

Fig.1 Radio activity of the air expressed in  $\mu\text{Sv/h}$  measured at monitoring stations about 40 km from Fukushima nuclear power plant.

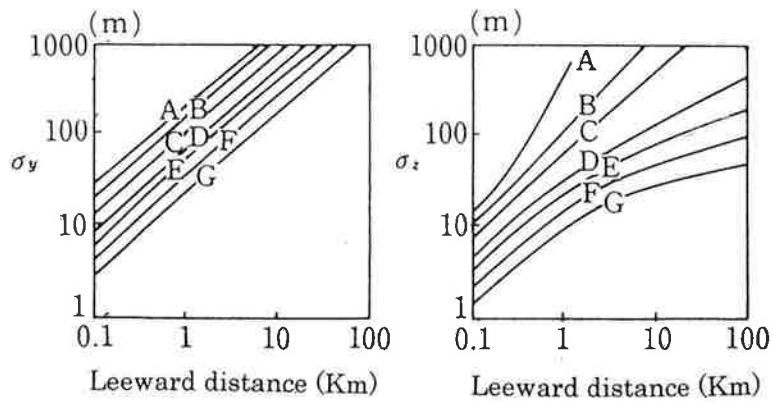


Fig.2 Pasquill-Gifford graph, with stability of the atmosphere as parameter. For A~G, see Table 1.

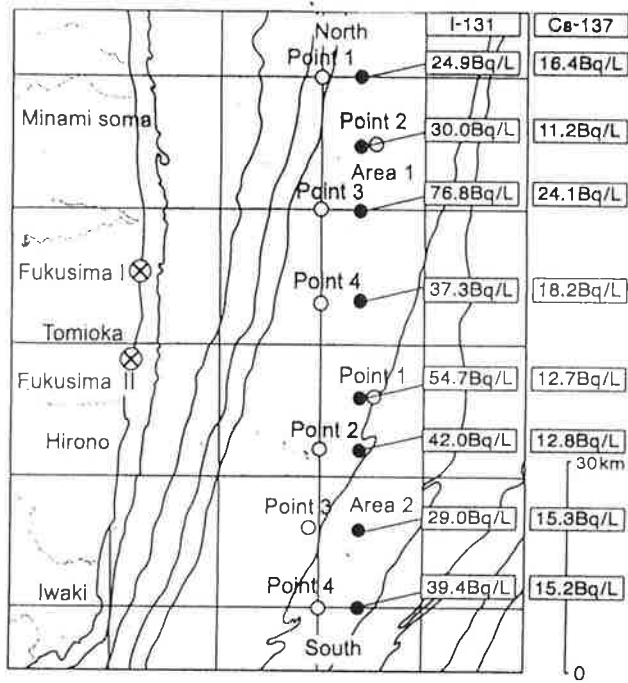


Fig.3 The radio active matter concentrations the seawater off coast of Fukushima nuclear power plant.

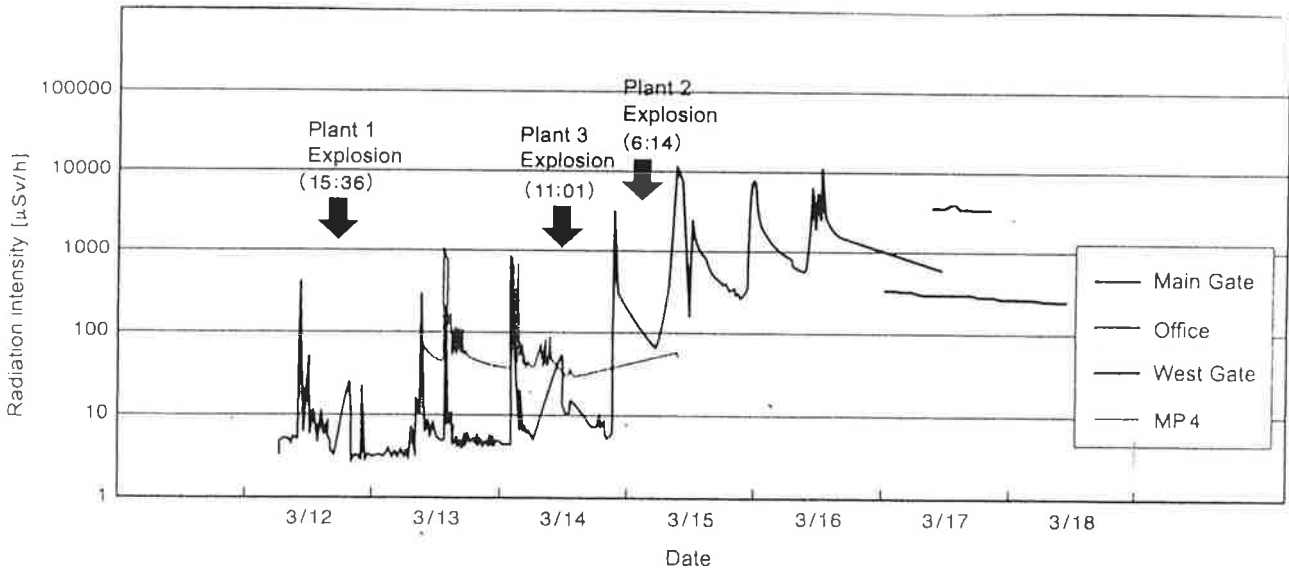


Fig.4 The sequence of events at the initial stage of the accident at Fukushima nuclear power.

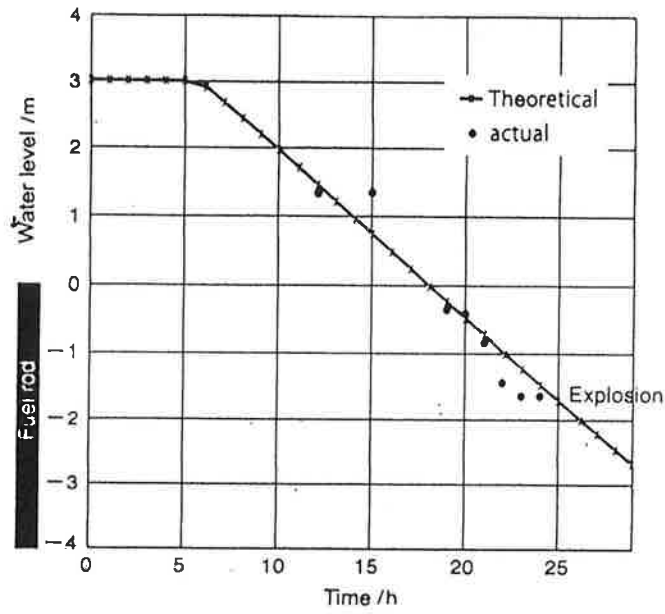


Fig.5 The water level of the reactor No.1 observed and theoretically estimated.

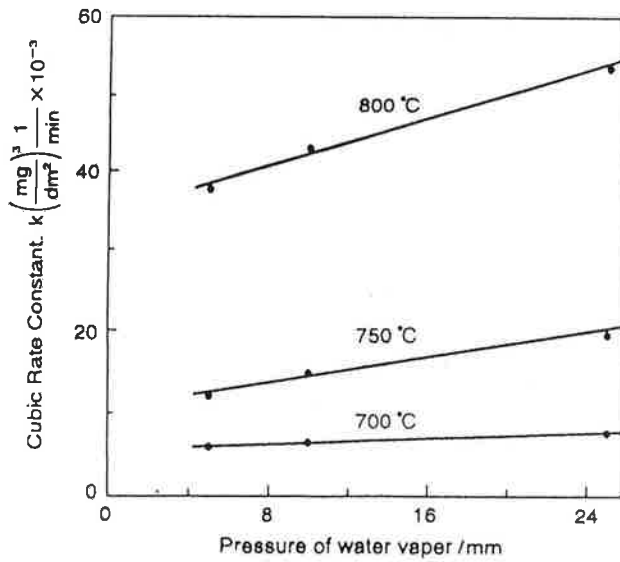


Fig.6 Oxidation of Zircaloy-2 in water vapor.  
Cubic rate constant R.E. Westman JECS 111

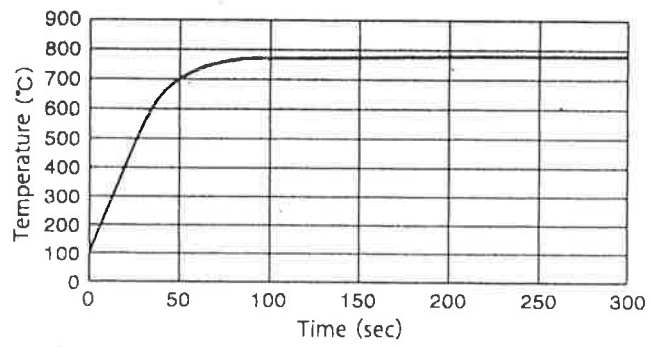


Fig.7 Temperature rise of the section of fuel rod dried up and exposed to water vapor when the generated heat is only released by radiation.

Table 1 Categorical Classification of the Stability in Japanese Pasquill-Gifford graph

| Wind Speed m/s (10m above ground) | < 2   | 2 ~ 3 | 3 ~ 4 | 4 ~ 6 | 6 < |
|-----------------------------------|-------|-------|-------|-------|-----|
| Solar Radiation                   |       |       |       |       |     |
| $\geq 50$                         | A     | A ~ B | B     | C     | C   |
| 49 ~ 25                           | A ~ B | B     | B ~ C | C ~ D | D   |
| $\geq 24$                         | B     | C     | C     | D     | D   |
| Cloudy (8 ~ 10)                   | D     | D     | D     | D     | D   |
| Night                             |       |       |       |       |     |
| amount of Cloud (5 ~ 10)          | (G)   | E     | D     | D     | D   |
| amount of Cloud (0 ~ 4)           | (G)   | F     | E     | D     | D   |

Table 2 Data used for estimation of water level in the reactor

|   |                            |
|---|----------------------------|
| Radius of reactor                               | 2.4 m                      |
| Height of reactor                               | 20 m                       |
| Initial water level                             | 7.5 m                      |
| Length of fuel rod                              | 4 m                        |
| Initial Water temperature                       | 40 °C                      |
| From fuel rod to reactor bottom                 | 0.5 m                      |
| Number of fuel rods in the reactor              | 400                        |
| Residual heat generation of a fuel rod          | 6000 kcal/h                |
| Residual heat generation in the reactor         | 2400000 kcal/h             |
| Pressure  | 0.353 MPa                  |
| Total volume of water in the reactor            | 135.7168026 m <sup>3</sup> |
| Boiling temperature of water under the pressure | 139 °C                     |
|   |                            |
| Rate of temperature rise in the reactor         | 17.68 °C/h                 |
| Time required from 40°C to 139°C                | 5.60h                      |

Table 3 Data for the oretical estimation of the temperature rise of the dried part of fuel rod exposed to water vapor when the generated heat isreleased only by radiation

|  |   |
|--|---|
| Residual heat generation of a fuel rod (Q) | 6000 kcal/h                                 |
| Heat generation for unit surface area (I)  | 69464.501 W/m <sup>2</sup>                  |
| Boltzmann Constant ( $\sigma$ )            | 5.67E-08 W/(m <sup>2</sup> K <sup>4</sup> ) |
| Radius of a fuel rod (d)                   | 0.008 m                                     |
| Length of fuel rod (L)                     | 4 m   |
| Surface area of a fuel rod (S)             | 0.100531 m <sup>2</sup>                     |