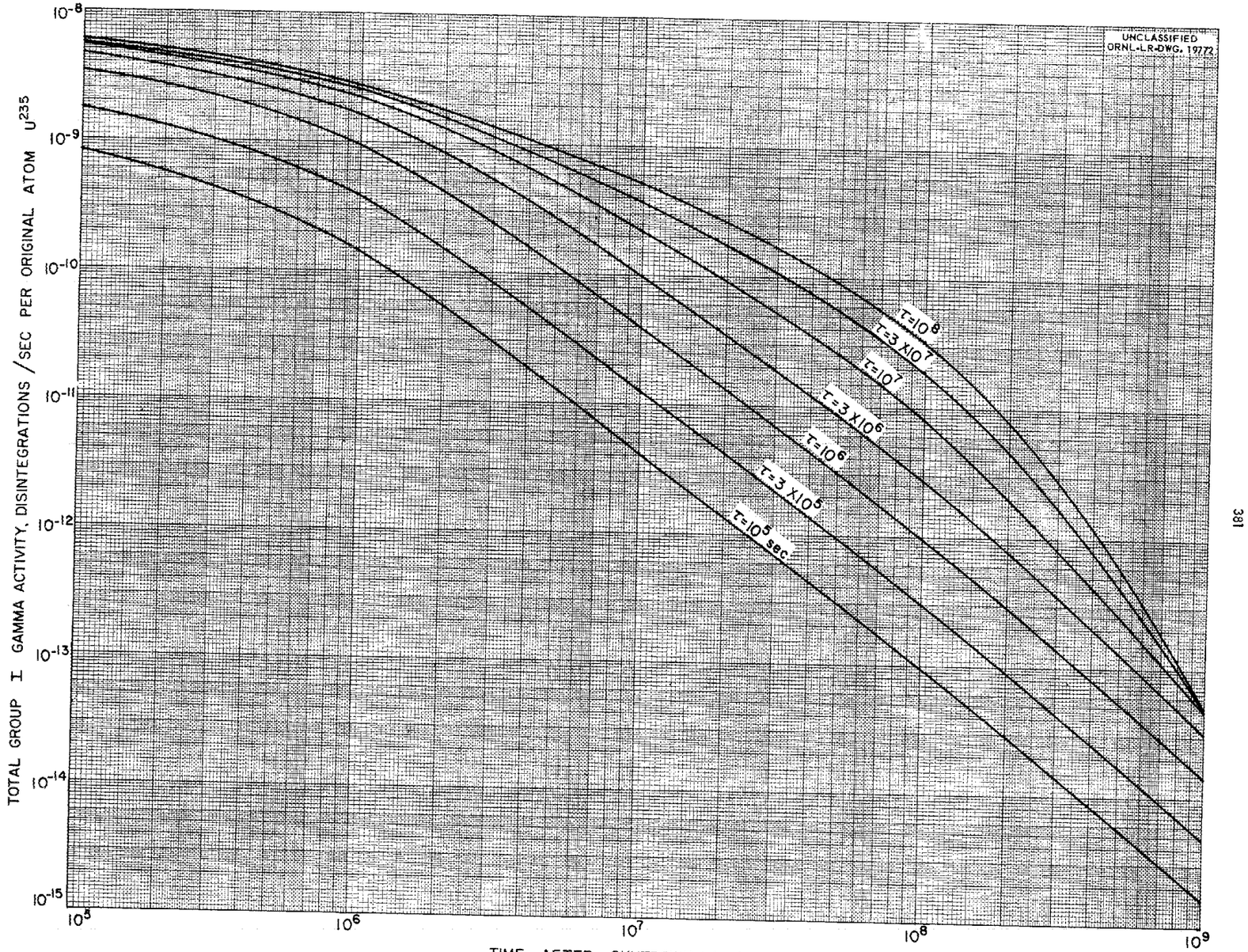


Fig. T-32a. Total Group I (0-0.25 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{13}$ n/cm$^2$/sec.

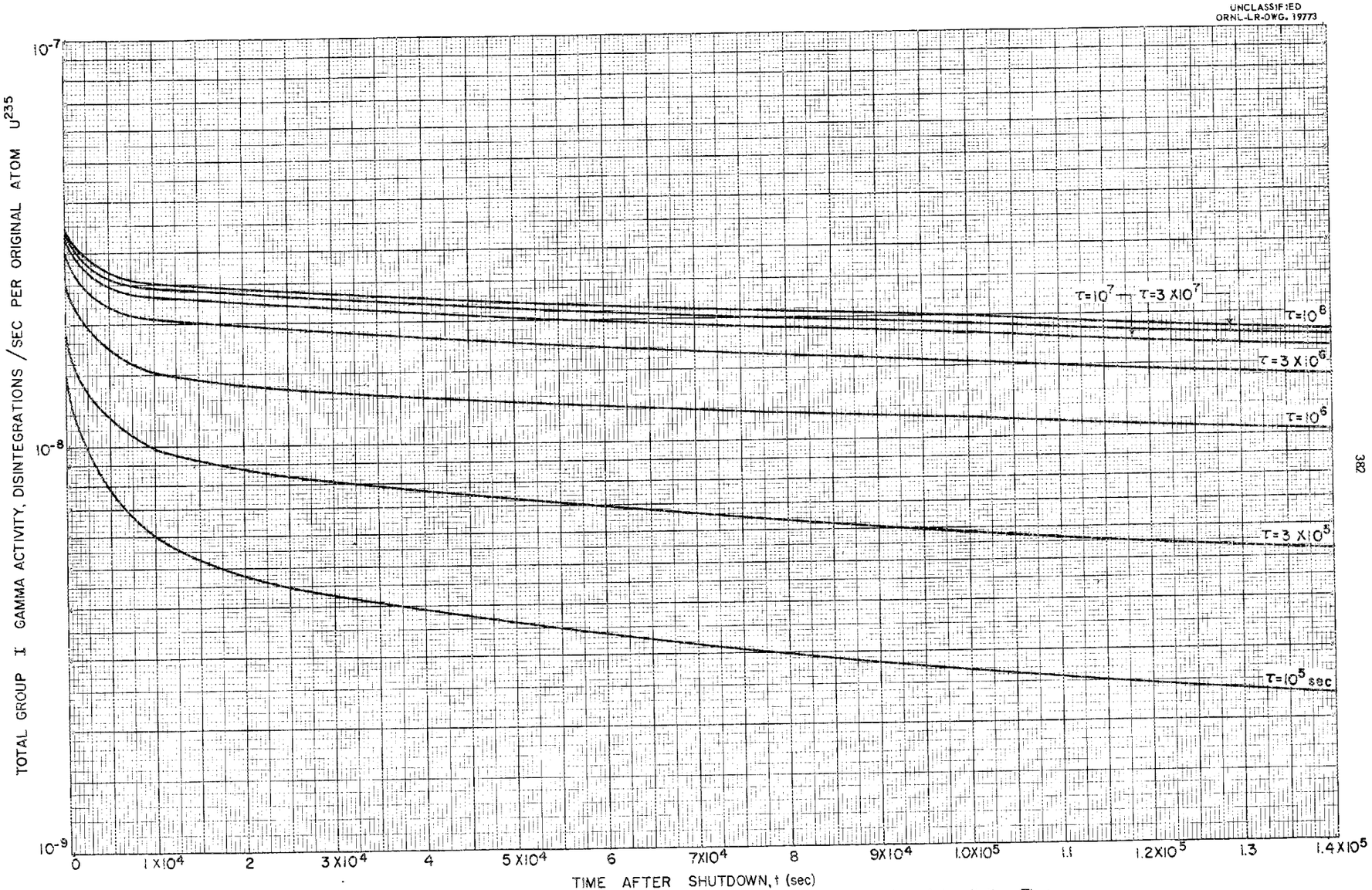


Fig. T-33. Total Group I (0-0.25 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{14}$ n/cm$^2$/sec.

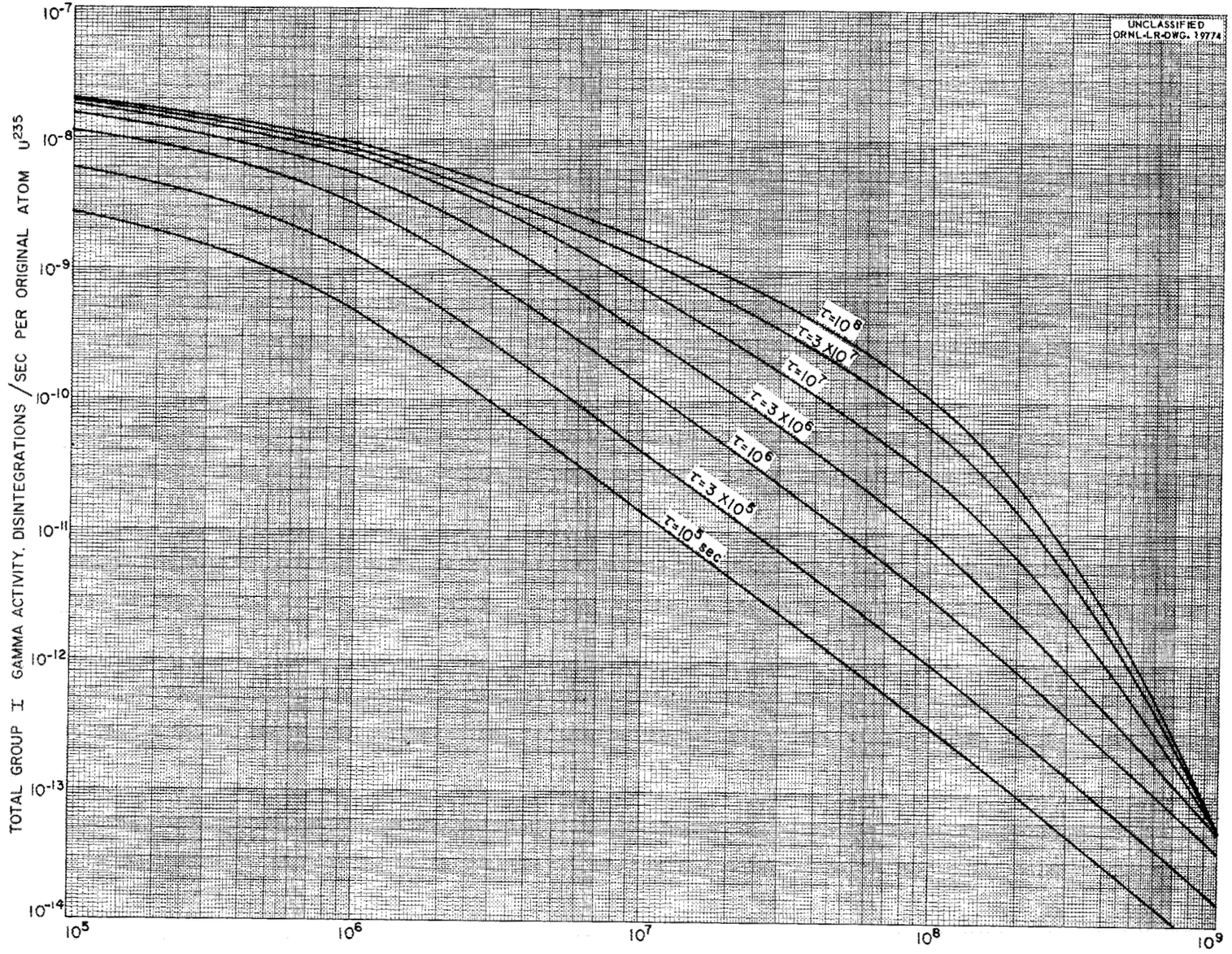


Fig. T-33 a. Total Group I (0-0.25 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{14}$ n/cm$^2$/sec.

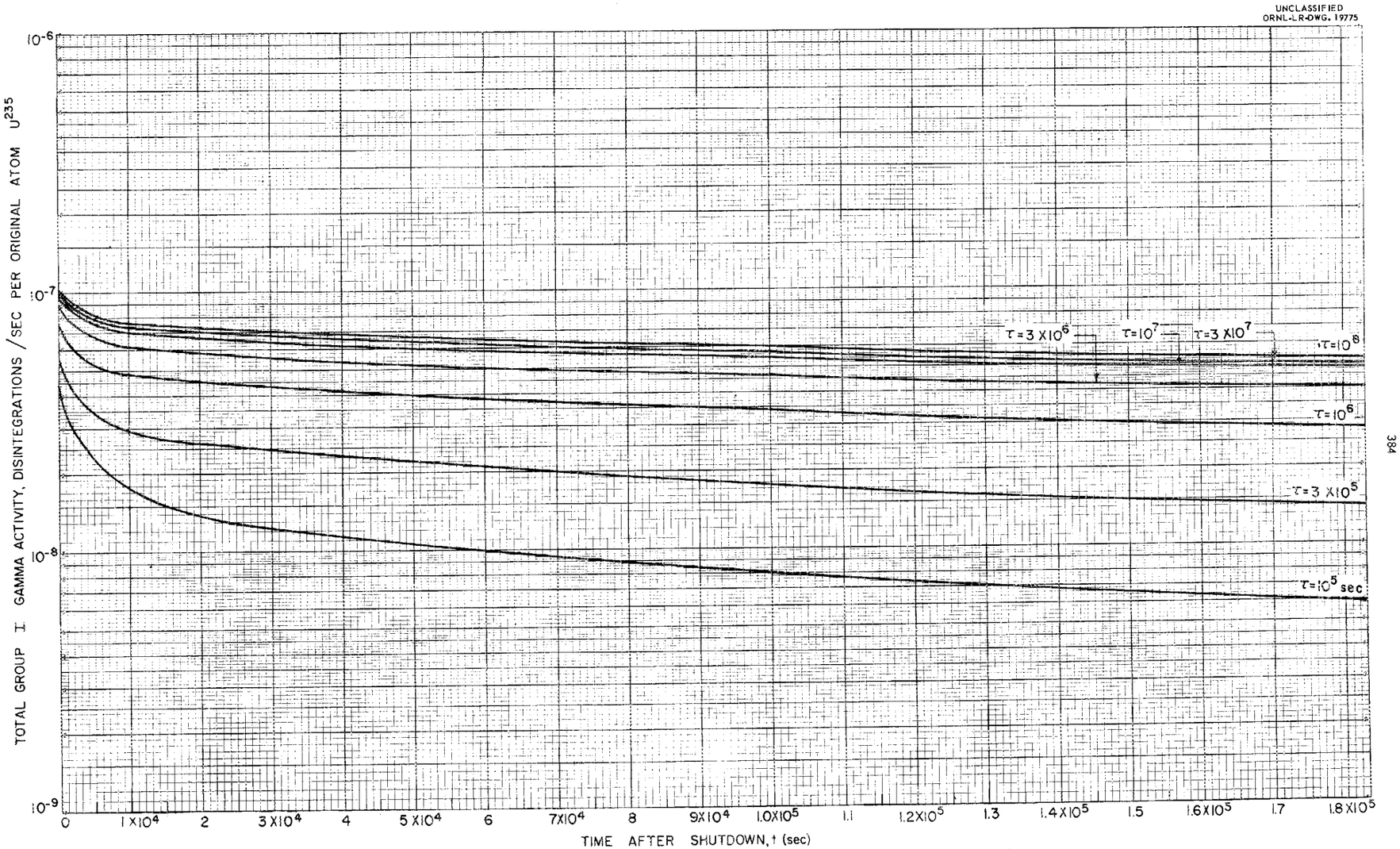


Fig. T-34. Total Group I (0-0.25 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{14}$ n/cm$^2$/sec.

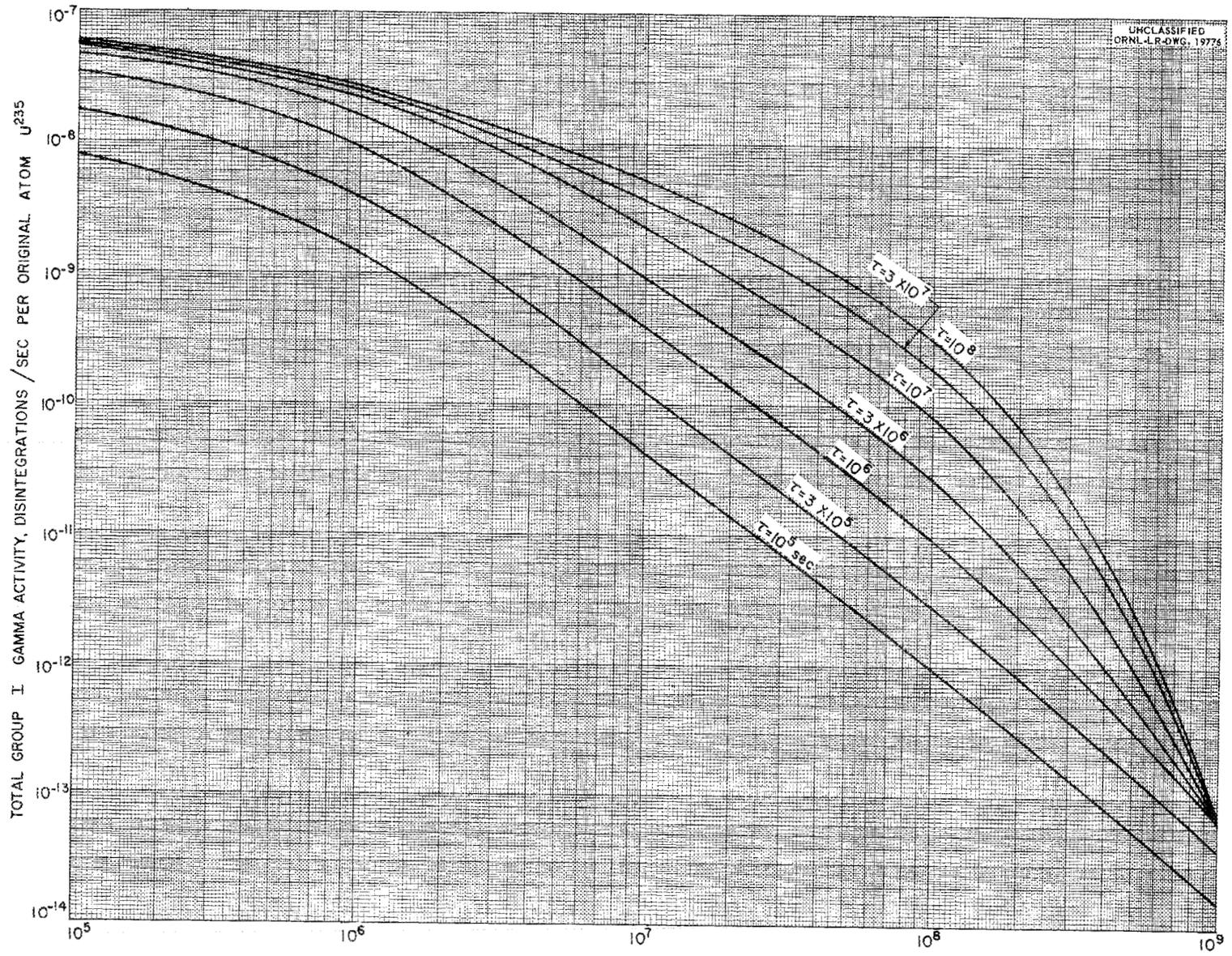


Fig. T-34a. Total Group I (0-0.25 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{14}$ n/cm$^2$/sec.

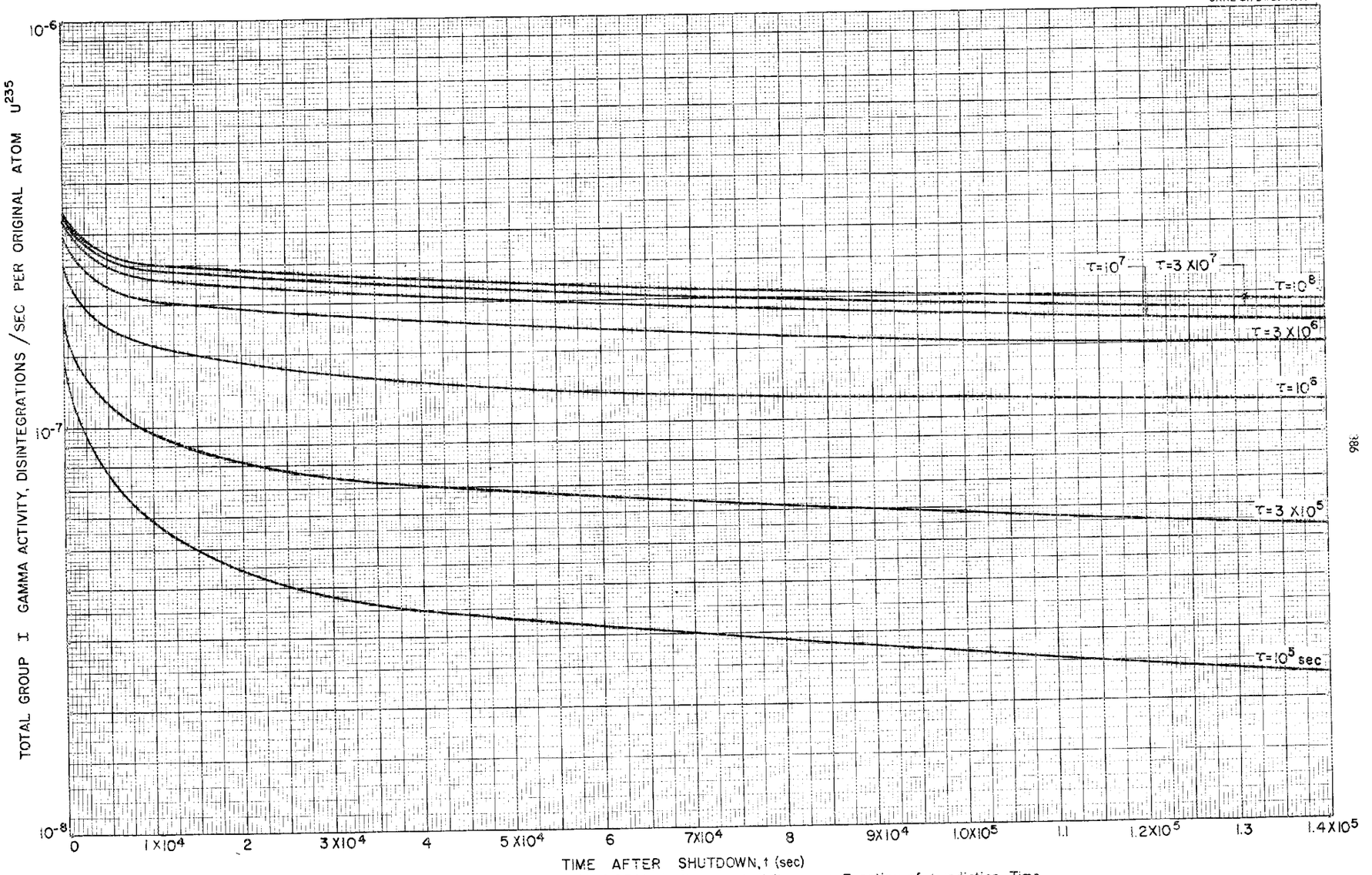


Fig. T-35. Total Group I (0-0.25 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm$^2$/sec.

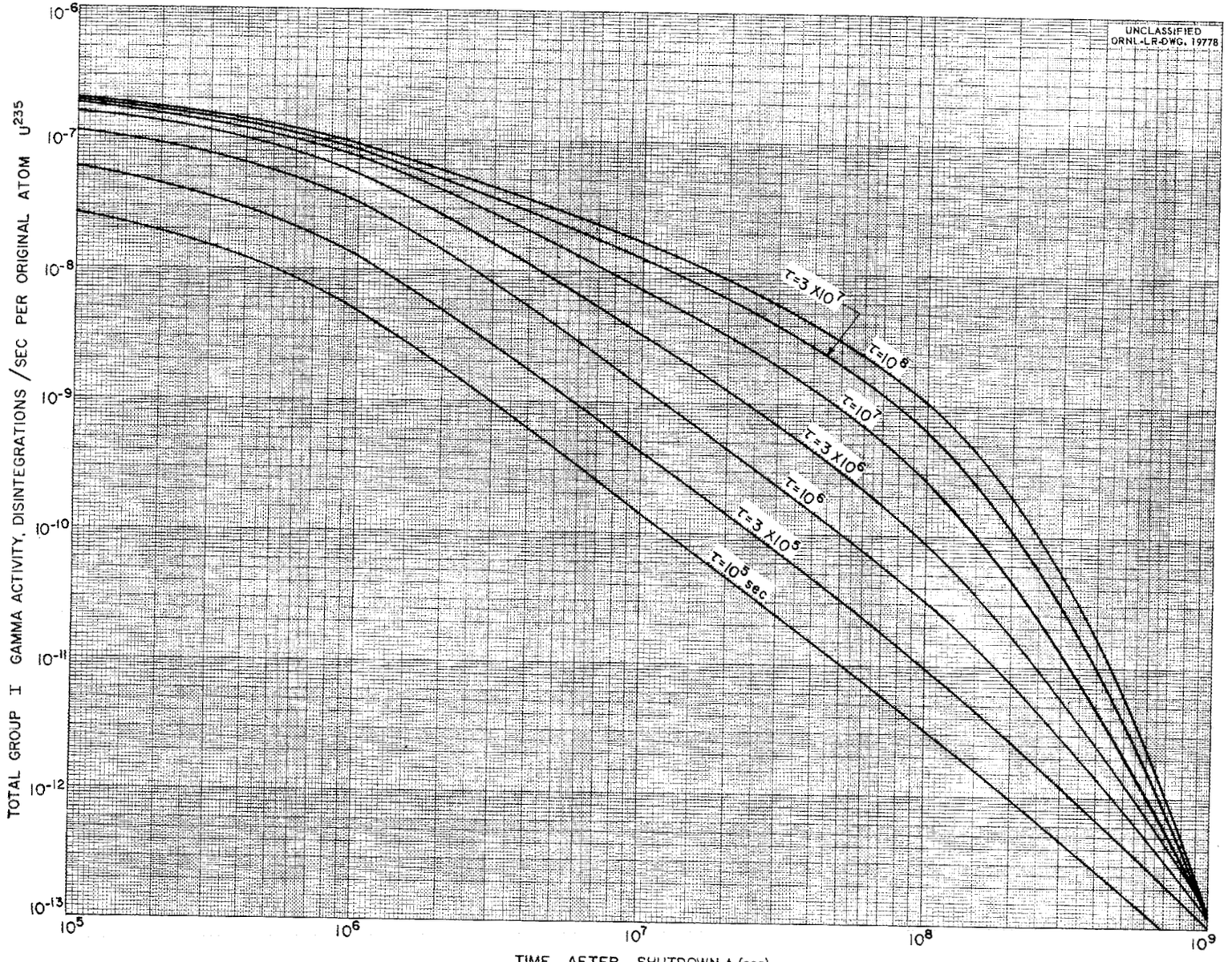


Fig. T-35a. Total Group I (0-0.25 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm$^2$/sec.

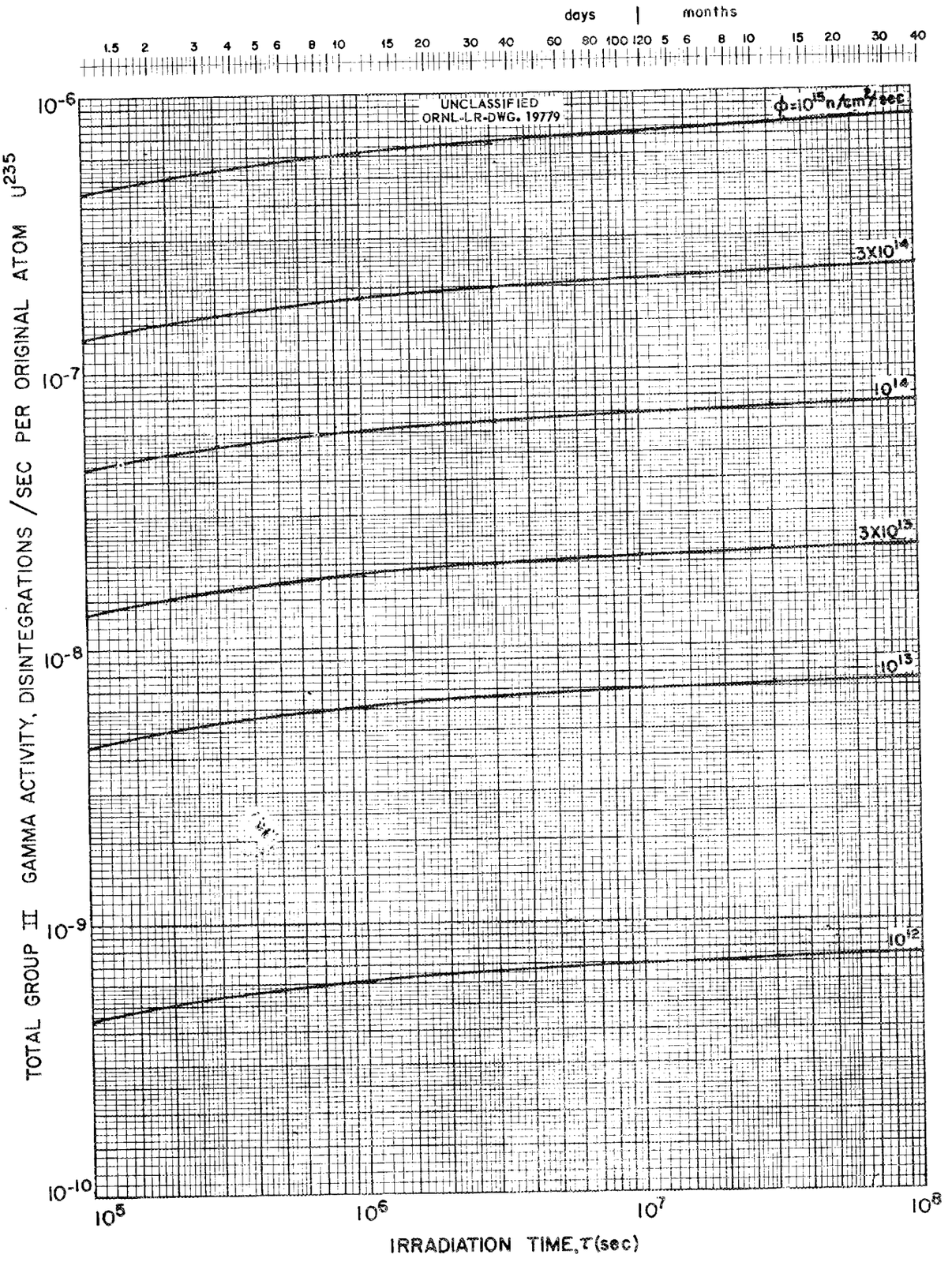


Fig. T-36. Buildup of Group II (0.26-1.00 Mev) Gamma Activity with Irradiation Time and Thermal Neutron Flux.

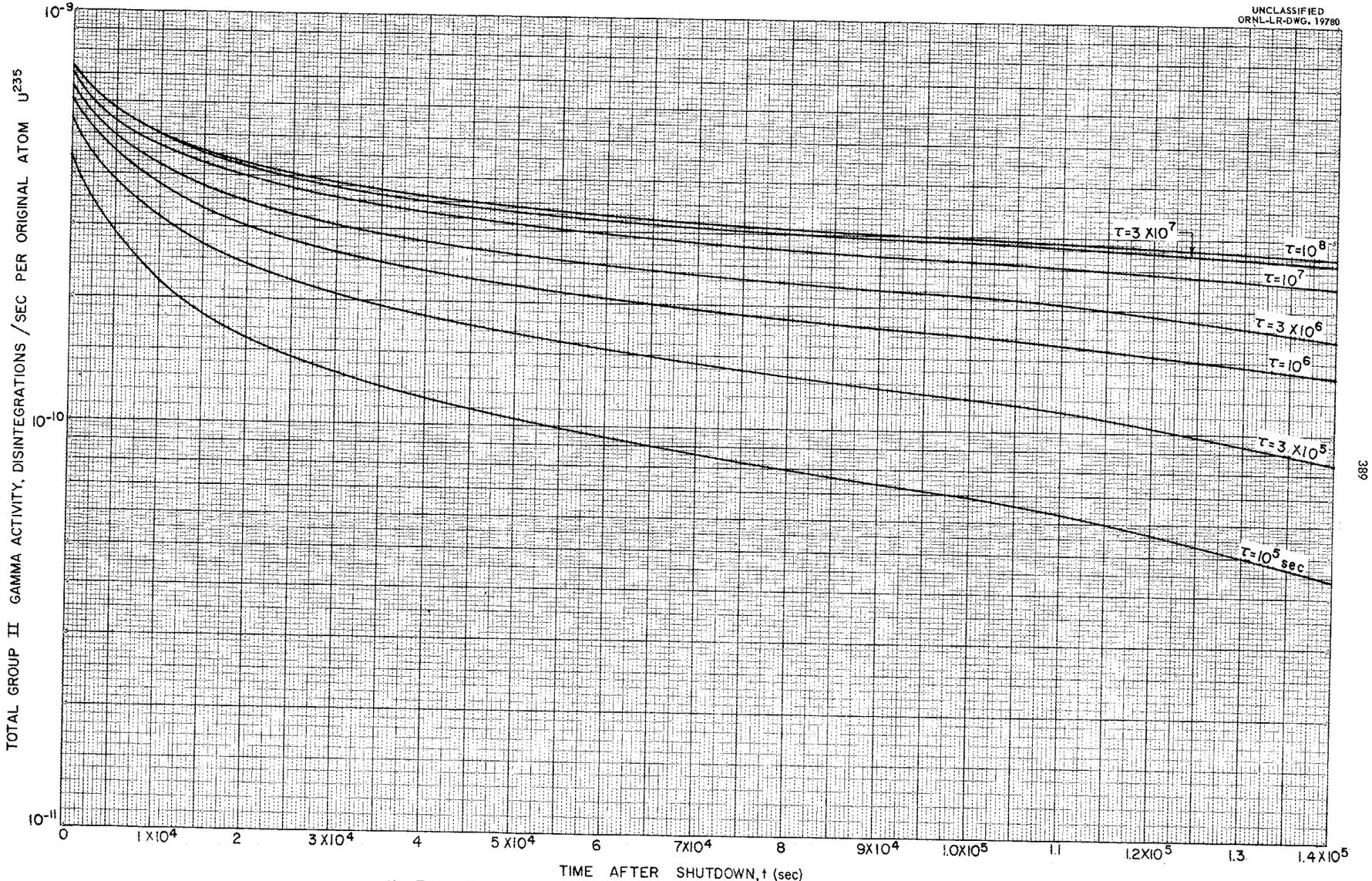


Fig. T-37 Total Group II (0.26–1.00 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{12}$ n/cm$^2$/sec.

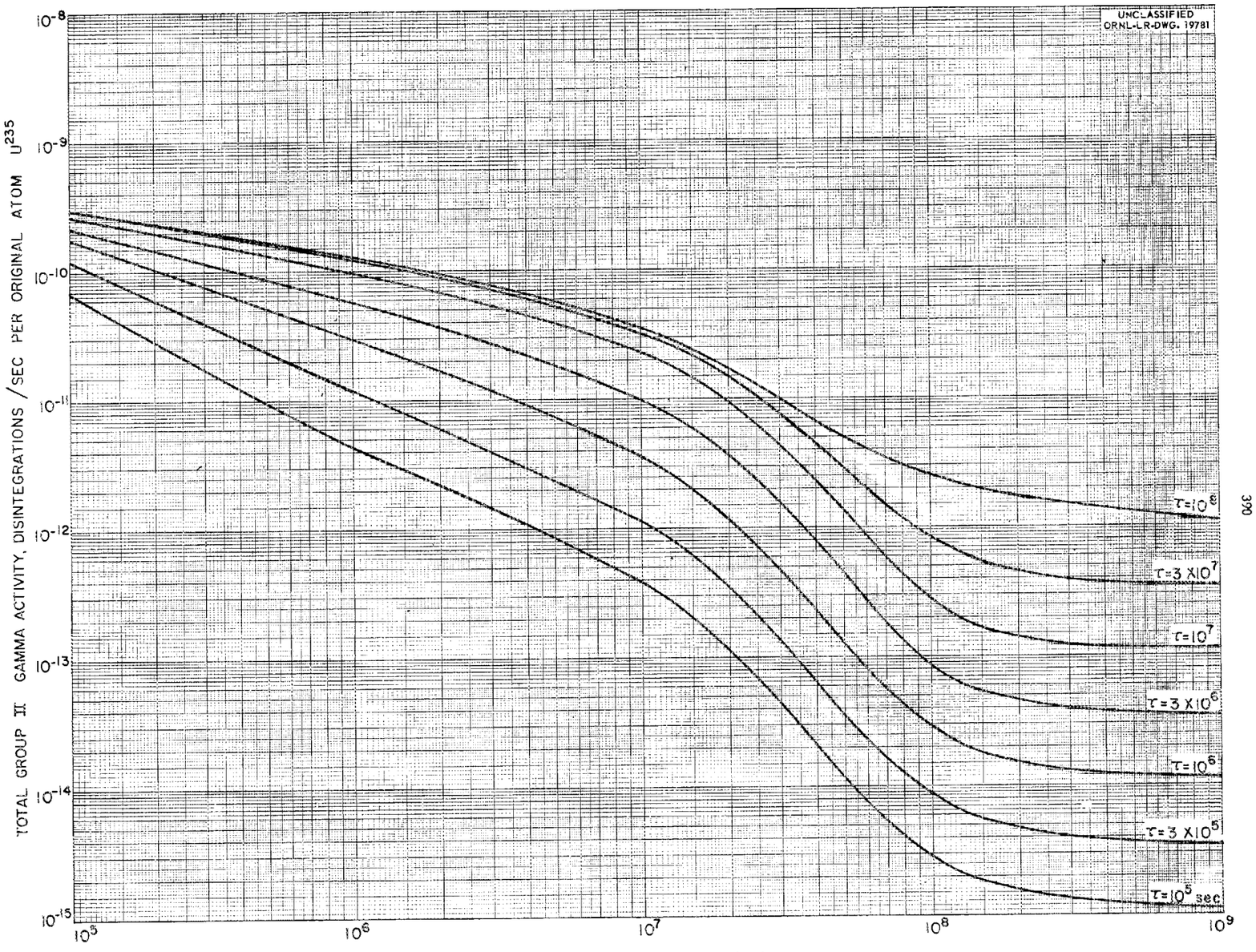


Fig. T-37a Total Group II (0.26-1.00 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{12}$ n/cm$^2$/sec.

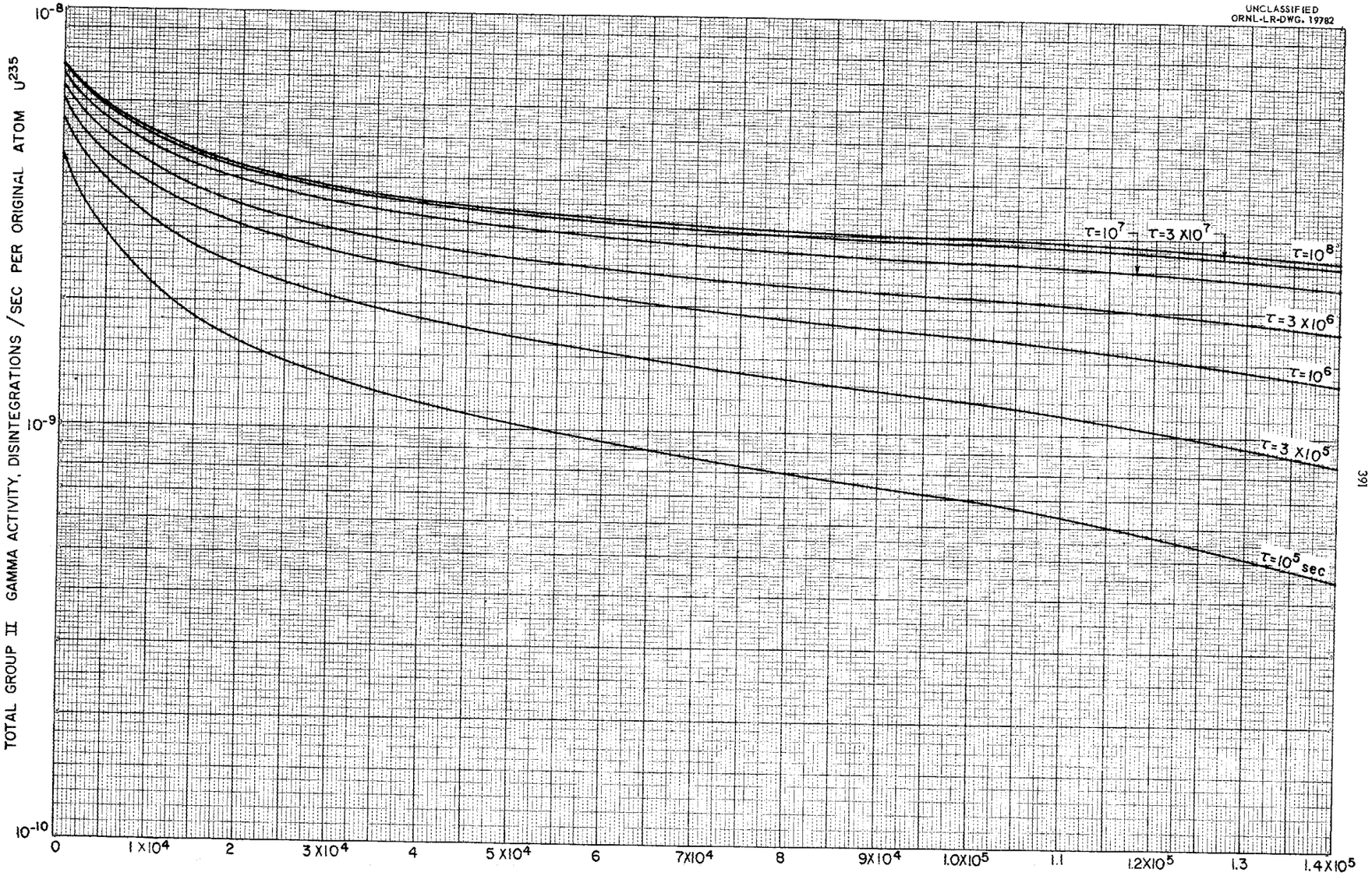


Fig. T-38 Total Group II (0.26–1.00Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{13}$ n/cm$^2$/sec.

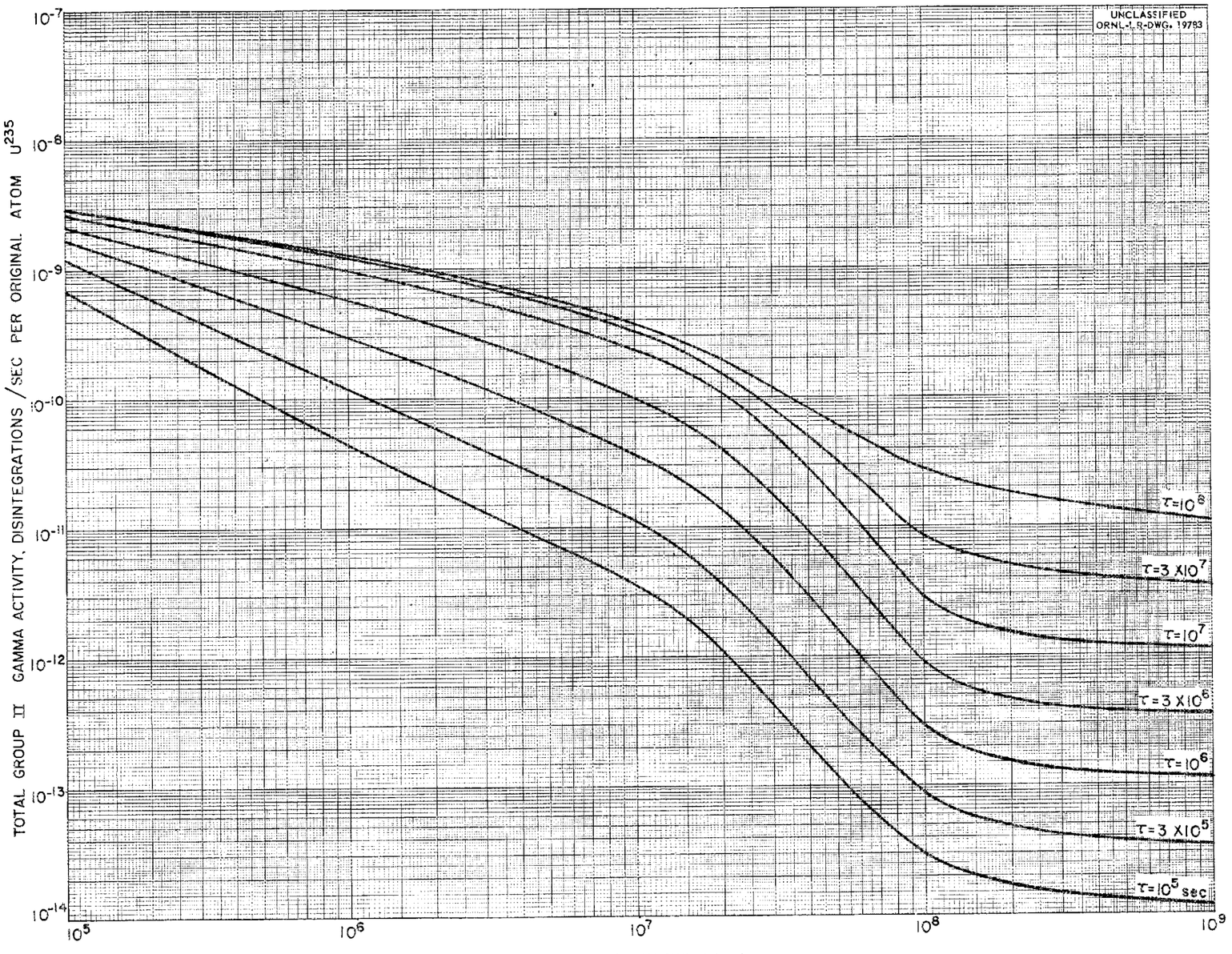


Fig. T-38a. Total Group II (0.26-1.00 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{13}$ n/cm$^2$/sec.

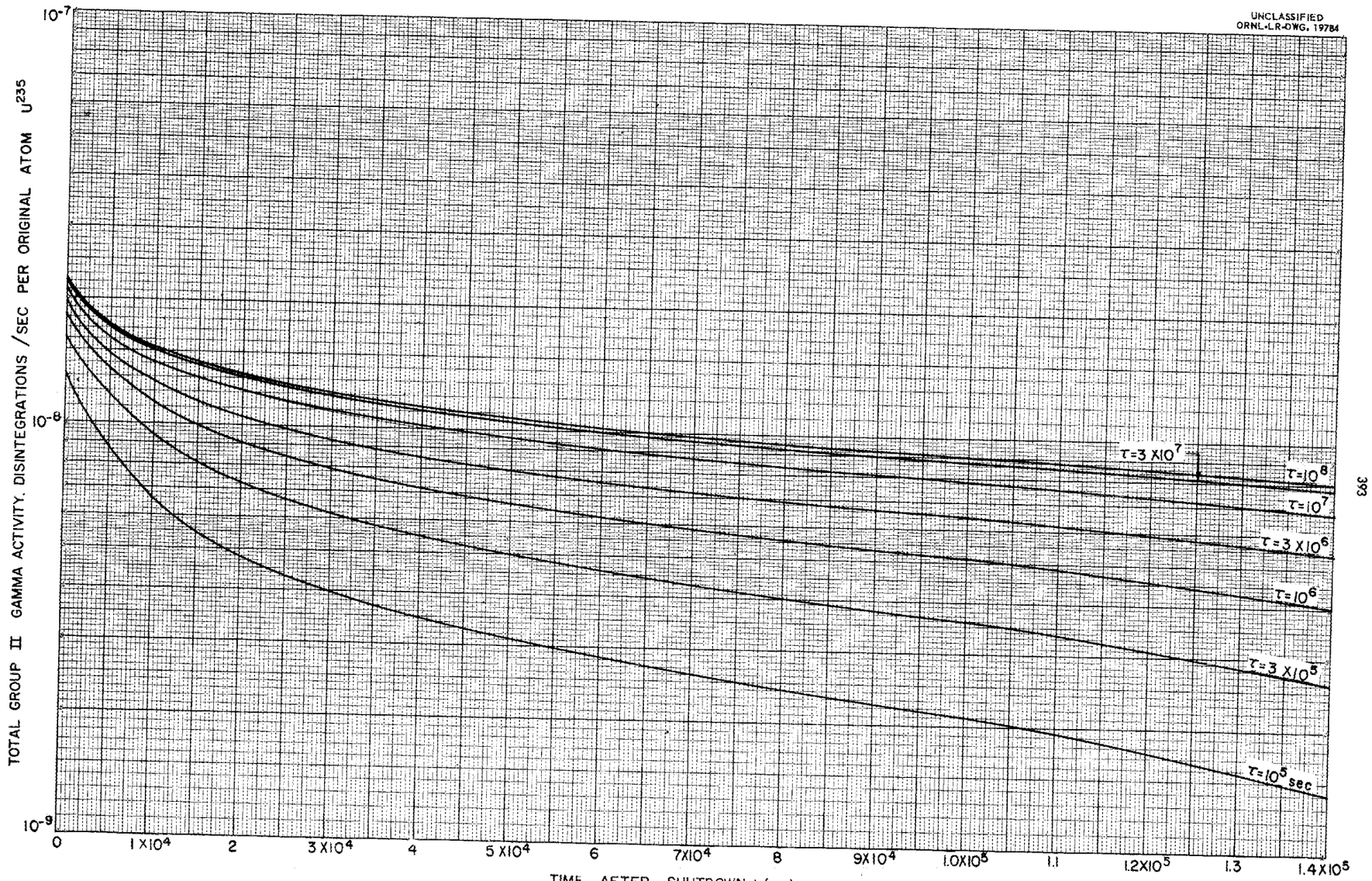


Fig. T-39 Total Group II (.026–100Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{13}$ n/cm$^2$/sec.

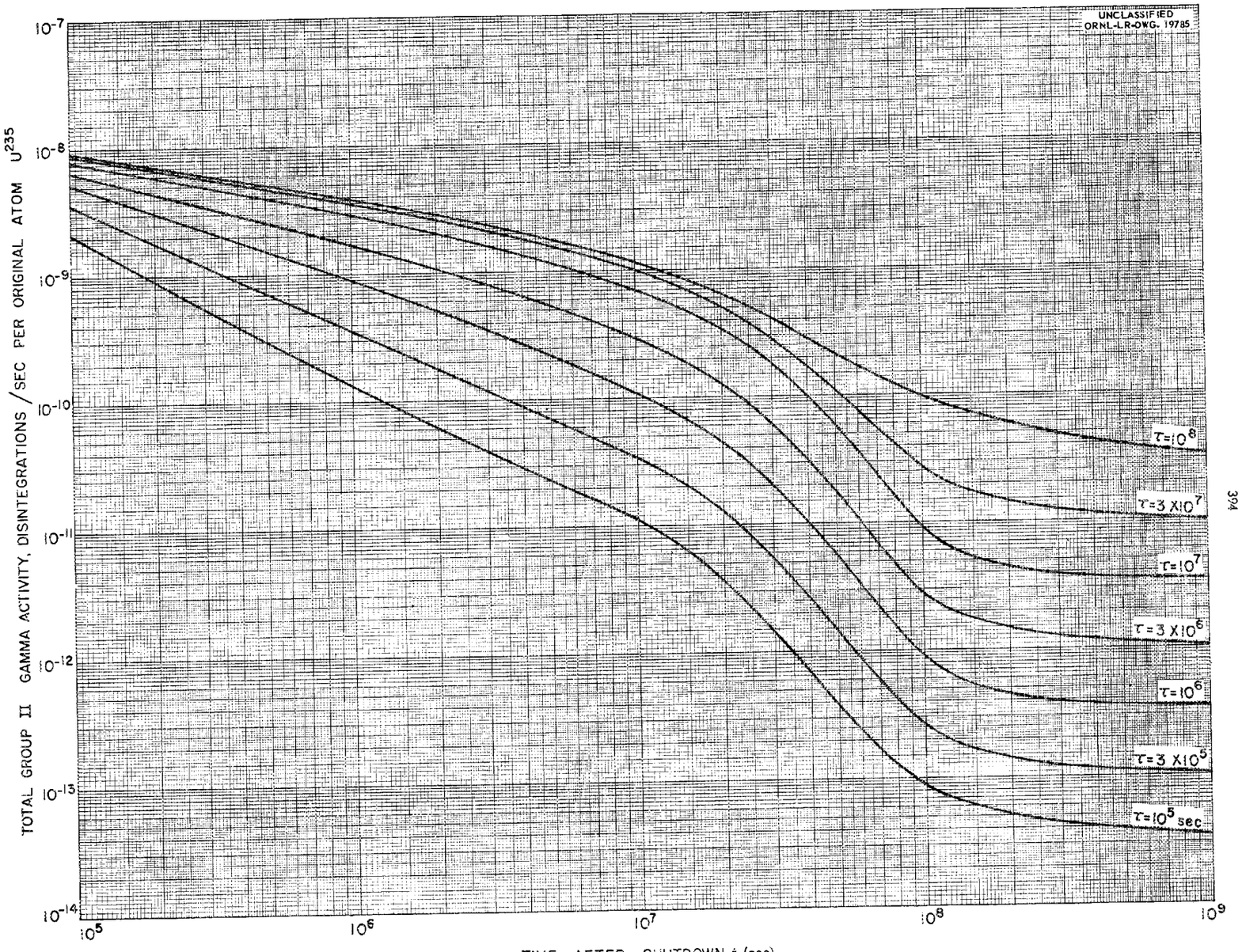


Fig. T-39a. Total Group II (0.26–1.00 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{13}$ n/cm$^2$/sec.

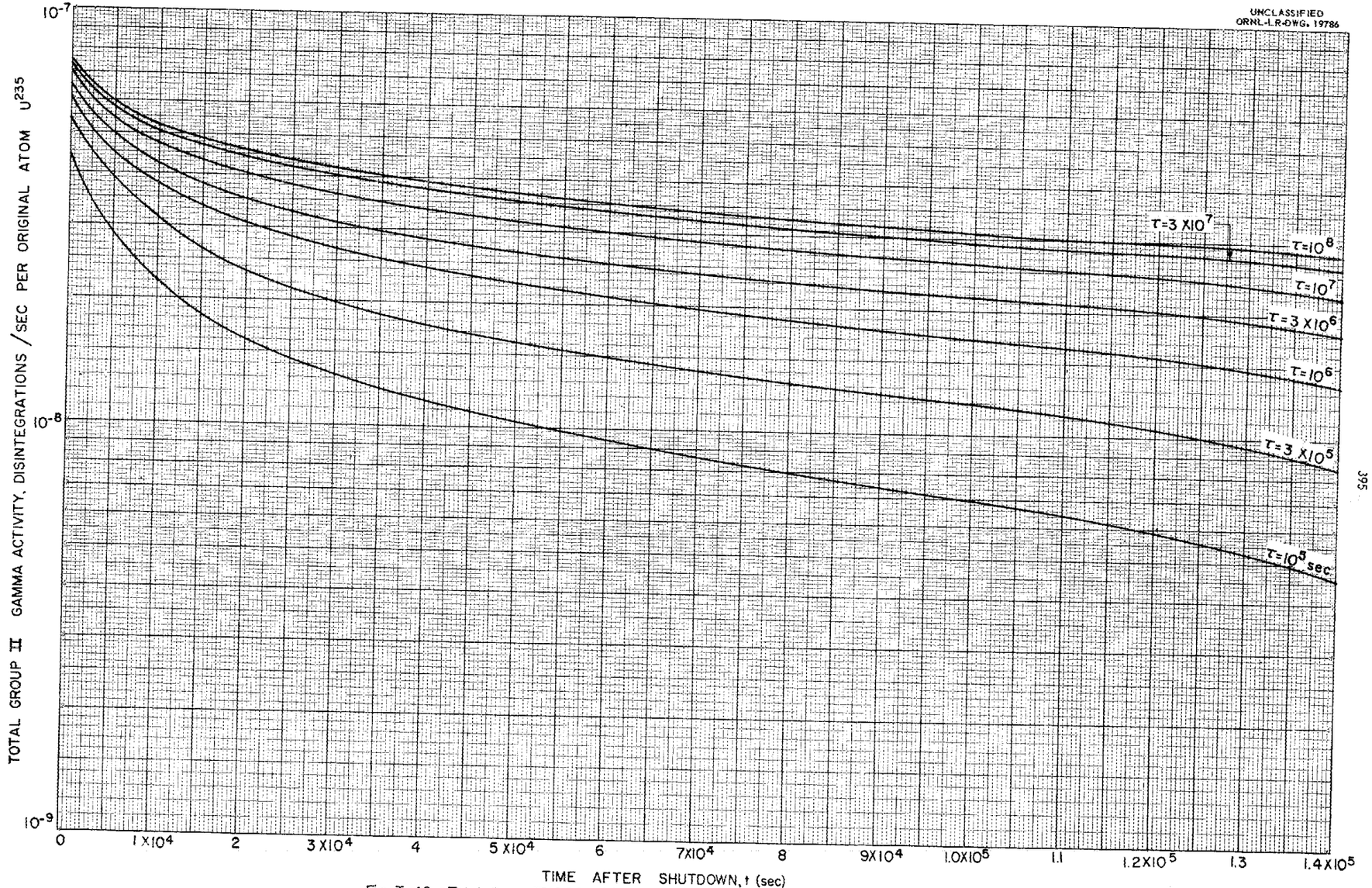


Fig. T-40. Total Group II (0.26–1.00 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{14}$ n/cm$^2$/sec.

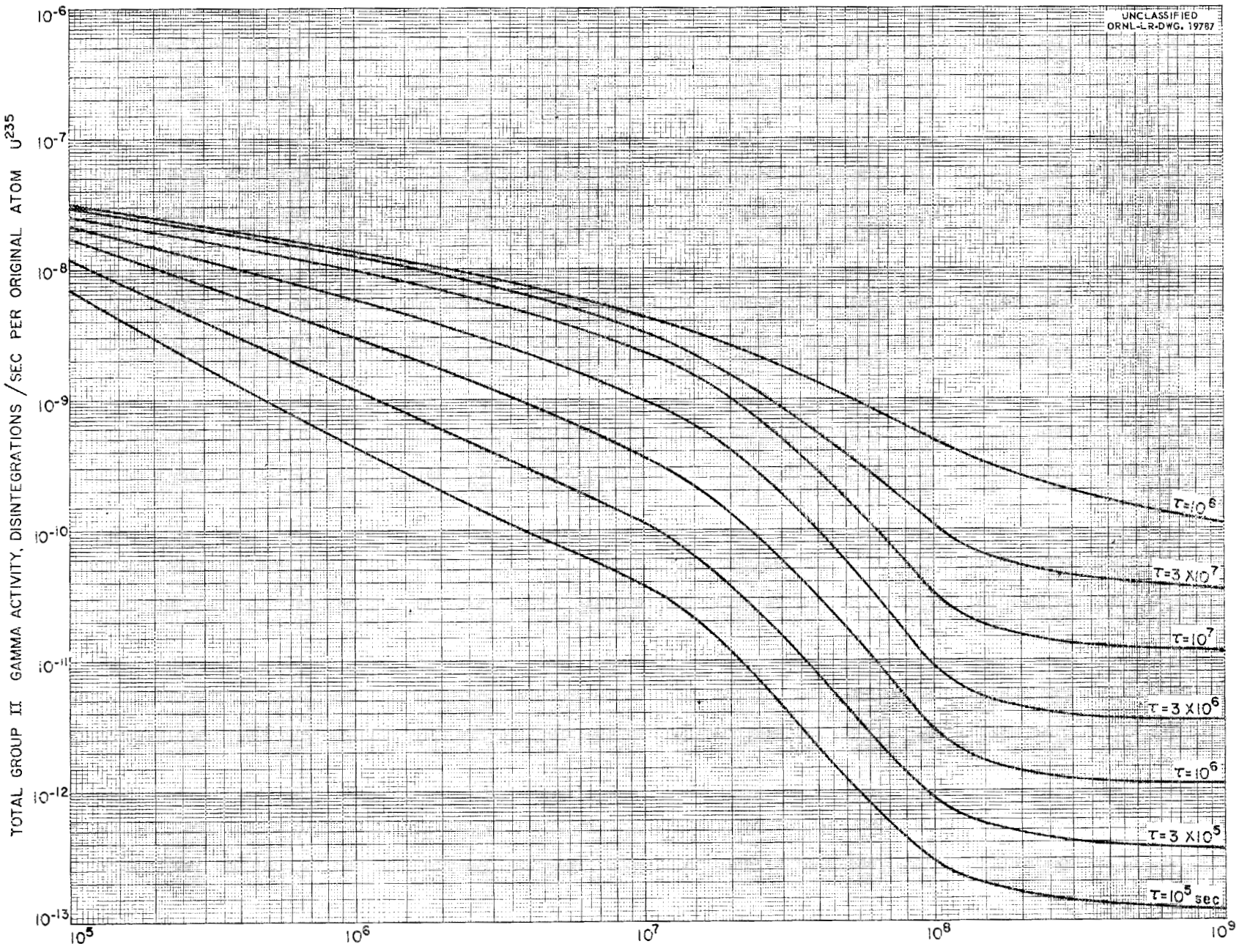


Fig. T-40o. Total Group II (0.26–1.00 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{14}$ n/cm$^2$/sec.

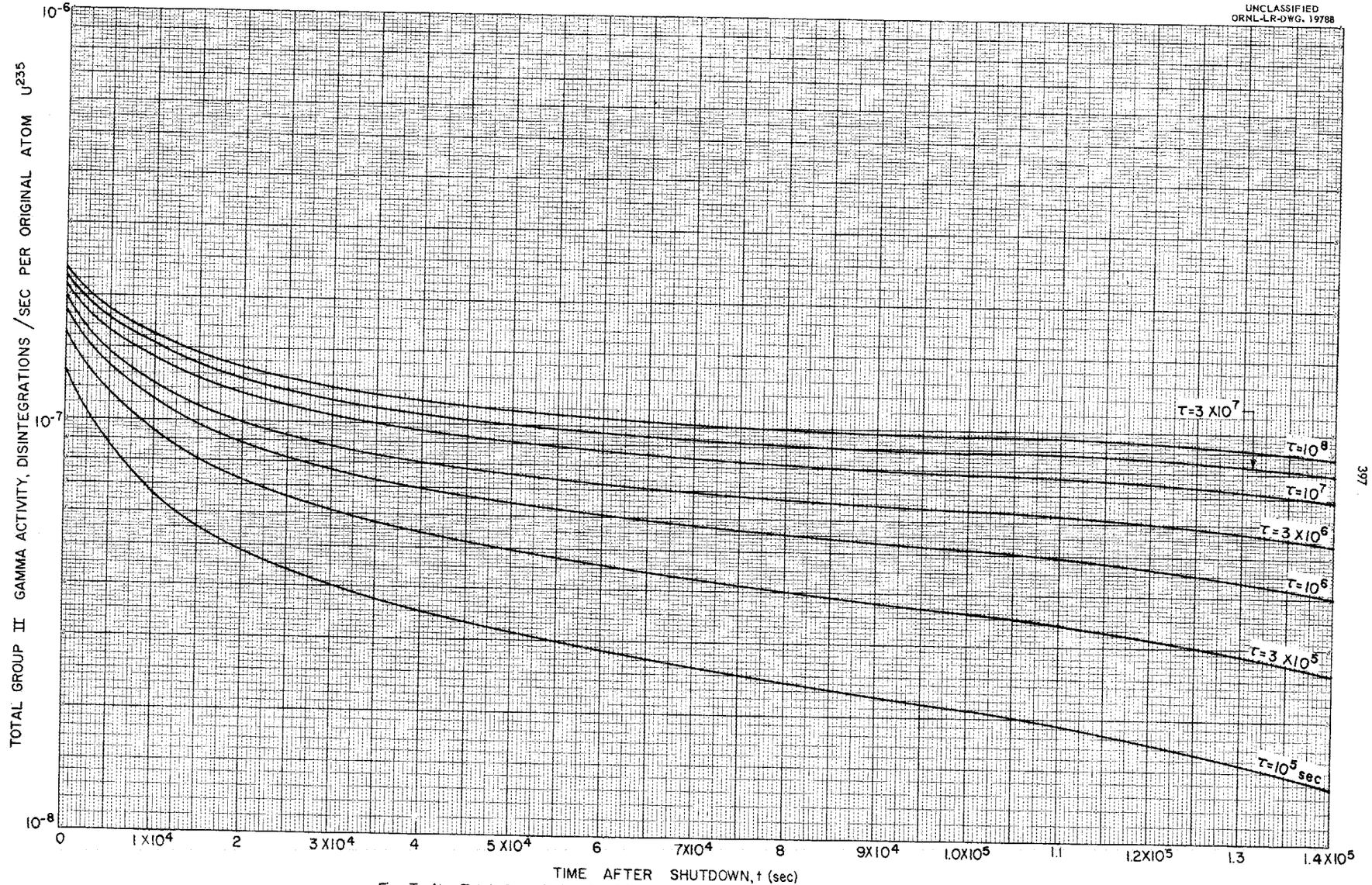


Fig. T-41. Total Group II (0.26-1.00 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{14}$ n/cm$^2$/sec.

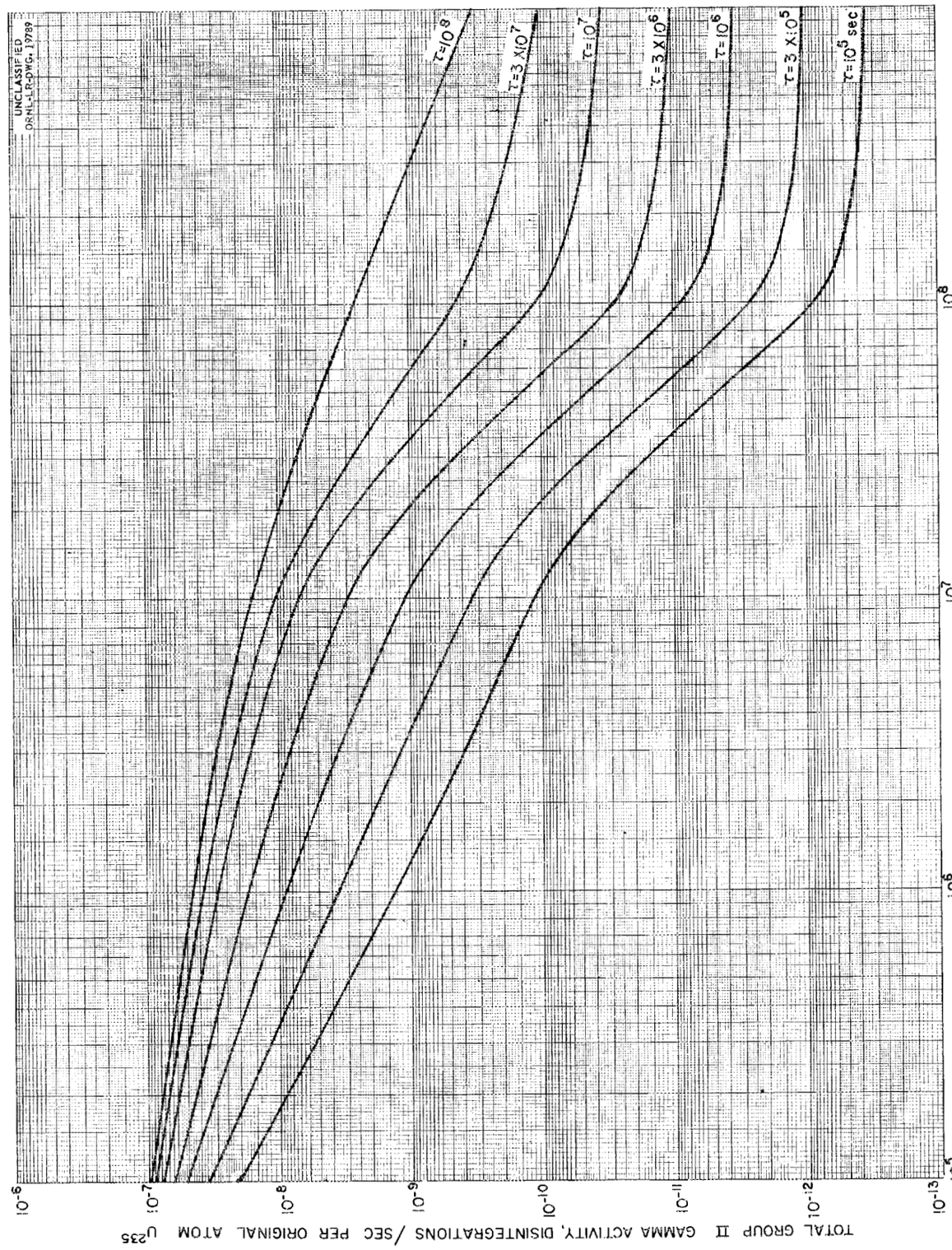


Fig. T-4i c. Total Group II (0.26–1.00Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3X10^{14}$ n/cm$^2$/sec.

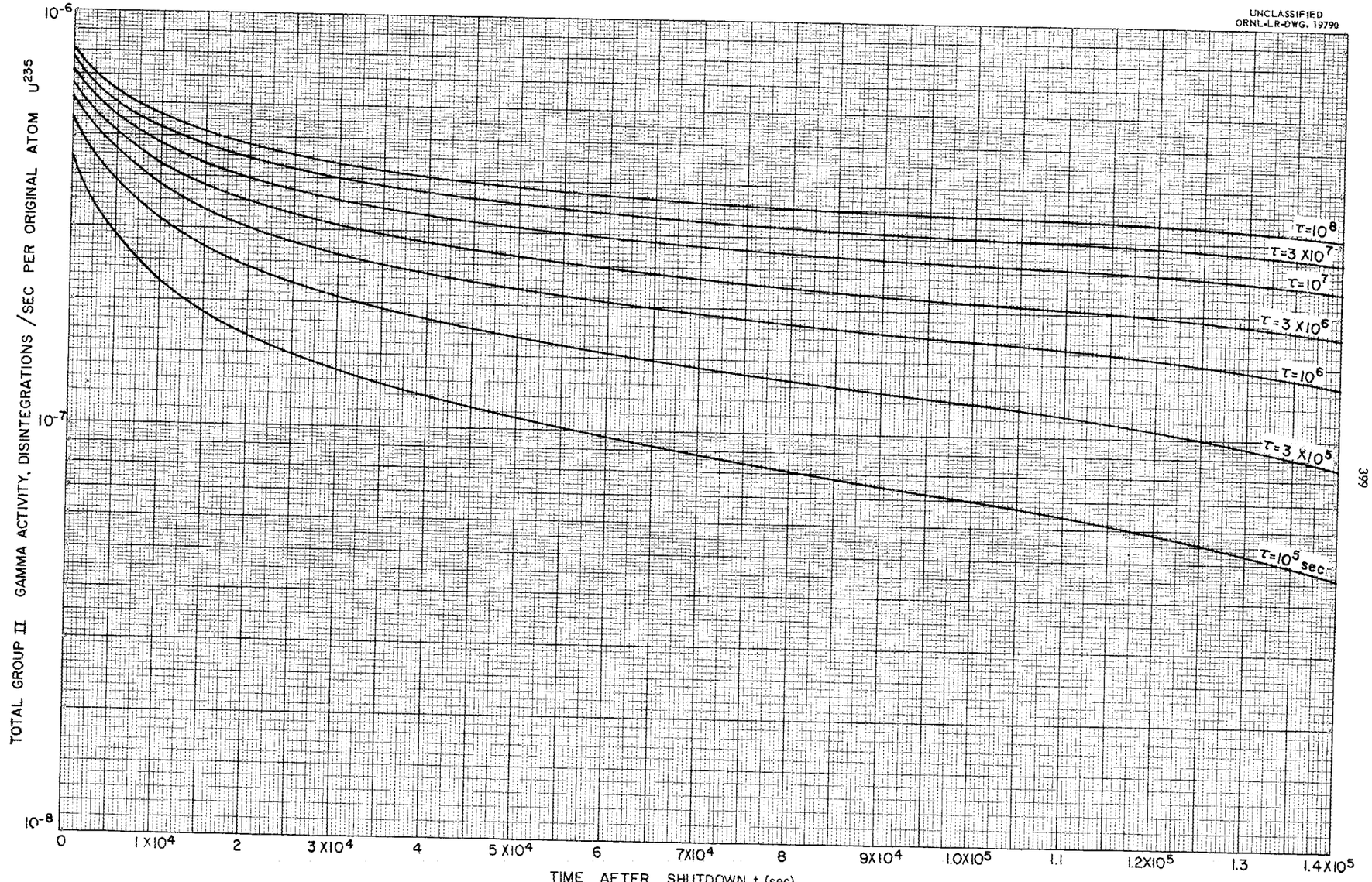


Fig. T-42. Total Group II (0.26–1.00Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm$^2$/sec.

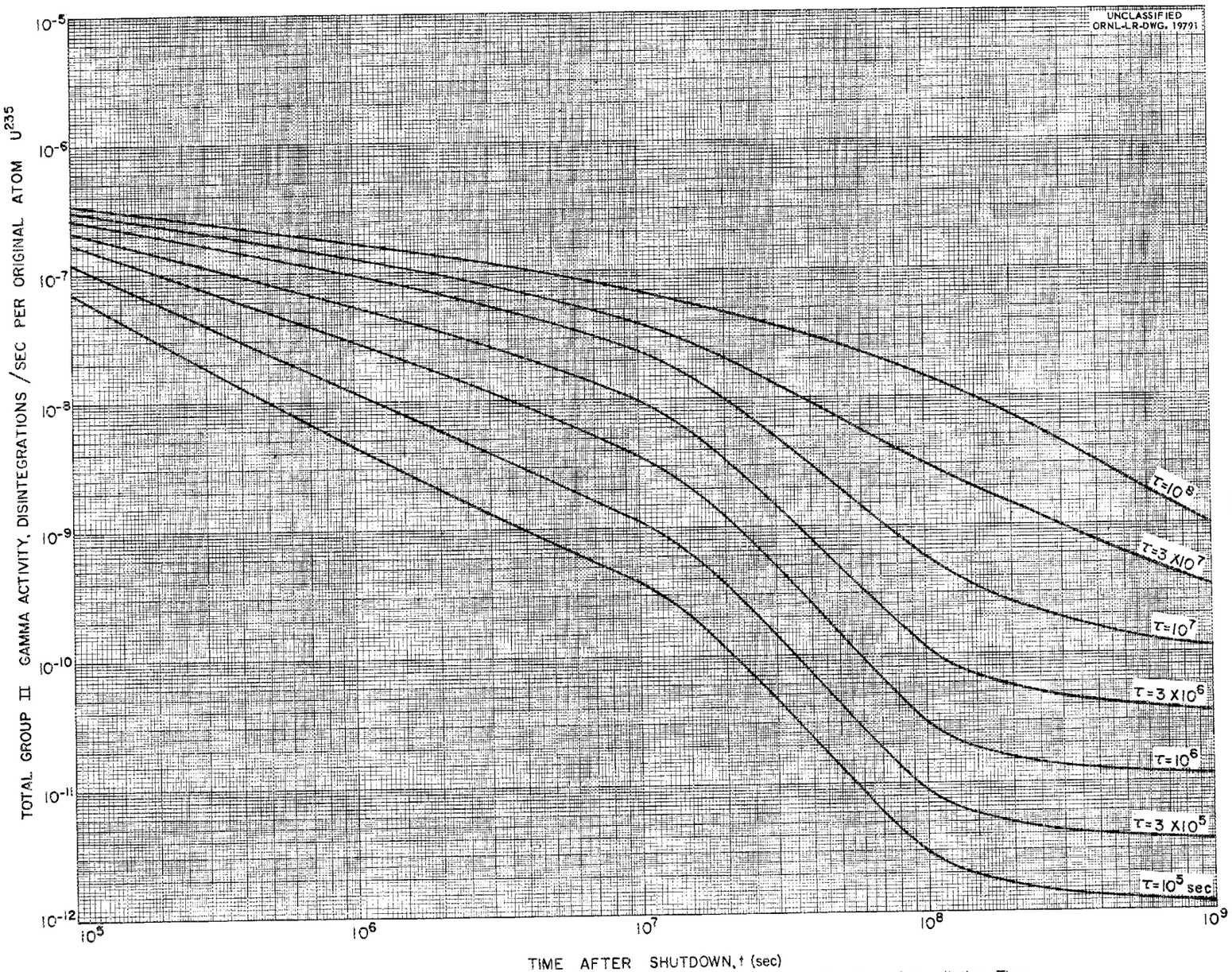


Fig. T-42 a. Total Group II (0.26–1.00 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm$^2$/sec.

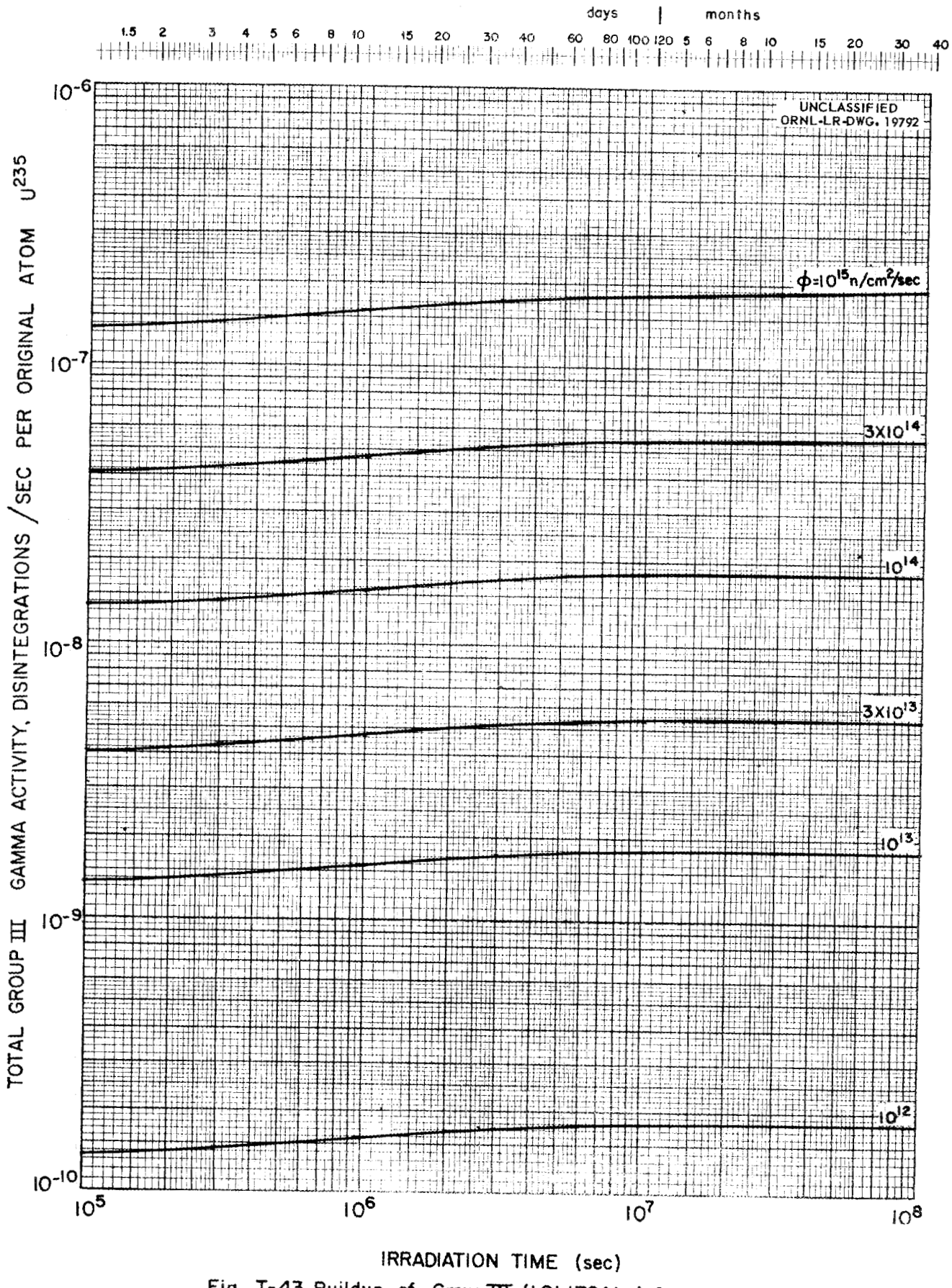


Fig. T-43 Buildup of Group III (1.01-1.70 Mev) Gamma Activity with Irradiation Time and Thermal Neutron Flux.

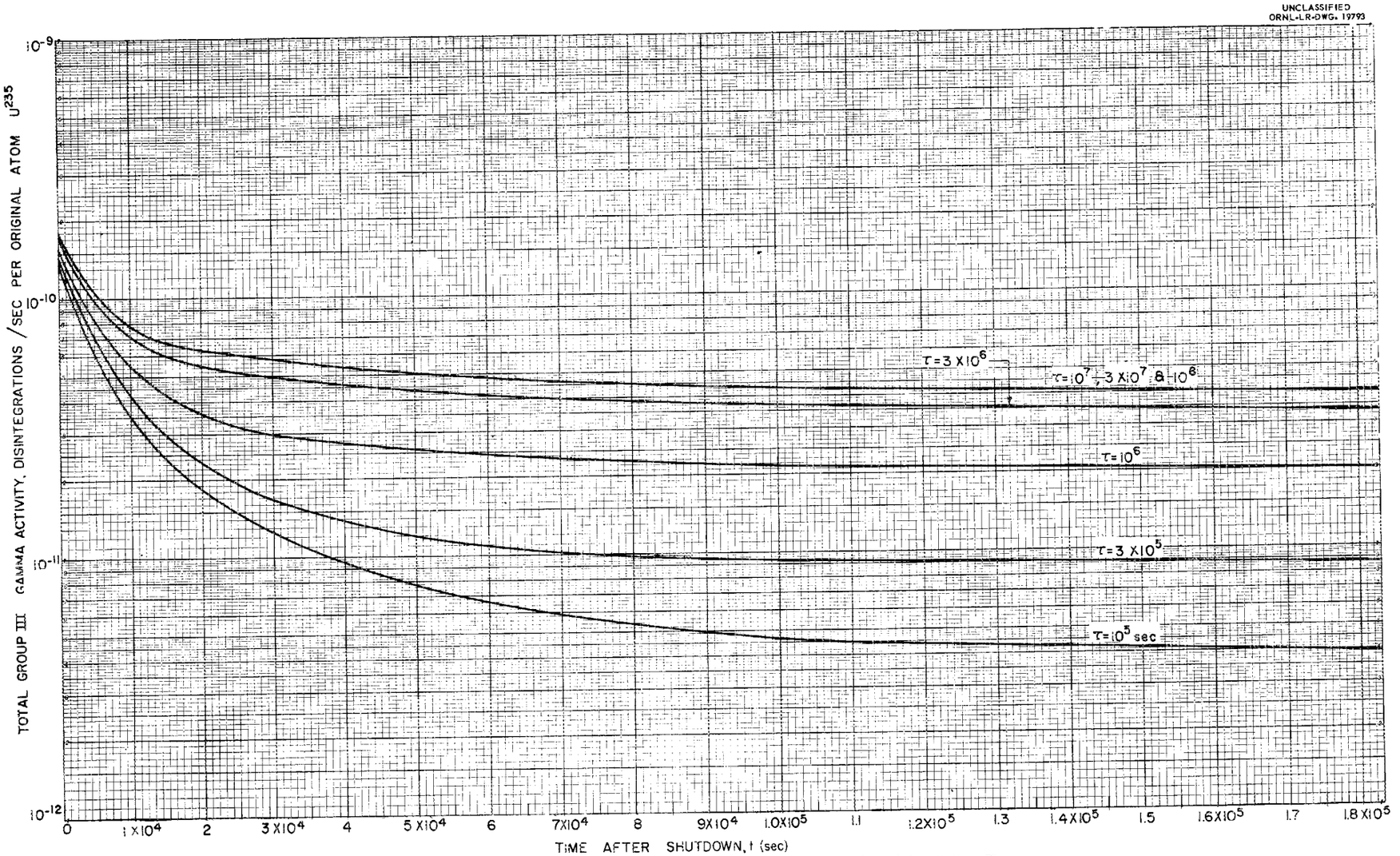


Fig. T-44. Total Group III (1.01-1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{12}$ n/cm$^2$/sec.

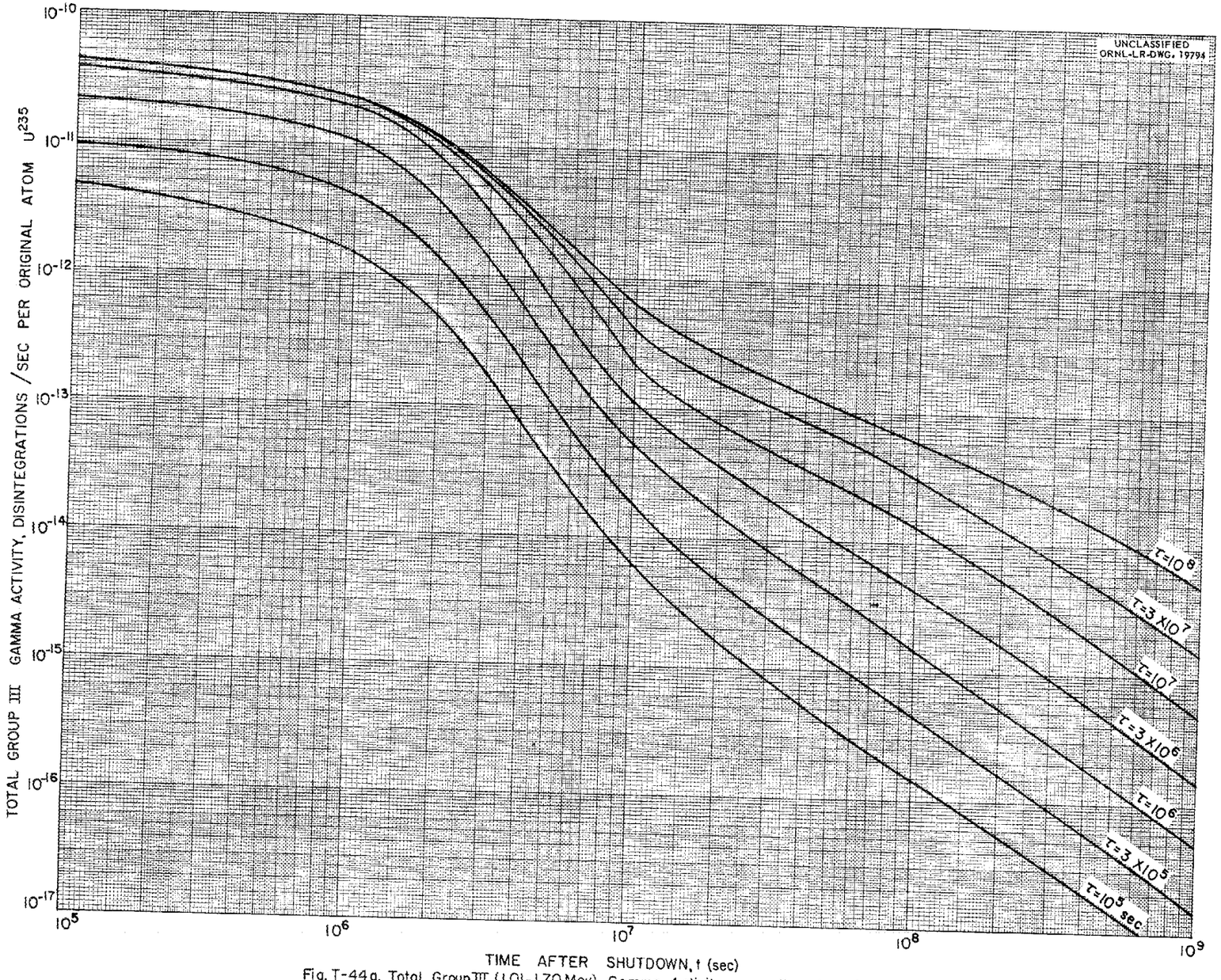


Fig. T-44a. Total Group III (1.01-1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{12}$ n/cm$^2$/sec.

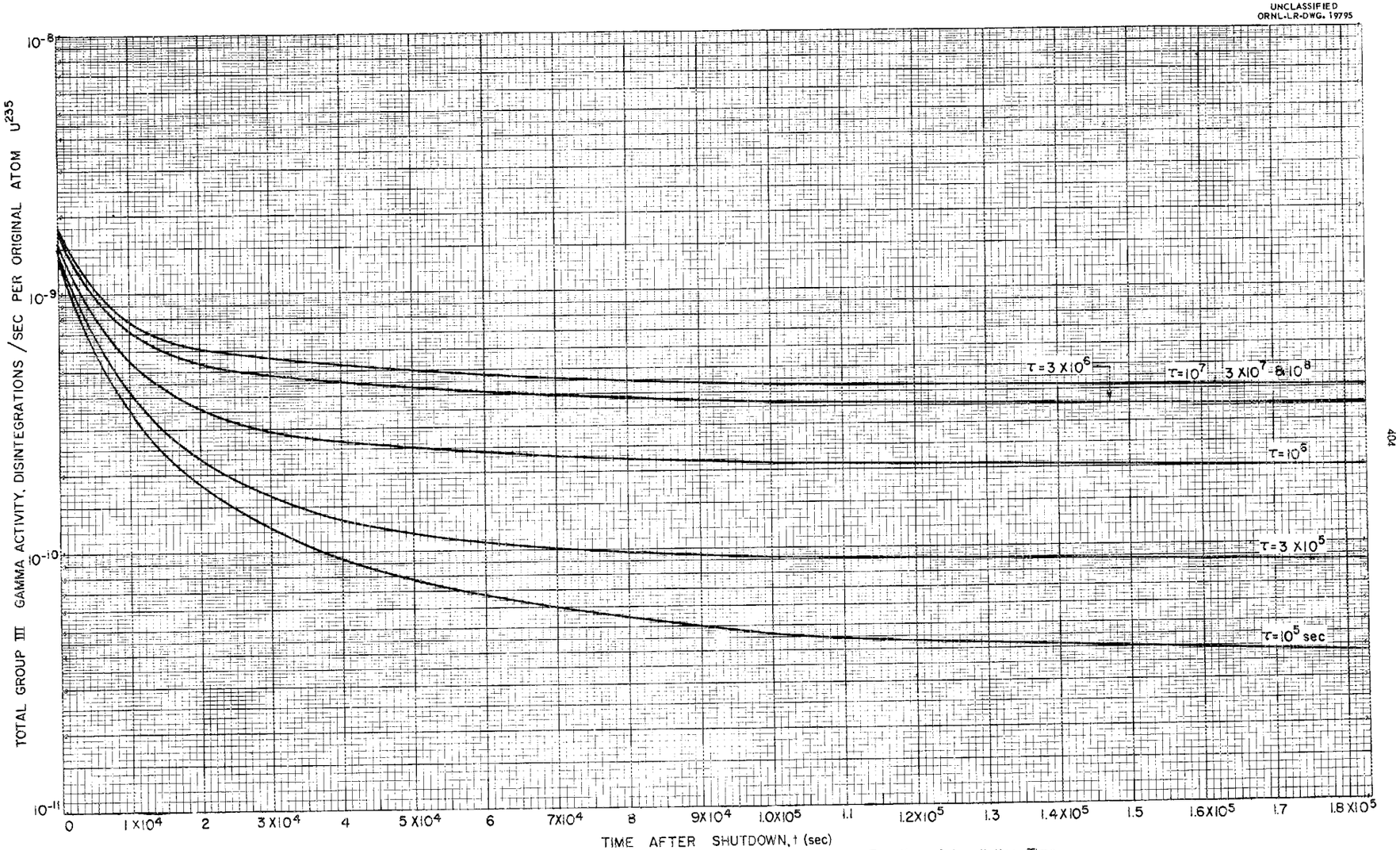


Fig. T-45. Total Group III (1.01-1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{13}$ n/cm$^2$/sec.

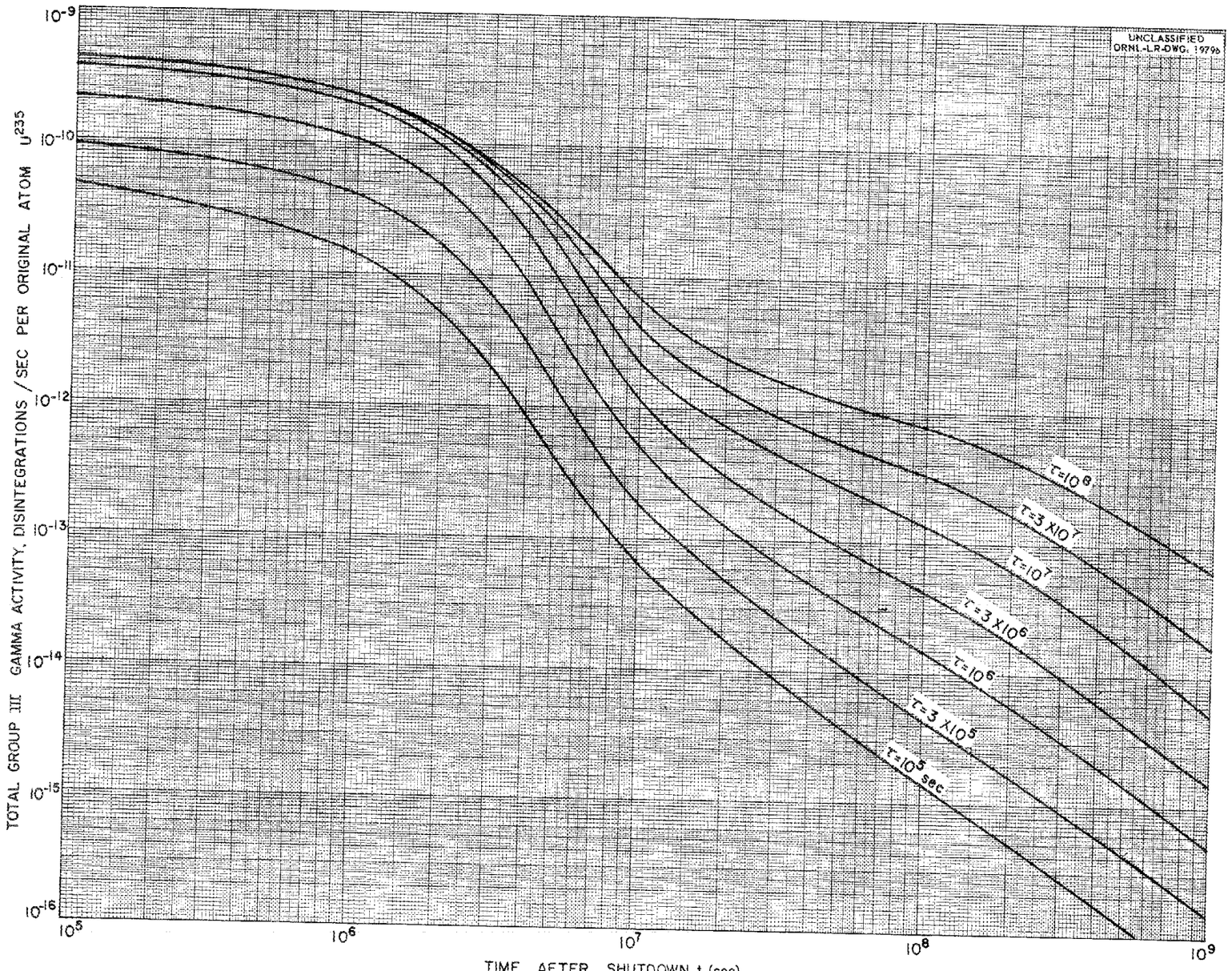


Fig. T-45a. Total Group III (1.01-1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{13}$ n/cm²/sec.

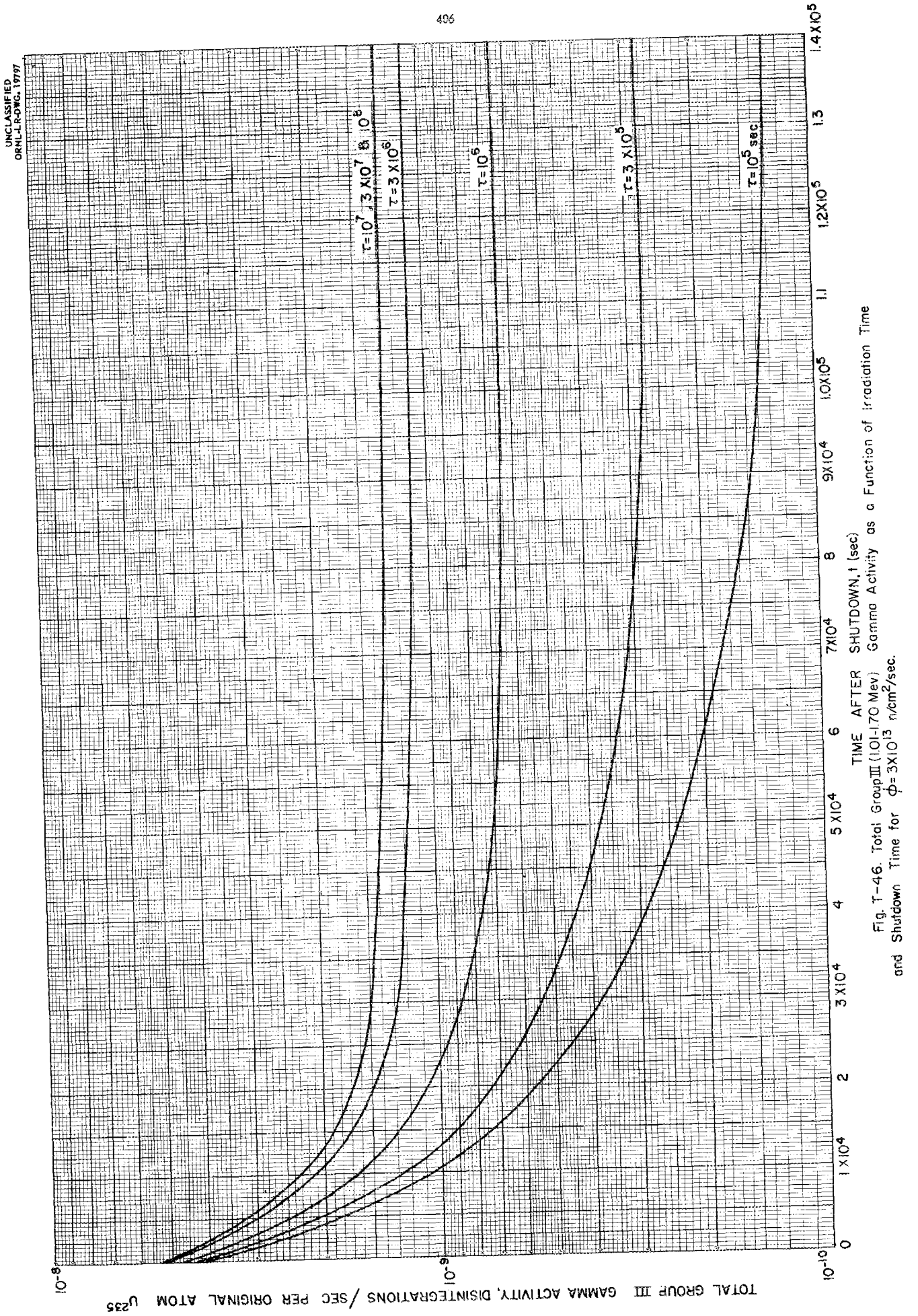


Fig. T-46. Total Group III (1.01-1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{13}$ n/cm$^2$/sec.

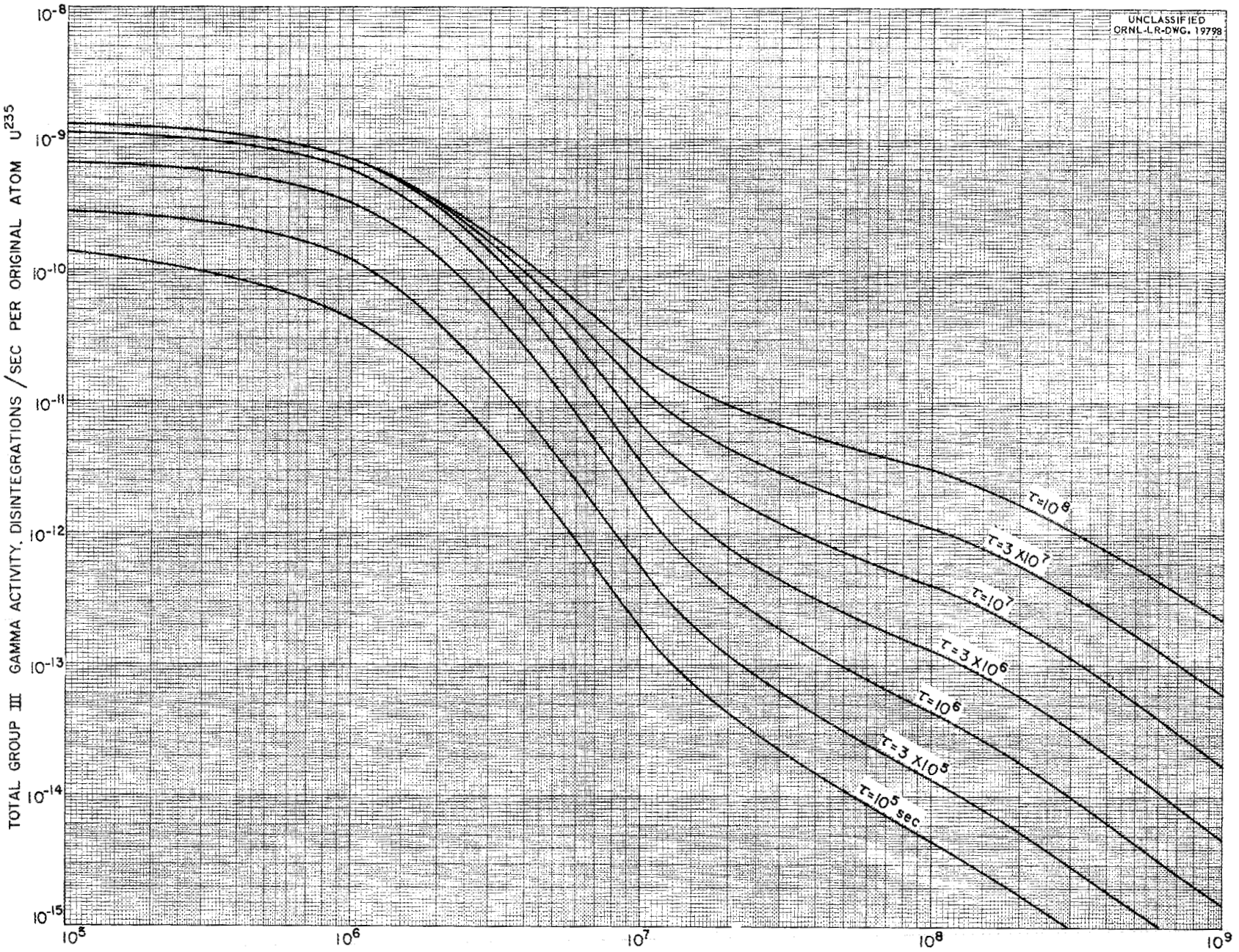


Fig. T-46a. Total Group III (1.01-1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{13}$ n/cm$^2$/sec.

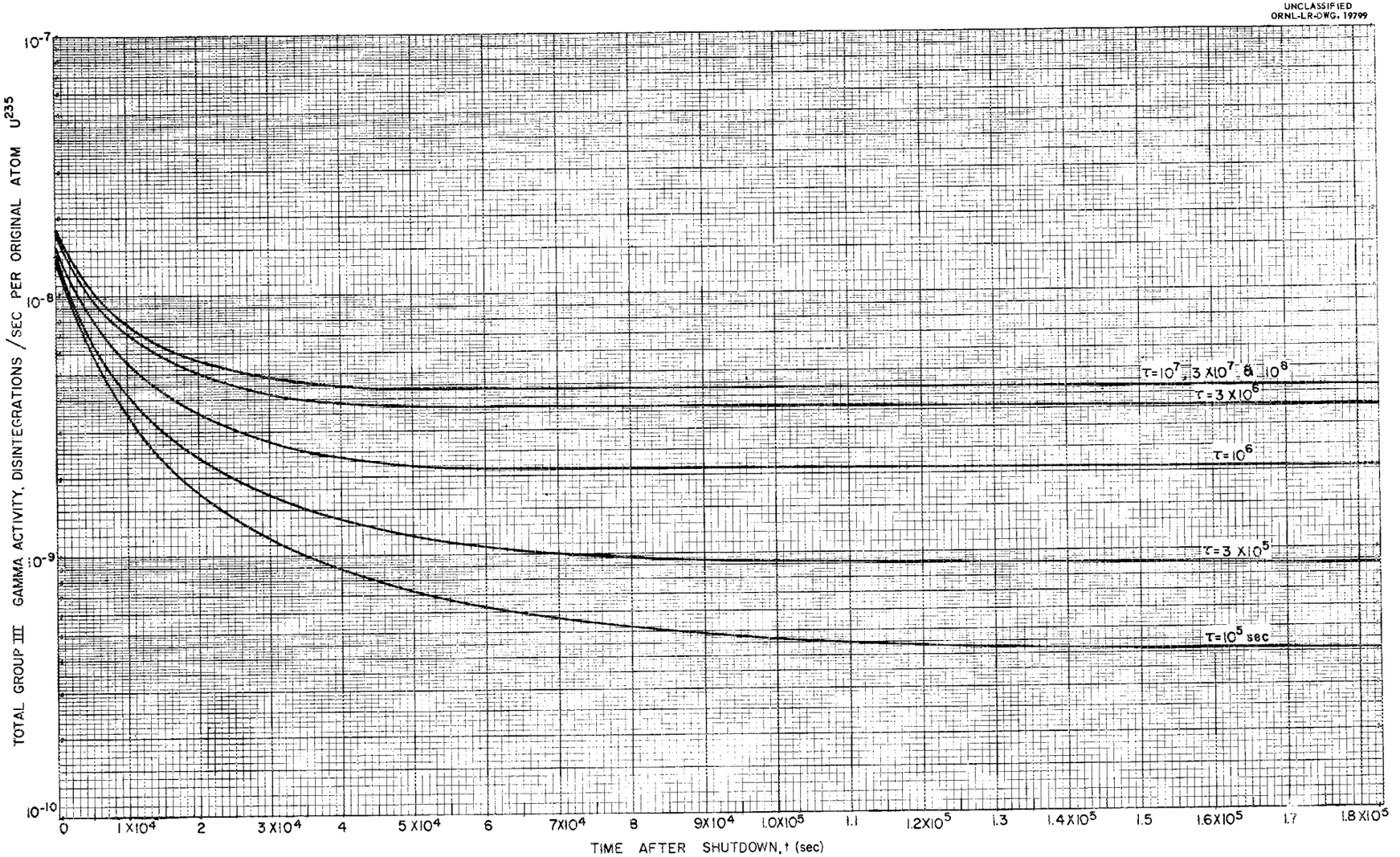


Fig. T-47 Total Group III (1.01-1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{14}$ n/cm$^2$/sec.

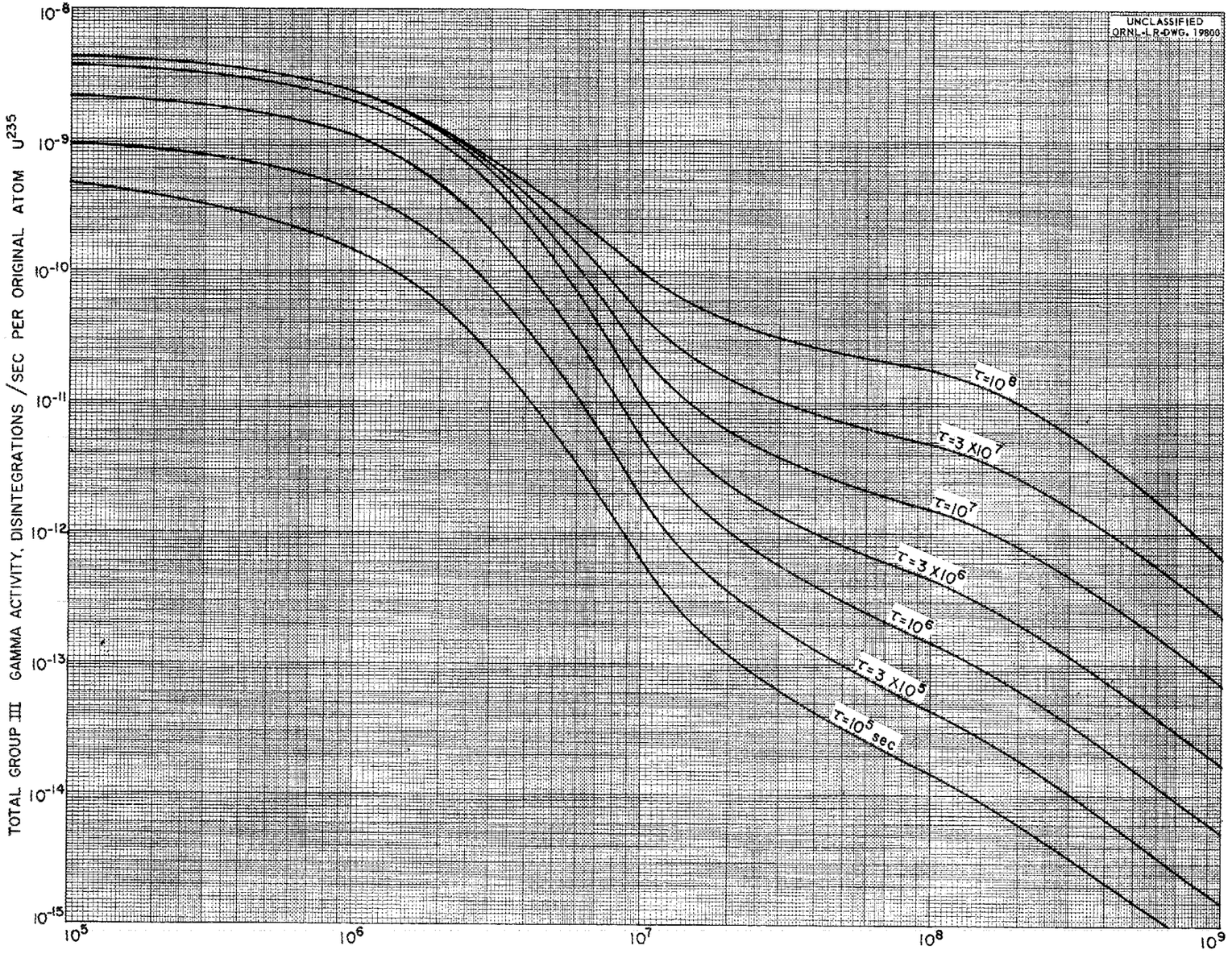


Fig. T-47a. Total Group III (1.01-1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{14}$ n/cm$^2$/sec.

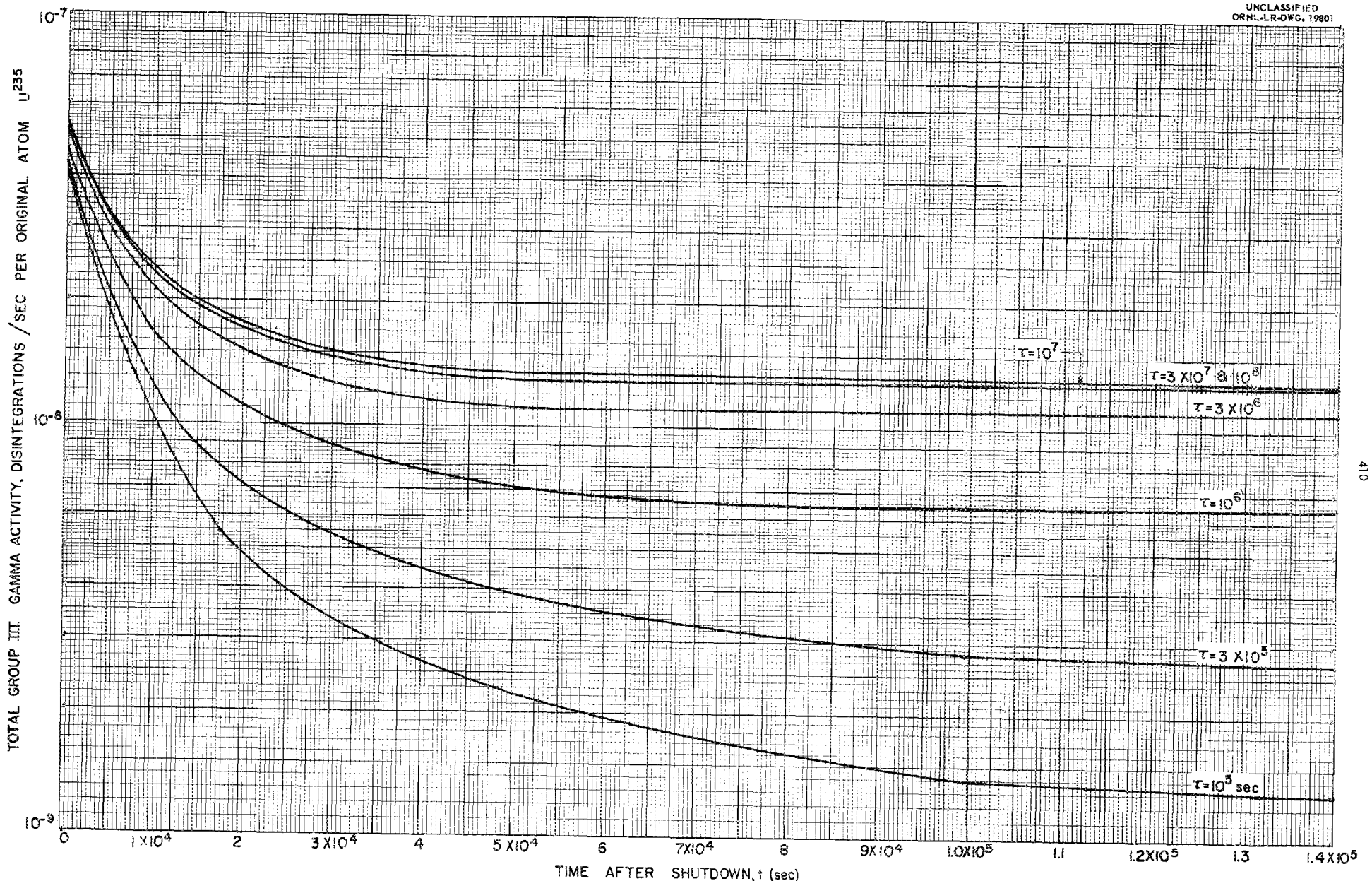


Fig. T-48. Total Group III (1.01-1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{14}$ n/cm$^2$/sec.

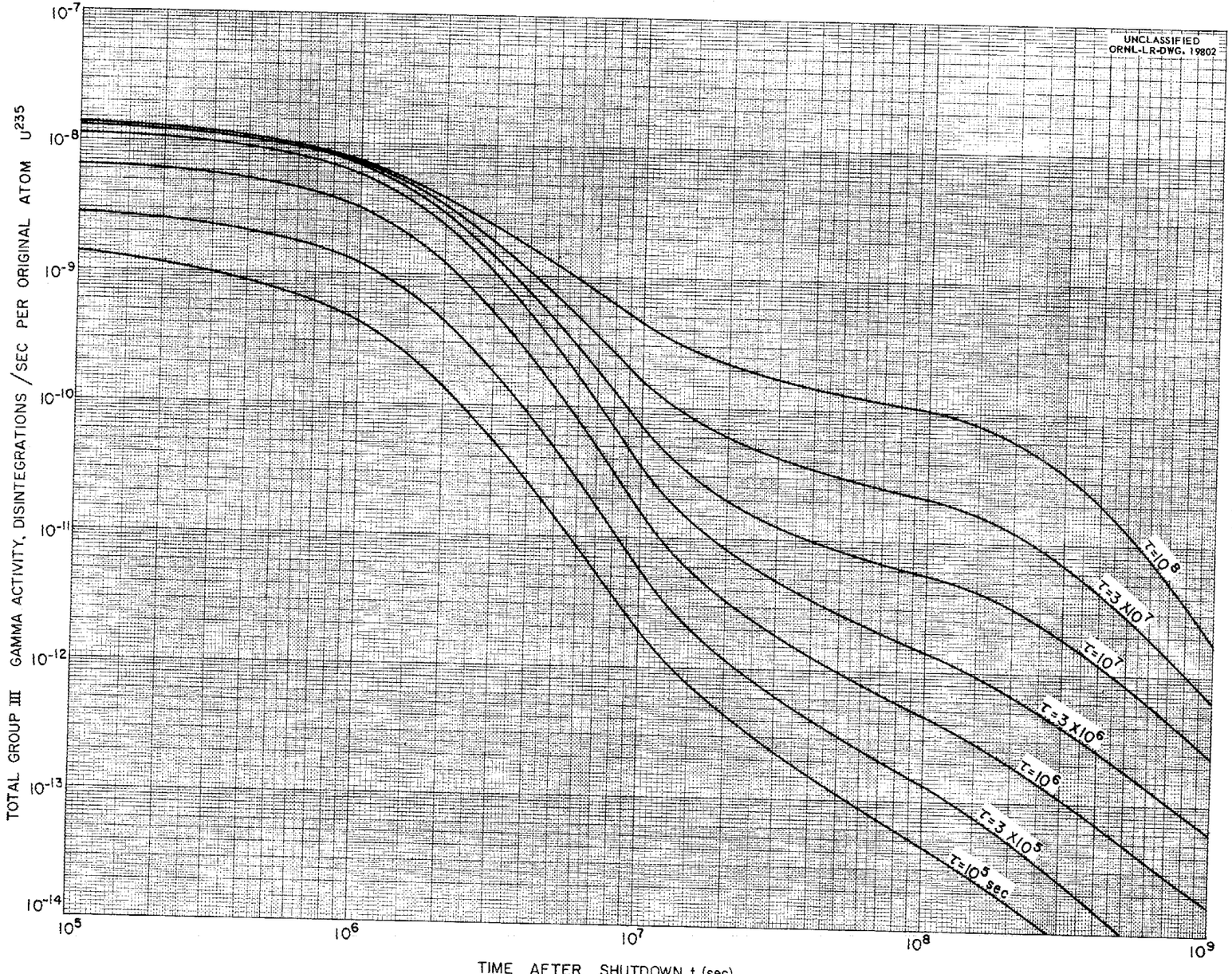


Fig. T-48a. Total Group III (1.01-1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3X10^{14}$ n/cm$^2$/sec.

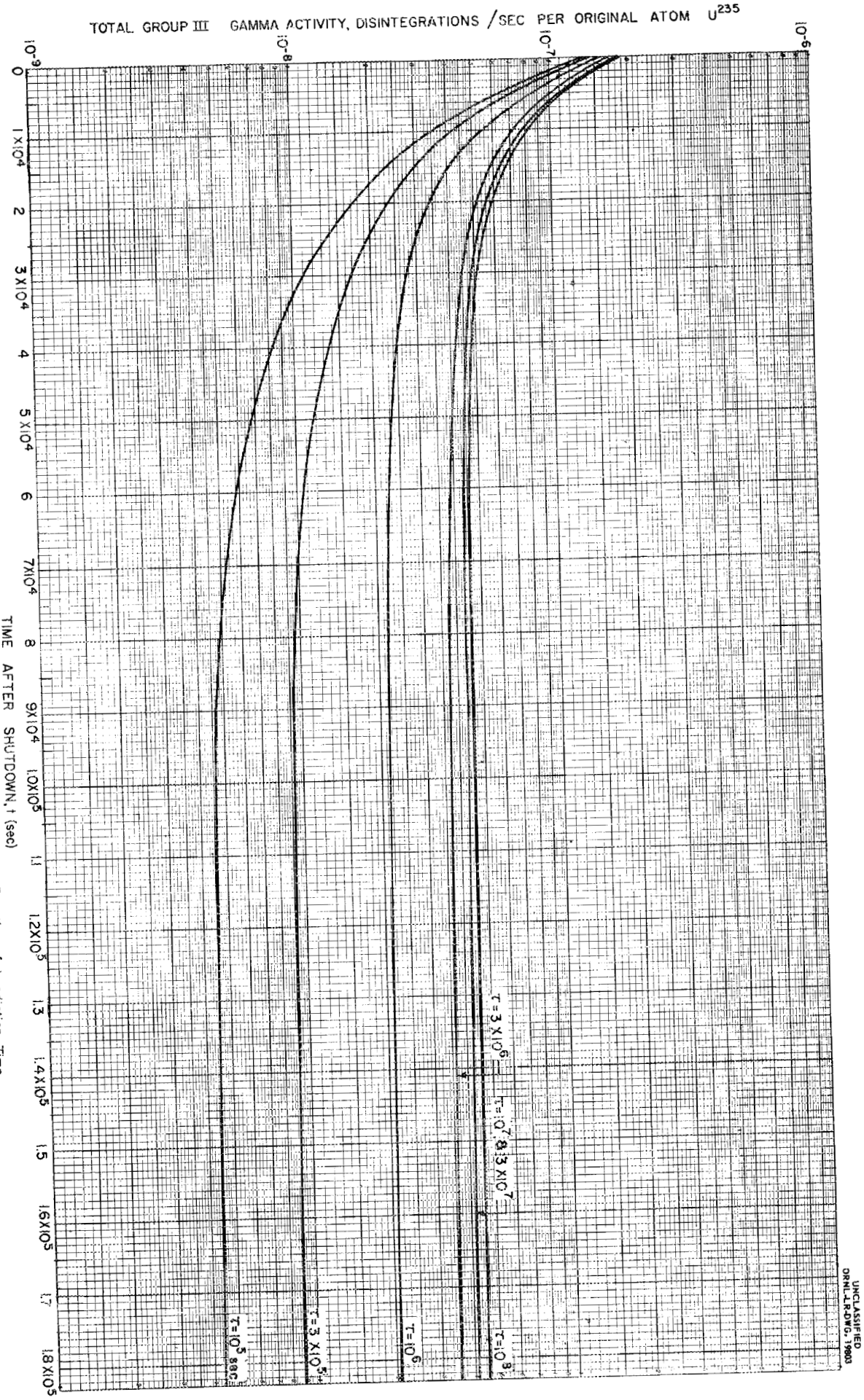


Fig. T-49. Total Group III (1.01-1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm²/sec.

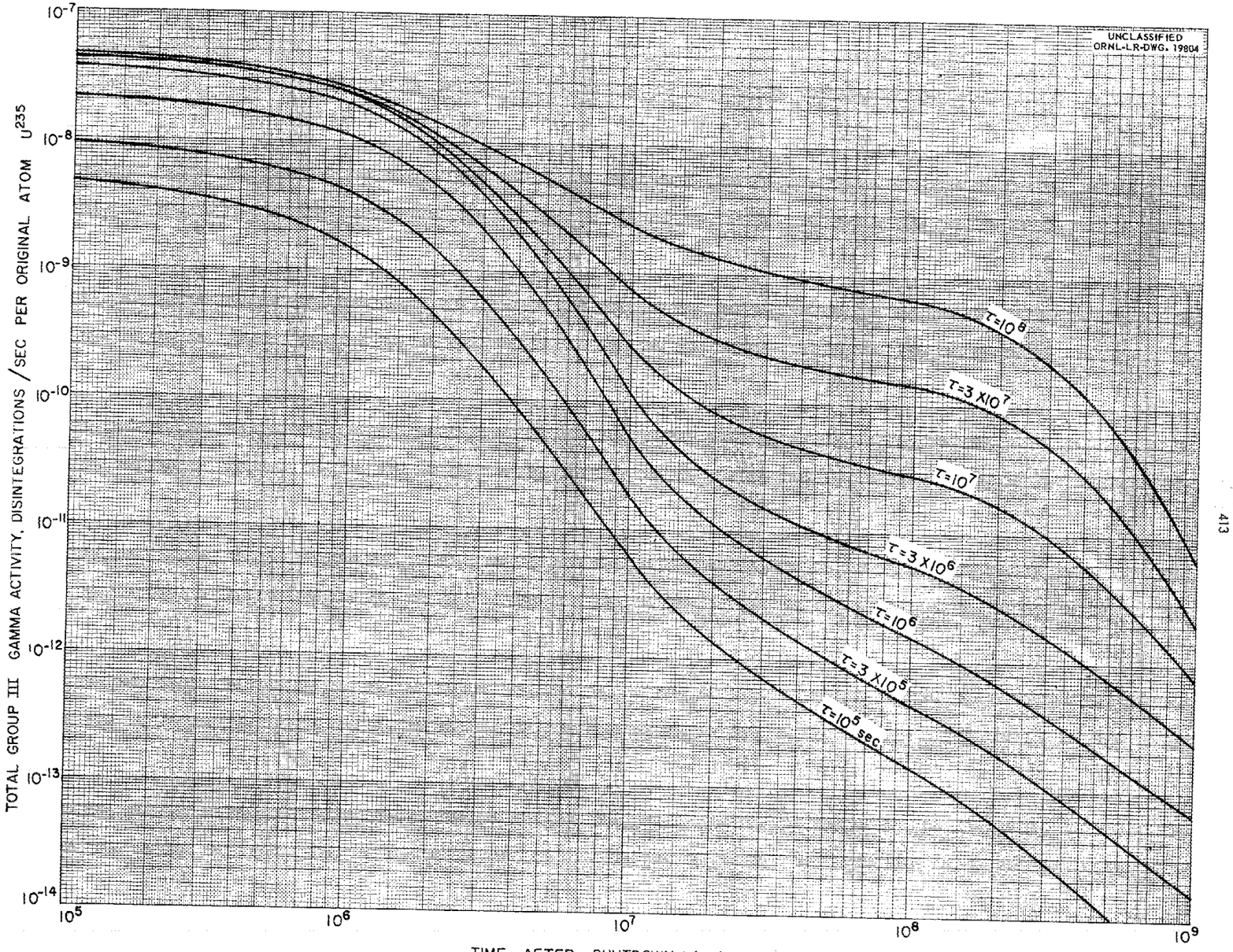


Fig. T-49 a. Total Group III (1.01-1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm$^2$/sec.

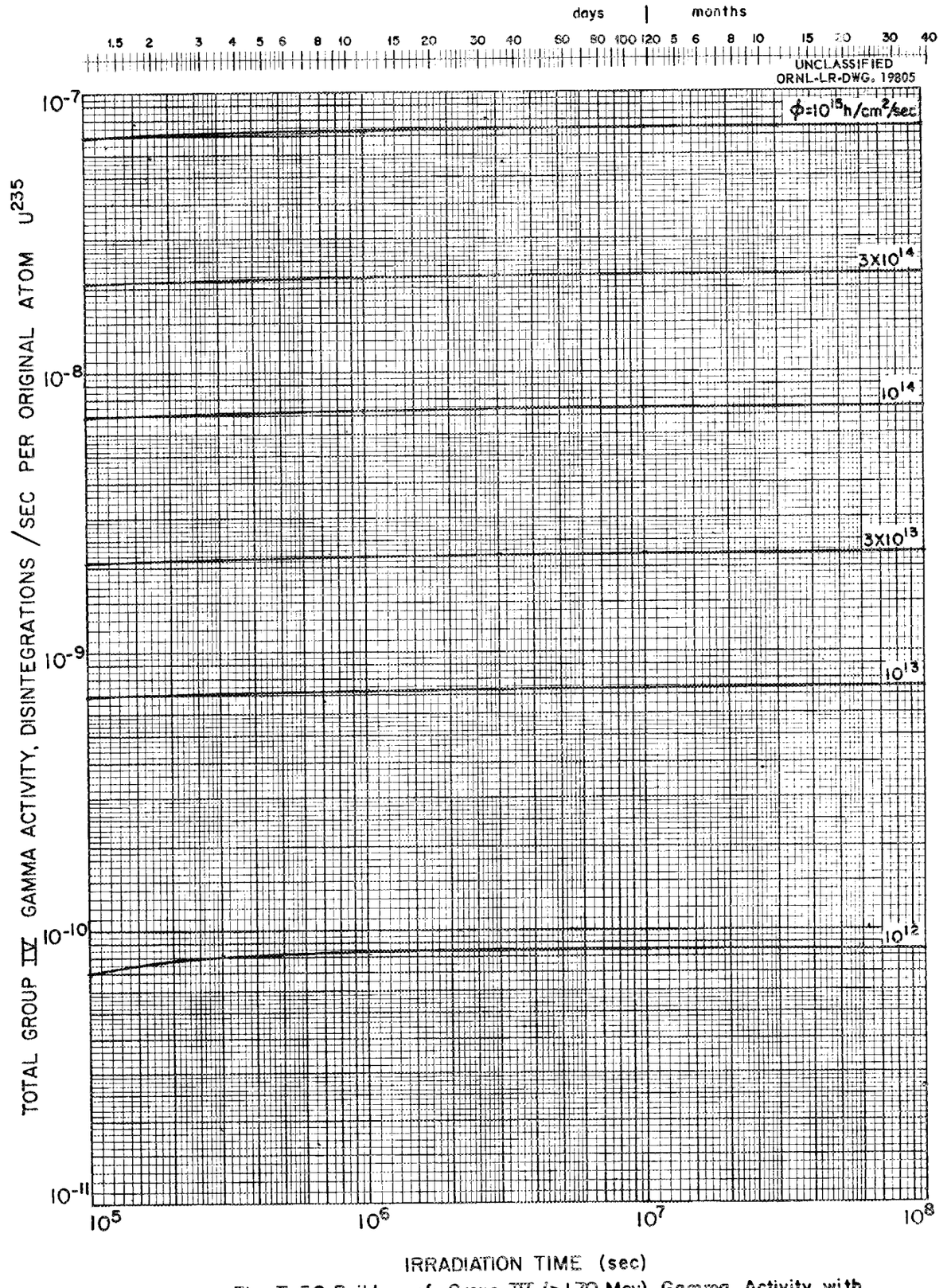


Fig. T-50 Buildup of Group IV (>1.70 Mev) Gamma Activity with Irradiation Time and Thermal Neutron Flux.

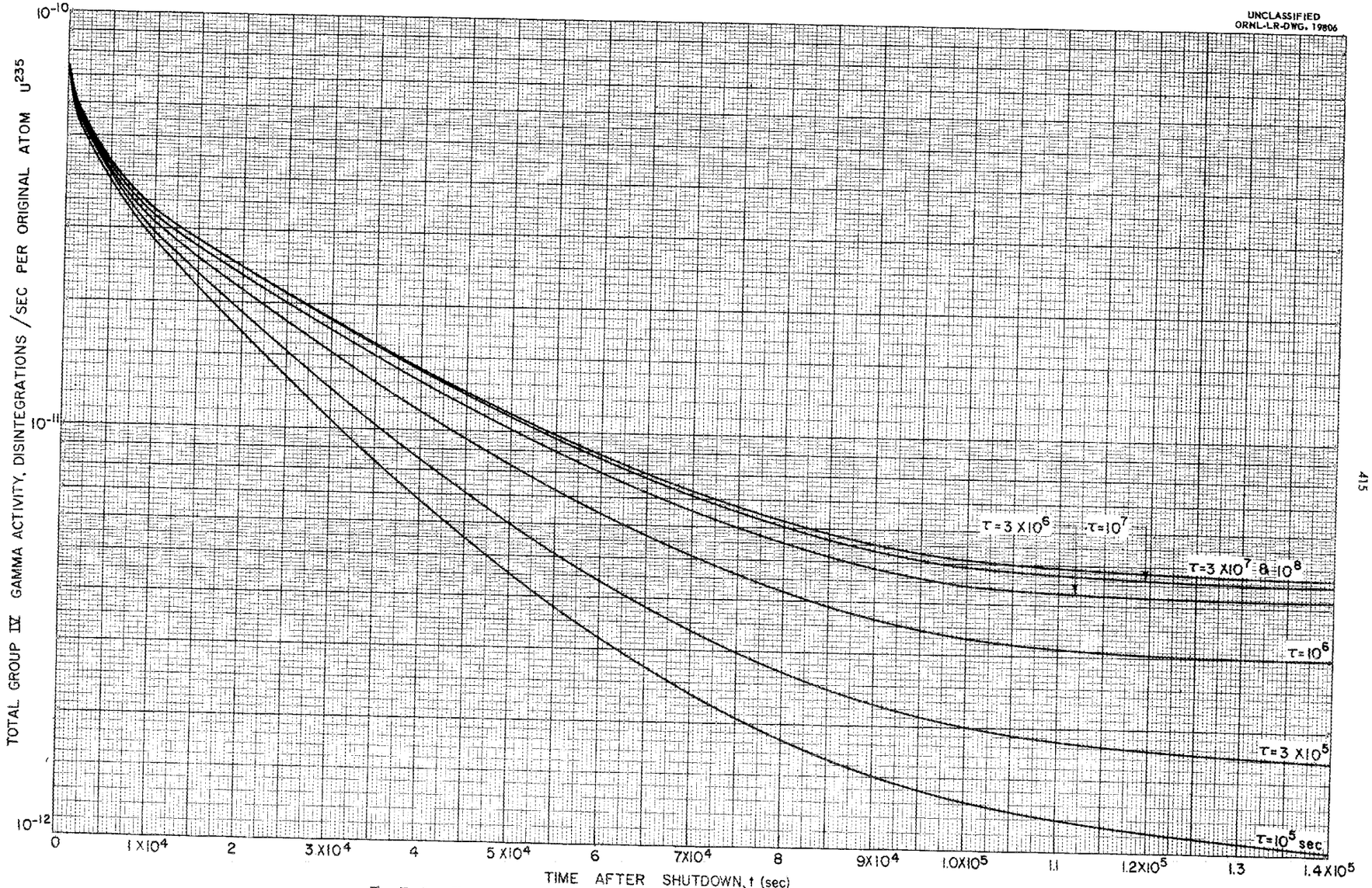


Fig. T-51. Total Group IV (> 1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{12}$ n/cm$^2$/sec.

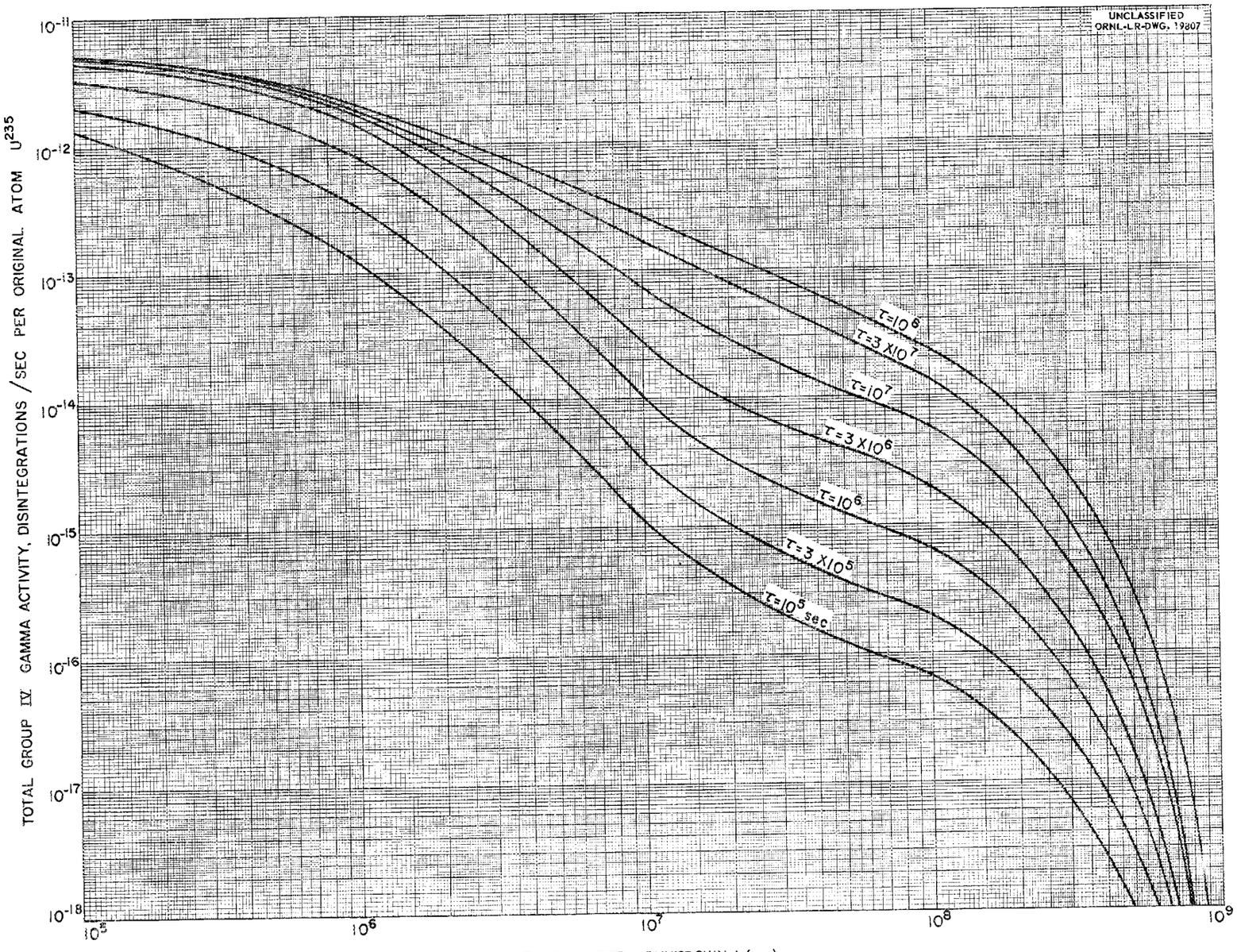


Fig. T-5.1 a. Total Group IV (>1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{12}$ n/cm$^2$/sec.

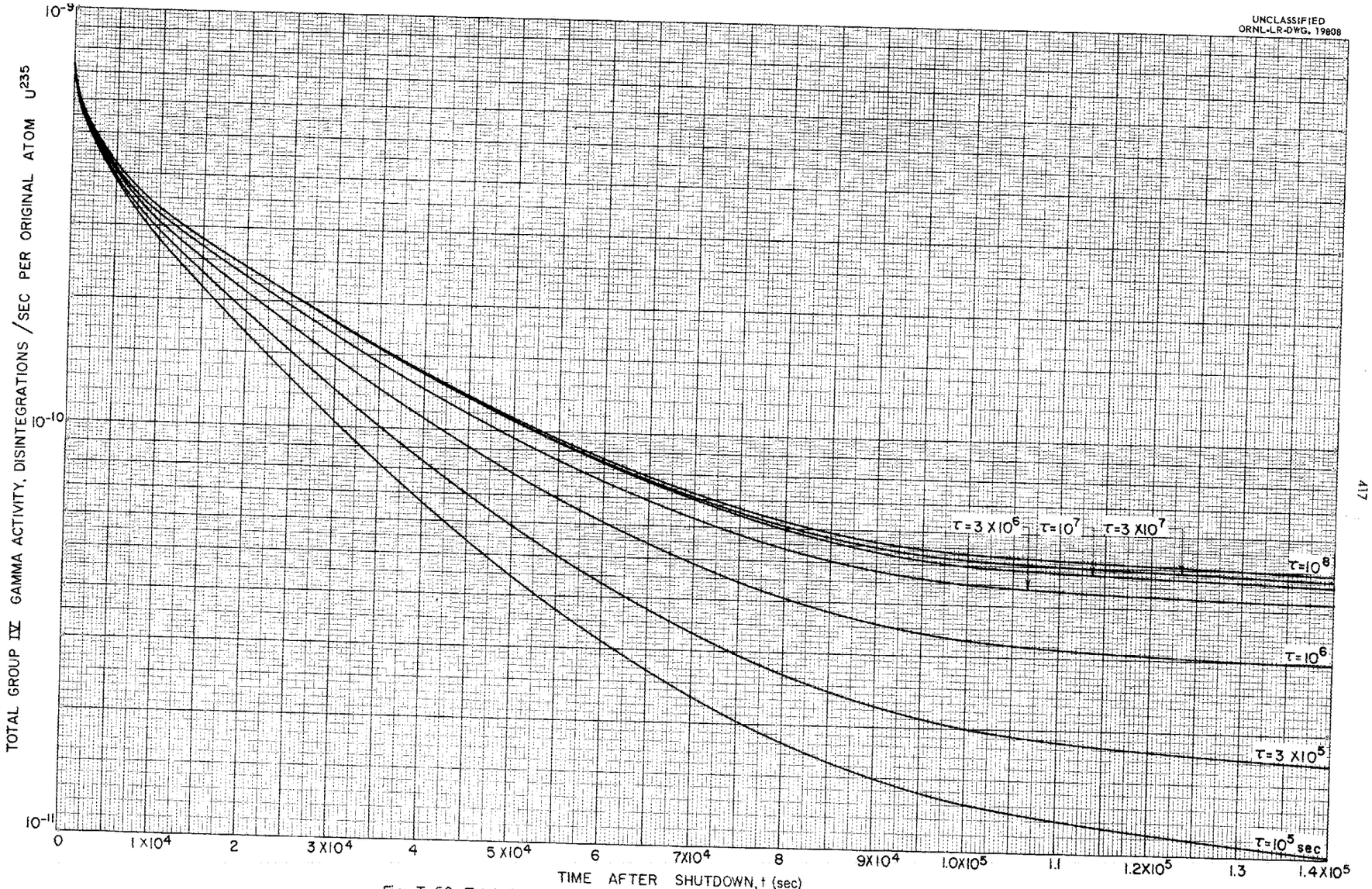


Fig. T-52. Total Group IV ( > 1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{13}$ n/cm$^2$/sec.

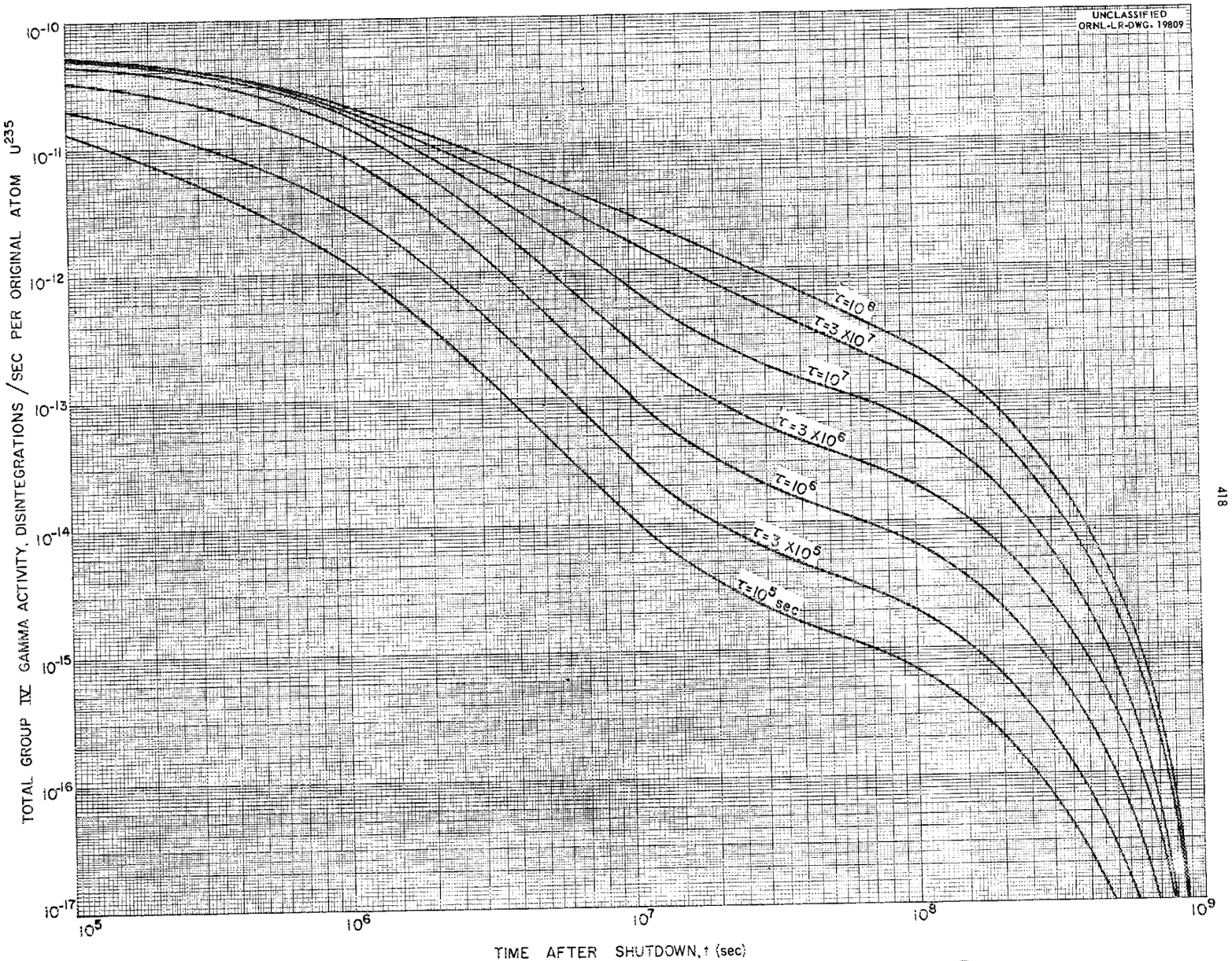


Fig. T-52 a. Total Group IV (> 1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{13}$ n/cm$^2$/sec.

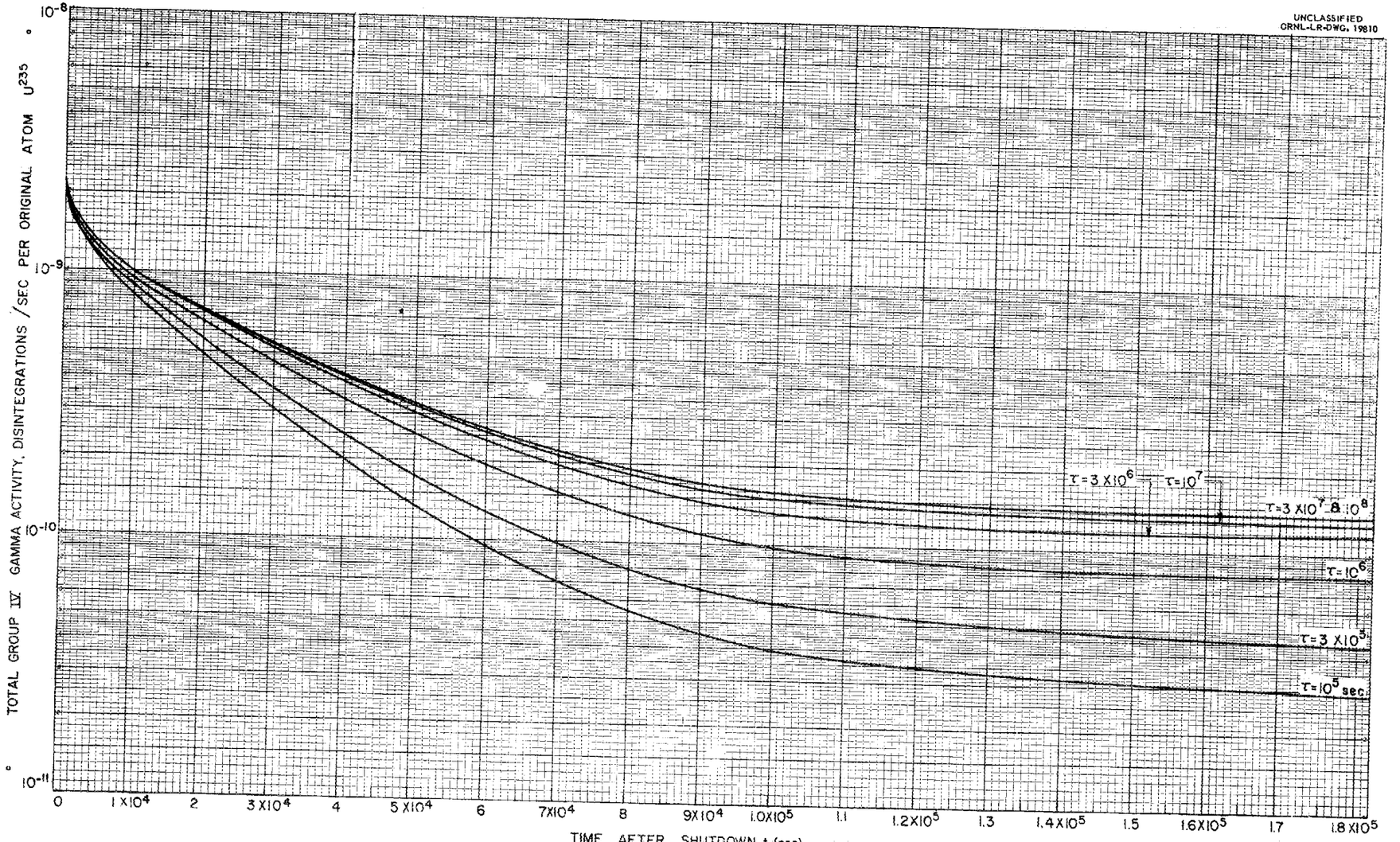


Fig. T-53. Total Group IV (>1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3X10^{13}$ n/cm$^2$/sec.

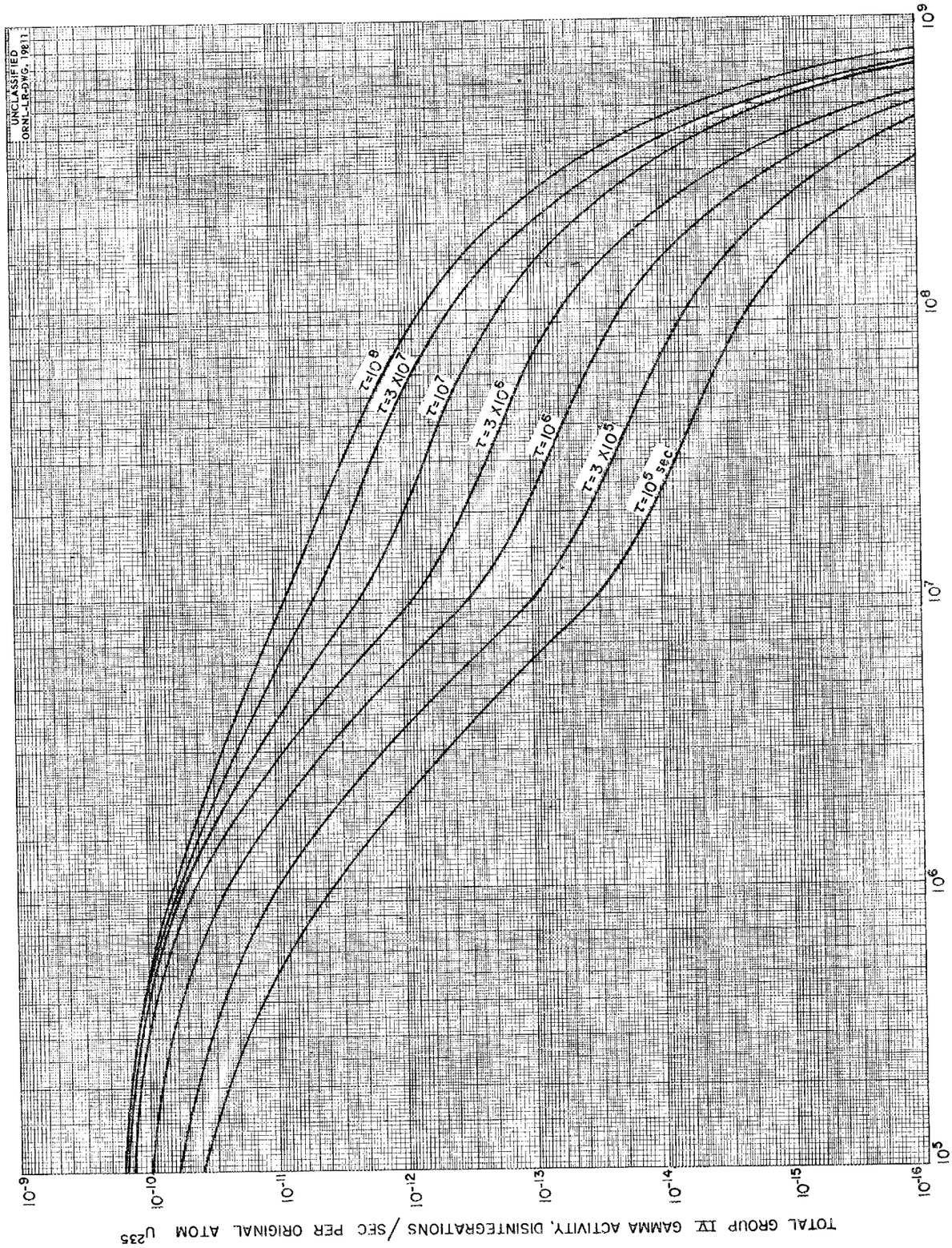


Fig. T-53a. Total Group IX (≥1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{13}$ n/cm²/sec.

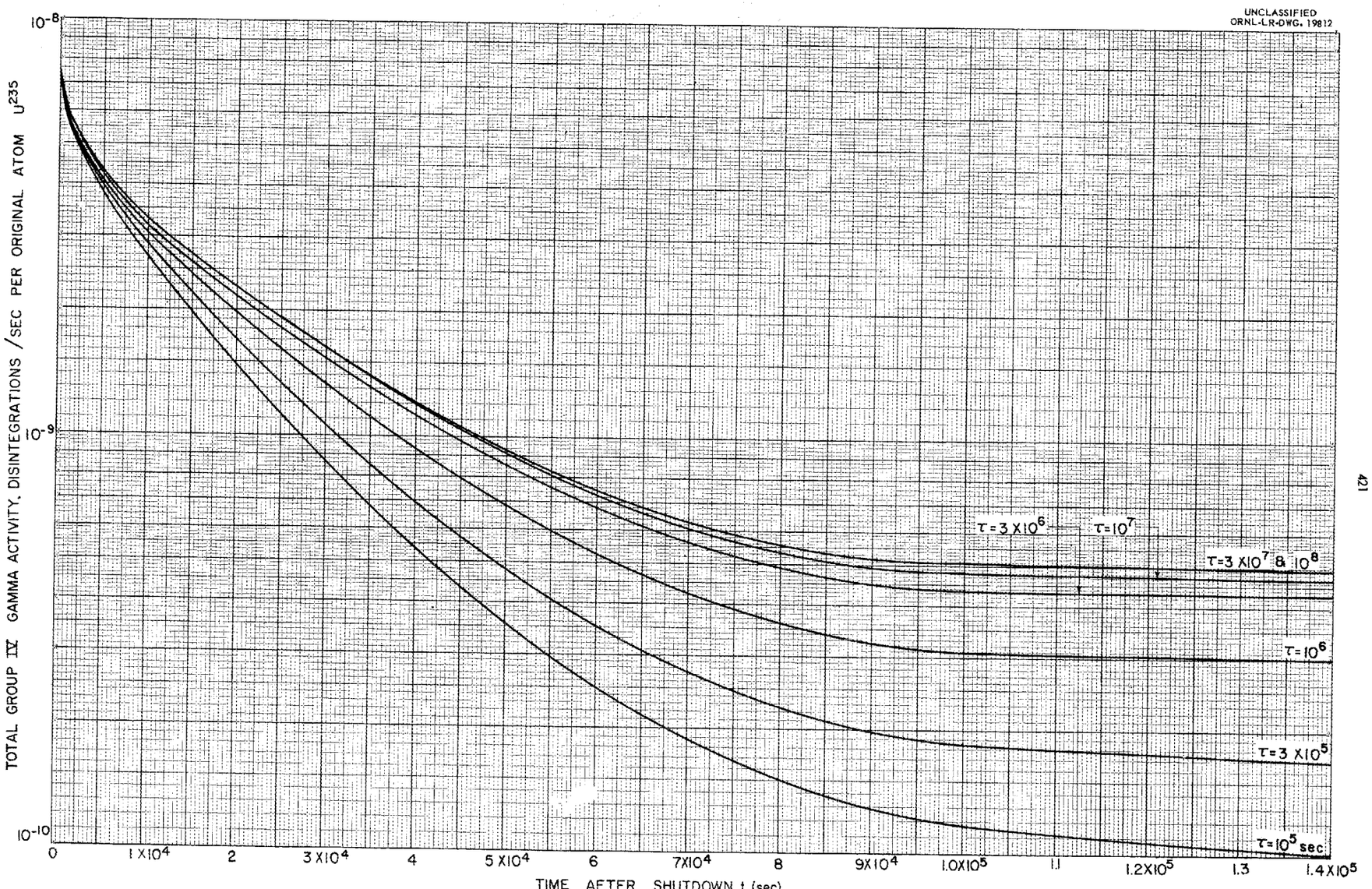


Fig. T-54. Total Group IV (>1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{14}$ n/cm$^2$/sec.

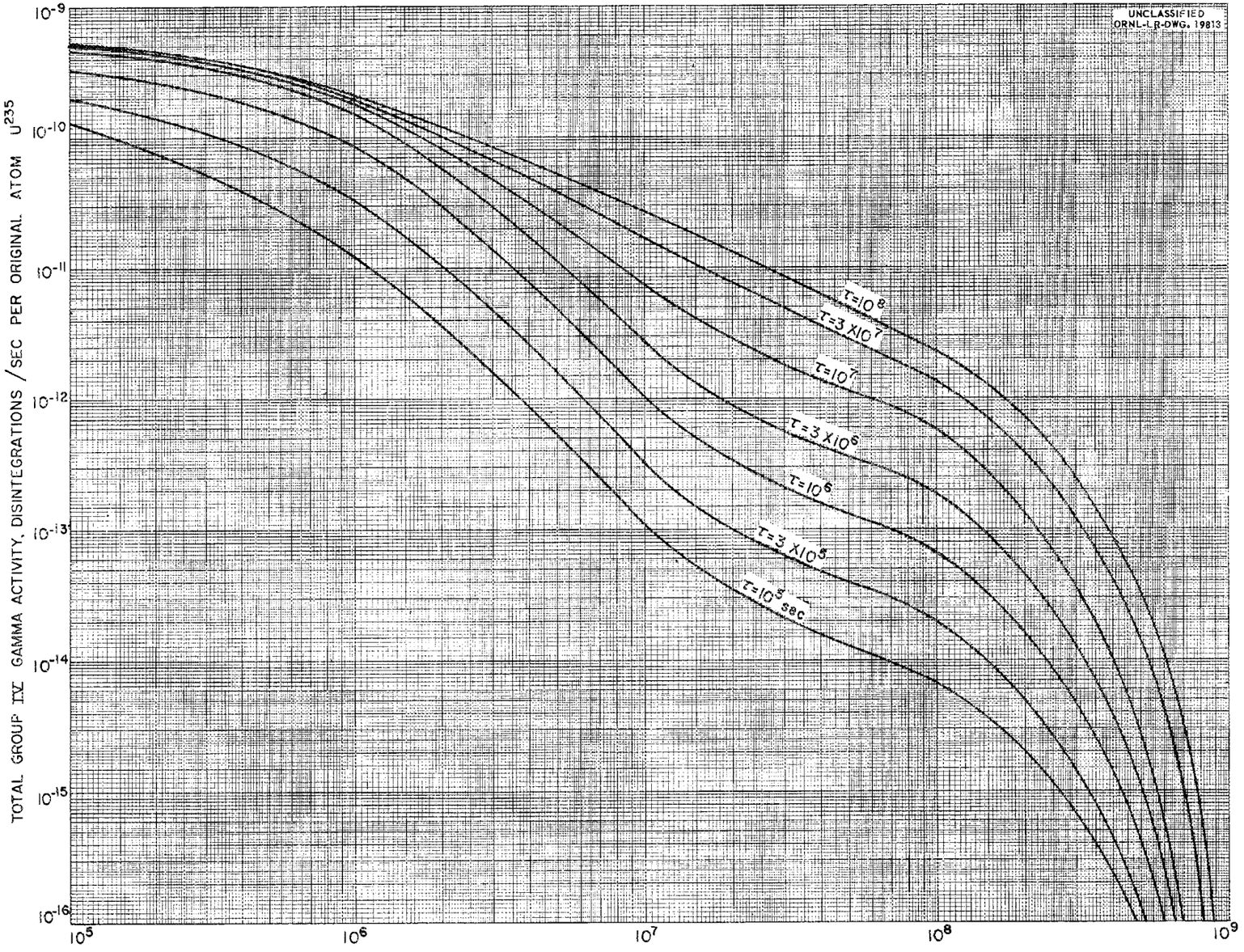


Fig. T-54a. Total Group IV (>1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{14}$ n/cm$^2$/sec.

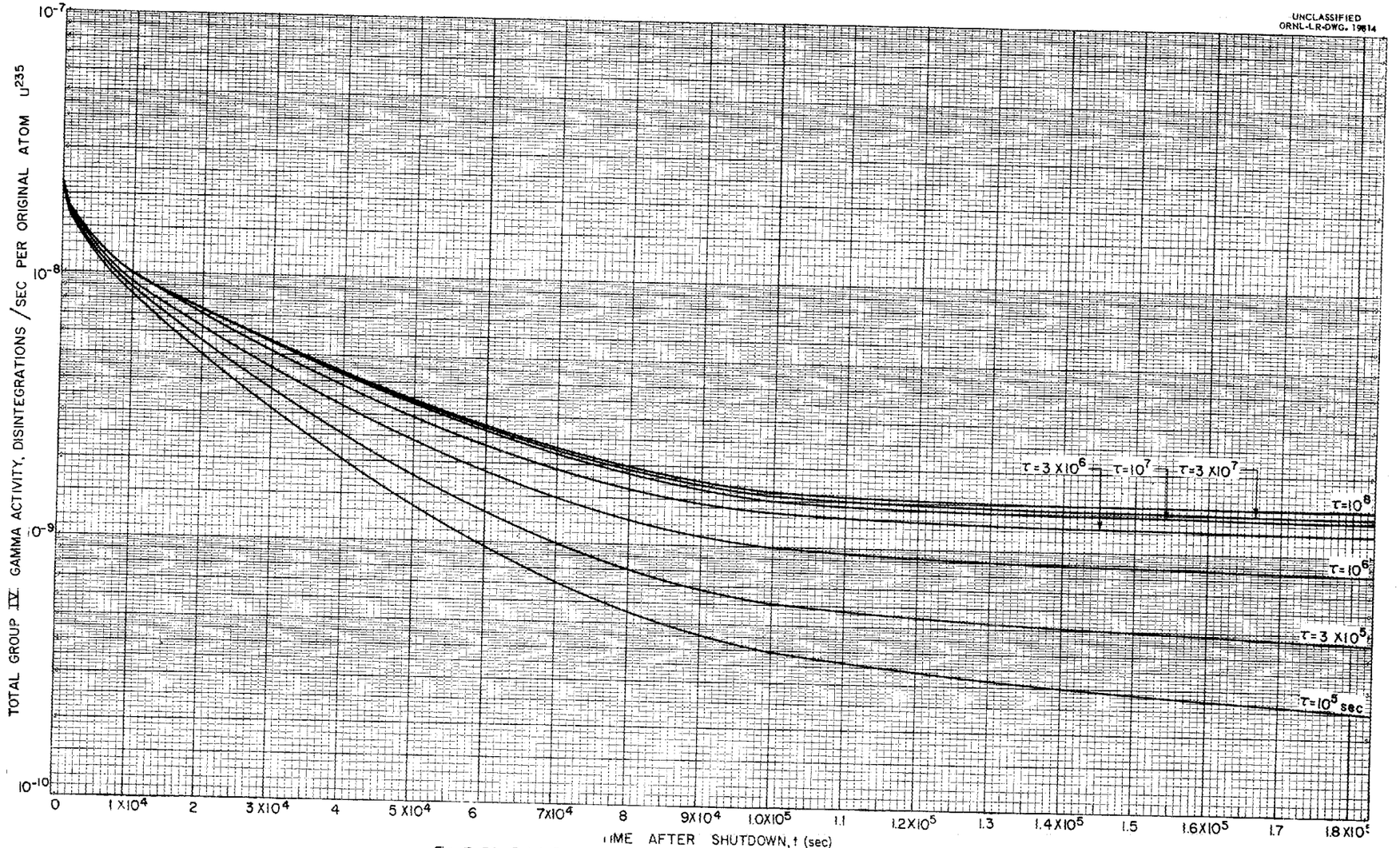


Fig. T-55. Total Group IV (> 1.70Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3X10^{14}$ n/cm$^2$/sec.

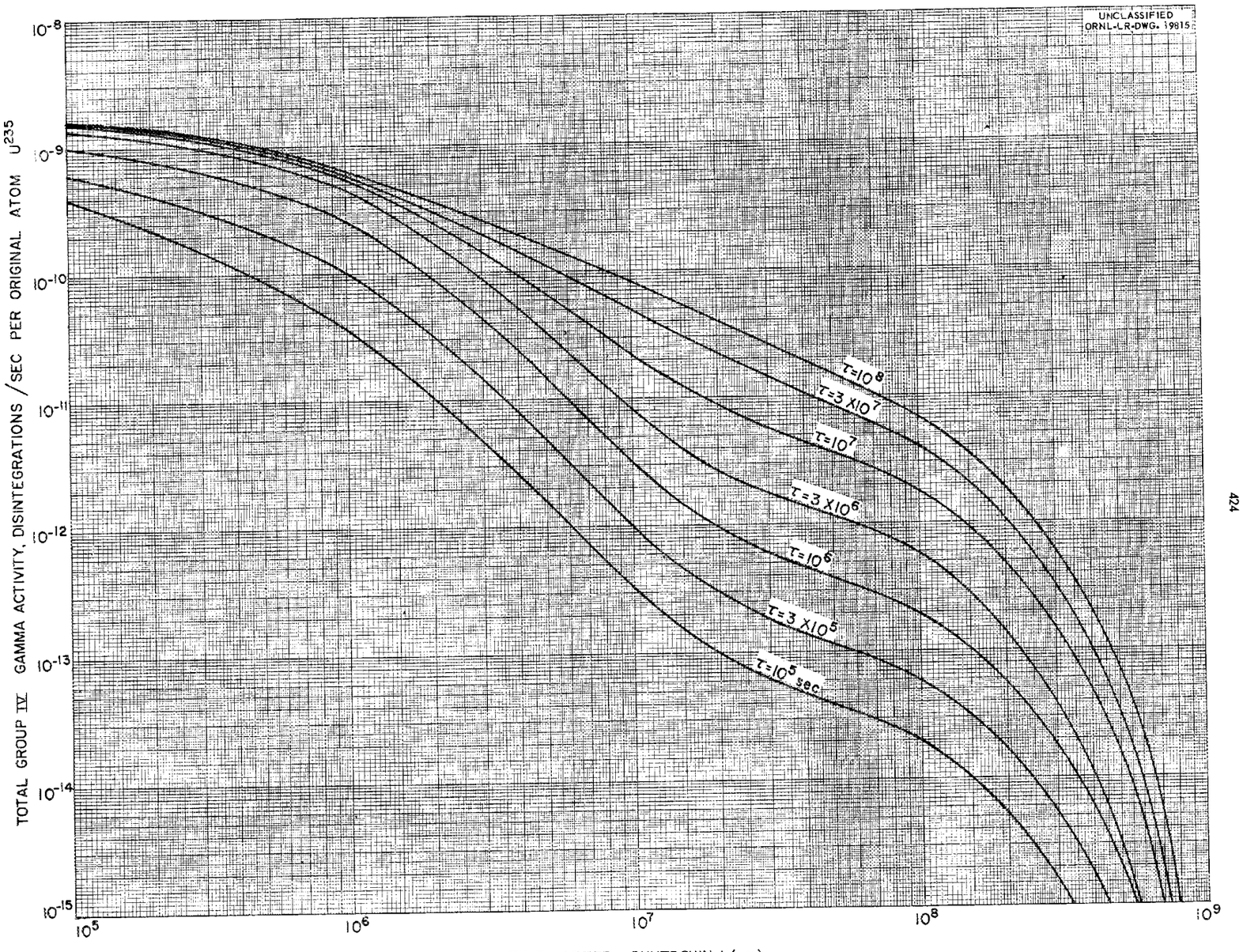


Fig. T-55a. Total Group IV (>1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 3 \times 10^{14}$ n/cm$^2$/sec.

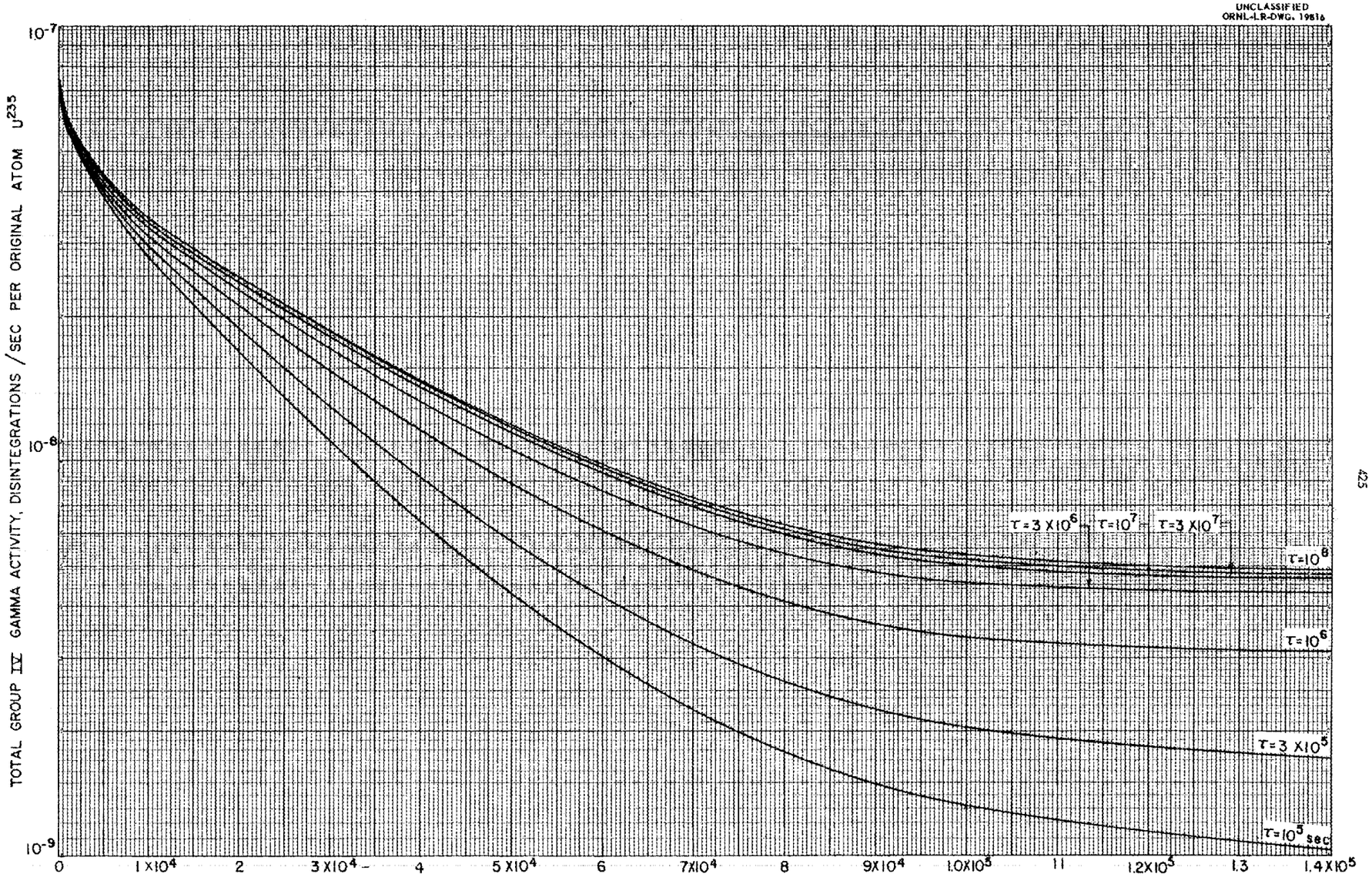


Fig. T-56. Total Group IV (>1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm$^2$/sec.

Revised Pg



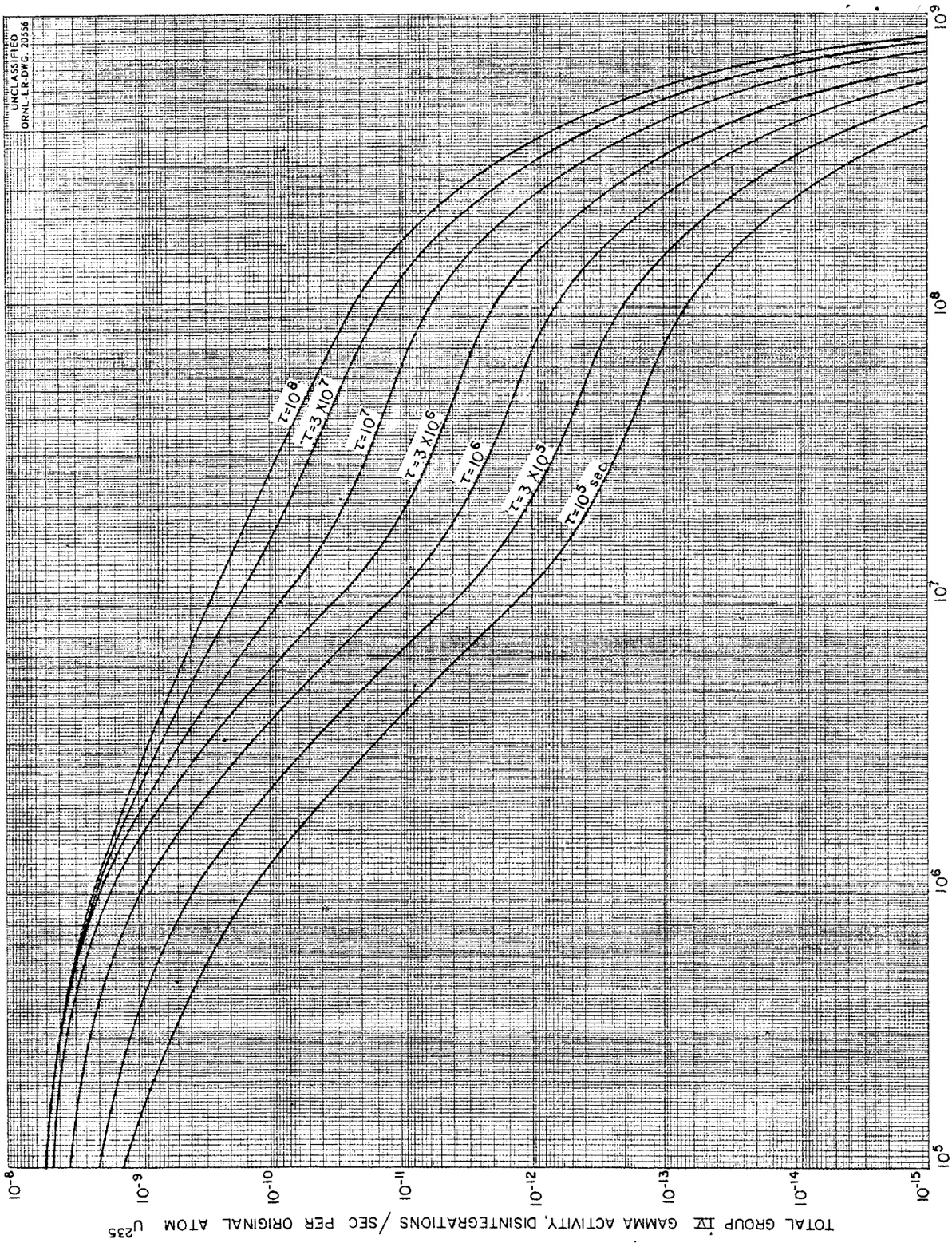


Fig. T-56a. Total Group IV (> 1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm²/sec.

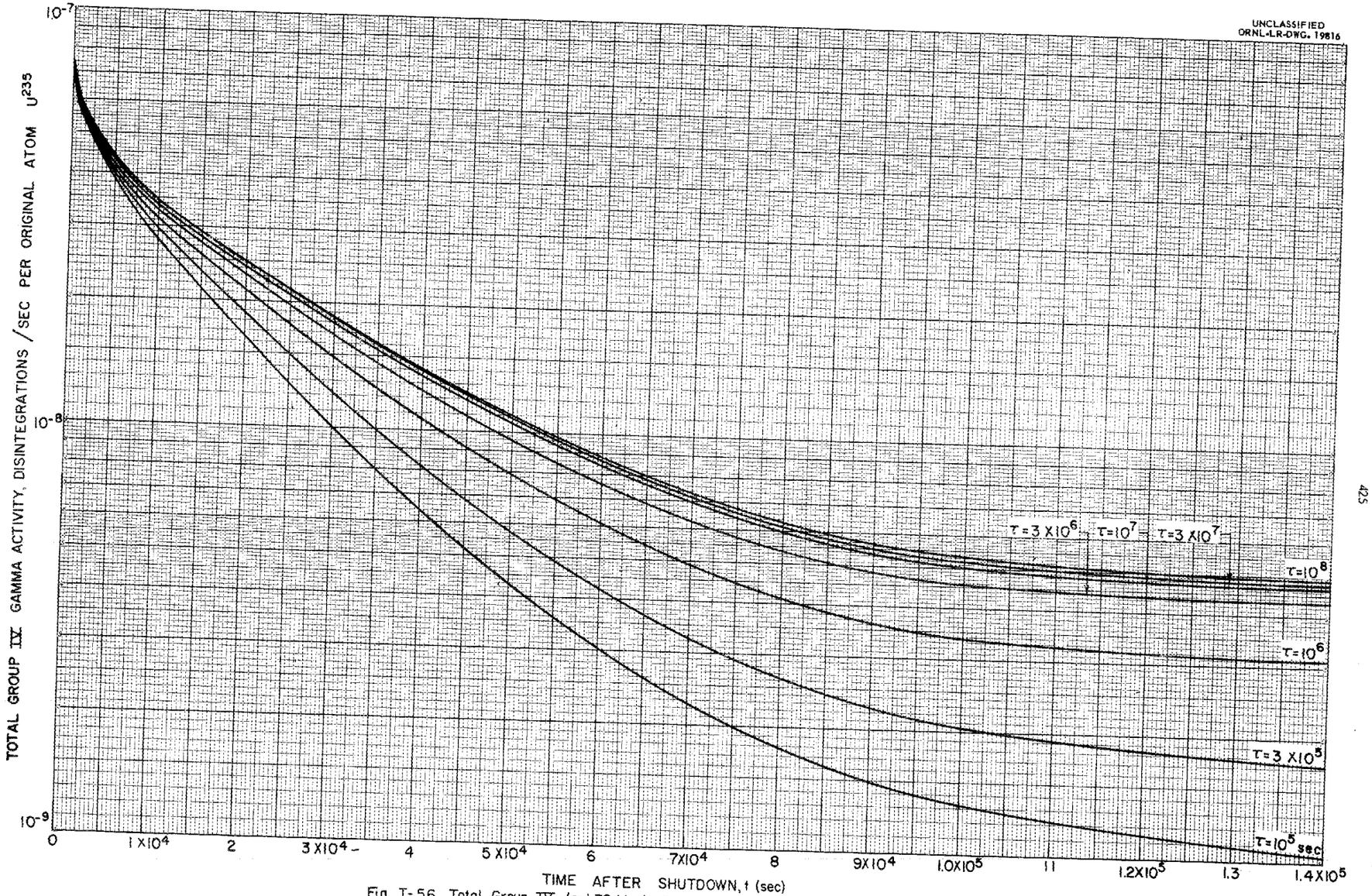


Fig. T-56. Total Group IV (>1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm$^2$/sec.

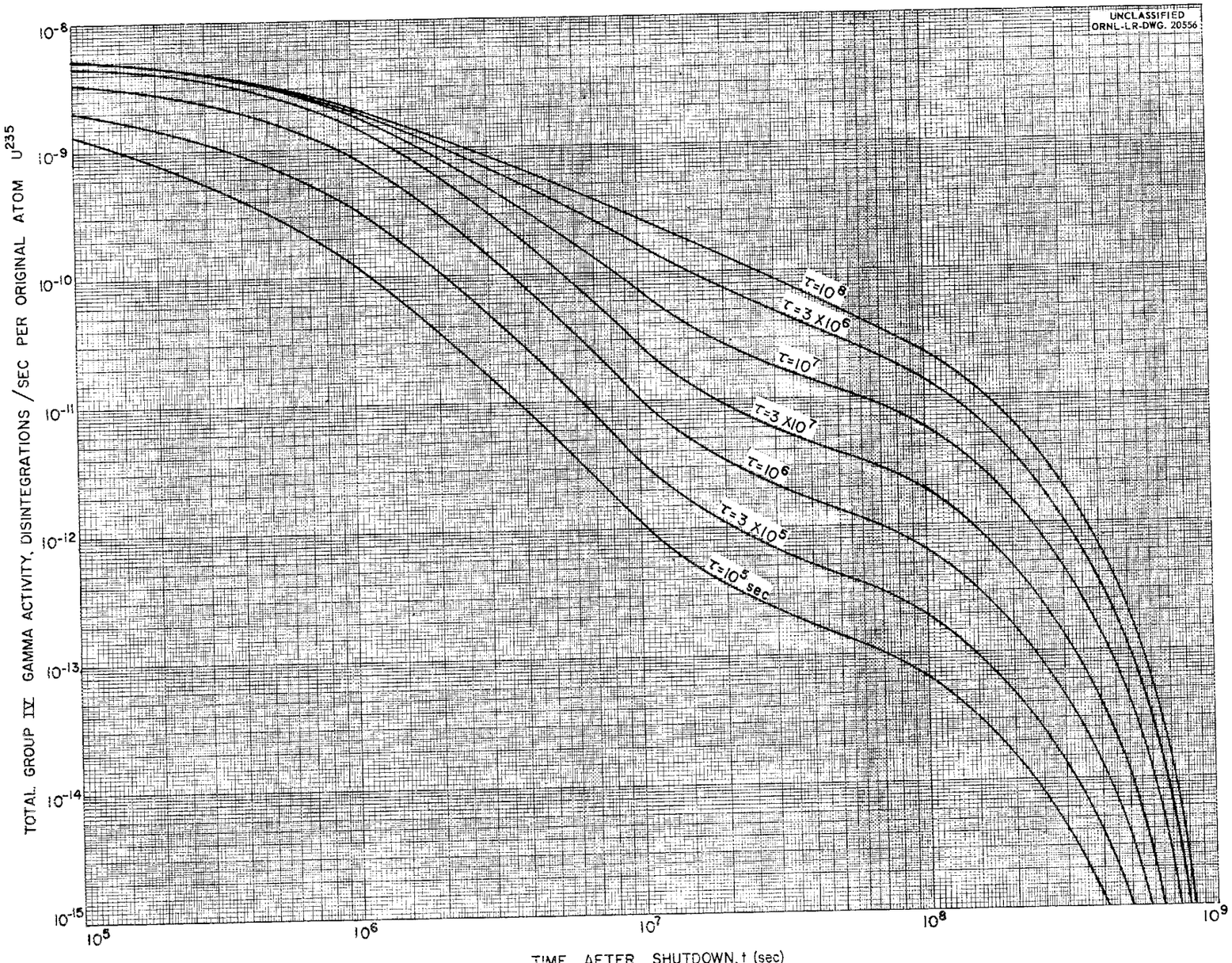


Fig. T-56a. Total Group IV (> 1.70 Mev) Gamma Activity as a Function of Irradiation Time and Shutdown Time for $\phi = 10^{15}$ n/cm$^2$/sec.